The American Association for the Advancement of Science (AAAS) is the world’s largest general scientific society and publisher of the journal *Science* (www.sciencemag.org) as well as *Science Translational Medicine*, *Science Signaling*, a digital, open-access journal, *Science Advances*, and beginning in 2016, two new journals—*Science Robotics* and *Science Immunology*. AAAS was founded in 1848 and includes some 250 affiliated societies and academies of science, serving 10 million individuals. *Science* has the largest paid circulation of any peer-reviewed general science journal in the world. The non-profit AAAS (www.aaas.org) is open to all and fulfills its mission to “advance science and serve society” through initiatives in science policy, international programs, science education, public engagement, and more. For the latest research news, log onto EurekAlert! (www.eurekalert.org), the premier science-news website, a service of AAAS.
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Through microscopes and telescopes, new scientific and engineering insights allow us to see worlds we never knew existed, and drive innovation to improve people’s lives. The blurry microscopes of the 1920s gave way to a revolution in imaging that vividly revealed 46 human chromosomes, making it possible to identify the cause of genetic conditions such as Down’s syndrome. The sequencing of the human genome, coupled with the power of computer-generated pattern recognition, uncovered the genetic flaws that cause diverse childhood leukemias, many of which are now treatable.

AAAS and the Science family of journals are working to further such scientific progress by advocating for the research enterprise, and by bringing scientists and engineers together worldwide to address urgent societal concerns. As part of an ambitious Transformation Initiative, AAAS in 2015 began focusing more intensively on advocacy and service to members. We spoke out against barriers to women in science, for example, and we helped scientists and engineers more effectively communicate key scientific findings. We also worked to improve science education, and we engaged directly with the public, through such events as Family Science Days. AAAS has transformed its journals, too, by adopting digital-first strategies to enhance scientific communication. Trellis, a new digital communication and collaboration platform, is being developed to make it easy for individuals, collaborations, and organizations to work together and share scientific information.

AAAS exerts a unique influence by informing the public and our representatives about the importance of science to our nation and the world. As part of those efforts, the association advocates for science diplomacy and international research collaboration while promoting inclusiveness and diversity in science. In 2015, for instance, the association administered travel awards for women scientists participating in an international Gender Summit, through a National Science Foundation (NSF) program, Mentoring Women in International Research Collaborations (MWIRC) in STEM. Also in 2015, AAAS built upon its historic 2014 agreement with the Cuban Academy of Sciences. Collaboration across three fields of neuroscience, supported by the Lounsbery Foundation and others, will result in a scientist-exchange program between the two countries (see pages 12-13).
To further encourage inclusiveness and reward innovation globally, AAAS in 2015 launched the Marion Milligan Mason Awards, honoring early-career women in the chemical sciences (page 31), and it again administered the Global Innovation through Science and Technology (GIST) competition, a U.S. State Department effort to encourage young entrepreneurs (13). AAAS provided essential recognition for talented journalists who communicate scientific advances and issues to the public, too: For the first time since 1945, the historic AAAS Kavli Science Journalism Awards program (9 and 35) expanded to accept international entries, thanks to a generous doubling by The Kavli Foundation of the program’s endowment. The AAAS Mass Media Science and Engineering Fellows program, dating to 1974, also continued to promote excellence in science journalism, by dispatching science and engineering scholars to newsrooms (27).

Communicating the scientific reality of global climate change was the focus of a policy briefing on Capitol Hill and a related AAAS symposium, hosted by the Carnegie Institution for Science. “Climate Science, 50 Years Later,” supported by the American Meteorological Society and the Linden Trust for Conservation, commemorated the 50th anniversary of the first official climate-change warning to a U.S. President and reaffirmed the 2014 AAAS What We Know report. The symposium also marked the launch of the Alan I. Leshner Leadership Institute, which announced the first cohort of 15 fellows—all climate scientists with an interest in promoting science-society dialogue. The Leshner Leadership Fellows will be supported by the AAAS Center for Public Engagement with Science and Technology, and the association’s popular Communicating Science workshops, which have provided training for more than 6,700 scientists and engineers since 2008 (9).

AAAS advocacy work in 2015 included strong opposition to ideological attacks on climate-change scientists and their findings, a call for research to better understand the root causes of gun violence, media interviews on the value of federal investments in science, and more (4-7). Our advocacy efforts were bolstered by programs that help to bring scientific insight to the policymaking process. These included the association’s well-respected analysis of U.S. research and development funding trends (18), and the AAAS Science & Technology Policy Fellowships, which in 2015 sent 280 scientists and engineers to work with Congress and many executive-branch agencies or departments as well as the Bill and Melinda Gates Foundation (15). To prepare the next-generation of civic-minded innovators, AAAS also supported a wide range of capacity-building programs, from efforts to improve K-12 science curriculum, to the NSF’s Emerging Researchers National Conference in STEM (24-27).

In 2015, scientific reports published by the growing Science family of journals—including Science Translational Medicine, Science Signaling, the open-access journal Science Advances, and coming soon, Science Robotics and Science Immunology—described a promising new melanoma vaccine trial, an enhanced lithium-air battery design, genetic tools to combat elephant poaching, a new hominin mandible that raised fascinating questions about human evolution, and much more. (Incidentally, a 2015 Science Advances study on the sixth mass extinction made its way into the top 5% of all research outputs ever tracked on Altmetric.com, a metrics reporting site for scholarly content.) Every member of AAAS plays an integral role in accelerating such advances, by supporting the association’s nonprofit programs, advocacy work, and scientific communication. AAAS members and donors allow us to serve as a voice and force for science worldwide, helping us to advance science in service to society.
AAAS continued in 2015 to advocate for the scientific enterprise through testimony, letters to policymakers, op-ed articles, and other outreach efforts. In particular, the association urged adequate, sustained U.S. federal support for research and development; action to address global climate change; broader international research cooperation; advances in science education; and more.

**Advocacy for the Scientific Enterprise**

**21 April.** In a letter to U.S. policymakers, AAAS expressed concern about the America COMPETES Act, noting that it did not follow key principles for steady and sustained real growth in the major federal research agencies. AAAS had earlier teamed up with other organizations to develop a set of Guiding Principles for reauthorization of the COMPETES Act. The AAAS letter urged policymakers to reconsider language that seemed to restrict the National Science Foundation’s ability to build new major research facilities, while barring Department of Energy-supported research from being used in evidence-based federal policymaking.

**21 April.** Responding to a U.S. Government Accountability Office report on the detrimental impacts of policies that have prevented many federal employees from participating in scientific conferences, AAAS and dozens of other leading organizations decried the restrictions: “Current policies are reducing government scientists’ and engineers’ participation in scientific and technical conferences while the administrative cost of overseeing these activities has increased significantly,” the group wrote to top policymakers.

**27 April.** AAAS President Geraldine Richmond expressed deep concerns about unintended
consequences of the Secret Science Reform Act of 2015, in a letter to policymakers. Language in the legislation would prevent the Environmental Protection Agency from using research conducted during one-time events such as the Deepwater Horizon oil spill, she noted. The legislation would also require a level of reproducibility that would be impossible for very long-term studies, which are usually tested and verified using statistical modeling. While transparency and high research standards are essential, Richmond said, unrealistic requirements could have a chilling effect on research, and increase costs. Earlier in 2015, AAAS and more than two-dozen other organizations sent a similar letter to the U.S. House Majority Whip. Richmond also wrote to the Chairman of the House Science, Space, and Technology Committee about the same issue.

1 June. Gerry Fink, AAAS chair, wrote to policymakers to oppose appropriations language that singled out four National Science Foundation (NSF) research directorates for increased funding, yet left out the important work of the Geosciences and Social, Behavioral and Economic Sciences area. Fink referenced the AAAS Geospatial Technologies Project as an example of exemplary work in the overlooked fields. Such projects “provide critical information on the impact of remote, isolated conflicts on civilians; a host of human rights violations; damage to sites of cultural heritage; environmental and social justice issues; cross-border conflicts; and indigenous rights,” Fink pointed out.

19 June. The 21st Century Cures Act was commended by the AAAS chair, in a letter to members of the House of Representatives. The legislation “authorizes roughly $1.5 billion in increases over three years and creates an Innovation Fund of $2 billion per year over five years,” significantly supplementing regular appropriations to the U.S. National Institutes of Health (NIH), Gerry Fink noted. “Robust, sustained funding for NIH is the pathway to progress.”

25 October. AAAS CEO Rush Holt appeared on MSNBC’s “Up With Steve” program, arguing for more sustained, robust U.S. federal funding for science and technology. “In every area of human welfare, there are real gains to be made” through scientific research, Holt said. “We are nowhere close to investing as much as we could productively invest.”

11 November. In an op-ed for New Scientist, the AAAS CEO urged policymakers to “unshackle U.S. science,” by dropping spending caps that were suppressing funding for research and development. “Science and technology are the wellspring of innovation, new jobs and economic progress, but the United States is underinvesting in them,” Rush Holt wrote. A bipartisan budget deal reached in late October provided much-needed relief for federal science agencies, he noted. However, the deal was set to expire after two years, meaning that it was only a temporary solution to the spending caps known as “sequestration,” which took effect in 2013.

Communicating Climate Science

29 October. Five decades after the first official climate-change warning to a U.S. President, and shortly before a historic summit in Paris, AAAS organized a daylong symposium and a related policymaker briefing to call for action. “Climate Science, 50 Years Later” featured presentations by more than a dozen prominent scientists who described the impacts of climate change, based on scientific evidence, and evaluated options for the future. “The climate is changing at a pace and in a pattern that is not explainable by natural influences,” said John P. Holdren, a past AAAS president who serves as Assistant to the President for Science and Technology and Director of the White House Office of Science and Technology Policy. “We know that with global temperature about 0.9 degrees Celsius above pre-industrial temperatures, these changes are already causing significant harm to life.”

