



ANNUAL REPORT 2001

# AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE



*Advancing science • Serving society*



## WELCOME

*From the Chair, Mary Lowe Good*

**S**cience and technology are key to the welfare of our global village. In 2001, we were reminded again of the importance of research to the well-being of people everywhere. Forensic genomics, chemical analysis, and other such pursuits—once arcane to all but specialists—became familiar to a larger audience, as news of efforts to understand tragedy reached us through newspapers, televisions, radios and the Internet. Scientific discussion, confined to Victorian-era parlors since the days of Darwinian debate, claimed a more central location on our cultural stage.

As the public's perception of and appreciation for science and technology changes, the AAAS and its membership are preparing to take on a larger leadership role on behalf of science and its applications.

The new AAAS rallying cry, "Advancing science • Serving society," reflects a desire to build more and better bridges between policymakers, scientists, educators, and the average citizen. After all, the population keeps growing while farmland disappears, and we're living longer than ever before, demanding better shelter, education, health care, and sanitation. Improved quality of life also requires answers to fundamental mysteries—from our cosmic origins, to our social and geographic paths as we peopled the Earth.

In 2001, basic and applied research delivered practical advances and esoteric knowledge alike: Molecule-sized circuits—so small that billions could fit on today's computer chips—were named the year's top scientific achievement, promising computers that translate conversations on the fly, or solve climate-change riddles in a snap. The human genomic sequence revealed the genetic similarity of all people. "Missing" neutrinos were found to morph and go incognito after leaving the sun, thus escaping detection by astronomers. And, the International Panel on Climate Change (IPCC) officially pinned the blame for global warming on human, rather than natural causes.

As *Science* reported, the September 11 terrorist attacks signaled the start of a "sobering new era" for people everywhere, in all walks of life. For the international scientific and engineering community, shrinking budgets, limited information-sharing, collaboration restrictions, and shifting research priorities are the hallmarks of a changed research climate.

In response, AAAS challenged policymakers to examine the scientific fallout of war, such as new rules on international students at U.S. universities, and to strike a balance between scientific freedom and public safety. As the cloning debate intensified, AAAS took first steps toward clarifying the promise of therapeutic cloning technologies—while condemning efforts to clone human beings.

Also in 2001, the Association's first Court Appointed Scientific Expert testified in an intellectual property case. And, the Association continued to promote sustainable strategies for threatened ecosystems, in regions from Latin America to Africa.

As AAAS looks to the future, it has set as its mission the need to advance science and innovation throughout the world. Key to this quest are seven goals, outlined on these pages, and exemplified by some of the many successful AAAS projects profiled here. It has been my honor to serve AAAS and its membership. I look forward to the many achievements that lie ahead for AAAS.

*Mary L. Good*  
MARY LOWE GOOD  
Chair, AAAS Board

*from the Chief Executive Officer*

It is both a privilege and a pleasure to have joined the AAAS staff. As new CEO of the Association, I have the good fortune to be starting from the superb foundation built by my predecessor Richard Nicholson. He worked with a series of outstanding AAAS Boards of Directors, and built an exceptional staff to significantly strengthen the Association. The organization is now poised to play an even greater leadership role, one that places it squarely within the global context of the 21st Century.



AAAS occupies an unmatched position in society, implying both opportunities and obligations. The largest general scientific society in the world, AAAS is also uniquely inclusive, drawing its members from every scientific and engineering discipline, and including many lay members with diverse interests in science and its applications.

With its more than 130,000 members and 272 affiliated societies, AAAS has a powerful voice. It must use that voice to provide strong leadership, nationally and internationally, and to fulfill its newly reframed mission, “to advance science and innovation throughout the world for the benefit of all people.”

We hope that in refining our mission and goals and the programs that we derive from them, we will increase our effectiveness and our impact. To illustrate how we implement our ideas, we have organized this report to provide concrete examples of how current AAAS programs track to our mission and goals. Those newly refined mission and goals will then be the template that guides future programmatic development.

As we look for practical ways to apply our new mantra—“Advancing science • Serving society”—we will also be reaching out more to the AAAS membership. With help from members and affiliated organizations, AAAS will seek to deliver its key messages more effectively to policymakers, educators, scientists, and society. In this way, we can leverage our status as the world’s largest general scientific organization, and our more than 150 years of service to society, to become truly a global voice of leadership in science for the benefit of all people.

A handwritten signature in black ink, appearing to read "Alan I. Leshner". The signature is fluid and cursive, written over a white background.

ALAN I. LESHNER  
*Chief Executive Officer*

“WITH HELP FROM MEMBERS AND AFFILIATED ORGANIZATIONS,  
THE AAAS WILL SEEK TO DELIVER ITS KEY  
MESSAGES MORE EFFECTIVELY TO POLICYMAKERS,  
EDUCATORS, SCIENTISTS, AND SOCIETY.”

# OUR MISSION

## ***TO ADVANCE SCIENCE AND INNOVATION THROUGHOUT THE WORLD FOR THE BENEFIT OF ALL PEOPLE***

**F**or more than 150 years, the American Association for the Advancement of Science (AAAS) has represented the entire community of scientists and engineers. AAAS is today the largest general scientific society in the world, drawing its members from all fields of science and engineering, as well as from the lay public. Its size and inclusiveness present both an opportunity and an obligation to provide strong leadership, nationally and internationally, on behalf of science and its uses.

A look into the future of our rapidly evolving world promises that science and technology will become increasingly central to modern life, thus making the AAAS leadership role ever more important.

The public and policymakers will need much-improved access to more scientific and engineering information, and to rational modes of thinking and analysis.

As problems of poverty, environmental degradation, health, and international development become increasingly complex, AAAS must continue to reach out beyond its U.S. origins to explore ways that science can be of service to all people throughout the world.

AAAS's core mission, to advance science and innovation throughout the world for the benefit of all people, is a restatement of its historic mission, in words that reflect the global context of the 21st Century. As the world moves toward new frontiers of knowledge, the Association must anticipate as well as adjust to change.

This is crucial to AAAS's continued, judicious support of the science and engineering enterprise, and to ensure that the work of scientists and innovators will continue to serve society. To fulfill its mission, AAAS must achieve broad goals, outlined in the pages that follow. Accompanying them are examples of specific strategies AAAS implements to achieve these goals, and short features that illustrate ways in which the organization displays its commitment to its mission.

## OUR GOALS

### ***FOSTER COMMUNICATION AMONG SCIENTISTS, ENGINEERS AND THE PUBLIC***

AAAS is recognized throughout the world for its publication of the renowned journal *Science*, and as a source of timely, accurate, reliable and unbiased scientific information. In *Science*, AAAS presents cutting-edge research that has been peer-reviewed, and, just as science knows no borders, the journal's articles are written and reviewed by scientists from many nations. Reports on their work are published and broadcast worldwide. In its news pages and its columns, *Science's* news staff investigates and reports research news, so that research findings spread far beyond the confines of individual disciplines.

The AAAS Annual Meeting serves as another forum for scientists who want their work to have impact across the disciplines of science and among interested lay citizens, sparking collaborations and new avenues for research.

TO APPROACH THIS GOAL, AAAS PROVIDES:

#### ***Rapid Access to the Latest Research Results***

AAAS continually seeks to ensure that scientific information is available when the user needs it. Research papers in *Science* are often subjected to rapid review and publication, and breaking science news appears in the journal, as well as on the *Science* Online website, and *ScienceNOW*. The journal's electronic publishing option, *Science Express*, now makes selected peer-reviewed articles available to the scientific community within days of acceptance.

