Celebrating our Planet
and the promise of Science and Technology
AAAS ANNUAL REPORT 2009
Science has the largest paid circulation of any peer-reviewed general science journal in the world, with an estimated total readership of 1 million. 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; and more. For the latest research news, log onto EurekAlert!, www.eurekalert.org, the premier science-news Web site, a service of AAAS.

The cover photograph of Gentoo penguins was captured 8 January 2010 in Antarctica by Alan I. Leshner. Gentoo penguins, distinguishable because of their bright orange-red bills and white triangular patches above each eye, are classified by the International Union for the Conservation of Nature and Natural Resources as “near threatened.” A number of Gentoo breeding sites are already protected, including natural World Heritage sites at Macquarie Island and Heard Island, and in some well-known areas their populations are booming.

But like penguins in general, Gentoo penguins are subject to a variety of environmental threats, and their overall numbers are decreasing. Introduced predators, human disturbance, competition with fisheries, habitat loss, pollution, and climate change all pose potential threats.
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Remarkable advances in 2009 reminded us yet again of the tremendous potential of science and technology to improve human quality-of-life and to enrich our knowledge of the natural world.

The breathtaking description in *Science* of a 4.4 million-year-old Ethiopian hominid fossil called *Ardipithecus ramidus*, for example, offered surprising new insights into human evolution. Also in 2009, AAAS launched *Science Translational Medicine*, an already-acclaimed new journal that is bringing researchers and clinicians together to help find cures faster. (Pages 16-19 offer details on *Science Breakthroughs in 2009*.)

Establishing productive new ties with scientific leaders and institutions in Syria, Cuba, China, and other nations, the association employed science diplomacy to leverage international collaboration. Those relationships were further enhanced by cooperative AAAS-based events offering international perspectives on how best to mitigate and adapt to climate change. (See pages 8-9.)

Project 2061, the science-education reform initiative at AAAS, meanwhile continued to promote science literacy across an array of languages in collaboration with educators from the United States to Shanghai, as noted on page 10. Through these and many other activities, AAAS demonstrated the extraordinary power and promise of science as an agent of positive change for people and our planet—despite the worst U.S. recession since the Great Depression.

Optimism surged this year as U.S. President Barack Obama promised to “restore science to its rightful place, and wield technology's wonders.” Two former AAAS presidents assumed leadership roles in the new administration, with John P. Holdren becoming the president's science advisor and Jane Lubchenco moving into the administrator's office at the National Oceanic and Atmospheric Administration. Later, the U.S. State Department named the first-ever U.S. science envoys: *Science* Editor-in-Chief Bruce Alberts, *Science Translational Medicine* Chief Scientific Advisor Elias Zerhouni, and Nobel Prize-winning scientist Ahmed Zewail.

Still more good news in 2009 came from the Alliances for Graduate Education and the Professoriate. That group, in collaboration with AAAS, reported a 33.9% increase between 2001 and 2008 in the number of doctoral degrees awarded by 66 universities to underrepresented minority candidates in science and technical fields. In support of such advances, the AAAS Education and Human Resources team promoted diversity in higher education, while Project 2061 launched a new “climate literacy” project. Also in 2009, innovative social media tools debuted on the popular *Science* Careers Web site. (See pages 10-11.)
AAAS communicated broadly about health and environmental threats—particularly related to the H1N1 virus and global climate change. Through congressional briefings and testimony organized by Science and Policy Programs staff (pages 12-13), as well as public statements and op-eds (pages 6-7), AAAS worked to inform decisions about endangered species, human embryonic stem cell research, federal funding for research, scientific integrity, and much more. At the same time, the AAAS Center for Science, Technology, and Security Policy released detailed reports on ensuring biosafety and preparing for major disease threats (pages 14-15).

Nobel Peace Prize winner Albert Gore, Jr. issued a call to action on global climate change during the 2009 AAAS Annual Meeting, as reported on page 20. His message garnered widespread media coverage, thanks to hundreds of journalists who followed the meeting via EurekAlert!, the AAAS online science-news service, or by checking into the AAAS newsroom on-site in Chicago.

Closer to home, AAAS headquarters became the first existing building in the District of Columbia to earn a Gold rating under the U.S. Green Building Council LEED certification program.

Throughout 2009 and particularly during an annual meeting focusing on “Our Planet and Its Life: Origins and Futures,” AAAS celebrated the 150th anniversary of Charles Darwin’s book On the Origin of Species. Ironically, the first commercial oil well also appeared in 1859, as did the findings of Sir John Tyndall’s research that set the stage for understanding carbon dioxide’s role as a greenhouse gas. Today, we know that atmospheric carbon dioxide levels, hovering around 389 parts per million (ppm) at the end of 2009, are higher than at any time in the past 800,000 years. At levels above 450 ppm, many researchers predict irreversible impacts, from ice loss and sea-level rise, to wildfires, droughts, and threats to the richly diverse life forms so vividly described by Darwin.

But as the 2009 AAAS Annual Report reveals, the association and its journals are doing far more than simply reflecting upon such threats to Earth and its inhabitants. With your help, we can achieve even more as AAAS continues to advance science, engineering, and technology for the benefit of all.

James J. McCarthy
AAAS Chair (2009-2010)
Alexander Agassiz Professor of Biological Oceanography, Harvard University

Alan I. Leshner
AAAS CEO and Executive Publisher, Science, Science Translational Medicine, and Science Signaling
Public Statements on Key Issues

AAAS increased awareness about science and technology issues of crucial importance to our health and well-being through enlightening op-eds, presentations, official letters of protest, commendations, and testimony before Congress. The statements tackled such hot topics as stem cell research, evolution, and climate change, inserting the rational voice of science into public debate.

**EVOLUTION IN THE NEWS**

- 23 March. “Texas Case Threatens Education and Competitiveness Nationally,” San Antonio Express-News, by AAAS President (2009-2010) Peter C. Agre, director of the Malaria Research Institute at the Johns Hopkins Bloomberg School of Public Health, with the AAAS CEO.

**GLOBAL CLIMATE CHANGE**

- 21 October. AAAS and 17 other scientific organizations sent a letter to members of the U.S. Senate, asserting that “rigorous scientific research” and “multiple independent lines of evidence” clearly support the reality of global climate change tied to human activities. “The severity of climate change impacts is expected to increase substantially in coming decades,” the letter concluded.
- 4 December. AAAS reaffirmed the position of its Board of Directors and leaders of other scientific organizations, noting that “global climate change is real, it is caused largely by human activities, and the need to take action is urgent.” While noting that investigations are appropriate whenever questions are raised regarding the transparency or rigor of science, isolated questions cannot overturn a century of robust evidence, AAAS asserted.
- 9 December. “Don’t let the climate doubters fool you,” op-ed, Washington Post, by AAAS CEO Alan I. Leshner, executive publisher, Science and related journals. “Climate-change science is clear,” Leshner wrote in a pointed response to an essay by former Alaska Governor Sarah Palin. “Major health and economic impacts are likely unless we act now to slow greenhouse gas emissions.” Leshner’s piece was republished by an array of media outlets, listed below.
- 11 December. The Guardian of the United Kingdom.
- 12 December. Los Angeles Times.
- 12 December. Daily News Tribune of Waltham, Massachusetts.
- 12 December. The MetroWest Daily News of Framingham, Massachusetts.
- 14 December. Atlanta Journal Constitution of Georgia.
- 14 December. The Juneau Empire of Alaska.
- 16 December. Bucks County Courier Times of Pennsylvania.
- 17 December. The Providence Journal of Rhode Island.