24 November. AAAS and seven other leading organizations expressed “grave concern” about a Congressional inquiry that unfoundedly called into question the integrity of federal scientists whose research, published in Science, seemed to debunk claims of a global-warming slowdown or “hiatus.” In a letter to Rep. Lamar Smith (R-Texas), chairman of the House Committee on Science, Space, and Technology, the group acknowledged the importance of appropriate congressional oversight of federally funded research, but emphasized that “scientists should not be subjected to fraud investigations or harassment simply for providing scientific results that some may see as politically controversial.”
7 December. As members of the Senate Committee on Commerce, Science, and Transportation prepared for a hearing on the magnitude of human impacts on the Earth’s climate, the AAAS chair sent a letter to Capitol Hill, confirming the scientific consensus on the reality of human-caused climate change. “Climate change is occurring, and rigorous scientific research demonstrates that the greenhouse gases emitted by human activities are the primary driver,” Gerry Fink wrote, referencing an earlier statement of the AAAS Board of Directors.

Gun-Violence Research
3 December. In response to news headlines about mass shootings, AAAS once again called for a better understanding of the root causes of gun violence by freeing up research funding for the U.S. Centers for Disease Control and Prevention. The research funding had been essentially frozen for two decades. “It is time for Congress to approve sensible steps to study gun violence as a public health issue,” the AAAS CEO said. “Quite aside from the ongoing political debates over gun control, it is essential that unbiased scientific research be used to gather data on this spreading epidemic that claims so many lives each year. The epidemiology of gun violence has been underfunded for far too long.” Holt added that there also is a role for science to play in providing technological solutions to gun violence, including safer guns that can only be fired by authorized users.

International Engagement
19 August. Marty Moss-Coane, whose popular public radio program offers insights on an eclectic range of topics, spoke with the AAAS CEO and then Chief International Officer Vaughan Turekian about the U.S.-Iran nuclear agreement, Cuba, climate change, Ebola, and more. The conversation, which aired on WHYY’s RadioTimes program, also included historian Audra Wolfe. Scientific progress “depends on the free flow of ideas, and evidence-based thinking is central to it,” CEO Rush Holt said. “Those things have democratizing and civilizing effects. Science can actually advance diplomacy and improve political and diplomatic relations.”

11 September. Science diplomacy was also the focus of a Science Friday segment in which host Ira Flatow interviewed the AAAS CEO and the Chief International Officer. CEO Holt, who had earlier joined other leading physicists in signing a letter to President Obama that endorsed the Iran Nuclear Deal, noted that being a scientist comes with both benefits and civic obligations to communicate science to the public, and to policymakers.

Science Education For All
25 September. The world needs talented scientists to solve the problems of the 21st century, but talent is wasted when women and minorities face obstacles that keep them out of the field, said Shirley Malcom.
of AAAS, in a live-streamed TEDxMidAtlantic talk. Malcom, who also serves as co-chair of the Gender Advisory Board of the United Nations Commission on Science and Technology for Development, and of Gender InSITE, called for Americans to recognize that talent can come from “every nook and cranny of this country,” and to value diverse perspectives in the sciences. “Today, in 2015, we have got to make a decision as a nation,” she said. “Do we choose to use the talent that is available, or do we choose to give in to the stereotypes about who does or does not belong?”

7 December. With the U.S. Supreme Court set to hear arguments on a case challenging the use of race-conscious admissions at the University of Texas at Austin, AAAS joined the American Educational Research Association (AERA) and nine other organizations in filing an amicus curie (or “friend of the court”) brief, noting that “student body diversity leads to significant educational benefits and prevents the harms of social isolation.” Shirley Malcom, director of Education and Human Resources at AAAS, also took part in a media briefing organized by the AERA.

Scientific Rights, Responsibilities, and Freedoms 31 March. In response to news headlines regarding challenges to the integrity of science, AAAS reaffirmed its commitment to robust, independent peer review as well as the sharing of research results through publications and public discourse, in accordance with well-crafted transparency policies and procedures. “AAAS remains dedicated to promoting the responsible conduct and use of science, and it asks individual scientists and engineers to remain vigilant in ensuring the transparency of the scientific enterprise,” the AAAS CEO wrote in a statement.

Women in Science 13 August. Institution leaders and others in the science community must do more to create welcoming environments for women, minorities, and other underrepresented groups, and “call out unfairness whenever and wherever it appears,” the AAAS director of Education and Human Resources wrote in a Science editorial. “The science community prizes objectivity, but research indicates that this isn’t necessarily reflected in the behavior and choices of scientists,” Shirley Malcom wrote. She noted that AAAS and the Science family of journals were looking internally to make improvements, while also looking outward to society colleagues so as to evaluate larger structural barriers to equality and diversity in science.

4 November. In response to a letter from U.S. Representative Jackie Speier (D-California), who had expressed concerns about gender bias, sexual harassment, and assault against women in science across the community, AAAS President Geraldine Richmond announced that AAAS would play a leadership role in combating such injustices. Noting that such cases are “abhorrent, unacceptable, and inconsistent with the long-standing values of AAAS,” Richmond announced that the association would organize a national Forum on Implicit Bias in Peer Review, to encompass grant-making and publication. She also described a wide range of long-standing AAAS efforts to advance the careers of women in STEM fields.
Advances in imaging technology and information analysis are increasing the speed of scientific discovery, from light-activated proteins that make neural pathways visible, to 3-D printing of fossil artifacts that facilitate shared exploration of evolutionary advances. These and many other developments were explored in the public lectures and technical sessions during the 181st AAAS Annual Meeting, organized around the theme, “Innovation, Information, and Imaging.”

Held for the first time in San Jose, California, the 12-16 February meeting drew more than 9,800 attendees, including researchers, journalists, and students. AAAS’s Family Science Days, two days of free hands-on activities and demonstrations for children and adults, attracted more than 5,000 people.

Massachusetts Institute of Technology geneticist and then AAAS President Gerald Fink described during his presidential address how human chromosomes were initially miscounted when researchers first viewed their fuzzy outlines under a microscope. Improved imaging revealed their actual number as well as the small defects that can lead to disease. Later, geneticists learned that only 2% of genes are actively used to make proteins, while the function of the other 98% remains a mystery, he said.

“That new vision is exciting because it reveals an unknown world that stimulates our curiosity...
and spawns new fields,” Fink said. “But it’s also threatening because a new picture can destroy our past understanding of our universe, a universe we thought we understood only yesterday.”

50 Years of Communicating About Climate Change
In a continuation of the “What We Know” climate-change communication series launched in 2014 (whatweknow.aaas.org), AAAS and the Carnegie Institution for Science organized a scientific symposium marking the 50th anniversary of the first official warning about climate change to a U.S. president. More than a dozen prominent scientists discussed climate-change impacts, including habitat loss and increased extreme-weather events, and how to best respond to, and communicate about these challenges.

In 1965, President Lyndon Johnson’s science advisors issued a report saying that the accumulation of atmospheric carbon dioxide from the burning of fossil fuels would “almost certainly cause significant changes” to the environment. By 1990, “We really knew enough scientifically to justify the kinds of actions that we’re only now talking about today 25 years later,” said John P. Holdren, Assistant to the President for Science and Technology, and Director of the White House Office of Science and Technology.

Following the symposium, supported by the American Meteorological Society and the Linden Trust for Conservation, AAAS organized a briefing for legislators in the U.S. Capitol Senate Visitors Center, in conjunction with Sen. Ed Markey (D-Mass.). AAAS also provided live video of the symposium, which celebrated the launch of the Alan I. Leshner Leadership Institute. The first 15 Leshner fellows are all climate scientists and communicators.

AAAS Kavli Science Journalism Awards
The 2015 AAAS Kavli Science Journalism Awards marked the first time in the program’s 70-year history that entries were accepted from journalists around the world. Almost 40% of all submissions were from international reporters, with a comparable number of international winners. The Kavli Foundation made the change possible by doubling the endowment that funds the awards program.

Independent panels of science journalists selected the two best examples of science reporting for a general audience in eight categories. Winning stories were published or broadcast by The New York Times, Baltimore Sun, PBS NewsHour, Le Monde, Nature, Minnesota Public Radio, and other media outlets. The prizes, $5,000 for a gold award, and $3,500 for a silver award, were given out at the 2016 AAAS Annual Meeting in Washington, D.C.

Communication Tools for Scientists & Engineers
AAAS is providing tools for scientists and engineers who want to more effectively communicate about their research and its implications. More than 1,500 of them were trained and given a chance to practice, during AAAS Communicating Science workshops held in 2015.

Staff in the Center for Public Engagement with Science and Technology organized 33 workshops and 17 invited talks, which were held at universities and government agencies, and at business and professional meetings. Workshop leaders taught participants to use different communication tools to engage a variety of audiences, including the public, reporters, and policymakers. They then had opportunities to refine their messages and build confidence through small-group discussions and practice.

Visitors at the 2015 Family Science Days explored scientific phenomena and met a diverse range of scientists and engineers, from anthropologists to zoologists.

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PHOTO: ©2015 ATLANTIC PHOTO—BOSTON
The Center also organized two communication seminars during the 2015 Annual Meeting that drew about 300 attendees. During “Scientists Communicating Challenging Issues,” presenters offered social science research about why some scientific issues, like climate change, are prone to controversy, and how scientists can navigate those tensions. A second workshop, entitled “Public Engagement for Scientists: Realities, Risks, and Rewards,” also drew on research to explore the methods and possible results of public outreach.

The Communicating Science program has reached more than 6,700 scientists and engineers since it was founded in 2008.

**EurekAlert! Reaches Out Worldwide**

EurekAlert!, the AAAS-operated science news service, continued to expand its international reach in 2015. It saw a dramatic increase in news releases from Japanese universities and science institutions after EurekAlert! staff visited several institutions in Japan. The staff also promoted an updated English-Japanese website. Afterward, Japanese institutions used the site to post four times more often than in 2014, and visits to the bilingual site more than quadrupled.

**EurekAlert! also offered its first international training for public information officers, in collaboration with the Chinese Academy of Sciences. The training, held in Chengdu, China, helped communicators practice linking their news to issues of interest to international reporters and audiences.**

**AAAS Colloquium Series Takes Off**

As part of the association’s ongoing Transformation Initiative, AAAS launched a new Colloquium Series, organized by staff volunteers, to provide a forum for exploring topics relevant to science and society. Initial Colloquium Series lectures, intended to engage staff, AAAS members, and the public, featured topics ranging from the state of Iranian science—the focus of a Science news feature by journalist Richard Stone—and the destruction of cultural heritage in Syria and Iraq, to U.S. science policy challenges and opportunities, and more.