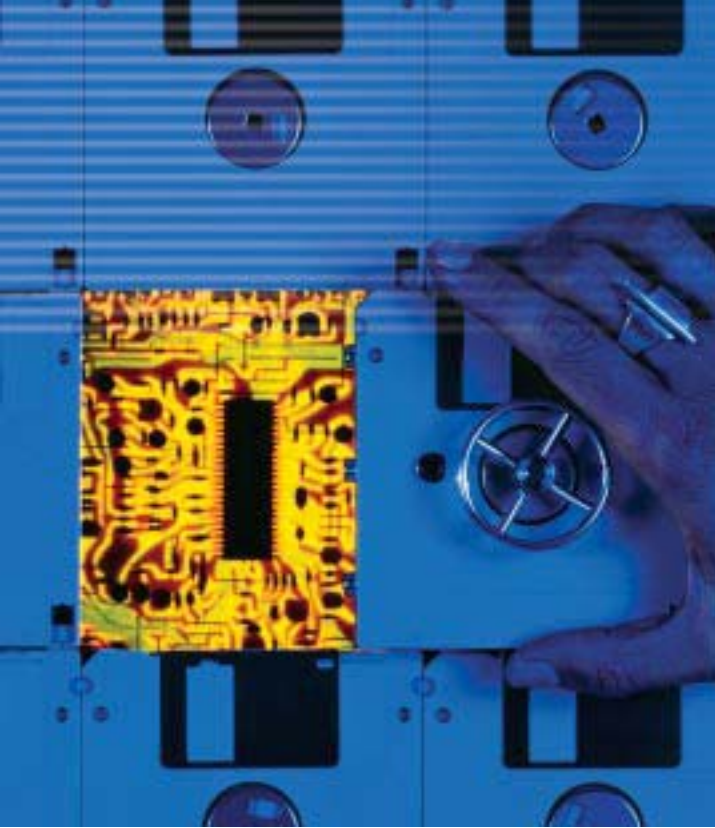
#### ***Web-Based Tools for Journalists***

The media is given access to advance information on an embargoed basis both on AAAS's EurekAlert!, and through the "scipak," the packages of *Science* articles that are sent one week in advance of publication to journalists around the world, with the understanding that the writers will respect the embargo.

#### ***Support for Communities of Interest***

Web-based "knowledge environments" provide the latest news, as well as all the resources necessary to scientists with a common research interest. *Science's* Next Wave is a website that provides information on careers and research funding to young scientists.





### ***Innovative Mechanisms for Scientific Discourse***

AAAS and *Science* are experimenting with the use of databases and computer technology that have been used to create phenomena such as in-depth reports on human rights abuses, and a connections map on the website of *Science*'s Signal Transduction Knowledge Environment (STKE).

**“EUREKALERT! HAS BECOME A STAPLE OF MY DAILY ROUTINE. I LOG ONTO IT FIRST THING IN THE MORNING AND CHECK IT REGULARLY THROUGHOUT THE DAY.”**

-Rob Stein  
*Washington Post*

## STRATEGIES IN ACTION

The following are among the recent and ongoing activities of AAAS in 2001 that demonstrate its commitment to fostering communication among scientists, engineers and the public:

### ***AAAS and Science: On the Cutting Edge***

The new millennium opened with publication of dramatic scientific findings that have the potential to transform human life. On 16 February 2001, *Science* magazine published one of two sets of findings that presented the results of the near-final sequencing of the human genome, suggesting that the human genome sequence might someday result in medical advances such as diagnostic tests, pharmaceuticals that reflect individual genetic variations, and perhaps gene therapies targeting segments of code responsible for disease.

In the future, wrote the authors of the *Science* article, “The real challenge of human biology, beyond the task of finding out how genes orchestrate the construction and maintenance of the miraculous mechanism of our bodies, will lie ahead as we seek to explain how our minds have come to organize thoughts sufficiently well to investigate our own existence.”

The two research teams discussed their findings at the 2001 AAAS Meeting in San Francisco on 12 February, where 5,600 participants, including about 1,100 press registrants, had come to take part in the multidisciplinary gathering of scientists from all over the world.

### ***Science's Knowledge Environment Builds Connections***

Until a couple of years ago, researchers interested in signal transduction had to scramble if they missed key meetings or overlooked an important journal article.

Now they can turn to one of the three web-based knowledge environments AAAS and *Science* have created to meet the growing needs of interdisciplinary research. *Science*'s Signal Transduction Knowledge Environment (STKE) offers a connections map that allows scientists to follow the latest developments in several signaling pathways, and provides immediate access to the scientific literature that supports the findings that the map illustrates.

Every few weeks, for example, in his laboratory at the University of Washington, Randall Moon, an investigator with the Howard Hughes Medical Institute, adds newly published information to the connections map regarding *Wnt* genes and their proteins, which have been found to play a role in cancer and in the development of the embryo.

“My hopes and expectations are that by developing these tools and approaches, we will give researchers a greater ability to synthesize information from different fields and different laboratories, while revealing unexpected synergy between different pathways and interaction between proteins that might not have been obvious at first glance,” says Moon, professor of pharmacology at the University of Washington.

### ***Website Opens World of Science to All Writers***

Until seven years ago, when AAAS first launched its EurekAlert! website, Jean-Michel Bader, science writer for *Le Figaro* in Paris, says that he, like most science writers, “chased after journals and scientists” to stay on top of the latest research news, always concerned that a colleague at another paper would get the story first.

No more. Since 1996, Bader and his colleagues have become regular users of EurekAlert! ([www.eurekalert.org](http://www.eurekalert.org)), which posts breaking news from journals and from universities, laboratories, and other research institutions. Reporters may use an “embargoed news” section of the website to obtain information in advance, as long as they promise to respect the publication date imposed by the relevant institutions. More than 4,300 science writers have signed up to use the site, and their response, when asked, is resoundingly positive.

“EurekAlert! has become a staple of my daily routine,” says *Washington Post* reporter, Rob Stein. “I log onto it first thing in the morning and check it regularly throughout the day.”



## OUR GOALS

### **ENHANCE INTERNATIONAL COOPERATION IN SCIENCE AND ITS APPLICATIONS**

**A**s science becomes increasingly global in character, scientists are more and more likely to reach across national borders in their search for collaborators. At the same time, science and technology are being asked to play a crucial role in addressing the social and economic ills that affect hundreds of millions of people.

The growing awareness that individual nations cannot alone take on challenges to environmental and physical health has led AAAS to work with national governments and international organizations such as the World Bank and the United Nations to seek international solutions. A response to these needs requires the creation of a solid scientific infrastructure in developing countries, as well as the proliferation of a culture of science worldwide—among residents of every country and their leaders.

TO FURTHER SUCH EFFORTS, AAAS WORKS TO:

#### ***Promote International Cooperation Among Scientists***

AAAS encourages international study for young scientists, as well international collaborations through workshops, grant programs and its annual meeting, making it possible for scientists from many countries to find forums for their ideas, and to see those ideas widely disseminated.

#### ***Help Build Scientific Infrastructure in Developing Countries***

AAAS works to help developing countries through collaborative projects, workshops and training. Also, through education reform and other efforts, AAAS encourages the development of a culture of science worldwide.

### ***Improve the Quality of Scientific Input in International Discourse***

Recognizing the need for improved knowledge about scientific issues, AAAS has established training programs and built on relationships with governmental and non-governmental organizations such as NATO, the European Union, UNESCO, and the Organization of American States, to address collaboratively critical issues in sustainable development and international security.