**SCIENCE DIPLOMACY**

- 24 March. Norman P. Neureiter, senior advisor to the AAAS Center for Science, Technology, and Security Policy, testified before a U.S. House subcommittee regarding the value of U.S. international scientific cooperation as a cornerstone of constructive foreign policy.
SCIENCE EDUCATION

10 June. “Adopt National Standards to Help Children Compete,” op-ed, Houston Chronicle, by the AAAS CEO and Jo Ellen Roseman, director, Project 2061. AAAS applauded a proposal to set uniform K-12 learning goals in reading and mathematics for all U.S. students, but called for shared science standards, too. This piece was republished by other media outlets, as follows:

- 23 June. St. Louis Post-Dispatch of Missouri.
- 22 June. Greenville News of South Carolina.


SCIENTIFIC INTEGRITY AND BIOETHICS

12 March. Artificial organisms, the meld between mind and machine, and the ethics of doing research in online communities such as Second Life should be part of the agenda for the successor body to the U.S. President’s Council on Bioethics, AAAS expert Mark S. Frankel said in a special presentation. Frankel directs the AAAS Scientific Freedom, Responsibility, and the Law program.

STEM CELL RESEARCH

9 March. Letter to U.S. President Barack Obama, by the AAAS CEO, commending an executive order on federal support for human embryonic stem cell research and applauding the decision to issue guidance on scientific integrity.

20 May. AAAS commented on draft U.S. National Institutes of Health guidelines on human stem cell research. While applauding fast action toward issuing guidelines, AAAS raised several concerns related to informed consent rules, a federal registry of stem cell lines, and the challenges of conducting public and private research within the same facility.

SUPPORT FOR RESEARCH AND DEVELOPMENT


U.S. VISA APPLICATIONS

10 June. “Visa Problems Harming America’s Scientific, Economic, and Security Interests,” statement by a coalition of 31 science and higher-education organizations led by AAAS, urging steps to improve the processing of U.S. visas for visiting scientists, engineers, and scholars.

WOMEN IN SCIENCE

23 June. “Science Benefits from 37 Years of Title IX Anti-Discrimination Law,” White House roundtable presentation by Shirley Malcom, director, AAAS Education and Human Resources. Title IX has supported significant educational strides for U.S. women, Malcom said, but financial and cultural support still are needed to promote women in science and math to “positions of power.”

21 July. In testimony before a U.S. House subcommittee, the AAAS CEO reported that women have made substantial gains in science and engineering fields during the past four decades. Yet, he said, the progress has been uneven and, in some cases, ground is being lost.
Beyond Copenhagen—Planning for Climate Change

In Europe, the annual growing season has lengthened by about 30 days in the past three decades, and continued warming could lead to rain losses of 30-40% in Southern Europe and increases of 30-40% in the north, a senior scientist with the European Commission’s Joint Research Centre said at a symposium co-sponsored by AAAS, the Embassy of Sweden, and the U.S. Delegation of the European Union.

Experts said disruptions associated with climate change have already begun—promising extreme heat waves, drought, and floods—and should be met with constructive responses, including new dikes and flood-warning systems and research on crop breeding. The challenges are a “crisis of opportunity,” said James W. Hansen, a research scientist at the International Research Institute for Climate and Society at Columbia University, adding that greenhouse gas concentrations are so high that society must prepare for their effects.

Two other events in the same “Beyond Copenhagen” forum looked at other ramifications of climate change. “Water and Urban Infrastructure” considered the likely effects of extreme rainfall and sea-level rise within cities. At “Water and Marine Services,” marine experts including James J. McCarthy, AAAS board chair (2009-2010), discussed ways to adapt to climate change’s effect on oceans, which are essential for sustenance and carbon dioxide absorption.

AAAS Science Diplomacy Takes Off

Since launching its Center for Science Diplomacy in 2008, AAAS has sent scientific delegations to Cuba, North Korea, and Syria. In early 2009, a series of meetings were held in Damascus and attended by David Baltimore, AAAS board chair (2008-2009), as well as AAAS senior managers Vaughan Turekian and Norman P. Neureiter. The meetings explored how science cooperation and scholarly exchanges might benefit the understanding of issues such as water, energy, and agriculture—and yielded considerable enthusiasm for collaboration as well as the reciprocal visit of a Syrian science fellow to AAAS. Similarly encouraging interactions involved AAAS visits with scientists and academics from the Democratic People’s Republic of Korea and Cuba, efforts that were led by AAAS President Peter C. Agre (2009-2010).

At a meeting co-sponsored by AAAS and hosted by the Royal Society in London, high-level scientists and science policy leaders took a step back and examined the most fruitful approaches to science diplomacy, as well as potential problems to avoid, while considering its role in addressing population growth, food demand, water shortages, energy consumption, economic breakdown, and environmental degradation.

Also this year, AAAS welcomed the heads of the three S&T councils from Kenya, Tanzania, and Uganda to discuss science cooperation and regional integration in East Africa. The discussion was moderated by former Rwandan Science and Education Minister Romain Murenzi, who is currently at AAAS as a senior scholar.

AAAS encourages global science cooperation in the interests of our increasingly interconnected world—helping to nurture relationships with the international science community and collaborating to address some of the world’s major challenges. Such cooperation takes on greater urgency in a world where almost every major issue has science and technology as either the cause or the cure.
Helping to Harmonize Global Science

New Zealand could meet most of its liquid fuel needs from converting softwood—mostly Monterey pine and some Douglas fir—to biofuels, according to collaborative research led by Scion, New Zealand's forest research institute. The work is also being conducted by Sandia National Laboratory in New Mexico, the Joint BioEnergy Institute in California, and Venerium, a private company in Massachusetts. The softwoods-to-biofuels technology could be adapted for use anywhere with such forests, leaving valuable agricultural lands to food production.

The New Zealand science community reportedly carries out 40% of its research with U.S. colleagues and seeks more foreign partners, said Helen Anderson, chief executive of New Zealand's Ministry of Research, Science, and Technology. She spoke at a AAAS lecture co-sponsored by the Washington Science Policy Alliance and the Embassy of New Zealand.

With international collaboration as a major goal, AAAS welcomed an impressive list of science and policy leaders in 2009 to work toward “harmonizing global science,” whether that involves developing global guidelines on embryonic stem cell research, standardizing rules about the use of human research subjects, or working across national boundaries to define science ethics. International guests included science leaders Li Jinghai, vice president of the Chinese Academy of Sciences and vice chair of the China Association for Science and Technology (CAST), Sir David King, chief scientific advisor to the government of the United Kingdom (2000-2007), and Mauro Dell’Ambrogio, Swiss state secretary for education and research, among many others.

First-Ever Science Envoys Named


“Nothing is more important than an effective S&T diplomacy for our country, now that the world is facing challenges in health, climate change, energy, and environment that go beyond the purview of any one nation,” Zerhouni said.
Science Careers and Education

Promoting understanding of science worldwide, recruiting science and math teachers, providing resources to young people starting out in science careers, strengthening and diversifying the workforce—AAAS works through its multi-targeted career and education programs to improve the quality of science education and the accessibility of resources available to those in science careers.

Promoting Climate Literacy and More

Thanks to grants from NASA and NOAA, the AAAS science-literacy initiative Project 2061 is developing classroom materials to engage middle-school students in concepts related to climate and climate change. The project aims to improve students’ understanding of climate science, yet it has another goal: to capture middle-schoolers’ curiosity at an age when science performance often drops. The grants allow Project 2061 staff, along with experts in climate science and teaching, to use real-world NASA and NOAA data to engage students in climate science.

Participating in the worldwide effort to promote science literacy, AAAS in 2009 welcomed educators from Pakistan and Japan with an interest in using Project 2061’s tools and resources to improve science teaching and learning in their own countries. As part of a five-year effort, Project 2061 also hosted a delegation of educators from Shanghai, and compared notes with them on challenges encountered in designing, implementing, and evaluating science education methods. The Chinese translation of Project 2061’s Atlas of Science Literacy, Volume 1, won a national prize in China, and Project 2061 Deputy Director George DeBoer was honored with an award in Shanghai for his contributions to international exchange.