**Trellis: Increasing Research Collaborations**

Research efforts increasingly cross disciplines, and they rely upon collaborations between institutions and across international boundaries. Some 80% of AAAS members surveyed said they wanted better ways to connect with other scientists online. In response, AAAS launched an online communication and networking platform called Trellis to promote discussions and research collaborations. A beta version of the website went live in December 2014, and added 5,700 users in 2015.

AAAS will also begin training community managers—people who can help facilitate collaborations between researchers within and outside their fields using platforms such as Trellis. Using a $773,000 grant from the Alfred P. Sloan Foundation, the AAAS Community Engagement Program will begin a one-year pilot program to train as many as 18 fellows in 2017.
Scientific Drivers for Diplomacy
The AAAS Center for Science Diplomacy continues to promote international engagement to facilitate research, and to leverage research as a way to bring together countries to address broader issues. “The principles of science—transparency, open communication, and evidence-based thinking—go a long way to diffusing difficult situations, breaking through barriers, and developing relationships,” said Rush Holt, CEO of AAAS, in an address at the first annual conference on science diplomacy, held at AAAS headquarters in April. More than 200 people participated, including representatives from the U.S. Department of State and other federal agencies, UNESCO, The World Academy of Sciences, and the Academy of Sciences of Cuba.

Conference panelists discussed the need for transboundary cooperation and information-sharing to address public health and environmental issues, such as cholera outbreaks, biodiversity loss, and climate change. Participants also related ways to foster cooperation during times of political strain, by working with shared resources, and the roles of institutions and networks in science diplomacy.

First Poland-U.S. Science Award
Two structural biologists who worked to develop AIDS treatments were honored with the first Poland-U.S.
Science Award in April 2015. The award, established in 2013, is given to a pair of scientists working in Poland and the United States for outstanding scientific achievements resulting from their collaboration. AAAS and the Foundation for Polish Science will grant the award every two years.

Prof. Mariusz Jaskólski of Adam Mickiewicz University in Poznań, Poland, and Dr. Alexander Wlodawer of the National Cancer Institute began working together in 1988 to understand the structure of retroviral proteins. That work led to the development of the first protease-oriented drugs for AIDS patients. Their continued collaboration has generated 37 joint publications to date.

Science Diplomacy Boot Camp
The second annual Course on Science and Diplomacy was held in June in Trieste, Italy, drawing together participants from 30 countries. The week-long meeting, organized by the AAAS Center for Science Diplomacy and The World Academy of Sciences (TWAS), provided science diplomacy training to 56 researchers and administrators.

The attendees learned how science diplomacy can be carried out, how to educate the public and policymakers about risks, and how some countries are already using science diplomacy.

Sir Peter Gluckman, science advisor to New Zealand’s prime minister, delivered the Paolo Budinich Lecture as part of the course. New Zealand is an example of how smaller countries can use their strengths in scientific research to gain global influence and advance their own policy interests, Gluckman said.

The 2015 AAAS-TWAS course was sponsored by the Golden Family Foundation, the Organization for Women in Science for the Developing World, the Swedish International Development Cooperation Agency, and the U.S. Agency for International Development.

U.S. and Cuban Researchers Begin Neuroscience Collaborations
United States and Cuban researchers will soon begin collaborating to improve magnetic resonance imaging technology, to advance neuroinformatics and neurodevelopment research, and to investigate the establishment of an international non-human primate research center in Cuba.

A U.S. delegation of researchers, academics, policymakers, and representatives of industries and foundations met with their Cuban counterparts at a December 2015 meeting in Havana to plan the research collaborations. The meeting was the first outcome of a 2014 agreement between AAAS and the Cuban Academy of Sciences to promote scientific cooperation between their countries.

Participants at the meeting, organized by AAAS and the Cuban Neurosciences Center (CNEURO), discussed research advances in neurodegenerative and psychiatric disorders, brain mapping techniques, imaging, and treatments.

AAAS in 2015 also began planning to launch a fellowship program for early and midcareer scientists from Cuba. The Cuban biomedical research fellows could begin research collaboration in the United States in 2016, under a program administered by the AAAS Center for Science Diplomacy.
That program is supported by a grant from the Lounsbery Foundation. AAAS staff members are still seeking funding to bring U.S. scientists to Cuba.

**Global Competition Propels Innovation**

An international competition for innovators, administered by AAAS, is helping entrepreneurs to develop low-cost solar-powered hearing aids in Botswana and a lemongrass-derived compound to protect stored crops from insects in Nigeria, while also providing role models to spur innovation in developing countries.

The Global Innovation through Science and Technology (GIST) Tech-I competition was held in Nairobi, Kenya in July 2015, and was organized by the AAAS Office of International and Security Affairs and the Research Competitiveness Program. The U.S. Department of State began the GIST initiative in 2011 to support scientific and technological innovation in the developing world.

Participants who apply for the program must go through an extremely competitive, multistep selection process to reach the finals, where they receive training and mentoring from leaders in industry, funding agencies, and other sectors. Thirty people from 23 developing countries competed to be one of the 13 winners, who took home almost $140,000 in cash prizes.

The finals were part of the annual Global Entrepreneurship Summit, which received a visit by President Barack Obama. GIST alumni who have commercialized their inventions have generated $110 million in revenue, according to State Department figures.

**Mentoring Women in International Research Collaboration**

Women and underrepresented groups trying to succeed in STEM fields may find themselves up against a “polycarbonate ceiling” to career advancement, said chemist and AAAS President Geraldine Richmond. It’s one they must find a way around, since it’s almost impossible to break.

AAAS has several programs to help women navigate the barriers that prevent them from fully participating in science, technology, engineering, and mathematics (STEM) careers, including some that also promote international research. Under one such program, Mentoring Women in International Research Collaborations (MWIRC) in STEM, AAAS has administered 15 research grants of $20,000 each to allow women to mentor graduate students or postdocs and carry out research in another country. The grants are funded by the National Science Foundation. In addition, the program began sponsoring travel awards to send two women scientists to the international Gender Summit, beginning with the April 2016 summit in South Africa.

The Elsevier Foundation Awards for Women in Science in the Developing World—supported also by Gilbert S. Omenn, a past AAAS president, and Martha Darling—provide five early-career women scientists with $5,000 and support for travel to the AAAS Annual Meeting. The 2015 winners were from Nigeria, Sudan, and Vietnam, and were selected for their contributions to nanoparticle physics, atmospheric physics, medical physics, and computational mathematics, as well as their efforts to encourage other young women to pursue STEM careers.

The L’Oréal awards, which AAAS administers, provide five women each year with $60,000 grants to fund postdoctoral research. And in October, four women were awarded the first AAAS Marion Milligan Mason Awards for Women in the Chemical Sciences, which provide funding for early-career researchers. (See also the Education, Outreach, and Careers section on pages 26-27.)

**Science & Diplomacy Update**

The AAAS Center for Science Diplomacy’s quarterly policy journal, *Science & Diplomacy*, published 21 articles plus editorials, perspectives, and letters in 2015. It attracted more than 36,000 readers, more than half of whom were outside the United States.

Popular articles included one by the executive director of the Academy of Sciences of Cuba detailing Cuba’s research history and its periods of collaboration with the United States, as it anticipates improved relations once again. An editorial by AAAS CEO Rush Holt on the relationship of science to diplomacy has also been viewed more than 1,000 times.
Concern about cuts to basic research funding was the overriding message during the 40th AAAS Forum on Science & Technology Policy. The two-day meeting, held in Washington, D.C. in April, drew more than 400 elected officials, government and business leaders, foreign embassy staff, researchers, and educators.

Funding for basic-science research in the United States is threatened by limits on “discretionary” spending due to budget sequestration, said John P. Holdren, director of the White House Office of Science and Technology Policy. In his keynote address, France Córdova, National Science Foundation director, questioned whether funding for basic research should continue to rely on the nation’s discretionary spending budget. “Our nation’s future, including our preparedness for that future, depends on innovation,” Córdova said. “Innovation in turn depends, in large part, on discovery, and discovery is fueled by basic research. This pursuit is not discretionary.”

The Forum saw the start of a new lecture series, the Gilbert S. Omenn Grand Challenges Address, intended to draw attention to the most pressing needs and goals at the intersection of science and society. Dr. Omenn, past president of AAAS, gave the 2015 address, encouraging consideration of “aspirational and inspirational” research challenges to “energize not only the scientific and engineering community, but
also students, journalists, the public, and their elected representatives, to develop a sense of the possibilities, an appreciation of risks, and an urgent commitment to accelerate progress.”

Additional speakers addressed how scientists can better engage with a skeptical public, how data can be used for the public’s benefit, and how the U.S. educational system can increase the number of workers prepared to take science, technology, engineering, and mathematics (STEM) jobs.

Protecting Antiquities and Predicting Conflict
Sites and objects with irreplaceable cultural value often become targets during armed conflicts, both for ideological reasons and for their value to collectors. The AAAS Geospatial Technologies Project assisted groups trying to protect sites in Syria and Iraq by analyzing recent satellite images with earlier ones to document the status of the sites. Some sites, such as one in Apamea, Syria, are so covered with pits and tunnels dug by looters that they appear to have been carpet-bombed, AAAS reported.

Sometimes sites are damaged or destroyed to remove reminders of a cultural heritage that terrorists or other groups oppose, or to demoralize the local people, said Katharyn Hanson, a visiting scholar with the Geospatial Technologies Project, in a November colloquium. Hanson and AAAS contributed to the Safeguarding the Heritage of Syria and Iraq (SHOSI) Project, which physically protects sites from bombings, using sandbags and other methods.

The Geospatial Technologies Project also studied the use of satellite imagery to better understand and help prevent border conflicts. With a grant from the United States Institute of Peace, it aggregated and correlated large amounts of information from previous cross-border conflicts, including satellite imagery, media reporting, and eyewitness accounts, to create a retrospective geospatial analysis. That process allowed it to identify trends that could contribute to the future detection, management, and peaceful de-escalation of similar incidents.

Science & Technology Policy Fellowships
The 2015-16 class of Science & Technology Policy Fellows includes researchers and engineers of all types, from all stages in their careers, who have one shared goal: to apply their science and technology skills to policy solutions. The program places doctoral-level scientists, or engineers with a Master’s degree, into various offices within the executive, legislative, and judicial branches of federal government and Congress for a year.