## STRATEGIES IN ACTION

The following are among the recent and ongoing activities of AAAS in 2001 that demonstrate its commitment to enhance international scientific cooperation:

### ***U.S. Diplomats Educated About Science and Science Policy***

“The whole area of environment, technology, and health is becoming a really big priority for us—much more than 10, or even 5 years ago,” says Lisa Fox, director of the Economic and Commercial Studies Division for the Foreign Service Institute (FSI). “We’d like to train all our officers in it, beginning with junior officers all the way up to the ambassadors.”

In 2001, AAAS was chosen to plan and implement two week-long FSI programs for employees of the U.S. State Department, most of whom were being assigned to their first science-related posts. The courses focused on discussions of health and population, emerging and infectious diseases, food safety, climate change, sustainable development, biodiversity, and science, technology and commerce. They went well, and AAAS staff has been asked to conduct a second series of workshops in 2002.

Brett Pomainville, a policy coordinator who attended the course in June, and is preparing for a summit on sustainable development in Johannesburg in September 2002, notes that science was once almost an afterthought at the State Department. He says his colleagues are increasingly aware that they have a lot to learn about the technical aspects of situations that arise in their work.

“It’s a struggle for us. But part of a diplomat’s job is to learn things quickly and to know who the people are who understand things in depth, and when to call on them for help,” Pomainville says.

### ***Fostering Sustainable Development***

In pilot projects in the La Plata Basin in South America and the Kola Peninsula in Russia, AAAS-sponsored researchers are exploring the interaction between human inhabitants and the natural environment in which they live. Two other projects, one in the Niger Delta in West Africa and one in the Mekong River in Southeast Asia are in the early stages of development. The AAAS Ecosystem Dynamics and Essential Human Needs (EDEHN) program has targeted the four watershed regions for an integrated multi-disciplinary approach to environmental management.



## OUR GOALS

“WE’RE CONSTANTLY TRYING TO BRAINSTORM FOR NEW IDEAS, TO ADDRESS NEEDS THAT WE SEE ARE UNFULFILLED.”

-Cassandra Dudka  
National Science Foundation (NSF)

The sprawling La Plata Basin, one of the world’s largest food producers, spans parts of Argentina, Bolivia, Brazil, Paraguay and Uruguay, and drives much of the economy of South America. But, recent agrarian expansions and agricultural development have become a potential threat to the ecosystem.

The Kola Peninsula is one of the most populated and polluted regions in the Arctic. AAAS, the Institute for Ecological Economics at the University of Maryland, and the Kola Science Center in Apatity, Russia are working on a multi-year US-Russian research effort to explore ways to improve the health of the damaged ecosystem.

### ***International Collaborations for Women Scientists***

Launched in 2001, the AAAS Women’s International Science Collaboration program, or WISC, is designed to give women researchers opportunities in international scientific research. The program provides women scientists in the United States with funds for planning research projects with a collaborator from a partner country.

The program initially focused on Central and Eastern Europe, but has recently expanded to most other regions of the world. The expanded program completed its first round of grantmaking in April 2002. A key requirement is that the applicants do not already have NSF funding for their proposed research. Their preparatory projects should then lead to full research proposals, to be submitted to the NSF or other funders.

“We’re constantly trying to brainstorm for new ideas, to address needs that we see are unfulfilled, says Cassandra Dudka, Program Manager for Central and Eastern Europe Programs at the National Science Foundation, which funds the program.”

## ***PROMOTE THE RESPONSIBLE CONDUCT AND USE OF SCIENCE AND TECHNOLOGY***

**S**cience and technology provide fundamental benefits to society and are central to the protection and promotion of health and well-being. For science to continue in this role, however, mechanisms must be in place to make sure that science is used appropriately, particularly as society crosses new frontiers in such areas as genetics and cloning research.

TO PROTECT THE INTEGRITY OF SCIENCE, AAAS WORKS TO:

### ***Define and Guide Responsible Conduct of Research***

AAAS works with the scientific community and other organizations to identify what constitutes responsible research conduct and the proper uses of science, and promotes a culture of high ethical standards among current and future researchers.

### ***Inform Societal Discourse on Ethical Implications of Research***

AAAS informs policymakers and other national leaders of the scientific opportunities and limitations associated with new research findings, alerting society to the social implications of scientific and technological advances, and helping to identify and discuss in public forums what constitutes responsible research conduct and uses of science.

### ***Promote the Verification of Research Findings***

AAAS supports the system of peer review as an important means of protecting the credibility of the research enterprise. Peer review confirms whether information is verifiable and accurate, allowing both scientists and the public to assess the potential of new research, and enabling policymakers to consider its value in the formulation and implementation of public policy.

### ***Defend Free Scientific Inquiry***

The success of scientific research is dependent on openness and on the ability of scientists to operate in an atmosphere that supports free inquiry. AAAS speaks out against those who seek to restrict scientific freedom and works with others in the scientific community to address human rights abuses directed against scientists throughout the world.



# STRATEGIES IN ACTION

The following are among the recent and ongoing activities of AAAS in 2001 that demonstrate its commitment to promoting responsible conduct and use of science and technology:

## ***Bringing Scientific Expertise into the Courts***

In 2001, AAAS took on its first case in a project designed to help federal judges find well-respected, qualified engineers and scientists to serve as expert witnesses. Known as CASE, for Court Appointed Scientific Experts, the project was developed under the aegis of the National Conference of Lawyers and Scientists (NCLS), a joint committee of AAAS and the American Bar Association's Science and Technology Law Section.

Judges have had the formal authority to appoint their own experts since 1975. And, since 1993, a U.S. Supreme Court ruling has required the federal judiciary to take steps to exclude unreliable testimony from the courtroom. The CASE project is an effort to alleviate the burden placed on the judiciary and to address the increasing level of complexity in cases.

## ***Guidance in Policymaking on Stem Cell Research***

The debate over whether the federal government should fund research on embryonic stem cells reopened in earnest in 2001, and policymakers needed help gathering all available information on this complex topic. AAAS stepped up to the plate.

In a letter dated 6 March, three officers of the AAAS Board wrote to U.S. President George W. Bush in support of federal funding for stem cell research, including cells from embryonic, fetal, and adult sources. The letter responded to President Bush's order for a review of a Clinton Administration decision that allowed funding of research on embryonic stem cells under guidelines that were published in the Federal Register in August 2000: "It would be tragic to squander this opportunity to pursue work that can potentially help millions of Americans in need," wrote Mary L. Good, Peter H. Raven, and Floyd E. Bloom, who were then chair, president and president-elect of the AAAS Board of Directors.

Five months later, a week after President Bush announced his policy in a nationally-televised speech on 9 August, AAAS again provided a measured response to the President's stem cell policy, this time recommending that the Bush Administration publicly disclose the sources of the existing embryonic stem cell lines that constitute the centerpiece of that policy. The Association noted that only by such disclosure can scientists assess the potential value of the cells for research and potential medical advances.


## ***Addressing Human Rights Abuses***

As prosecutors prepared for the trial of former Yugoslav President Slobodan Milosevic in late 2001, they had in hand a document from AAAS that implicated Milosevic's forces in the killings of 10,000 people and the displacement of thousands of refugees in Kosovo in 1999.

Patrick Ball, a statistician and deputy director of the AAAS Science and Human Rights Program, had been asked to testify in Milosevic's trial, providing an analysis of data gathered from exhumation records, Albanian border records on refugee crossings, and interviews with thousands of refugees.

The 67-page report, which applied highly sophisticated statistical and computer programming tools, was produced with help from the American Bar Association's Central and East European Law Initiative. It was the latest of AAAS's efforts to apply science to the promotion of human rights.