Social Media for Career Development

Taking advantage of new Web technologies and internal synergies, Science Careers—in conjunction with AAAS Education and Human Resources, the Office of Publishing and Membership Services, and the Center for Careers—have launched two social networks. Both draw editorial content from Science Careers, and invite individuals and organizations to contribute ideas and resources for exploring the pathways to successful science careers.

CTSciNet is an online community for people interested in or pursuing careers in clinical and translational research. Built in partnership with 13 other organizations, CTSciNet is funded by the Burroughs Wellcome Fund. Meanwhile, MySciNet brings together scientists and students from diverse communities to network—and build the personal and professional connections needed to succeed in the sciences. MySciNet received funding from the William T. Golden Fund for Program Innovation at AAAS and 10 other sources.

Science Careers has also drawn on its network of career experts and scientists to produce two Webinars linked to print and digital versions of resource booklets. Career Trends: The Informed Job Search and Career Trends: Careers Away from the Bench. In addition, a new booklet called Career Basics: Advice and Resources for Scientists is intended for early-career scientists, and one titled Young Women in Science: Forging New Pathways speaks to the career interests of young women and girls.

Transforming Undergrad Biology

Most graduates of introductory college-level biology lack an understanding of scientific inquiry, including how to evaluate explanations of the natural world. Realizing this and its alarming ramifications, 500 faculty, college administrators, and policy-makers converged in July at an event sponsored by AAAS and the National Science Foundation, Minority Opportunities in Research of the National Institutes of Health, and the Howard Hughes Medical Institute. The main topic was how to prepare students, not just biology majors, to work...
and participate in a world in which understanding science is critical. The conference followed a series of conversations, with more than 200 educators from around the country as well as undergraduates, designed to elicit ideas on how to improve undergraduate biology education. The gathering resulted in a report, *Vision and Change: A Call to Action*, ongoing networking and dissemination of materials related to the topic, and more.

**Building Capacity, Supporting Diversity**

Underrepresented minorities—including African Americans, Native Americans, Hispanics, and women and people with disabilities—represent two-thirds of the U.S. workforce but hold only a quarter of the science and technology jobs. Through the Center for Advancing Science & Engineering Capacity, AAAS offers expert advice on how to help scientists and engineers succeed. The Center organized and hosted four workshops—on mentoring of female scientists, promoting participation in computing, and two on law and diversity on university campuses. In the law and diversity workshops, the Center produced materials on navigating the legal maze around promoting diversity in undergraduate and graduate faculty and student bodies. With counsels and provosts from 35 Association of American Universities member institutions, the workshops provoked meaningful dialogue on how to support diversity. These forums give universities tools for “refining the way they do business,” Center Director Daryl Chubin told attendees.

**Science and Mathematics Teachers**

Three AAAS initiatives are aimed at ensuring a pool of highly effective teachers.

DC ACTS and DC FAME, professional education programs conducted in partnership with George Washington University and funded by the D.C. Office of the State Superintendent of Education, provide veteran and new teachers with the content, pedagogical knowledge, and leadership skills to become agents of change in their schools.

In another effort, AAAS collaborates with the National Science Foundation in support of the Robert Noyce Teacher Scholarship Program. Cultivating science and mathematics teachers is the mission of the scholarships, which offer classroom experience and support as well as stipends to undergraduate science, mathematics, and engineering majors; post-baccalaureate students; and professionals already working in science and engineering. For each year of support, recipients teach at least two years in a high-need school district. The program conference, supported by the NSF, brought together 400 faculty, students, and professionals in science, technology, engineering, and mathematics, who discussed the best strategies for supporting new teachers, including observation and feedback, mentoring, and co-teaching.

**Careers for Engineers with Disabilities**

At a first-of-its-kind meeting of engineers with disabilities, participants from academic institutions, federal agencies, and professional societies discussed how they have solved problems that faced them in school and the workplace. Funded by the National Science Foundation and organized by the AAAS Project on Science, Technology, and Disability, the meeting sought to tap the problem-solving skills that people with disabilities develop to get around in the world, skills that often translate into success in science, technology, engineering, and mathematics fields. Coming up with workplace solutions for engineers and scientists is part of an effort to increase diversity and innovation in those fields. Also working toward that end are AAAS’s ENTRY POINT! and ACCESS programs, co-sponsored by NASA, which place students with disabilities in summer internships at corporations and at federal laboratories.

“I gained further knowledge through the FAME program, and then in turn I passed that knowledge on to my students,” said Marlo Thigpen, a math teacher at Shaw Middle School at Garnett-Patterson Campus. “I try to expose students to everything possible so that they can succeed. As I gain more, I give them more.”

Courtesy of Marlo Thigpen
Forum Showcases New U.S. Priorities

“Without energy, there is no economy; without climate, there is no environment; and without economy and environment, there is no well-being. So we had better figure out how to get this right,” President Barack Obama’s science advisor and former AAAS President John P. Holdren said during the 2009 AAAS Forum on Science and Technology Policy. The annual Forum is the largest and most important science and technology conference in the country. Organized by AAAS Science and Policy Programs, the Forum also hosted U.S. Energy Secretary Steven Chu, who with Holdren and other strong representatives of the science community, outlined for 600 leaders from government, business, research centers, and universities the new science objectives and funding put forth by the Obama Administration. Also at the Forum, U.S. Rep. Bart Gordon, the Tennessee Democrat who chairs the House Committee on Science and Technology, urged scientists and engineers to protect unprecedented new levels of funding by communicating their work to others in society, especially given the tough economic times. “What I try to explain is that spending money on research and development really is jobs—it’s our future.”

S&T Policy Fellows at the Forefront

Nina Fedoroff, science and technology advisor to the U.S. Secretary of State, was one of several top-level officials from government, non-governmental organizations, and academia who addressed the S&T Policy Fellows during their 2009 orientation program. Then celebrating its 35th year, the program has dispatched highly trained scientists and engineers to key U.S. Congress and Executive Branch offices to help solve pressing world problems. For example, fellows have helped turn former anthrax factories in Russia, Georgia, and Kazakhstan into vaccine production and disease surveillance facilities in those countries. They have organized a forum on sustainable urban development in the Middle East. And they have led an effort to retrain Iraqi weapons scientists to do civilian work. One 2009 fellow, who is a neuroscientist, went to work at the Pentagon, where he hosts a weekly radio program, interviewing senior officials not only about weapons research, but about the Defense Department’s research in such areas as biomedicine, the environment, and the social sciences. The broadcast reaches out to a civilian and military audience. In general, the S&T Policy Fellowships provide scientific expertise to policy-makers needing solutions to increasingly technical issues, while providing a path for scientists who would like to participate in public policy.

Science in Service of Human Rights

Satellite images detected evidence of intense fighting within a Sri Lankan civilian safety zone in May, according to a detailed analysis of the high-resolution images completed by AAAS. Blamed by the government of Sri Lanka on Tamil rebels “bombarding their own civilians,” the fighting resulted in massive displacement of the population and widespread loss of life, as evidenced by hundreds of recent graves, AAAS reported. The AAAS analysis was requested by Human Rights Watch and Amnesty International USA.

The AAAS Science and Human Rights Program also assessed satellite images in Afghanistan, where evidence of the excavation of a mass grave raises questions about a 2001 incident in which Uzbek General Abdul Rashid Dostum reportedly ordered the mass burial of 2,000 Taliban prisoners of war, after they suffocated while being transported in containers. The advocacy group Physicians for Human Rights, whose mission is to “investigate the health consequences of human rights violations and work to stop them,” asked AAAS...
to analyze the satellite images. In July, U.S. President Barack Obama announced that his national security staff would look into the deaths of the Taliban prisoners to determine if the United States contributed to possible war crimes.

Also in 2009, the AAAS Science and Human Rights Coalition met to continue the work of enlisting scientists to take up important work on human rights, holding workshops and meetings such as, “Human Rights 101 for Scientists” and “Ethical Dilemmas in Science Practice.” Meanwhile, the “On-call” Scientists initiative, which helps connect scientists wanting to do volunteer work with human rights organizations, attracted more than 350 scientists and engineers to work on such projects as assessing evidence of torture, investigating the effects of oil extraction in the Congo and gold mining in Guinea, and evaluating the psychological impacts of child labor in the diamond mines of the Democratic Republic of Congo.