“Scientists have such an important role to play in society beyond the bench,” said Sapana Vora, who served as a fellow at the State Department.

Of the 280 fellows, 163 fellows were new fellows, 99 had renewed their fellowship for a second year, and 18 were in special alumni fellowships. Thirty-
one fellows served in Congress; 245 served in the executive branch among 18 agencies or departments, including overseas missions with the U.S. Agency for International Development; and four were placed with the Bill and Melinda Gates Foundation in Seattle.

In August, the fellows had a chance to meet with S&T Policy Fellowship alumnus Rush Holt, CEO of AAAS. A physicist by training, Holt called his fellowship experience “life-changing,” and said that it led to his serving for 16 years in the U.S. House of Representatives. He told the fellows that he hopes to enlist their help in advocating for science for years to come.

Promoting Research Competitiveness
The AAAS Research Competitiveness Program (RCP) has worked for 20 years to build capacity for STEM systems through its work on peer-reviewed competitions, program and institutional assessment, trainings, and innovation and entrepreneurship initiatives.

In 2015, RCP finished the first phase of support for grant competitions of the King Abdulaziz City for Science and Technology (KACST) in Saudi Arabia. For seven years, RCP had solicited more than 15,000 reviews for about 5,000 proposals for KACST. It continues to provide review of grantee progress reports. RCP also in 2015 solicited reviews for more than 100 applications to the Connecticut Bioscience Innovation Fund, which has awarded $4.5 million since 2014 to five universities and four companies.

Since 1996, RCP has organized expert assessments for more than $1 billion spent on science initiatives in the United States and worldwide. In 2015, the program helped states implement and sustain multi-institutional, interdisciplinary research programs, encompassing assessments of five programs funded by the National Institutes of Health (in Louisiana, Mississippi, New Hampshire, Rhode Island, and Oklahoma), and two programs funded by the National Science Foundation (in Maine and South Dakota).

In its work on innovation and entrepreneurship, RCP assumed leadership of the Global Innovation through Science and Technology (GIST) Tech-I competition, and organized the training and judging for the 2015 Tech-I finals held at the Global Entrepreneurship Summit in Nairobi, Kenya. RCP was also awarded funding in 2015 for three GIST Women’s Village workshops on networking for science and technology entrepreneurs, to be held in Côte d’Ivoire, Nigeria, and Mozambique in 2016.

Science for Religion Reporters
The AAAS Dialogue on Science, Ethics, and Religion program (DoSER) convened independent judges who selected eight writers and broadcasters to receive the first Science for Religion Reporters Award, given during the 2016 AAAS Annual Meeting. The $2,000 awards recognize journalists whose audiences are attentive to religion and culture, and who demonstrate an interest in reporting about science.

The award-winning journalists reach a wide range of audiences, through reporting distributed by such media outlets as CBS, the Religion News Service, The Atlantic, and Sojourners, among others. The program is funded by a grant from The John Templeton Foundation, with support from AAAS.

AAAS staff members Christine Scheller (far left) and Jennifer Wiseman (far right) celebrated the first eight winners of the AAAS Science for Religion Reporters Awards (L-R): Kimberly Winston, Liz Kineke, Kelsey Dallas, Renee Gadoua, Emma Green, Cathy Lynn Grossman, Patti Miller, and Catherine Wooldiiss.

PHOTO: AAAS
AAAS Government Relations shares the wide-ranging value of the scientific enterprise with policymakers by communicating directly with Congressional representatives, offering Capitol Hill briefings, and providing evidence-based science and technology updates. It sponsors training to equip and encourage scientists and engineers to become more active in communicating and advocating for science. The group also offers authoritative, ongoing analysis of federal investments in science and engineering research and development.

AAAS Protests Climate-Science Inquiry
AAAS led a protest of an inappropriate Congressional inquiry into federal climate-science research that threatened to violate federal scientists’ academic freedom. In June, a research group from the National Atmospheric and Oceanographic Administration (NOAA) published findings in the journal *Science*, showing that what had previously appeared to be a 15-year slowdown in the rate of global warming early in the 21st century was likely due to incorrect estimates of surface temperatures, and that warming had continued at the same rate during that period.

The chairman of the U.S. House Committee on Science, Space, and Technology sent subpoenas in October to NOAA, requesting “all documents and communications” related to the *Science* paper. AAAS and seven other science societies sent a letter in support of federal scientists, stating that needlessly intrusive Congressional inquiries can inhibit scientific discovery, particularly if scientists are threatened with legal action.

“Science cannot thrive when policymakers—regardless of party affiliation—use policy disagreements as a pretext to attack scientific
conclusions without public evidence,” the coalition’s letter said. “We are concerned that establishing a practice of inquests directed at federal scientists ... could well have a chilling effect on the willingness of government scientists to conduct research that intersects with policy-relevant scientific questions.”

The letter acknowledged the importance of appropriate Congressional oversight of federally funded research, and suggested that the House committee use other established mechanisms for assessing technical information, such as advisory reports of the National Academies of Sciences, Engineering, and Medicine.

AAAS also held a symposium and Congressional briefing in October to discuss advances in climate science and strategies for communicating about climate change, while marking the 50th anniversary of the first warning to a U.S. president of the threat posed by climate change.

Neuroscience, Human Health, and Policy

The AAAS Neuroscience and Society series organized four public lectures and four Capitol Hill briefings on topics ranging from the treatment of mental illness in people of all ages, to the complexity of chronic pain. Each of the public events, held at AAAS headquarters, drew up to 100 people.

Researchers also addressed policymakers in briefings about topics including how increased access to marijuana in states where it has been legalized is affecting teens, and how schools can improve learning for children with disabilities such as attention deficit hyperactivity disorder and dyslexia. The Capitol Hill neuroscience briefings were hosted in conjunction with Rep. Chaka Fattah (D-Pennsylvania).

The Neuroscience and Society series is supported by a grant from The Dana Foundation.

Golden Goose Awards

Created to honor odd-sounding basic research that has led to important benefits for society, the 2015 Golden Goose Awards were given to seven researchers who studied self-control strategies, how the brain interprets visual stimuli, and the distribution of people at various altitudes.

One winner, psychologist Walter Mischel, designed the “marshmallow test” in the late 1960s to see how young children can delay gratification to get a larger reward later. He found that distraction works best, and over the next 30 years, he and his colleagues followed up with some of the original subjects of the research. They found that having self-control strategies did correlate with greater academic and social success later in life, and that such strategies can be taught to improve children’s later outcomes.

Rep. Jim Cooper (D-Tennessee) and a coalition of organizations, including AAAS, the Association of American Universities, and the Association of Public- and Land-grant Universities, created the Golden Goose award in 2012. Cooper and a bipartisan group of Congressional representatives attended the September awards ceremony at the Library of Congress. “These awards remind us that scientific breakthrough rarely follows the straight and narrow path,” said Sen. Chris Coons (D-Delaware), and “how important it is that we continue to support the basic research that only the federal government can sustainably fund.”

Analyzing U.S. R&D Funding Trends

The AAAS R&D Budget and Policy Program has been tracking federal spending for research and development since 1976 by following Congressional debates and bills, and by parsing the President’s yearly budget proposals. There has been much to follow of late, as spending caps on discretionary spending created by the Budget Control Act of 2011 allowed for only a 0.2% increase in spending, before factoring in inflation.

The National Science Foundation and the Department of Energy’s laboratories did have small budget increases in 2015, but the National Institutes of Health’s overall budget continued a decade-long decline. After multiple budget adjustments, Congress eventually passed an omnibus spending bill for fiscal year 2016 that added 5.2% to the discretionary spending allowance, and provided about an 8% increase in R&D spending.

Matt Hourihan, the AAAS program’s director, gave R&D budget briefings on Capitol Hill and at the association’s 40th annual Forum on Science & Technology Policy, in addition to publishing periodic analyses. He told Hill attendees that the United States remains the largest global contributor to R&D, spending more than twice as much (in dollars) as China, the next largest funder. Two-thirds of U.S. R&D spending is generated by industry, with the remainder coming from the federal government.

However, there has been “a very clear shift from west to east” in recent years, Hourihan said. China, Singapore, Taiwan, Japan, and South Korea collectively increased their share of global R&D spending from 24% in 2000 to 36.8% in 2012. Analysts believe that China may surpass the United States in total R&D funding from all sources by 2019.
AAAS Joins Rally for Medical Research
AAAS was one of more than 300 organizations that sent researchers, physicians, and patients to speak with their Congressional representatives in support of biomedical research on 17 September. The Rally for Medical Research was an effort to reverse a decade-long decline in federal spending for the National Institutes of Health (NIH), whose $29.5 billion budget for 2015 was 22% lower than its 2003 peak, after adjusting for the high rate of inflation in the biomedical sciences.

People with many conditions, including cancer, influenza, Ebola, and AIDS, are relying on NIH-funded research to find a cure, said NIH Director Francis Collins during a rally reception. The NIH is the largest funder of medical research in the world.

Among rally participants appealing to Congress were graduate students who participated in the AAAS Catalyzing Advocacy in Science and Engineering (CASE) event, a three-day workshop that provides policy, advocacy, and communication training. Close to 80 students representing 43 institutions participated in the second annual CASE workshop.

The program was created in response to repeated requests from graduate students who were interested in science policy and advocacy. It encourages attendees to continue their involvement in science policy. Alumni have gone on to become a California Science and Technology Policy Fellow and to participate in similar programs.

Engaging Scientists and Engineers in Policy
AAAS and a coalition of universities and science and engineering societies are working to help researchers, science and technology professionals, and students become more involved in policy initiatives. The Engaging Scientists and Engineers in Policy (ESEP) website provides a list of fellowships, internships, graduate programs, trainings, degree programs, websites, publications, and more.