"The findings of this study are consistent with the hypothesis that action by Yugoslav forces was the cause of the killings and the refugee flow," Ball and his co-authors wrote in their report to the war crimes tribunal, *Killings and Refugee Flow in Kosovo: March-June 1999*.



“THE FINDINGS OF THIS STUDY ARE CONSISTENT WITH THE HYPOTHESIS THAT ACTION BY YUGOSLAV FORCES WAS THE CAUSE OF THE KILLINGS AND THE REFUGEE FLOW.”

-Patrick Ball, AAAS, and co-authors  
*Killings and Refugee Flow in Kosovo: March-June 1999.*

# OUR GOALS

## ***FOSTER EDUCATION IN SCIENCE AND TECHNOLOGY FOR EVERYONE***

In a world increasingly influenced by science, mathematics and technology, all people need some understanding of these disciplines and their extensive impact on daily life. Through its own programs and in collaboration with other organizations, AAAS works to improve science education in the United States and other nations.

IN PURSUIT OF THIS GOAL, AAAS IMPLEMENTS THE FOLLOWING STRATEGIES:

### ***Develop and Disseminate Goals for Teaching K-12***

With the guidance of top educators and scientists, the Association helps to guide goals and standards for science, mathematics and technology (SMT) education, and is a leader in promoting appropriate policies and the development of curricula and assessments based on those goals.

### ***Promote Research on Effective Teaching of Science and Mathematics***

AAAS seeks to influence the teaching of science, mathematics and technology in college and in K-12. It influences teacher education programs, focusing particularly on SMT content and how to teach it to students with diverse backgrounds, languages, and interests, and in a variety of formal and informal settings.

### ***Develop Science Education Resources for Use in Formal and Informal Education***

AAAS enters into partnerships with the institutions that people most often turn to with their questions, publishing clearly-written information on complex issues in science and technology, and creating educational websites and radio programming.



## STRATEGIES IN ACTION

The following are among the activities through which AAAS fosters education in science and technology for everyone:

### ***New Book Offers a Way Out of “Superficiality”***

AAAS's Project 2061 released a book in 2001 that tells science and mathematics educators how to “unburden the curriculum.” *Designs for Science Literacy*, published by Oxford University Press, was the latest in a series of print and electronic tools and professional development services aimed at strengthening teaching and learning as part of the education reform initiative that AAAS launched in 1985.

The new book also addresses the challenging question of *how* to design K–12 curricula in a way that reflects local needs and interests, while enabling all students to reach national goals of literacy in science, mathematics, and technology.

Released 24 May at a gathering of education leaders, *Designs for Science Literacy* suggests how teachers might find the time to teach the most important ideas well. The authors devote an entire chapter to showing educators how to relieve the interminable accumulation of topics, superficial detail, and technical language that far exceeds most students' understanding.

### ***AAAS Education Website Reaching All 50 States***

Part of the “MarcoPolo Learning Initiative,” Science NetLinks, is AAAS's contribution to a partnership that includes websites managed by five other non-profit organizations. Together they provide free, Internet-based materials for educators across academic disciplines on the site that is now used as a resource for educators in all 50 states (<http://marcopolo.worldcom.com/>).

Science NetLinks (<http://www.sciencenetlinks.com/>) offers a comprehensive array of lesson plans and carefully selected links to related websites that are tied to the *Benchmarks for Science Literacy*, a set of science literacy goals developed by AAAS.

The detailed lesson plans include, for example, explanations of what teachers should expect students to record in their journals about a project on propagation.

“An entry for what was done to the plant should not be, ‘I watered it’. Rather, The plant was given 50 ml of water,” instructs the lesson plan.

### ***Teaching Science through Web-Based Adventures***

According to the results of four pilot projects in after-school programs in New York City and in Washington, DC, AAAS's Kinetic City Super Crew website successfully draws children in and teaches them the principles of science.

Based on those results, and thanks to a \$1.3 million grant from the National Science Foundation (NSF), the program, which began seven years ago as a weekly radio show, is going national in 2002 with its new on-line format.

The principles that are taught by the program are based on the *Benchmarks for Science Literacy*, as developed by AAAS's Project 2061. The target population is made up of children 8 to 11 who take part in after-school programs. The program is geared for clubs of about 30 children who will work together to solve the science problems presented on the site.



## OUR GOALS

### ***ENHANCE THE SCIENCE AND TECHNOLOGY WORKFORCE AND INFRASTRUCTURE***

**A** well-trained and supported science and technology workforce is essential to the continued vitality of the science and technology enterprise and to its contributions to society. To maintain the quality of that workforce over time requires sustained efforts at all stages of the educational pipeline. AAAS focuses attention on the recruitment, training and retention of scientists and engineers, as well as working to ensure adequate resources to sustain their work. Young scientists in particular need help identifying sources of support for both their education and their research projects.

**IN PURSUIT OF THIS GOAL, AAAS IMPLEMENTS THE FOLLOWING STRATEGIES:**

#### ***Support for Young Scientists***

AAAS supports young people with a number of websites, fellowship opportunities, and other services, offering advice and information on financial aid, grants, graduate school, and how to change careers. AAAS also conducts career fairs and workshops, and provides forums and fellowships for undergraduate and graduate students, as well as for professional scientists and engineers. A website, *Science's Next Wave*, offers information on scientific training, career development, and the science job market.

#### ***Increasing Diversity***

Women, African Americans, Hispanic Americans, and Native Americans, as well as persons with disabilities, are among the underrepresented in the science and technology workforce. AAAS is a recognized leader in developing and providing programs and resources to encourage under represented groups to pursue science and technology careers at the highest levels. AAAS advises institutions on training and retention of scientists and engineers, and promotes ways of making that workforce better educated and more diverse.

## STRATEGIES IN ACTION

The activities described below are among the AAAS initiatives that demonstrate the Association's commitment to enhancing the science and technology workforce, and to making it more diverse.

### **Online Effort to Raise Number of Minority Scientists**

Launched with the purpose of diversifying the ranks of the nation's top scientists, the Minority Scientists Network, a new AAAS web site, is creating an online community of students, mentors, and administrators. At the heart of MiSciNet are individual voices, sharing personal experiences. These snapshots offer a glimpse into the private pathways chosen by successful minority scientists, and the strategies that effectively help keep them on course. Student essays, in particular, reveal the obstacles that may confront underrepresented scientists, and their tactics for overcoming prejudice and for resisting efforts to keep them from moving forward.

"I am very happy now, doing science policy at the national level and learning how the big decisions in science are made," says Joan E. Esnayra, a Native American scientist in an essay on MiSciNet. "When I reflect back on the faculty in my graduate program, I realize they were just little fish in a little pond. I, on the other hand, have become a fearless and tough fighter. And I am afraid of no one."

### **Jobs for Young Scientists with Disabilities**

For 25 years, AAAS has worked to bring young scientists with disabilities into the workforce. Its most recent effort is a program known as ENTRY POINT!, which has served as a bridge into jobs in engineering and sciences in both the public and private sectors since 1996. The men and women who take part in the program are either blind or deaf, or they may use wheelchairs or have learning disabilities. But their disabilities do not define them, and have not stopped them from taking jobs as biologists, computer scientists, mechanical engineers, and aerospace scientists.

The ENTRY POINT! program—which received a Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring, through the National Science Foundation—now claims some 200 alumni. An estimated 92 percent are either working on science or engineering fields, or pursuing degrees in graduate programs.