Tracking R&D Funding Trends

Top agencies doing basic research are experiencing funding increases under the Obama Administration. Detailed, authoritative information about such trends is the product of the AAAS R&D Budget Policy Program, directed by Patrick Clemins, and that product is especially valuable in a difficult economy, as policy-makers make decisions regarding science and technology. Publishing a comprehensive yearly statistical and analytical report on proposed research and development allocations by the federal government, as well as ongoing online updates on R&D funding, the program provides objective, up-to-the-minute information on U.S. science funding levels. U.S. funding levels are often compared to those of other countries, and the information is made available to the scientific and engineering communities, as well as to congressional staffs. “Science and technology are recognized as drivers of economic health and growth, not only in the United States, but also the world,” Clemins said.

Events on Climate, Health, and More

Nearly 30 events at AAAS and on Capitol Hill helped to inform policy-makers and the public about global climate change, infectious disease threats, and more. For instance, in November, experts said sea-level rise, severe weather, and ocean acidification are already inevitable.

James J. McCarthy, AAAS board chair (2009-2010), also took up the climate charge. McCarthy, who gave the 2009 Robert C. Barnard Environmental Lecture, said, “We are headed to dangerous territory at breakneck speed,” in reference to the potential for disaster posed by climate change. McCarthy, who was co-chair of Working Group II for the 2001 Intergovernmental Panel on Climate Change report, urged consideration of some of the newer issues that have surfaced in the climate debate. For example, McCarthy pointed out that nations may be forced to manipulate the climate with geo-engineering, such as putting fine particles in the atmosphere to reflect some sunlight back to space, in order to counter global warming.

“We may reach a point,” McCarthy said, “where we’re going to be so desperate that we will need to look critically at various geo-engineering approaches.”

Even more diverse topics, from the safety of the chemical bisphenol A, found in plastic baby bottles and other products, to nanotechnology, were addressed during a series of seminars organized by the AAAS Archives and the Chemical Heritage Foundation’s Center for Contemporary History and Policy.
Science, Technology, and Security

The AAAS Center for Science, Technology, and Security Policy brings science to security policy and security awareness to the scientific community. The center convened top experts to provide authoritative technical information in 2009 on such topics as biodefense, counterproliferation of weapons of mass destruction, and combating the H1N1 flu. Such efforts resulted in a number of influential publications and events, packaged for quick transmission to lawmakers, government officials, and the public. The center is primarily funded by the John D. and Catherine T. MacArthur Foundation.

Biosafety, Biodefense, and Fighting Infectious Disease

Anticipating and effectively combating infectious disease outbreaks requires coordination between experts across different disciplines, concluded a report documenting a May 2009 workshop with public health officials.

The AAAS report included an example from New York City in which an important connection was initially missed between seven human deaths and the fatal illness of several animals at the Bronx Zoo. Unfortunately, health officials researching the human deaths had no knowledge of the animals’ illness, which was identified as West Nile Virus. It was only after zoo officials shared their information with public health officials that the human deaths were recognized as the first U.S. casualties of West Nile. With a better system of communication between public health officials and experts outside of their discipline, the animal deaths could have been a mechanism for early identification of the human outbreak.

Serious threats to society’s welfare underlie the relevance and urgency of topics such as communicating about and preparing for disease outbreaks. Other expert workshops organized through the AAAS Center for Science, Technology, and Security Policy (CSTSP) tackled such issues as ensuring biological lab security while encouraging vital research, as well as the urgent need for scientists trained to help create biodefense policy.

Addressing Global Challenges

Although U.S. specialists had been warning of the possibility of a deadly flu pandemic for several years, the assumption was that this pandemic would arise far from the United States from the mutation of a deadly but not very contagious flu strain into a strain that would spread rapidly from person to person. However, the rapid spread of flu, beginning in April 2009, did not fit this model.

Some of the first cases were reported in California, and the strain involved was not the H5N1 avian flu, which had given rise to the earlier concerns, but an H1N1 flu more closely related to the strain responsible for the deadly epidemic in 1918. Despite initial reports of fatalities, the 2009 flu did not appear to be very lethal. “What we had was completely different” than what had been anticipated, Anne Schuchat of the Centers for Disease Control and Prevention in Atlanta told an audience at a discussion in the “Global Challenges” series organized by AAAS, Georgetown University’s Program on Science in the Public Interest, and the American Chemical Society. Moderated by Richard Harris of National Public Radio, the event called upon Schuchat, an assistant surgeon general in the U.S. Public Health Service, and influenza specialist Jeffrey Taubenberger of the National Institute of Allergy and Infectious Diseases to explain the main difficulties presented by H1N1. Those difficulties included the delays manufacturers encountered in trying to produce enough vaccine to counter the virus, which speakers said pointed to an urgent need for new vaccine technologies.

Other “Global Challenges” programs welcomed top authorities in health, ecology, the environment, sea life, and science policy to present expert insight into topics that included the impact on the oceans of increased carbon and
the interconnection of water and energy, with considerable quantities of each consumed to deliver the other.

**Other Public, Press, and Policy Events**

The interplay between science and the policies and campaigns that shape global security took many different forms in events organized by CSTSP in 2009. Ken Brill, director of the National Counterproliferation Center in the Office of the Director of National Intelligence, spoke to an afternoon session in the AAAS auditorium about the collaboration of scientists and the intelligence community to prevent the spread of nuclear, chemical, and biological weapons in a world where even terrorist groups might have the technology to develop weapons of mass destruction. Leaders of an international evaluation of nuclear testing detection told a rapt crowd at a three-hour Capitol Hill luncheon event that recent technological advances have enabled a system of sensors monitoring the Earth’s crust, oceans, and atmosphere to be even more effective at detecting nuclear explosions than was projected when the Comprehensive Nuclear Test-Ban Treaty was negotiated in 1996. Top experts also spoke at events focusing on science diplomacy with North Korea, as well as the advisability of ending the production of weapons-grade fissile materials as a step toward nuclear disarmament. These and other 2009 events brought balanced technical analysis to the general public, the media, and policy-makers.

**Epstein Joins Security Policy Center**

This year, the Center for Science, Technology, and Security Policy welcomed Gerald Epstein, a physicist with exceptional expertise on nuclear and biosecurity issues, as its new director. Epstein comes from the Center for Strategic and International Studies and previously from the Institute for Defense Analyses, where he was assigned to the Defense Threat Reduction Agency. He also worked for the White House Office of Science and Technology Policy and the National Security Council as well as the congressional Office of Technology Assessment. He holds as his mission ensuring that security policy is made with the best scientific and technical input, and that its implementation is fully consistent with the pursuit of scientific and technical excellence.
**Science Breakthroughs**

Life-changing research published this year by *Science* focused on such developments as new evidence of the destruction of the ozone layer by nitrous oxide, a gene therapy technique that might someday save the lives of children with a debilitating brain disease, and meticulously studied skeletal remains that bring us ever closer to the last common ancestor shared by humans and chimpanzees. Each issue of *Science* underlined the role of science in our lives and brought greater understanding to issues of dire importance. See [www.sciencemag.org](http://www.sciencemag.org).