The ESEP program has conducted several workshops at AAAS meetings. ESEP also began a webinar series that allowed participants to ask questions and interact with experts in real time. Speakers included AAAS CEO Rush Holt (a former member of Congress), government affairs representatives for science societies, and lobbyists who described the tools they use to advocate for science policy, and how to use them most effectively.
First Scientific Results from Flyby of Pluto

In the first published results from the flyby of the Pluto-Charon system in 2015, researchers reported that the surface of the dwarf planet is marked by plains, troughs, and peaks that appear to have been carved out by geological processes that have been active for a very long period and continue to the present. (Stern et al., Science, 16 October)

Fast, Continuous, 3D-Printing Out of Liquid Bath

Researchers developed a method for growing detailed solids out of a liquid bath at rates that dwarf three-dimensional (3D) print speeds. Their method makes it possible to convert 3D designs into parts in minutes instead of hours. (Tumbleston et al., Science, 20 March)

A Global Look at Plastic in the Oceans

Using comprehensive data from 192 coastal countries, researchers estimated that between five and 13 million tons of plastic waste wind up in the world’s oceans every year. Based on their
projections, this amount could increase tenfold in the next decade, the researchers said. (Jambeck et al., Science, 13 February)

**Personalized Vaccines Target Skin Cancer’s Mutations**
Researchers who tailored vaccines for different melanoma patients expanded the number and the reach of these patients’ cancer-fighting T cells—providing a shot in the arm for cancer immunotherapy. (Carreno et al., Science, 3 April)

**The Oldest Fossil of the Homo Genus**
This analysis of a partial hominin mandible found in Ethiopia with five of its teeth still intact suggests that the Homo genus arose by about 2.8 million years ago—almost half a million years earlier than previous evidence had indicated. (Villmoare et al., Science, 6 March)

**DNA from Illegal Ivory Points to Poaching Hotspots**
New genetic tools helped researchers trace illegal ivory back to the African elephant populations from which it came, creating a mechanism by which to assist law-enforcement officials in cracking down on poaching in the future. (Wasser et al., Science, 19 June)

**Measles Risk in Countries Hit by Ebola**
Researchers uncovered how healthcare services in Liberia, Sierra Leone, and Guinea were disrupted by the Ebola outbreak, adversely affecting routine vaccination of children against measles—an infection that often follows such humanitarian crises. (Takahashi et al., Science, 13 March)

**Virally Cleansing the Pig Genome with CRISPR**
In an effort to enable organ transplants into humans, researchers used the CRISPR gene-editing technique to inactivate all 62 copies of a retrovirus in a pig cell line, a significant step on the road to generating pig organs for possible xenotransplantation. (Yang et al., Science, 16 October)

**New England Cod Collapse Linked to Warming Waters**
Scientists revealed how rapid warming in the Gulf of Maine correlated to the near collapse of New England’s cod stocks, despite cuts to fishery activity. The results reveal how a warming climate complicates fisheries management. (Pershing et al., Science, 30 October)

**Sequencing Tumor Alone May Misidentify Mutations**
In perhaps the largest-scale evaluation of its kind, a study of 815 patients across 15 cancer types revealed that compared to genomic analysis of tumors alone, analysis of both tumor and normal tissue from the same patient more accurately identified cancer-causing mutations. (Jones et al., Science Translational Medicine, 15 April)

**“Designer Cell” Implants Detect and Treat Psoriasis**
Designer cells programmed to serve as miniature disease-sensors and drug factories showed promise against psoriasis. Researchers built and implanted into mice synthetic cells capable of detecting psoriasis, automatically producing therapeutic proteins, and effectively treating the condition. (Schukur et al., Science Translational Medicine, 16 December)

**Infants Lacking “Good” Bacteria at Greater Asthma Risk**
Infants with low levels of four protective bugs in their gut microbiome are more likely to develop asthma, this study of 300 children showed. The findings pave the way to designing a diagnostic screen and probiotic therapy to prevent at-risk babies from developing asthma. (Arrieta et al., Science Translational Medicine, 30 September)
Burning All Fossil Fuels Could Eliminate Antarctic Ice Sheet
Researchers who performed a long-term modeling study estimated that if all of the currently available carbon resources were burned, the Antarctic Ice Sheet would melt entirely and trigger a global sea-level rise of more than 50 meters. (Winkelmann et al., Science Advances, 30 September)

Uncontacted Amerindians Exhibit Extremely Diverse Microbiomes
The microbiome of Amerindian villagers from the Venezuelan Amazon with no documented contact with Western peoples contains perhaps the highest levels of bacterial diversity ever reported in a human group, researchers reported. (Dominguez-Bello et al., Science Advances, 30 September)

More Than Half of All Amazonian Tree Species Threatened
More than half of all tree species in the Amazon may be at risk for extinction, this study revealed. The results increase the number of threatened plant species on Earth by approximately 22%, and could have implications for land-use policy. (ter Steege et al., Science Advances, 20 November)

Methylation Takes Signaling Down a Notch
Researchers showed that chemically tagging the Notch protein with a methyl group helped curb Notch signaling activity, which controls many developmental processes. The finding offers a potential strategy for turning off the pathway and sheds light on why Notch—when defective—drives many cancers and developmental disorders. (Hein et al., Science Signaling, 24 March)

Other Science Highlights
Powerful Special Issues: Science published 14 substantive special issues on a range of topics, from “The End of Privacy,” to “General Relativity at 100,” to “Isolated Tribes in the Amazon.” On 4 September, a special issue, “Science in Iran,” explored the scientific challenges and triumphs of a country that has experienced international isolation in recent years. As Science International News Editor Richard Stone explained, though decades of economic sanctions have deprived Iranian scientists of critical scientific resources and collaboration, these researchers have persevered, using homespun ingenuity to create their own resources from scratch.

February marked the launch of AAAS’s first open-access journal, Science Advances. Scientific reports published in the journal during its first year described the creation of electronic plants that could be used to speed up plant-based drug development, a smartphone system for early earthquake and tsunami warnings, and how exposure to space radiation may put astronauts at risk for cognitive problems. A 2015 Science Advances study on the sixth mass extinction made its way into the top 5% of all research outputs ever tracked on Altmetric.com, a metrics-reporting site for scholarly content.

In 2015, AAAS also laid the foundation for the publication of Science Immunology and Science Robotics, both set to launch in 2016. Science Immunology will feature interdisciplinary research focused on the understanding of problems in cellular and clinical immunology, including links to microbiology. Science Robotics will highlight new advances in complex engineered systems for exploration of and intervention in environments as diverse as the body, a factory, land, air, sea, and space.

The blog, In the Pipeline, an editorially independent commentary on drug discovery and the pharma industry by medicinal chemist Derek Lowe, moved to the Science Translational Medicine website, attracting a wide readership.

Finally, Science in the Classroom, a program launched in October 2011 with support from the National Science Foundation, received a considerable boost in funding. The program continues to help students across the country better understand core science concepts through a freely available site that features specially developed learning exercises and Science research articles annotated by student volunteers.
Honors we brought in
Three *Science* news reporters received prestigious journalism prizes. For her story, “Eavesdropping on ecosystems,” *Science* staff writer Kelly Servick was awarded the 2013-2014 Acoustical Society of America’s Science Writing Award. *Science* staff writer Eric Hand received the Gold EXCEL Award for the best in-depth exploration of a single topic for “Martian obsession,” published 28 November, 2014.

Judges of the D.C. Science Writers Association Newsbrief Award for short journalism recognized *Science* staff writer Emily Underwood with honorable mention for her story, “Rats forsake chocolate to save a drowning companion.”

Honors we gave out
The Grand Prize winner of the international competition for the *Science* & SciLifeLab Prize for Young Scientists was Allison Clearly of Pennsylvania State University, recognized for her research on how breast cancer cells cooperate to enable tumor growth. Established in 2013, the $25,000 prize is awarded annually to one young scientist for outstanding life science research. Cleary’s winning essay, “Teamwork: The tumor cell edition” describes how her team’s innovative approach unraveled a mysterious feature of human breast cancer biology—the interactive relationship between tumor cell subpopulations within single tumors, which is needed for tumors to grow. The prize is a coordinated effort of *Science*/AAAS and four Swedish universities comprising the *Science* for Life Laboratory, a Swedish national center for molecular biosciences with a focus on health and environmental research.

The 2014-2015 AAAS Newcomb Cleveland Prize was awarded to Eric Betzig and colleagues for the report, “Lattice light-sheet microscopy: Imaging molecules to embryos at high spatiotemporal resolution,” published in *Science* on 24 October 2014. This microscopy advance provides an unprecedented understanding of the inner workings of live cells. According to *Science* Editor-in-Chief Marcia McNutt, “There are several criteria that the selection committee looks for in an outstanding Newcomb Cleveland awardee, and this year’s winner had it all: a major advance in the field, a well-communicated contribution, and broad potential application beyond a narrow sub-discipline.” The association’s oldest award, the AAAS Newcomb Cleveland Prize was established in 1923. Now supported by The Fodor Family Trust, it acknowledges an outstanding paper published in *Science’s* Articles, Research Articles, or Reports sections.
Global Influence of Science Literacy Efforts

In 2015, Project 2061’s leaders participated in international conferences about promoting science literacy and science, technology, engineering, and mathematics (STEM) innovations, and shared results from some of the Project’s work. George DeBoer, Project 2061’s deputy director, was a keynote speaker at the 2015 Shanghai International Forum on Science Literacy for Adolescents in September. He described the evolution of science standards for education in the United States, and the challenges of taking a more integrated approach to teaching STEM.

Director Jo Ellen Roseman spoke in July at the U.S.-Korea Conference on Science, Technology, and Entrepreneurship about the project’s efforts to promote science literacy for all, and the role of scientific organizations such as AAAS in reforming education. Inspired by Project 2061’s publication, *Science for All Americans*, which defined what a science-literate adult should know and be able to do, the Korea Foundation for the Advancement of Science and Creativity (KOFAC) is working to create a similar document for Koreans.

Bringing Energy Concepts to Teens

Project 2061 received a grant from the U.S. Department of Education’s Institute of Education Sciences to develop a six-week curriculum unit for high-school biology students. The new unit will help...
develop students’ understanding of energy transfer and conservation in both living and non-living systems so that they can explain fundamental processes in living organisms, a major topic in most high-school biology courses.

“Energy concepts are quite abstract and can be very difficult for students, especially in a life-science context,” said Jo Ellen Roseman, Project 2061’s director. “Many middle-school students and college undergraduates share some of the same misunderstandings about energy, so it’s clear that a whole new approach is needed.”

To help make ideas about energy more concrete, the new unit will use a variety of analogies, beginning with phenomena drawn from more familiar physical systems such as combustion and charging a cellphone battery. Building on these experiences, the unit will then help students understand that the same energy-releasing and energy-requiring chemical reactions also occur in living organisms—they are just more complex and difficult to observe. Examples of biological energy transfers include cellular respiration, and creating a charge across a membrane in mitochondria and nerve cells.