And the public and private partners in the program say they are delighted at the quality of ENTRY POINT! interns. "Going through AAAS, we knew we could get some of the best talent in the industry," says Ted Child, Vice President, IBM Workforce Diversity. "We like the students and we like the skills they bring to the job."

### **New Careers for Bioweapons Scientists**

With a grant from the U.S. Commerce Department, AAAS is working with a group of former bioweapons scientists from Russia, providing them with training so that they can apply their skills to challenging and useful work. In 2001, AAAS brought a group of 17 scientists to Washington, DC, for a workshop on technology commercialization and commercialization principles.

"We learned about some new elements of the quality system that we had no idea of. But of course, to implement in our country it will require serious work. Work, work, work!" says one of the participants, Valentina Ivanovna Masycheva, Director of Research and Design in the Technological Institute of Biologically Active Substances for the Russian Research Center of Virology and Biotechnology (VECTOR).



## OUR GOALS

### **INCREASE PUBLIC UNDERSTANDING AND APPRECIATION OF SCIENCE AND TECHNOLOGY**

Science touches everyone's life, either directly or indirectly; therefore everyone should have at least a rudimentary understanding of the scientific enterprise and how it works. AAAS tells the "science behind the story," to help people appreciate how their lives intersect with science in obvious ways and how important discoveries actually come about. In this way, the impact of science and innovation on events of major importance can be given their proper due.

TO INCREASE THE PUBLIC'S UNDERSTANDING AND APPRECIATION OF SCIENCE AND TECHNOLOGY, AAAS WORKS TO:

#### **Develop Tools to Improve Communication of Science**

AAAS organizes press briefings, provides in-depth analyses of complex issues, and provides educational content for the Internet, for television and for radio programs. Every week, AAAS emails a pre-approved group of more than 3,400 journalists details about the research to be published in the next issue of *Science*. Science writers can also sign up for access to EurekAlert!, a AAAS website that provides embargoed and other breaking news from research institutions worldwide.

#### **Enhance Communication Skills of Scientists and Engineers**

AAAS helps scientists and engineers become highly effective in communicating to the public the complex principles that underlie their work. When scientists are properly trained, their stories quickly capture the public imagination.

#### **Form Partnerships to Improve Public Understanding**

AAAS enters into partnerships with other international, national, regional, and local organizations to provide science and technology programs for all age groups. AAAS teams up with these groups to develop local and national science programs, as well as to create resources for print and broadcast media and to provide guidance on the quality of resources for information on science and technology.

## STRATEGIES IN ACTION

The activities described below are among the AAAS initiatives that demonstrate the Association's commitment to increase public understanding and appreciation of science and technology:

### **Scientists and Engineers as Journalists**

Ann Celi is a medicine/pediatrics physician and researcher at Harvard Medical School in Boston, MA. She is in practice at Harvard Vanguard Medical Associates in Boston, where she is conducting a study on the factors that influence women to breastfeed their babies. She is also one of more than 400 scientists and engineers who are alumni of AAAS's Mass Media Fellowship program.

Every summer about 25 young scientists and engineers are sent to work for newspapers and magazines and for radio and television programs across the country. The purpose of the 28-year-old program is to further public understanding and appreciation of science and technology.

Celi's 10-week internship at Wisconsin's *Milwaukee Journal* in 1992 taught her to explain scientific concepts carefully to journalists, a lesson she draws on when talking publicly about breastfeeding.

"To get substance into a (newspaper) article, you have to make information clear and succinct," Cecil says. "If you don't, that will be the first thing the copy editor takes out."

### **Training in Radio and Science Writing for South Africans**

In much of rural Africa, radio is the major means of communicating news and other information. So, radio science journalism is what AAAS staff members are teaching a group of South African journalists and scientists in a three-year program that began in 2001.

With support from the South African Department of Arts, Culture, Science, and Technology (DACST), the DACST-AAAS Science Radio Journalism Fellows Project, is attempting to attract applicants outside the cosmopolitan Johannesburg/Pretoria area. To apply, they must be fluent in an indigenous language.

In August 2001, the first South Africans in the program said they had come to the United States to learn; but the visitors may have taught their hosts something as well.

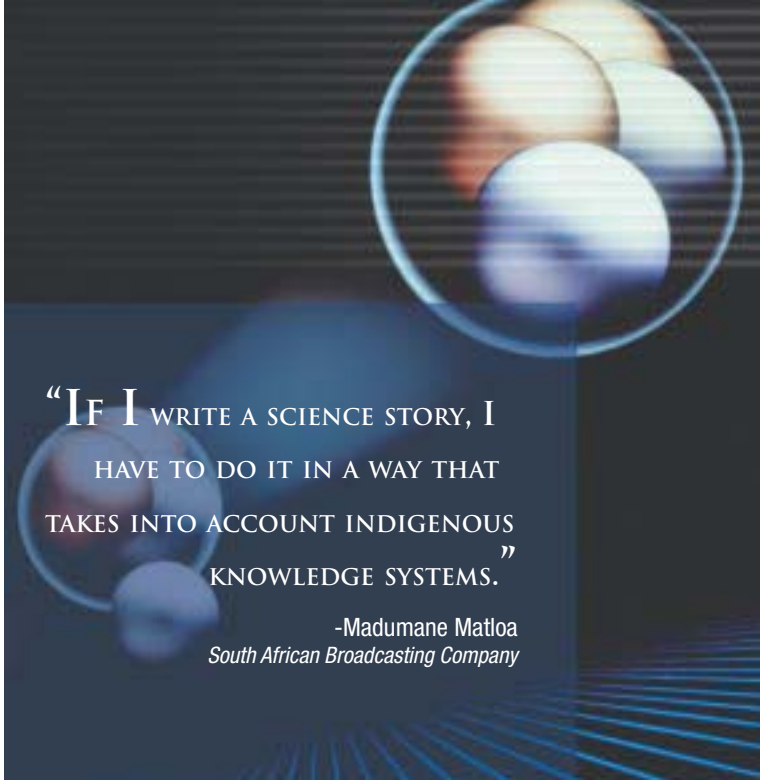
"If I write a science story, I have to do it in a way that takes into account indigenous knowledge systems," says Madumane Matloa, 27, a science and technology radio producer for the South African Broadcasting Company. "We have to show that we do not disrespect the ways of our people."

### **Daily Radio Spots Answer Questions, Feature Research**

Since 1988, more than 2,800 of AAAS's radio shows have run on commercial radio programs across the United States. The 90-second features tell the public about the latest research in science and technology, explaining topics such as the Human Genome Project and the origin of the universe in language that is clear, lively, and free of jargon.

One 2001 spot, for example, features a scientist at the University of Southern California, who studies the timing and impact of earthquakes by digging trenches across faults and examining sediment for evidence of activity.

"To many people, (the trench) looks like a hole in the ground, but to me it's a physics experiment," says James Dolan of the University of Southern California in an interview for *Science Update*. "To me, it's a window into the past that allows us to see how earthquakes in the past have interacted with one another."



"IF I WRITE A SCIENCE STORY, I  
HAVE TO DO IT IN A WAY THAT  
TAKES INTO ACCOUNT INDIGENOUS  
KNOWLEDGE SYSTEMS."

-Madumane Matloa  
South African Broadcasting Company

## OUR GOALS

### **Strengthen Support for the Science and Technology Enterprise**

For society to reap the full benefits of the promise of research, the scientific enterprise must flourish. That requires financial support, a healthy infrastructure, a public that values the ideals of science, and national leaders who understand the role of science in moving society forward. In addition, scientists and engineers should understand the process for making decisions about science policy and research funding, and be given opportunities to take part in the process.