**RESEARCH HIGHLIGHTS**

**Maize Genome**

*Plant genetics and crop breeding got a major boost when scientists sequenced the entire genome of one of the oldest and most important crops, the maize plant.* (Schnable, 20 November)

![Maize Genome](image1.jpg)

**Reimagining the Heliosphere**

*Missions by the Interstellar Boundary Explorer and Cassini spacecrafts are providing a totally unexpected picture of solar winds carving out a radioactive cavity in space for our sun, known as the heliosphere.* (McComas, 15 October, *Science Express*)

![Heliosphere](image2.jpg)

**Ardipithecus ramidus**

*Emerging as a pivotal figure in the story of human evolution, the Ethiopian fossil specimen known as “Ardi” predates Lucy, once known as the Mother of Man, bringing researchers closer to the last common ancestor shared by humans and chimpanzees.* The *Science* articles about Ardi represented 15 years of painstaking research by 47 scientists from nine nations. (White and colleagues, 2 October)

To learn more about Ardi, go to [www.sciencemag.org/ardipithecus](http://www.sciencemag.org/ardipithecus).

![Ardipithecus](image3.jpg)
New Top Ozone-Depleting Emission

Nitrous oxide causes more ozone destruction than more commonly known ozone-depleting substances, and limiting its emission could significantly speed the recovery of Earth's ozone layer, scientists reported. (Ravishankara, 27 August, Science Express)

Can Cutting Calories Increase Life Spans?

Significantly reducing caloric intake increases longevity in rhesus monkeys, a 20-year study suggests. Because of parallels between the monkeys and humans, the study suggests that the bodies of humans who cut calories might react similarly. (Colman, 10 July)

Fighting to Save the World’s Fisheries

Changing the way fisheries are managed could save them from collapse, new evidence indicates. Strategic closures, gear restrictions, ocean zoning, and economic incentives might sacrifice current yields but would help to ensure the fisheries’ survival. (Worm, 31 July)

African Genetic Diversity and Ancestry

The population of Africa evolved from 14 ancestral populations, suggested a new genetic study, which revealed immense diversity across the continent. The findings could lead to medical advances in Africa and to further insights into human evolutionary history. (Tishkoff, 30 April, Science Express)

Fermi Data Illuminate Gamma-Ray Pulsars

Like a new set of eyes in space, the Fermi Gamma-ray Space Telescope has revealed a whole new level of information about pulsars, objects that pulse brightly at gamma and radio wavelengths. (Abdo, 2 July, Science Express, 14 August)

Science News Highlights

The Best of Science Writing anthologies selected two Science articles in 2009.

– Science staff writer Jennifer Couzin explored the idea that happiness, smoking, and even obesity spread among friends. (23 January)
– In a profile of the late Norman Borlaug, Science staff writer Erik Stokstad described one man’s battle to stamp out a devastating wheat fungus. (8 May)

Two Science writers won prestigious prizes in 2009 for work published in 2008:

– Correspondent Jon Cohen was awarded the Excellence in Media Award by the Global Health Council for his investigation of the successes and failures of HIV-AIDS funding in Uganda and Botswana. (25 July 2008)
– Examining new research that implicates shock waves in blast trauma suffered by soldiers in Iraq, Science writer Yudhijit Bhattacharjee was honored with Mental Health America’s Media Award. (25 January 2008)

Read about other Science developments, next page.
**Other *Science* Developments**

**Science Translational Medicine Launched**

This new *Science* publication debuted in October to publish research that offers significant promise in improving medical treatment and patient care. An offshoot of *Science, Science Translational Medicine* follows the successful journal *Science Signaling*, which was expanded last year. The first issue of *Science Translational Medicine* contained an article describing a device for detecting tiny amounts of estrogen, which could be useful in breast cancer screening. Elias Zerhouni, M.D., former director of the U.S. National Institutes of Health and recently named a U.S. science envoy by the U.S. State Department, serves as the new journal’s chief scientific advisor. See www.sciencetranslationalmedicine.org.

**Science Celebrates the Year of Darwin**

In celebration of the 150th anniversary of Darwin's *On the Origin of Species*, as well as the 200th anniversary of Darwin's birth, *Science* published a wide range of research on how living things diversify and produce new species. The articles represented an overall effort to continue Darwin's work, and to understand and document the forces behind evolution, while at the same time reflecting how genetics is answering questions on a molecular and cellular level about what enables evolution to occur. Also in celebration of Darwin, *Science* offered monthly "Origins" essays as well as a corresponding blog on key developments in evolution and in human culture.

**Communicating About H1N1**

Starting in May, just one month after the first cases of H1N1 were reported, *Science* began publishing both research and news articles about the alarming pandemic. Working hard to shed light on H1N1's threat as well as the campaign to combat it, *Science* editors quickly vetted research on topics as divergent as the flu's origins, its severity and spread, and an evidence-based method for choosing which segments of the population should be first to receive flu vaccine in order to best protect the public health. At an event sponsored by the Council on Foreign Relations and *Science*, top experts in the fields of science, economics, public health, and foreign relations said H1N1 influenza revealed cracks in the global plan for dealing with pandemics but also offers opportunities to fine-tune that plan for potentially more deadly epidemics.

**Special Focus on Education**

Led by Editor-in-Chief Bruce Alberts, *Science* has taken on the mission of promoting progress in science education and the "science of education" by publishing research and discussion that explores and analyzes educational systems. Throughout 2009, *Science* published important research and insights to education in the form of original research, Perspectives, Reviews, and "Education Forums." The articles delved into such topics as determining the effectiveness of technology in education, connecting at-risk students' science classroom experiences to their everyday lives, the benefits to student performance of getting teachers into research labs, opening educational resources to all, bringing scientific inquiry into the classroom, and new research suggesting that gesturing to babies at around 14 months gives them an advantage in developing vocabulary.
Alberts, who in early 2009 met privately with the Chinese premier, Wen Jiabao, returned to China with a delegation that included Richard Stone, the Science Asia news editor, and a representative for AAAS’s EurekAlert! Chinese science news service. In a lecture at the Chinese Academy of Sciences, Alberts urged the U.S. and Chinese governments to improve science education. He also encouraged young scientists to take creative risks in their research.

Prizes Awarded and Announced

The winner in the 2009 Eppendorf and Science Prize in Neurobiology, Richard Benton, was recognized for his research on the molecular mechanisms of odor detection in insects, work that could lead to controlling odor-evoked behaviors of insects that transmit diseases such as malaria.

The GE and Science Prize for Young Life Scientists went to Michael Crickmore, for his research on why the body parts of a single animal develop into different sizes. Focusing on the common fruit fly, Crickmore showed how the regulation of particular proteins controls the development of wings and appendages.

Authors of two Science articles, “Optical Images of an Exo-solar Planet 25 Light-Years from Earth” and “Direct Imaging of Multiple Planets Orbiting the Star HR 8799,” won the Newcomb Cleveland Prize, supported by Affymetrix, for offering the first definitive, direct imaging of planets that orbit distant stars. Their work may one day lead to the direct imaging of Earth-like planets in order to examine them for gases associated with life. (See page 27.)

Also in 2009, the Science Prize for Online Resources in Education (SPORE) was developed to distinguish the best online materials available to science educators. Science publishes an article by each recipient of the award explaining each winning project.

Six previously unknown swimming species of acrocirrid polychaete worms recently discovered in the deep Pacific Ocean. Hypothetical relationships are represented by the twisted evolutionary path leading to each species in this unrooted tree. A typical benthic acrocirrid is included for comparison to the swimming species.
Media and Public Engagement

AAAS brought public visibility to science and its importance in our world with events ranging from a White House exhibit for citizens of all ages to the 2009 Annual Meeting, attended by thousands, including hundreds of media professionals. Evolution, genetics, and sustainability were just some of the topics tackled by AAAS in 2009 with the goal of engaging the public in thoughtful exploration of our natural world. Through events, science news for journalists worldwide, and media workshops for scientists and engineers, AAAS facilitated the broad communication of science.

A Call to Action on Climate
Among the all-star speakers at the AAAS 2009 Annual Meeting in Chicago was Nobel Peace Prize-winner Al Gore, who called on scientists to join in communicating the truth about climate change and its impact on the Earth. Gore, speaking to an overflow crowd of 3,000, asked scientists to employ their “knowledge and wisdom” at every level of the political process to push a shift to renewable energy over the next 10 years. Introducing Gore, James J. McCarthy, AAAS board chair (2009-2010), said, “No single individual deserves more credit … for our public acceptance of climate change—public acceptance that has emboldened growing numbers of mayors, governors, senators, and presidential candidates.”