The unit will also have students work with a range of models, such as interactive simulations and virtual labs, designed to help them think about and explore energy phenomena and make sense of their observations.

Over the course of the three-year curriculum project, the research team will design a professional-development program and materials for teachers, plus a set of assessments for evaluating students’ understanding of the concepts presented in the new unit.

**Workshops for Educators**

Science teachers, curriculum and assessment specialists, and education researchers continued to turn to Project 2061 for help in improving their students’ learning. Nearly 70 educators attended Project 2061 workshops in 2015 to learn more about developing and using high-quality science curricula and assessments, including those that are designed to support Next Generation Science Standards. Attendees also included middle-school teachers who were getting ready to use the project’s new Toward High School Biology curriculum unit.

In addition to introducing the Project’s research and development efforts, the workshops gave participants a chance to try out its tools and resources for themselves. They engaged in activities from the new curriculum unit, for example, and used diagnostic test items from the Project’s science-assessment website.

**New Weather@School Website Launched**

A new website developed by Project 2061, WeatherSchool@AAAS (weatherschool.aaas.org), uses real-world data collected from around the globe to teach fundamental concepts of weather and climate. In a series of interactive modules that include graphing tools, data sets, guided activities, and quizzes, middle- and high-school students can learn how moving air masses cause day-to-day temperature variations, how geographic factors such as elevation above sea level influence temperature, and how the movement of the Earth in relation to the sun affects temperatures over the course of a year.

The new site is consistent with recommendations in the Next Generation Science Standards, and it encourages teachers to integrate the core ideas that students are learning with the practices of science, such as generating data, creating graphs and tables, and looking for relationships and patterns.

**Searching for Standards-Aligned Curricula**

While 12 states and the District of Columbia have adopted new Next Generation Science Standards (NGSS) for K-12 classrooms, educators are struggling to find teaching materials and curricula that fit with the standards’ goals. In response, Project 2061 in April led a symposium at the annual meeting of the National Association for Research in Science Teaching. Three case studies were presented, in which curriculum materials were analyzed using the Educators Evaluating the Quality of Instructional Products (EQuIP) Rubric developed by Achieve, an organization that helped to create the NGSS.

“Everyone is desperately looking for examples of what [NGSS] looks like in curriculum materials and teaching,” said Jo Ellen Roseman, director of Project 2061. Educators are also going to need tools and measures they can use to evaluate textbook publishers’ claims that their materials are “NGSS-aligned,” she said. The NGSS standards emphasize three main dimensions of science learning: science practices for investigating the world, crosscutting concepts common to all scientific topics, and core ideas within scientific disciplines.

Roseman and her colleagues reported that the EQuIP tool helped them to identify strengths and weaknesses of curricula in several key ways, and engaging in the EQuIP analysis deepened their understanding of the NGSS and its vision for science teaching and learning.
More than 1,000 students, researchers, professors, and administrators from 240 colleges and universities attended the 2015 Emerging Researchers National (ERN) Conference in STEM, hosted by AAAS and the National Science Foundation (NSF). The ERN conference, held annually in Washington, D.C., provides an opportunity for undergraduate and graduate students in STEM fields to enhance their science-communication skills through poster and oral presentations, and to benefit from career-information sessions on topics such as applying to graduate schools, funding higher education, and STEM career trends.

Many of the students attending the ERN conference participate in programs funded by the NSF’s Division of Human Resources Development, which provides opportunities for underrepresented minorities, women, and persons with disabilities to pursue research and education in STEM fields.

The conference tries to provide a supportive, encouraging space for students who face additional barriers to entering science to present their research, often for the first time, said Shirley Malcom, director of AAAS Education and Human Resources Programs. “This is a wonderful entrée into being able to see yourself as part of the scientific community,” she told attendees.
AAAS-Lemelson Invention Ambassadors
Seven men and women from academia and industry joined the second class of AAAS-Lemelson Invention Ambassadors in July. Formed by a partnership between AAAS and The Lemelson Foundation, the program is designed to cultivate a new and diverse generation of inventors, and to increase understanding of the role of invention in creating new products and establishing new businesses.

The Ambassadors, who together hold more than 220 patents, were selected for their high regard for the role of invention, their success with invention, their accomplished professional careers, a commitment to invention’s role in impacting environmental sustainability, and their interest in speaking to different audiences. “All of us have an inventor inside of us,” said Ambassador Lisa Seacat DeLuca, the most prolific woman inventor in IBM history.

EntryPoint! Widens the S&T Pipeline
Twenty-seven undergraduate students with disabilities got a chance to try out working in STEM positions, through internships facilitated by the AAAS EntryPoint! Program. Launched in 1996, the program has recruited students to work in industry, universities, and government agencies, including at NASA, Georgia Tech, and Johns Hopkins University.

Of the 580 alumni of the program, more than 80% are now working in STEM fields, and alumni sometimes mentor new students, said Laureen Summers, the program’s coordinator. It is the only such program for disabled college students that focuses on STEM jobs, she said.

Changing the Face of Science
While the number of women entering STEM careers, including faculty positions in academia, has been growing, women, along with minorities and persons with disabilities, are still underrepresented in these fields. AAAS sponsors several awards to help women succeed in science.

Four women were awarded the first AAAS Marion Milligan Mason Awards for Women in the Chemical Sciences in October. The award is named for a long-time AAAS member and chemist who left a $2.2 million bequest to provide funding for early-career women researchers. The $50,000 awards, which help winners do research and attract and mentor graduate students, will continue to be awarded to three women every two years for the next 20 years.

At an awards ceremony at AAAS, four winners spoke with appreciation for the mentors who helped to steer them on their course. “As I evaluate all the mentorship that I had during my chemistry career, I would like to pass that along to my students,” said Luisa Whittaker-Brooks, an assistant professor of chemistry at the University of Utah. She became interested in science as a high-school student in Panama, thanks in large part to an enthusiastic teacher who told her that she had a bright future in chemistry.

AAAS also administers the L’Oréal USA for Women in Science Fellowship, which awarded five women with $60,000 research grants in October. The recipients were an exoplanet astrophysicist, a marine microbiologist, a synthetic biologist, a cancer bioengineer, and a condensed matter physicist.

The Elsevier Foundation Awards for Women in Science in the Developing World, with its partners, the Organization for Women in Science for the Developing World and the World Academy of Sciences, also recognize early-career women scientists. Each year, five women are awarded $5,000 and a trip to the AAAS Annual Meeting. The 2015 winners from Nigeria, Sudan, and Vietnam were selected for their contributions to nanoparticle physics, atmospheric physics, medical physics, and computational mathematics, and their efforts to encourage other women to pursue STEM careers. Gilbert S. Omenn, a past AAAS president, and Martha Darling helped to support the awards.

Mass Media Fellows March On
Most of the 2015 AAAS Mass Media Science and Engineering Fellows began their 10-week internships at Scientific American, Slate, WIRED, the Los Angeles Times, NPR, and other outlets having little or no journalism experience—just a knowledge of science and a desire to share it while improving their communication skills. Afterward, about two-thirds said that they would like to continue to work in journalism, and many of those who will return to science say they want to continue to use the skills they honed to communicate about science with the public.

“This program helps in both ways. Not only do we have some of the best science journalists anywhere who have come out of this program and now give back to this program, but we also have dynamic scientists who have come out of this program, and they are also excellent communicators,” said Shirley Malcom, director of Education and Human Resources Programs at AAAS. The highly competitive fellowship is open to upper-level undergraduate students, graduate students, or post-doctoral scholars in STEM fields.
The 30th annual meeting of the AAAS Caribbean Division convened 12 September in San Juan, Puerto Rico. Carlos A. Torres Ramos, an assistant professor at the University of Puerto Rico School of Medicine, and president of the AAAS Caribbean Division, welcomed more than 150 scientists, educators, and students who attended the day-long event, which had three concurrent sessions on themes of science education and sustainability.

Sergio Jorge Pastrana, the executive director and secretary of foreign affairs at the Academy of Sciences of Cuba, gave the keynote address on the Academy of Sciences of Cuba and its role in international scientific collaborations. Established in 1861, the Academy was the first association of its kind in the New World.

Two centuries later, following the Cuban Revolution, the country intensely focused on building its capacities in education, science, and medicine. Today, Cuba’s biotechnology industry exports a number of important vaccines and other biomedical technologies, and the country’s infant mortality rates and average lifespans are roughly comparable to those in the United States.

Pastrana has been a key figure in many science-related partnerships between Cuba and other countries, including the United States. He
participated in an April conference on science diplomacy, held at AAAS headquarters, and earlier, he took part in a meeting between the Cuban Academy of Sciences and a AAAS-led delegation in Havana. That conference resulted in a joint agreement to foster joint cooperation in biomedical research (for more information, see page 12).

Arctic Division
The health and sustainability of near-shore zones and estuaries in the face of climate change was the focus of the 2015 Arctic Science Conference, which took place 1-3 October. These areas, where freshwater and oceans meet, serve as a gateway for fish and other migratory animals. They are increasingly important and vulnerable as climate change affects their chemistry and biology, and as it opens new sea routes.

The conference, which was hosted by the University of Alaska Anchorage, also served as the annual meeting of the AAAS Arctic Division. Researchers from the life, physical, and social sciences as well as artists and educators attended the meeting.

The Arctic is warming twice as fast as the lower latitudes, according to the Arctic Report Card, prepared by the National Oceanic and Atmospheric Administration (NOAA). As a result, scientists are trying to track the changes it is undergoing to learn what may eventually occur in more populated southern regions, said Larry Duffy, executive director of the AAAS Arctic Division.

“What we see happening in the north within the biota and the physical environment will happen later at lower latitudes, but with a much bigger impact,” said Duffy, a professor of biochemistry at the University of Alaska Fairbanks. “When we talk here about a village of 500 people being eroded away, that’s a problem. But when we talk about New York and New Jersey losing a portion of their coast due to sea-level rise—that’s a big problem.”

The warming temperatures also create stress on the 4 million people who live in the Arctic region, many of whom are indigenous people who rely on subsistence hunting and fishing. Arctic communities are seeing more frequent and severe extreme weather events, changing animal migration patterns, disappearing traditional ice paths, increasing tree lines, and eroding riverbanks, reported Mary Dallas Allen, associate professor at the University of Alaska Anchorage School of Social Work. Arctic communities are losing what it means to be home, she said.