TO SUPPORT THIS GOAL, AAAS IMPLEMENTS THE FOLLOWING STRATEGIES:

#### **Promote Recognition of the Benefits of Science and Technology**

AAAS disseminates knowledge about the products of science and technology, the interrelationships among disciplines, and the role basic science plays in producing the technological advances that are integral to improved health care, quality of life and economic prosperity.

## **Inform National Leaders about Scientific Research, Innovation and Related Policies**

AAAS provides national leaders with thoughtful analyses and perspectives on new discoveries and emerging trends. It has become, for example, the nationally recognized and trusted resource for up-to-date, objective analyses of federal funding for scientific research.

## **Collaborate with Diverse Sectors of Society**

AAAS collaborates and works in alliance with organizations that represent other major sectors of society. These are critical not only for what they do to support the scientific enterprise in general, but in setting research priorities.

## **Strengthen Scientists' Voice in the Policy Process and in the Media**

AAAS helps researchers become effectively involved in the policy process, providing opportunities for them to gain an understanding of policy and of the funding mechanisms that make possible the work of scientists.

# STRATEGIES IN ACTION

The activities described below are among the AAAS initiatives that demonstrate the Association's commitment to strengthening support for science and technology and its applications for the benefit of society:

### **Analysis of Federal Budget for Science and Technology**

As AAAS staff completed their annual task of analyzing the FY 2002 federal budget for science and technology funding last year, they noted that the budget, finalized in December, had not been affected by the nation's economic downturn.

Instead, the federal budget for science, like many other areas of government spending, reflected the impact of the events that followed the September 11 attacks on the World Trade Center and the Pentagon. The big winners were the Department of Defense and the National Institutes of Health, but most federal agencies received increases in their final R&D budgets, in contrast to proposals for steep cuts earlier in the year.

Since 1976, when AAAS began publishing federal budget numbers for R&D, scientists, engineers and policymakers with an interest in science have turned to AAAS for the latest information on federal funding of the nation's S&T enterprise. The Association also hosts an Annual Colloquium on Science and Technology Policy to provide a forum to discuss and debate the federal budget and other matters relating to science and technology policy.

### **Exposing Policymakers to Science; Scientists to Policy**

AAAS established the Center for Science, Technology, and Congress in July 1994. Founded with assistance from the Carnegie Corporation of New York and currently funded by a grant from the Burroughs-Wellcome Fund, this AAAS program provides timely, objective information to Congress on current science and technology issues and assists the science and engineering community in understanding and working with Congress.

The following are thumbnail sketches of two of the briefings that the AAAS Center for Science, Technology, and Congress organized in 2001 on Capital Hill:

- The formal announcement in 2001 about the near-completion of the human genome sequence has raised hopes of a medical revolution, as well as fears that the genetic information might be used to discriminate unfairly against people. AAAS set up a series of seminars to examine the nature of concerns about genetic discrimination in different settings and to promote the sharing of information and public dialogue.

- The 2000 presidential election, particularly as it played out in Florida, awakened a national interest in the technologies with which we cast our votes. To help policymakers as they considered ways to improve the nation's voting systems, AAAS organized a briefing in July 2001 at which a group of faculty from the Massachusetts Institute of Technology (MIT) and the California Institute of Technology (Caltech) presented the results of an important study of voting technology that revealed major flaws in the system.

AAAS publishes the monthly newsletter, *Science and Technology in Congress*, when Congress is in session. Information about these and other AAAS congressional activities is available at [www.aaas.org/spp/cstcl](http://www.aaas.org/spp/cstcl).

### **New World of Science Policy for Scientists, Engineers**

In 1973, the AAAS Congressional Fellowship Program started with seven Fellows sponsored by AAAS and three other national scientific and engineering societies. Currently there are about 30 participating societies, with AAAS sponsoring two Fellows and 30 other societies, each sponsoring one or more Congressional Fellows. In addition, AAAS has established eight other programs in federal agencies, which provide science policy learning experiences for another 50-plus scientists and engineers. The AAAS programs place Fellows in a dozen executive branch agencies, including the departments of state, justice, defense, and agriculture.

There are now about 1,300 former fellows, many of whom have gone on to make important contributions in science and science policy. Kerri-Ann Jones, who has her doctorate in molecular biophysics and biochemistry, was a fellow at the U.S. Agency for International Development 17 years ago, and eventually served in the White House's Office of Science and Technology.

"The fellowship was a platform for everything I've gone on to do," says Jones, who now directs a program to improve Maine's research infrastructure under the University of Maine System and the Maine Science and Technology Foundation.

# SECTIONS AND DIVISIONS

## Sections

AAAS offers 24 sections, covering the spectrum of scientific disciplines, so members can promote issues in a particular field.

- Agriculture, Food, and Renewable Resources
- Anthropology
- Astronomy
- Atmospheric and Hydrospheric Sciences
- Biological Sciences
- Chemistry
- Dentistry and Oral Health Sciences
- Education
- Engineering
- General Interest in Science and Engineering
- Geology and Geography
- History and Philosophy of Science
- Industrial Science and Technology
- Information, Computing, and Communication
- Linguistics and Language Science
- Mathematics
- Medical Sciences
- Neuroscience
- Pharmaceutical Sciences
- Physics
- Psychology
- Social, Economic, and Political Sciences
- Societal Impacts of Science and Engineering
- Statistics

AAAS's four geographic divisions allow members to combine forces at a local level. Through annual meetings and other activities, members address science issues that are significant in their own region. Each division determines its own course, with all offering programs of support for young scientists.

## Arctic Division

The terrorist attacks of September 11, 2001, led to the cancellation of the 52nd Arctic Science Conference, which was to be held on 12-15 September in Anchorage, Alaska. While the decision to cancel was made with regret, it was clear that a viable conference would not have been possible given the cancellation of flights, and the loss of spirit following this national tragedy. The theme of the 53rd Arctic Science Conference in 2002 will focus on connections and relationships among northern ecosystems, and how they interact at their boundaries.

After almost 10 years as executive secretary of the AAAS Arctic Division, Patricia A. Anderson has stepped down. During Anderson's tenure the Arctic Science Conference expanded, becoming the major Arctic science meeting in the western hemisphere. Lawrence K. Duffy, professor of chemistry and biochemistry, University of Alaska, Fairbanks, took over as executive secretary at the AAAS Annual Meeting in Boston in February 2002. Duffy also serves as associate dean for graduate programs and outreach in the College of Science, Engineering and Mathematics.

## Caribbean Division

The Caribbean Division sponsored three events in 2001. The 28th Science Congress of Puerto Rico Junior Science and Humanities Symposium was held at the University of Puerto Rico. AAAS presented three scholarships for the best student presentations. A second event, The Annual Symposium on Island Ecology, was held in October 2001 at the Interamerican Metro University. Co-hosted by the Association of Science Teachers, the symposium drew representatives from government, industry, and private organizations. A third meeting, of the First Chemistry Congress, was conducted in collaboration with the Teacher's Alliance for Excellence. The major topic was curriculum revision for courses in general and organic chemistry.

Current activities include planning for an annual meeting in collaboration with Puerto Rico EPSCoR (the National Science Foundation's Experimental Program to Stimulate Competitive Research); development of an 8-week summer science program to provide laboratory experience for high school science students; and efforts to increase communication and scientific interchange between Puerto Rico and Venezuela and between Puerto Rico and Cuba.