Other top speakers included evolutionary biology expert Sean Carroll, who spoke about Charles Darwin, Alfred Russell Wallace, and Henry Walter Bates—explorers from what Carroll termed “the first golden age” of evolutionary biology. Genetic science has brought us to another golden age in evolutionary science, Carroll said in a presentation that brought his audience to their feet with its storytelling, music, and slide show of stunning nature shots. Nearly 6,600 people attended the 2009 Annual Meeting.

Science and the White House
In spring 2009, AAAS-Science contributed the first-ever science activity at the White House egg roll. A joint effort of AAAS Education and Human Resources and the Office of Public Programs, the exhibit, which was designed and staffed by AAAS, attracted thousands of visitors of all ages. Children played an interactive egg-matching game in which they matched reproductions of six eggs with their animal parents. They could also view live amphibian eggs, and learn about the life cycle of a frog and the structure of eggs. A coloring sheet presented the kinds of animals that lay eggs. The exhibit was intended to offer “something for everyone,” said Shirley Malcom, director of AAAS Education and Human Resources. “Science is everywhere, it’s all around us, and you’re never too young.”

Building Bridges: Science and the Public
Scientists and the public understand more about each other since the release of a study by the Pew Research Center, conducted in collaboration with AAAS. The study showed that large majorities of Americans believe that science has had a positive effect on society and has made life easier for most people. Even those who are skeptical of scientific conclusions on such topics as climate change and evolution rate scientists highly and believe in government investment in science.

At the same time, 85% of scientists see the public’s lack of scientific knowledge as a major problem for science, and 76% say another problem for science is that news reports fail to distinguish between findings that are well-founded and those that are not.
AAAS communicated the survey’s conclusions through an article on the AAAS Web site and a teleconference; an audio recording was then uploaded onto aaas.org as well.

**Abelson Seminar: Translational Medicine**

Erin Lavik is experimenting with a nanoparticle designed to activate blood platelets, with the goal of slowing the bleeding that worsens spinal-cord damage immediately following an injury.

Lavik represents the intensely multidisciplinary approach of translational medicine, which brings advances in research into medical settings and which was the focus of the 2009 AAAS Abelson Advancing Science event. Honoring the legacy of science icon Philip Hauge Abelson, a long-time AAAS senior advisor and *Science* editor emeritus, the event brought together Lavik, Elias Zerhouni, who is the chief science advisor for *Science Translational Medicine*, and Hal Dietz, another translational pioneer.

The event was part of broader efforts to communicate the potential of translational medicine by AAAS. In October 2009, AAAS CEO Alan I. Leshner brought the topic to a Capitol Hill briefing, introducing the *Science Translational Medicine* journal, which was designed to promote communication between academic and corporate researchers and doctors. Such collaboration is seen as crucial to fostering medical advances, especially when venture capital money is scarce and big drug companies are pursuing conservative investments.

**AAAS Divisions Unite**

The annual AAAS Arctic Division meeting in 2009 focused on sustainability versus the consequences of climate change, even as Arctic communities suffer severe erosion and encroaching waters because of increasingly devastating storms and rising seas. Food shortages are another resultant problem, as climate change affects fish runs and disrupts the habits of game animals.

The four regional divisions of AAAS organize meetings on regional issues and promote publications from scientists within each of the divisions. At the 2009 meeting of the Pacific Division, sustainability was also a focus and included pollution and climate change threats to the San Francisco Bay, with discussions taking into account the complication of working to sustain a natural environment that is constantly evolving. “We have to figure out how to adapt our conservation and sustainability to a world in which a strategy that works one moment may not work the next,” said Roger Christianson, executive director of the division.

The Caribbean Division conference put forth a strong push toward building public interest in science. “We strongly believe that the public, including poor and disadvantaged groups, has the right to enjoy the benefits of scientific progress and its applications,” said Caribbean Division President Jorge Colón, “but that right can only be fulfilled if science and technology are broadly available and accessible.”

The Southwestern and Rocky Mountain Division Annual Division meeting offered symposia on rainforest natural history and alternative energy, and workshops on science communication. The meeting emphasized the importance of transcending traditional boundaries of science in a world in which “the largest problems facing society are so large and burdensome that no one scientific discipline, institution, or research method can find solutions,” said David Nash, executive director of the division.
More than 84% of the support for AAAS’s diverse programs comes from grants, contributions, and other outside funding. Working in collaboration with AAAS staff, donors can establish special funds that accomplish important goals.

New Endowment Recognizes Public Engagement

The year was 2008, and with his wife Margee, Bob Hazen, then an outgoing member of the AAAS Committee on Public Understanding of Science and Technology (CoPUST), had an idea. The Hazens and Bob's fellow committee members knew that scientists’ public engagement work—their efforts to communicate exciting concepts to the public with “accurate simplicity”—was of the utmost importance, especially at a time when so many of the key issues on the minds of Americans are tied to science and technology. But they also knew that earlier career scientists would not earn tenure or get grants just by being great communicators.

So Bob and Margee Hazen began establishing a fund to endow the newest of the AAAS awards: The Early Career Award for Public Engagement with Science.

According to Bob: “By recognizing one early-career scientist each year, the award will highlight successful examples of public engagement and create models for other scientists and engineers. As the major voice for science, AAAS is really in a unique position to give these kinds of efforts the credibility that they deserve.”

AAAS CEO Alan Leshner agreed, and in fact, he and his wife Agnes made substantial gifts of their own.

Since then, many more donors have stepped forward to show their support.

“Without the generosity of the donors who have supported this important and timely effort, this award would be a good idea, but it would definitely not yet be a reality,” Leshner said. “This is an excellent example of what can be accomplished when generous people get behind a good idea.”

By press-time, just under $20,000 more was needed to reach the $150,000 goal to sustain the new award in perpetuity. AAAS will launch the new award in 2010, selecting the first recipient to be recognized at its 2011 Annual Meeting. Information on how to apply will be available online at www.aaas.org/aboutaaas/awards/.

$2.3 Million Gift to Endow AAAS Kavli Science Journalism Awards

The 2009 Science Journalism Awards are the first to be given under a new endowment established by Fred Kavli and The Kavli Foundation. The awards—first given in 1945—now are called the AAAS Kavli Science Journalism Awards. Kavli is a Norwegian-born physicist, entrepreneur, business leader, innovator and philanthropist who is dedicated to supporting research and education that has a positive, long-term impact on the human condition. He established The Kavli Foundation in 2000 to advance science for the benefit of humanity.

“I am very pleased that The Kavli Foundation, with goals similar to those of AAAS, has joined in helping us honor such fine examples of science journalism,” said Alan I. Leshner, chief executive officer of AAAS and executive publisher of the journal Science. “The winners demonstrate the breadth and depth of contemporary science reporting, even at a time when journalism outlets continue to face daunting economic challenges.”

“We are truly delighted to support this award honoring science journalists whose excellence has been recognized by

Bob Hazen and student
Nearly 500 members of the science reporting community gather to honor the 2009 AAAS Kavli Science Journalism Award winners.

Two AAAS Members Honor Their Teacher

When Woody Savage and Lyn Armbruster first entered John Marean’s high school physics class, they had a passing interest in science. When they left at the end of the year, they were scientists in the making.

Over decades of teaching, Marean worked to uphold his belief that teachers need to offer assistance to students who are eager to try different educational approaches. As a result of his efforts, Woody and Lyn, who married ten years later, gained a tremendous amount of self-confidence and appreciation for the seemingly endless opportunities science offered. Marean’s lasting influence also led to careers in the field—Woody, as a seismologist at the U.S. Geological Survey; and Lyn, as a middle- and high-school mathematics teacher in both public and private schools (now retired) and also a developer of supplemental mathematics educational materials.