Pacific Division
With a special focus on the 180th anniversary of Darwin’s visit to the Galápagos Islands, the AAAS Pacific Division explored “Science in the Anthropocene” during its 14-17 June annual meeting at San Francisco State University. The gathering also began a celebration of the 100th anniversary of the year when the Pacific Division was founded.

Approximately 450 scientists, educators, students, and science enthusiasts from across the western United States attended the event, which was open to the public. Richard Cardullo, president of the AAAS Pacific Division and professor of biology at the University of California, Riverside, gave the Pacific Division presidential address on the science of human population growth and control.

The three-day symposium featured more than 30 speakers who discussed new research and a range of issues related to the Galápagos Islands, with sessions on the ecological impacts of human activities, and the status and conservation of the islands’ native plant and animal species. The program also included a variety of symposia on other topics, including building relationships between racially diverse communities and police departments, 3D printing and open-source technology in science, technology, engineering, and mathematics education, as well as factors driving the emergence of vector-borne diseases.

The Pacific Division’s annual meeting was co-sponsored by the California Academy of Sciences and Sigma Xi, The Scientific Research Society.
A Transformative Gift from the Golden Family Foundation

Last fall, Lifetime Giving Society donor Sibyl R. Golden revealed her intention to make a gift of $4 million to AAAS, through the Golden Family Foundation. News of one of the most generous gifts in AAAS history generated significant excitement in the William T. Golden Center for Science and Engineering—the AAAS headquarters building in Washington, D.C.

Ms. Golden’s gift honors her late father, William T. Golden, who was well-known for his contributions to science policy and his long career of public service and philanthropy. His input led to many milestones for the science enterprise, including the appointment of the first Science Advisor to the President and the Secretary of State, and the creation of the Office of Science and Technology in the Executive Office of the President (now the Office of Science and Technology Policy), the President’s Science Advisory Committee (today, the President’s Committee of Advisors on Science and Technology, or PCAST), and the National Science Foundation.

His influence was also a transformational force for AAAS. Mr. Golden served as AAAS Treasurer from 1969 to 1999, and as Honorary Treasurer until 2007. Over those 30 years, his generosity and foresight led to the creation of many of our best-known programs, including the signature Science and Technology Policy Fellowships program, which has been placing scientists in executive, legislative, and judiciary branch offices since 1973.

AAAS CEO Rush Holt is one of more than 3,000 alumni of that program. “Bill Golden’s legacy is unparalleled. He has transformed the science-policy world, AAAS, and even my own career,” Holt said.
The recent Golden Family Foundation contribution is second in magnitude only to Mr. Golden’s 2003 gift of $5.25 million, which established the William T. Golden Fund for Program Innovation. At the time, Mr. Golden said, “I have great respect for the AAAS, as well as great affection and admiration for it, and I believe that the organization can become even more useful to society.” His gift was intended to serve as the catalyst for creative, new, high-impact ideas that would not otherwise be funded as part of the association’s budget.

And so it has, for just over a decade. In its first 12 years, more than 40 projects have received support from the Golden Fund, ranging from the popular Leadership Seminar in Science and Technology Policy—a one-week “crash course” designed for those who need to know how S&T policy works, to communication tools and training for scientists; and a Chinese-language portal for EurekAlert!, the science-news consortium established by AAAS for some 12,000 reporter-registrants; as well as key activities to build capacity for philanthropy.

Ms. Golden’s 2015 contribution in her father’s memory, which brings the William T. Golden Fund for Program Innovation to more than $9 million, creates opportunities for initiatives not otherwise possible, and will enhance AAAS’s ability to pursue creative, innovative endeavors well into the future.

Leshner Leadership Institute Fellows Announced
AAAS has announced the first fellows of the Alan I. Leshner Leadership Institute for Public Engagement with Science. All are climate scientists with an interest in promoting dialogue between science and society.

The fellows will plan and implement climate communication activities with assistance from AAAS and work to promote public engagement within their institutions and professional communities. In June 2016, the Leshner fellows will convene at AAAS headquarters for a week of public engagement and science communication training, networking, and plan development.

The Leshner Leadership Institute was established in 2015 with support from more than 130 philanthropic gifts. The first cohort will focus on climate change; the second will address infectious disease. Subsequent fellows will focus on other areas of science. To learn more about this work and how to support it, contact the Office of Philanthropy and Strategic Partnerships at 202-326-6636.

First AAAS Marion Milligan Mason Awards Honor Early Career Women Chemists
In October 2015, the first AAAS Marion Milligan Mason Awards for Women in the Chemical Sciences were awarded to four outstanding women. The awards, made possible by a $2.2 million bequest to AAAS, provide each chemist with $50,000 to ramp up their research projects while mentoring their own students. Marion Mason’s gift honors her family’s commitment to higher education for women. (See also the Education, Outreach, and Careers section of this report.)

Marion Milligan Mason Award Winners: From left, Rush Holt, Shirley Malcom, and Geraldine Richmond, representing AAAS, joined winners Luisa Whittaker-Brooks, Kristin Parent, Katherine Mackey, and Alison Fout. At right is AAAS Board Member Laura Greene.

PHOTO: MICHAEL COLELLA/COLELLADIGITAL.COM
The AAAS awards celebrate the achievements of extraordinary scientists, engineers, educators, and journalists. We congratulate each of our distinguished winners.

**Eric Lander**

**AAAS Philip Hauge Abelson Prize**

PHOTO: TONY CENICOLA/THE NEW YORK TIMES/REDUX

The Philip Hauge Abelson Prize, established in 1985, is awarded to a public servant in recognition of sustained exceptional contributions to advancing science, or to a scientist whose career has been distinguished both by scientific achievement and other notable services to the scientific community.

Dr. Eric Lander was recognized for advancing science and serving society through his extraordinary contributions to science, and for his ability to explain science to the public and students as well as his work bringing science to bear in serving the public.

**Sir Peter Gluckman**

**AAAS Award for Science Diplomacy**

Established in 2010, the AAAS Award for Science Diplomacy recognizes an individual or a limited number of individuals working together in the scientific and engineering or foreign affairs communities to make an outstanding contribution to furthering science diplomacy.

Professor Sir Peter Gluckman was recognized for transforming the theory and practice of science diplomacy in New Zealand and internationally, and for uniting national science advice by successfully bringing both fields together into a global network to strategically address global challenges.
Jean Maria Arrigo

AAAS AWARD FOR SCIENTIFIC FREEDOM AND RESPONSIBILITY
The AAAS Award for Scientific Freedom and Responsibility, established in 1980, honors scientists, engineers, and their organizations whose exemplary actions, sometimes taken at significant personal cost, have served to foster scientific freedom and responsibility.

Dr. Jean Maria Arrigo was honored for her courage and persistence in advocating for ethical behavior among her fellow psychologists, the importance of international human rights standards, and against torture.

Mark Rosin

AAAS EARLY-CAREER AWARD FOR PUBLIC ENGAGEMENT WITH SCIENCE
The AAAS Early-Career Award for Public Engagement with Science, established in 2010 through the generosity of several AAAS donors, recognizes early-career scientists and engineers who demonstrate excellence in their contribution to public engagement with science activities.

Dr. Mark Rosin was honored for his broad range of creative and sustainable public-engagement strategies that target audiences who may not be actively seeking science information.

Mark Miodownik

AAAS AWARD FOR PUBLIC ENGAGEMENT WITH SCIENCE
The AAAS Award for Public Engagement with Science, formerly the Award for Public Understanding of Science and Technology, was established in 1987 and recognizes working scientists and engineers who make outstanding contributions to the “popularization of science.”

Dr. Mark Miodownik was recognized for his enthusiastic and successful commitment to public engagement, and for igniting a sense of wonder about the world by unveiling the interplay between science, engineering, and the society.

Christine Grant

AAAS MENTOR AWARD
The AAAS Mentor Award, established in 1996, honors AAAS members who have mentored significant numbers of students from underrepresented groups, or who have changed the climate of a department, college, or institution to significantly increase the diversity of students pursuing and completing doctoral studies in the sciences. This award is directed toward individuals who have mentored students for less than 25 years.

Dr. Christine Grant was recognized for facilitating dramatic education and research changes that are leading to a significant production of African American doctorates and females in chemical engineering.

Saundra Yancy McGuire

AAAS MENTOR AWARD FOR LIFETIME ACHIEVEMENT
The AAAS Mentor Award for Lifetime Achievement, established in 1991, honors AAAS members who have mentored significant numbers of students from underrepresented groups, or who have changed the climate of a department, college, institution, or field to significantly increase the diversity of students pursuing and completing doctoral studies in the sciences. This award is directed toward individuals with more than 25 years of success in mentoring students.

Dr. Saundra Yancy McGuire was recognized for her transformative impact and contributions toward creating a diverse doctorate workforce in the field of chemistry.
AAAS/Newcomb Cleveland Prize
Supported by The Fodor Family Trust
The Association's oldest award, the AAAS Newcomb Cleveland Prize was established in 1923 with funds donated by Newcomb Cleveland of New York City. Now supported by The Fodor Family Trust, the Prize acknowledges an outstanding paper published in the Articles, Research Articles, or Reports sections of Science.


AAAS/Subaru SB&F Prizes for Excellence in Science Books

A Chicken Followed Me Home! Questions and Answers About a Familiar Fowl
Robin Page, Author and Illustrator
(Beach Lane Books)

The Octopus Scientists: Exploring the Mind of a Mollusk
Sy Montgomery
(Houghton Mifflin Harcourt)

A Kid’s Guide to Keeping Chickens
Melissa Caughey
(Storey Publishing)

How to Clone a Mammoth: The Science of De-Extinction
Beth Shapiro
(Princeton University Press)
AAAS KAVLI SCIENCE JOURNALISM AWARDS

These awards, endowed by the late Fred Kavli and The Kavli Foundation, recognize excellence in reporting for a general audience and honor individual reporters for their coverage of the sciences, engineering, and mathematics. A generous doubling of the program endowment by The Kavli Foundation permitted two awards in each of the eight categories for the first time—a Gold Award and a Silver Award—and opened the competition to entries from journalists worldwide.