### *Pacific Division*

The Pacific Division held its 82nd annual meeting in June 2001 on the campus of the University of California at Irvine. Among the notable events at the meetings were the day-long session on Science and Management of Coastal Water Quality, a particularly sensitive topic in Southern California, and half-day sessions on Informatics and the New Biology, Local Adaptation to Global Environmental Change, as well as several education programs designed for both college and high school level teachers. On Sunday, the division held a special poster session for high school students, for which both cash awards and certificates of excellence were given.

The year 2001 was a transition year for the AAAS Pacific Division. David E. Bilderback stepped down as the executive director of the division, and Alan E. Leviton was asked to take his place while the division's executive committee sought a new executive officer. In June, the Council of the Pacific Division elected Roger Christianson to the office of executive director of the division, effective January 2002. The division council also elected John Carroll president-elect for 2001–2002, and Garnis Curtis delivered his presidential address, after which he turned the gavel over to Nina G. Jablonski, incoming division president.

### *Southwestern and Rocky Mountain Division*

The Southwestern and Rocky Mountain Division (SWARM) held its 77th Annual Meeting in Denton, Texas, 25–28 March 2001, in cooperation with the University of North Texas and Texas Woman's University. There were 124 presentations, including poster displays, and 11 keynote addresses. Three special symposia covered the behavior and nutrition of animals, special relativity, and experiments in electrodynamics. Richard Machalek, of the University of Wyoming, gave The John Wesley Powell Memorial Lecture, entitled "Prospects for an Evolutionary Social Science."

For the third year in a row, SWARM organized a fall mid-western meeting, in Omaha, Nebraska, from 11–13 November, in cooperation with Creighton University and the University of Nebraska at Omaha. This meeting featured 74 presentations, including oral presentations and poster displays; two keynote addresses; and four special symposia.

Due to the untimely death of Donald J. Nash, the executive director of SWARM, the 2002 meeting had to be cancelled. David Nash was appointed as the interim executive director of SWARM. The 2003 Spring Meeting will be held in Tulsa, Oklahoma, 8–11 April 2003.





# OUR AWARDS

Each year, AAAS salutes scientists, engineers, public servants, and journalists for their outstanding contributions to scientific progress and the public's understanding of science.

## AAAS Lifetime Achievement Award

William T. Golden, chairman emeritus, American Museum of Natural History, and treasurer emeritus, AAAS Board of Directors, was recognized for a lifetime of leadership and counsel on behalf of the advancement of science. Golden is credited with convincing President Truman 50 years ago to establish an office of science advisor to the president, and was instrumental in the recent creation of the position of Science and Technology Adviser to the U.S. Secretary of State.

## AAAS Philip Hauge Abelson Prize

Norman E. Borlaug, plant biologist and Nobel Laureate, was honored for his lifetime spent helping to meet the growing demand for high-yield agriculture. He is credited with starting the "Green Revolution" in the 1970s that reversed food shortages in India and Pakistan.

## Award for International Scientific Cooperation

Guenter Bauer, physics professor at the Johannes Kepler University in Linz, Austria, was recognized for his efforts in overcoming cultural and national frontiers, bringing researchers together at multinational meetings funded by both U.S. and international organizations.

## AAAS Mentor Award

Leticia Márquez-Magaña, professor of biology at San Francisco State University, was honored for her activities in support of students of color, particularly Hispanic Americans and those of Pacific Island heritage. In particular, she was honored for creating programs at UC-Berkeley and at Stanford University that support minority students both in their social and professional lives.

## AAAS Mentor Award for Lifetime Achievement

Etta Zuber Falconer, mathematician and Fuller E. Callaway Professor of Mathematics at Spelman College, was recognized for her dedication – as a mentor, role model, administrator and educator – to increasing the number of African American women in mathematics.

James H. M. Henderson, plant biologist and Chairman Emeritus of the Division of Natural Sciences at the Tuskegee Institute, was recognized for devoting his professional life to helping students of science and mathematics overcome barriers of race and gender to make the transition from high school to college and beyond.

## AAAS Award for Public Understanding of Science and Technology

Ian Stewart, popular author and professor of mathematics at Warwick University, won the AAAS Award for Public Understanding of Science and Technology. He is best known for writing on mathematical themes in books and for newspapers and magazines.

## AAAS Newcomb Cleveland Prize

Nenad Ban, Poul Nissen, Jeffrey Hansen, Peter B. Moore and Thomas A. Steitz were recognized for two research articles, both published 11 August 2000 – "The Complete Atomic Structure of the Large Ribosomal Subunit at 2.4 Å Resolution," and "The Structural Basis for Ribosome Activity in Peptide Bond Synthesis."

Marat M. Yusupov, Gulnara Gh. Yusupova, Albion Baucom, Kate Lieberman, Thomas N. Earnest, JHD Cate and Harry F. Noller were honored for a research article entitled "Crystal Structure of the Ribosome at 5.5 Å Resolution," published 4 May 2001.

## AAAS Science Journalism Awards

**Newspapers with a circulation of more than 100,000:** Scott Shane, *The Baltimore Sun*.

**Newspapers with a circulation of less than 100,000:** Richard Monastersky, *The Chronicle of Higher Education*.

**Magazines:** Heather Pringle, *Discover*.

**Radio:** Christopher Joyce, *National Public Radio*.

**Television:** Betsey Arledge, Julia Cort, and Robert Krulwich, WGBH/NOVA.

**Online:** David J. Tenenbaum, Sue Medaris, Terry Devitt, Darrell Schulte, and Amy Toburen, *The Why Files*.



AAAS Mentor Award: AAAS CEO Alan I. Leshner and AAAS Board Chairman Peter H. Raven (2002) congratulate award-winner Leticia Márquez-Magaña.

# ROSTER OF FELLOWS

We are proud to present the distinguished members elected to the status of AAAS Fellow by the AAAS Council for 2001. The Fellows are distinguished scientists and engineers who are chosen in recognition of outstanding accomplishments in their fields, and for their dedicated commitment to furthering the scientific enterprise.

## **Agriculture, Food, and Renewable Resources**

ELTON D. ABERLE, *Univ. of Wisconsin, Madison*  
WALTER J. ARMBRUSTER, *Farm Foundation, Oak Brook, IL*  
BARBARA P. GLENN, *Federation of Animal Science Societies, Bethesda, MD*  
ANTHONY H. C. HUANG, *Univ. of California, Riverside*  
F. THOMAS LEDIG, *Institute of Forest Genetics, U.S. Forest Service, Placerville, CA*  
OWEN J. NEWLIN, *Des Moines, IA*  
HERBERT W. OHM, *Purdue Univ.*  
BENNIE I. OSBURN, *Univ. of California, Davis*  
SONNY B. RAMASWAMY, *Kansas State Univ., Manhattan*  
K. RAMESH REDDY, *Univ. of Florida*  
PHILIP A. ROBERTS, *Univ. of California, Riverside*  
GARY H. TOENNIESSEN, *Rockefeller Foundation, New York, NY*  
SANT S. VIRMANI, *International Rice Research Institute, Makati City, Philippines*

## **Anthropology**

RALPH M. GARRUTO, *State Univ. of New York, Binghamton*  
JOHN H. RELETHFORD, *State Univ. of New York, Oneonta*  
PAT SHIPMAN, *Pennsylvania State Univ.*  
SARAH WILLIAMS-BLANGERO, *Southwest Foundation for Biomedical Research, San Antonio*