Since their respective time in his class, Woody and Lyn, by their own introspections, realized that Marean was a “touchstone” of their lives, both personally and professionally. It is with this spirit that they decided to honor and thank Marean with their pledge in his name to support the AAAS Leadership in Science Education Prize.

Established in 2006 with a generous contribution from Edith D. Neimark, this annual award recognizes high-school science teachers for the development and implementation of innovative teaching methods and encouraging the next generation of scientists.

Learn more about the 2009 AAAS Leadership in Science Education Prize at www.aaas.org/aboutaaas/awards/hs_scied_leadership/.

their peers,” said Kavli. “The ability to communicate science in an understandable, interesting and exciting way is essential to gain the support of the public and policy-makers, and to stimulate the interest and excitement in our youth to select science careers.”

The new endowment also allowed expansion of the television category to include two awards for the first time, one for spot news/feature reporting and one for in-depth reporting.

Independent panels of science journalists select the winners of the awards.

Golden Fund: Social Media and Policy

The late William T. Golden, treasurer emeritus of AAAS, established the William T. Golden Endowment Fund for Program Innovation with a generous, historic gift of $5.25 million in 2003. The purpose of the fund is to support activities beyond the scope of AAAS’s general budget, catalyzing programmatic innovation.

In 2009, the Golden Fund supported Expert Labs, providing seed money for this cutting-edge collaboration with the John D. and Catherine T. MacArthur Foundation to provide a platform for interactive dialogue between policy-makers and the science community.

Expert Labs will leverage and extend the potential of social networking, a technological realm popularized by such public systems as Facebook and Twitter. The effort is headed by Web gurus Gina Trapani and Anil Dash, who described Expert Labs as “making technology that helps government listen to citizens,” by answering the questions of policy-makers with authoritative information from an online community of experts in science and technology and other citizens with specialized expertise. AAAS CEO Alan I. Leshner described the project as a perfect fit for AAAS’s mission of promoting the effective use of science in public policy, while enhancing communication among scientists, engineers, and the public. See www.expertlabs.org.

Are you interested in supporting the AAAS Early Career Award for Public Engagement with Science, encouraging excellence in science teaching, making a gift in someone’s honor, establishing a special fund, or providing general support to AAAS?

Please contact the Development Office at (202) 326-6636 or jstalano@aaas.org.

Special Funds at AAAS

By establishing special funds, donors ensure long-term support for a wide range of initiatives to advance science and serve society.

The Charles Valentine Riley Memorial Endowment supports an annual lecture to enhance agriculture through increased scientific knowledge.

The Fund for Honesty in Scientific Research supports efforts to promote scientific integrity.

AAAS’s John P. McGovern Endowment funds a lecture by a prominent behavioral scientist to explore the accomplishments and challenges of the behavioral sciences.

The Joshua E. Neimark Memorial Travel Assistance Endowment provides grants to support travel to the AAAS Annual Meeting.

AAAS’s Leadership in Science Education Fund recognizes high-school science teachers for the development and implementation of innovative teaching methods.

The Revelle Fund supports one AAAS Science & Technology Policy Fellow in the area of domestic or international environmental issues.

The William T. Golden Endowment Fund for Program Innovation inspires new program ideas by funding activities not normally supported by the AAAS general budget.
AAAS is here – helping scientists achieve career success.

Every month, over 400,000 students and scientists visit ScienceCareers.org in search of the information, advice, and opportunities they need to take the next step in their careers.

A complete career resource, free to the public, Science Careers offers a suite of tools and services developed specifically for scientists. With hundreds of career development articles, a grants and scholarships database, webinars and downloadable booklets filled with practical advice, a community forum providing real-time answers to career questions, and thousands of job listings in academia, government, and industry, Science Careers has helped countless individuals prepare themselves for successful careers.

As a AAAS member, your dues help AAAS make this service freely available to the scientific community. If you’re not a member, join us. Together we can make a difference.

To learn more, visit aaas.org/sciencecareers.
AAAS Awards and Prizes

The AAAS awards celebrate the achievements of extraordinary scientists, engineers, and journalists. We congratulate each of our distinguished winners.

Francis S. Collins
AAAS Philip Hauge Abelson Prize
The Philip Hauge Abelson Prize honors a public servant for sustained exceptional contributions to advancing science or a scientist or engineer who has been distinguished both for scientific achievement and service to the community.

Francis S. Collins was recognized on the basis of his extraordinary skills as a scientist, as a spokesperson for the ethical and responsible use of science, as a communicator with the public and policy makers, and for his pioneering leadership of major, highly successful federal scientific initiatives.

May R. Berenbaum
AAAS Award for Public Understanding of Science and Technology
The award recognizes working scientists and engineers who make outstanding contributions to the “popularization of science.”

May R. Berenbaum was honored for her extraordinary ability to integrate her original research on the world of insects with her inspirational efforts to communicate the wonders and complexity of nature.

Katepalli R. Sreenivasan
AAAS Award for International Scientific Cooperation
The award recognizes extraordinary contributions to furthering international cooperation in science and engineering.

Katepalli R. Sreenivasan was chosen for his role as a transformational leader of an international research center that promotes cutting-edge science by bringing together the brightest minds from nations within and beyond the developing world.

Nancy Olivieri
AAAS Award for Scientific Freedom and Responsibility
The award honors scientists and engineers whose exemplary actions, sometimes taken at significant personal cost, have served to foster scientific freedom and responsibility.

Nancy Olivieri was selected for her indefatigable determination that patient safety and research integrity come before institutional and commercial interests and for her courage in defending these principles in the face of severe consequences.

Luis A. Colón
AAAS Mentor Award
The award honors early- or mid-career 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.

Luis A. Colón was chosen for his deep commitment to advancing diversity in the chemical sciences, leading to an increase in Hispanic American Ph.D.s in chemistry.

Diola Bagayoko
AAAS Mentor Award for Lifetime Achievement
The award honors AAAS members who, for 25 years or more, 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.

Diola Bagayoko was honored for his extraordinary efforts to significantly increase the number of African American Ph.D.s in physics and chemistry.
AAAS Newcomb Cleveland Prize

Supported by Affymetrix


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

These prizes, sponsored by Subaru of America, Inc., celebrate outstanding science writing and illustration for children and young adults.

**Children’s Science Picture Book**
- Penny Chisholm, Author; Molly Bang, Author and Illustrator
  - *Living Sunlight: How Plants Bring the Earth to Life* (Blue Sky Press/Scholastic)

**Middle Grades Science Book**
- Pamela S. Turner, Author; Andy Comins, Illustrator
  - *The Frog Scientist* (Houghton Mifflin)

**Young Adult Science Book**
- Idan Ben-Barak, Author
  - *Invisible Kingdom: From the Tips of Our Fingers to the Tops of Our Trash, Inside the Curious World of Microbes* (Basic Books)

**Award for Lifetime Achievement in Hands-on Science Writing**
- Robert Gardner, Author

AAAS Kavli Science Journalism Awards

These awards, endowed by 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. (Also see page 22.)

**Large Newspaper** - Carl Zimmer, *The New York Times*
**Small Newspaper** - Amie Thompson, *Great Falls Tribune*
**Magazine** - Gary Wolf, *Wired*
**Television Spot News/Feature Reporting** - Julia Cort, NOVA scienceNOW
**Television In-Depth Reporting** - Doug Hamilton, WGBH/NOVA
**Radio** - Jad Abumrad, Soren Wheeler, Robert Krulwich, WNYC Radiolab
**Online** - Lisa Friedman, ClimateWire
**Children’s Science News** - Douglas Fox, *Science News for Kids*
AAAS Fellows

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 2009. AAAS congratulates them and thanks them for their service to science and technology.