LARGE NEWSPAPER—
CIRCULATION OF 150,000 OR MORE

Gold Award
Andrea K. McDaniels
The Baltimore Sun

Silver Award
Nathaniel Herzberg
Le Monde

SMALL NEWSPAPER—
CIRCULATION LESS THAN 150,000

Gold Award
Matthew Miller
Lansing State Journal

Silver Award
Helga Rietz
Neue Zürcher Zeitung (Switzerland)

MAGAZINE

Gold Award
Alexandra Witze
Nature and Science News

Silver Award
Amanda Gefter
Nautilus

TELEVISION SPOT NEWS/FEATURE REPORTING
(20 MINUTES OR LESS)

Gold Award
Katie Campbell
KCTS 9 (Seattle)

Silver Award
Miles O’Brien
PBS NewsHour

IN-DEPTH REPORTING (MORE THAN 20 MINUTES)

Gold Award
Jonathan Renouf and Alex Freeman
BBC

Silver Award
Lone Frank and Pernille Rose Grønkjær
Danish Broadcasting Corporation

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Gold Award
Rami Tzabar and Angela Saini
BBC Radio 4 and BBC World Service

Silver Award
Dan Kraker and Elizabeth Dunbar
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ONLINE

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Mark Harris
Backchannel

Silver Award
Kevin Sack, Sheri Fink, Pam Belluck and Adam Nossiter, with Daniel Berehulak, Dan Edge (for Frontline), and The New York Times graphics team
The New York Times

CHILDREN’S SCIENCE NEWS

Gold Award
Stephen Ornes
Science News for Students

Silver Award
Joan Cartan-Hansen
Idaho Public Television
AAAS Fellows are elected annually by the AAAS Council for meritorious efforts to advance science or its applications. Fellows have made significant contributions in areas such as research, teaching, technology, services to professional societies, and the communication of science to the public. The following members, presented by Section affiliation, were elected Fellows in fall 2015. AAAS congratulates them and thanks them for their services to science and technology.
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The Lifetime Giving Society recognizes individuals who have contributed a cumulative total of $100,000 or more during the course of their involvement with AAAS.

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The Edison Society recognizes individuals who pave the way for the success of AAAS and our efforts on behalf of science and society through their leadership gifts throughout the year.

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“[I support AAAS because of its critical role in educating lawmakers so that they better understand the science behind policy decisions.]” – Kenneth A. Cowin

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Sui Huang
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Kay Huebner
Michael J. Huerkamp
Vicki D. Huff
Carroll G. Hughes III

† Deceased
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American Anthropological Association
American Association of Colleges of Pharmacy
American Chemical Society
American Educational Research Association
American Geophysical Union
American Geosciences Institute
American Institute of Physics
American Mathematical Society
American Meteorological Society
American Nuclear Society
American Orthopsychiatric Association
American Philosophical Association
American Physical Society
American Psychological Association
American Public Health Association
American Society of Agronomy/Crop Science Society of America/Soil Science Society of America
American Society of Plant Biologists
American Society of Anesthesiologists
American Sociological Association
American Society of Civil Engineers
American Society for Microbiology
American Society of Mechanical Engineers
American Statistical Association
American Veterinary Medical Association
Association for Information Science and Technology
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Institute of Food Technologists
Institute of Navigation
The International Society of Optics and Photonics
Iowa State University
King Abdulaziz City for Science and Technology
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Louisiana State University
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National Institute of Justice
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Smithsonian Institution
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Society for Neuroscience
Society for Research in Child Development
Society for Science & the Public
The Society for the Psychological Study of Social Issues
Society of Automotive Engineers
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University of Utah
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The Charles Valentine Riley Memorial Endowment
The Early-Career Award for Public Engagement Fund
The Fund for Honesty in Scientific Research
The Gilbert S. Omenn Grand Challenges Endowment
The Marion Milligan Mason Fund
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The AAAS Annual Meeting is interdisciplinary and inclusive. Thousands of leading scientists, engineers, educators, policymakers, and journalists from around the world will gather to discuss recent developments in science and technology.

Registration opens August 2016.

aaas.org/meetings
Research published in the *Science* family of journals in 2015 described advances in cancer immunotherapy and personalized vaccines, new insights to climate-change impacts, and the first fascinating flyby of the dwarf planet Pluto and its moon, Charon. At the same time, AAAS dispatched 280 Science & Technology Policy Fellows to Capitol Hill and elsewhere, bringing science to bear in policy decisions. The association also provided awards and mentoring programs to help uplift women in science, worked to improve science education, leveraged science diplomacy, and spoke forcefully on the urgent need to address climate change and to fully fund research and development. AAAS members remain essential to these and many other high-impact activities. By becoming members of AAAS, scientists, engineers, teachers, and others become a force for advancing science to serve society, and a voice for the scientific enterprise worldwide.

The benefits of AAAS membership include the *Science* journals, but also much more—particularly now, as the association has been transforming itself to better serve its members. In addition to becoming a member-facing organization, the Transformation Initiative calls on AAAS to ramp up advocacy efforts, and to adopt innovative, “digital-first” approaches to scientific communication. Already, AAAS has made significant strides toward becoming a truly digital-first enterprise, through a comprehensive redesign of the *Science* website, the rollout of an open-access journal, *Science Advances*, and plans for two new journals, *Science Robotics* and *Science Immunology*.

AAAS has also made meaningful progress toward putting members first. Engaging every AAAS member more fully in the association and its contributions to society, while also substantially increasing the number of members who help give science a voice on pressing global issues, will remain key priorities for the new Membership Engagement and Development Office. This has meant finding ways to better serve members both by improving member services, and by providing members with what they need and want to advance their careers throughout their lives—from kindergarten through the post-doctoral and professional stages.

How is AAAS improving member services? By the end of 2016, a new AAAS Member Platform will provide long-time and new members alike with much more
intuitive access to AAAS, thereby enhancing the member experience. Specifically, the new Member Platform will allow users to maintain a single log-in, learn how they can become more involved with AAAS, update their membership profile, and more easily renew their relationship with the association, 24-7. Already, the membership-renewal process has been streamlined and simplified. The association’s public website, www.AAAS.org, is meanwhile being merged with MemberCentral to provide a smoother user experience across all AAAS online sites.

New career services and products are also being launched, including certificate-level online courses to help members avoid common errors in proposal writing, understand the federal R&D budget process, effectively work with policymakers, communicate science to non-scientists, and engage with the public on science-society issues. (See Careerdevelopment.AAAS.org.)

Members make it possible for AAAS to help broaden the science and technology talent pool, build bridges toward international research cooperation, and communicate the value of science—and scientific investments—to society. AAAS is therefore working to dramatically expand its membership, by reaching out to sectors that may have been less engaged with AAAS in the past, such as those working in industry, students and faculty at community colleges, early-career professionals, high-school students, and eventually, the science-interested public. As part of a new Employee Ambassadors Program, every member of the AAAS staff has become a member of AAAS so that they can experience firsthand what it means to be a member. Employees are also being challenged to help expand the ranks of AAAS. Every existing member can be a positive force for science, too, by spreading the word about the good work that AAAS is doing. Help to give scientists and engineers an influential voice worldwide. For AAAS membership information, log onto www.aaas.org/join.
## Consolidated Statements of Financial Position for the years ended December 31, 2015 and 2014
($ in thousands)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASSETS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>5,311</td>
<td>5,860</td>
</tr>
<tr>
<td>Accounts receivable, net</td>
<td>3,345</td>
<td>2,929</td>
</tr>
<tr>
<td>Grants and contributions receivable, net</td>
<td>11,064</td>
<td>6,316</td>
</tr>
<tr>
<td>Prepaid expenses and other</td>
<td>2,800</td>
<td>2,307</td>
</tr>
<tr>
<td>Investments</td>
<td>77,169</td>
<td>92,335</td>
</tr>
<tr>
<td>Property, plant and equipment</td>
<td>57,490</td>
<td>58,046</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>157,179</strong></td>
<td><strong>167,793</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LIABILITIES AND NET ASSETS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liabilities:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounts payable and accrued expenses</td>
<td>10,629</td>
<td>13,169</td>
</tr>
<tr>
<td>Deferred dues, subscriptions revenue and other</td>
<td>22,133</td>
<td>24,465</td>
</tr>
<tr>
<td>Bonds payable, net</td>
<td>7,471</td>
<td>9,209</td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td><strong>40,233</strong></td>
<td><strong>46,843</strong></td>
</tr>
</tbody>
</table>

| Net assets:         |          |          |
| Unrestricted        | 83,611   | 93,986   |
| Temporarily restricted | 18,309   | 17,776   |
| Permanently restricted | 15,026   | 9,188    |
| **Total net assets** | **116,946** | **120,950** |

| **Total liabilities and net assets** | **157,179** | **167,793** |

## Consolidated Statement of Changes in Net Assets for the years ended December 31, 2015 and 2014
($ in thousands)

<table>
<thead>
<tr>
<th></th>
<th>2015</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenues:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member dues</td>
<td>9,446</td>
<td>9,914</td>
</tr>
<tr>
<td>Publishing</td>
<td>49,891</td>
<td>49,748</td>
</tr>
<tr>
<td>Grants and other program support</td>
<td>29,023</td>
<td>29,077</td>
</tr>
<tr>
<td>Leasing, investments and other</td>
<td>10,185</td>
<td>11,771</td>
</tr>
<tr>
<td><strong>Total revenues</strong></td>
<td><strong>98,545</strong></td>
<td><strong>100,510</strong></td>
</tr>
</tbody>
</table>

| **Expenses:**       |          |          |
| Publishing          | 47,198   | 46,711   |
| Education, policy and other programs | 38,424   | 38,987   |
| General and administrative expenses | 16,398   | 15,642   |
| **Total expenses**  | **102,020** | **101,340** |

| Operating income, before tax | (3,475) | (830) |
| Provision for income tax     | 58      | 221   |
| Nonoperating revenue and expense | (6,841) | (3,399) |
| **Change in unrestricted net assets** | (10,374) | (4,450) |
| **Change in restricted net assets** | 6,370   | (644)  |
| **Change in net assets**     | (4,004) | (5,094) |
| Net assets, beginning of year | 120,950 | 126,044 |
| **Net assets, end of year**  | **116,946** | **120,950** |
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