Agriculture, Food, and Renewable Resources
Caitlin Allen
Steven R. Archer
David D. Baltensperger
Wilbert H. Blackburn
Michael D. Casler
Joseph Chappell
Robert Bruce Goldberg
Peter K. Hepler
Harry J. Klee
Donald P. Knowles
Clint W. Magill
Ronald J. Nachman
Henry T. Nguyen
Peggy Ozias-Akins
Ivette Perfecto
Gary A. Peterson
Anirreddy Reddy
Robert Schmidt
David Spooner
Bruce E. Tabashnik
Ewen Cameron David Todd
George F. Vance
Donald P. Weeks
Valerie Moroz Williamson
Carol E. Windels

Biological Sciences
David B. Allison
Frances H. Arnold
Sarah Assmann
James R. Baker, Jr.
Utpal Banerjee
Eddy (Tika) Benveniste
Randy Dean Blakely
Michael Boehne
S. Marc Breedlove
David Breshears
Anthony Paul Bretscher
Bonita J. Brewer
Terry M Bricker
W. Zacheus Cande
Ing-Ming Chiu
James Edward Cleaver
Timothy Close
Pierre A. Coulombe
Harry A. Dailey, Jr.
Ross E. Dalbey
Sarah D. DeMasson
James K. Deitz
Janis Lou Dickinson
Barry J. Dickson
John E. Donelson
Timothy Donohue
Michael E. Dorcas
David Draper
Stuart E. Dryer
Natalia Dudareva
Jay Clark Dunlap
Scott V. Edwards
Peggy Farnham
Donna Fekete
Mauro Ferrari
Carol Lynn Folt
Steven A. Frank
Bernd Fritzsch
William E. Fry
Steven D. Gaines
Sandra J. Gendler
Mark Gerstein
J. Whitfield Gibbons
Alfred L. Goldberg
Erich Grotewold
David M. Haaland
Mark S. Hafner
Klaus Hahn
Jonathan Haines
Sarah Carter Hake
Michael N. Hall
Mary Ann Handel
F. Ulrich Hartl
Graham F. Hatfull
Norman B. Hecht
S. Blair Hedges
Rogene F. Henderson
Vincent J. Hilser
James T. Hollibaugh
Austin L. Hughes
Mary Hunziker-Dunn
Thomas E. Johnson
Peter A. Jones
Cynthia M. Jones
Jerry Kaplan
Richard Karban
Steve A. Kay
Kenneth J. Kempheus
Ellen D. Kettersson
Joseph Kieber
Thomas S. Kilduff
Marc W. Kirschner
Todd Robert Klaenhammer
Alan K. Knapp
Duncan C. Krause
Robert L. Last
Frederick C. Leung
Daniel J. Lew
Anthony D. Long
Robert J. Maier
Thomas E. Martin
Barry R. Masters
Makoto Matsuoka
Gary Frederick McCracken
Don J. Melnick
Mary Ann Moran
James Thomas Morris
Donna M. Murasko
Karim Musier-Forsyth
John H. Nilson
Donald R. Ort
Mark A. Peifer
Cynthia B. Peterson
Catherine M. Pringle
Stephen W. Ragsdale
John N. Reeve
Erl E. Robertson
G. Shirleen Roeder
Mark D. Rose
Joan B. Rose
Michael G. Rosenberg
Jay A. Rosenheim
John R. Roth
David D. Sabatini
Osvaldo Esteban Sala
Virginia M. Sanders
Michael Scannell
Daniel Schlenk
John Scott
Raymond D. Semlitsch
Andrey S. Shaw
Jen Sheen
Thomas E. Shenk
Charles J. Sherr
Yigong Shi
Gerald I. Shulman
Gail Entner Sonenshein
Michael Robert Stalcup
Michael F. Summers
Lorraine S. Symington
James M. Tepper
Bruce Tidor
Liang Tong
Judith L. Van Houten
Willem F.J. Vermaas
Xiao-Fan Wang
Stephen G. Weller
Charlene J. Williams
Dennis R. Winge
Curt Wittenberg
Cynthia Wolber
Larry James Young
Su-May Yu
Maria Elena Zavala
Huimin Zhao

Chemistry
Mufti Akinc
Yitzhak Apeloig
R. Thomas Baker
Simon R. Bare
Alison A. Baski
Hagan Bayley
Tadgh P. Begley
Philip C. Bevilaqua
Robert K. Boeckman, Jr.
Jillian M. Buriak
Judith N. Burstyn
Richard A. Cerione
Richard Chamberlin
Chung-Hsuan Chen
Eric L. Chronister
Robert Norman Compton
Victoria J. DeRose
Barry Dellingmer
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<th>$2,500 - $4,999</th>
<th>$500 - $999</th>
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<td>Peter Agre</td>
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<td>Gillian M. Air</td>
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<td>Gary K. Beauchamp</td>
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<td>Monica M. &amp; E. James Bradford</td>
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<td>William T. Golden*</td>
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## Financial Summary

### Consolidated Statement of Financial Position for the years ended December 31, 2009 and 2008

<table>
<thead>
<tr>
<th>($ in thousands)</th>
<th>2009</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASSETS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>7,799</td>
<td>8,090</td>
</tr>
<tr>
<td>Accounts receivable, net</td>
<td>5,399</td>
<td>6,361</td>
</tr>
<tr>
<td>Grants and contributions receivable</td>
<td>7,121</td>
<td>9,069</td>
</tr>
<tr>
<td>Prepaid expenses and other</td>
<td>3,366</td>
<td>3,296</td>
</tr>
<tr>
<td>Investments</td>
<td>86,534</td>
<td>88,373</td>
</tr>
<tr>
<td>Property, plant and equipment</td>
<td>55,340</td>
<td>56,211</td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>165,559</strong></td>
<td><strong>171,400</strong></td>
</tr>
</tbody>
</table>

| **LIABILITIES AND NET ASSETS** |      |      |
| Liabilities:                  |      |      |
| Accounts payable and accrued expenses | 14,541| 14,103|
| Deferred dues, subscriptions revenue, and other | 24,138| 24,924|
| Bonds payable                  | 24,685| 33,304|
| **Total liabilities**          | 63,364| 72,331|

| Net assets:                   |      |      |
| Unrestricted                  | 83,472| 79,863|
| Temporarily restricted         | 10,060| 10,903|
| Permanently restricted         | 8,663 | 8,303 |
| **Total net assets**           | **102,195**| **99,069**|

| **Total liabilities and net assets** |      |      |
|                                     | **165,559**| **171,400**|

### Consolidated Statement of Changes in Net Assets for the years ended December 31, 2009 and 2008

<table>
<thead>
<tr>
<th>($ in thousands)</th>
<th>2009</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenues:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Member dues</td>
<td>12,464</td>
<td>13,151</td>
</tr>
<tr>
<td>Publishing</td>
<td>41,071</td>
<td>43,251</td>
</tr>
<tr>
<td>Grants and other program support</td>
<td>24,745</td>
<td>22,721</td>
</tr>
<tr>
<td>Leasing, investments, and other</td>
<td>9,550</td>
<td>10,569</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>87,830</strong></td>
<td><strong>89,692</strong></td>
</tr>
</tbody>
</table>

| **Expenses:**    |      |      |
| Publishing       | 39,918| 40,255|
| Education, policy, and other programs | 32,493| 32,127|
| General and administrative expenses | 13,671| 13,680|
| **Total**        | **86,082**| **86,062**|

| Operating income, before tax | 1,748| 3,630|
| Provision for income tax     | (174)| 641 |
| Nonoperating revenue and expense | 1,687| (17,401)|

| Change in unrestricted net assets | 3,609| (14,412)|
| Change in restricted net assets  | (483)| 3,115  |
| Change in net assets             | 3,126| (11,297)|
| Net assets, beginning of year    | 99,069| 110,366|
| **Net assets, end of year**      | **102,195**| **99,069**|
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This report was written by Michaela Jarvis, based on content originally prepared by various members of the AAAS Office of Public Programs staff during 2009. The design was developed by Sandra Audia, Publication Services.

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