## **Astronomy**

BRUCE BALICK, *Univ. of Washington, Seattle*  
RICHARD F. GREEN, *National Optical Astronomical Observatories, Tucson*  
WILLIAM K. HARTMANN, *Planetary Science Institute, Tucson*  
KENNETH J. JOHNSTON, *U.S. Naval Observatory, Washington, DC*  
YERVANT TERZIAN, *Cornell Univ.*  
TREVOR C. WEEKES, *Whipple Observatory, Amado, AZ*

## **Atmospheric and Hydrospheric Sciences**

ELLEN R. M. DRUFFEL, *Univ. of California, Irvine*  
DAVID HALPERN, *Jet Propulsion Lab., Pasadena, CA*  
CHARLES A. KNIGHT, *National Center for Atmospheric Research, Boulder*  
RONALD G. PRINN, *Massachusetts Institute of Technology*  
DAVID A. RANDALL, *Colorado State Univ., Ft. Collins*

## **Biological Sciences**

DONNA JEANNE ARNDT-JOVIN, *Max-Planck Institute for Biophysical Chemistry, Göttingen, Germany*  
JAMES G. BALDWIN, *Univ. of California, Riverside*  
AMIYA K. BANERJEE, *Cleveland Clinic Foundation*  
KAMALJIT S. BAWA, *Univ. of Massachusetts, Boston*  
PHILIP A. BEACHY, *Johns Hopkins Univ.*  
CAROLINE SHAFER BLEDSOE, *Univ. of California, Davis*  
CAROL L. BOGGS, *Stanford Univ.*  
DAVID WAYNE BOLEN, *Univ. of Texas Medical Branch, Galveston*  
MICHAEL R. BOTCHAN, *Univ. of California, Berkeley*  
RICHARD C. BRUSCA, *Arizona-Sonora Desert Museum*  
BARBARA KATHRYN BURGESS, *Univ. of California, Irvine*  
MARIO RENATO CAPECCHI, *Univ. of Utah*  
SEAN B. CARROLL, *Univ. of Wisconsin, Madison*

DEBORAH A. CLARK, *Univ. of Missouri, St. Louis*  
DIANE W. DAVIDSON, *Univ. of Utah*  
CAROL A. ERICKSON, *Univ. of California, Davis*  
JOHN FAABORG, *Univ. of Missouri, Columbia*  
MARK H. GINSBERG, *Scripps Research Institute, La Jolla, CA*  
BRIAN J. HALES, *Louisiana State Univ., Baton Rouge*  
GONZALO HALFFTER, *Instituto de Ecologia, Veracruz, Mexico*  
R. SCOTT HAWLEY, *Univ. of California, Davis*  
JOHN B. HAYS, *Oregon State Univ.*  
LEWIS A. JACOBSON, *Univ. of Pittsburgh*  
PHILIP HUNG-SUN JEN, *Univ. of Missouri, Columbia*  
LINDA JEN-JACOBSON, *Univ. of Pittsburgh*  
RUSSELL L. JONES, *Univ. of California, Berkeley*  
SAMMY WILLIAM JOSEPH, *Univ. of Maryland, College Park*  
KAZUHIKO KINOSITA, JR., *Keio Univ., Yokohama, Japan*  
HYNDA K. KLEINMAN, *National Institute of Dentistry and Craniofacial Research, Bethesda, MD*  
IRVING L. KORNFELD, *Univ. of Maine, Orono*  
STEPHEN C. KOWALCZYKOWSKI, *Univ. of California, Davis*  
ALAN M. LAMBOWITZ, *Univ. of Texas, Austin*  
JAMES CHING LEE, *Univ. of Texas Medical Branch, Galveston*  
BARRY R. LENTZ, *Univ. of North Carolina, Chapel Hill*  
ROBERT L. LESTER, *Univ. of Kentucky, Lexington*  
PAUL A. LOACH, *Northwestern Univ.*  
MARTHA L. LUDWIG, *Univ. of Michigan, Ann Arbor*  
MICHAEL E. MAGUIRE, *Case Western Reserve Univ.*  
JOHN L. MARKLEY, *Univ. of Wisconsin, Madison*  
BETTIE SUE MASTERS, *Univ. of Texas Health Science Center, San Antonio*  
DAVID B. MCKAY, *Stanford Univ.*  
SANDRA D. MICHAEL, *State Univ. of New York, Binghamton*  
SCOTT EVERETT MILLER, *National Museum of Natural History, Washington, DC*  
DIANA G. MYLES, *Univ. of California, Davis*  
SHAHID NAEEM, *Univ. of Washington, Seattle*  
REED F. NOSS, *Conservation Science, Inc., Corvallis, OR*  
LYNNE R. PARENTI, *National Museum of Natural History, Washington, DC*  
MARY V. PRICE, *Univ. of California, Riverside*  
PAUL PRIMAKOFF, *Univ. of California, Davis*  
CURTIS J. RICHARDSON, *Duke Univ.*  
JAMES A. SPUDICH, *Stanford Univ.*  
FERN TABLIN, *Univ. of California, Davis*  
CINDY LEE VAN DOVER, *College of William and Mary*  
MICHAEL VECCHIONE, *National Marine Fisheries Service, Washington, DC*  
NICKOLAS M. WASER, *Univ. of California, Riverside*  
ERIC WESTHOF, *Univ. Louis Pasteur, Strasbourg, France*  
SUE HENGREN WICKNER, *National Cancer Institute, Bethesda, MD*  
CHARLES F. YOCUM, *Univ. of Michigan, Ann Arbor*

## **Chemistry**

EDWARD V. ARNOLD, *Rutgers Univ.*  
CHARLES A. ARRINGTON, *Furman Univ.*  
KIM K. BALDRIDGE, *Univ. of California, San Diego*  
MICHAEL ROBERT BERMAN, *Air Force Office of Scientific Research, Arlington, VA*  
ELLIOT R. BERNSTEIN, *Colorado State Univ., Ft. Collins*  
CAROLYN R. BERTOZZI, *Univ. of California, Berkeley*

DAVID A. BRANT, *Univ. of California, Irvine*  
 MAURICE S. BROOKHART, *Univ. of North Carolina, Chapel Hill*  
 BRIAN P. COPPOLA, *Univ. of Michigan, Ann Arbor*  
 DENNIS P. CURRAN, *Univ. of Pittsburgh*  
 PHILIP R. DESHONG, *Univ. of Maryland, College Park*  
 DAVID EISENBERG, *Univ. of California, Los Angeles*  
 CATHERINE C. FENSELAU, *Univ. of Maryland, College Park*  
 JOSEPH S. FRANCISCO, *Purdue Univ.*  
 M. REZA GHADIRI, *Scripps Research Institute, La Jolla, CA*  
 RICHARD I. GUMPORT, *Univ. of Illinois, Urbana*  
 CARLOS G. GUTIÉRREZ, *California State Univ., Los Angeles*  
 CHARLES B. HARRIS, *Univ. of California, Berkeley*  
 WILLIAM R. HEINEMAN, *Univ. of Cincinnati*  
 ANDREW KALDOR, *Exxon Mobil Research and Engineering Co., Annandale, NJ*  
 GEORGE B. KAUFFMAN, *California State Univ., Fresno*  
 CHARLES E. KOLB, JR., *Aerodyne Research, Inc., Billerica, MA*  
 ERIC T. KOOL, *Stanford Univ.*  
 JEFFREY D. KOVAC, *Univ. of Tennessee, Knoxville*  
 GERD N. LA MAR, *Univ. of California, Davis*  
 FREDERICK D. LEWIS, *Northwestern Univ.*  
 DAVID M. LUBMAN, *Univ. of Michigan, Ann Arbor*  
 MICHAEL A. MARLETTA, *Univ. of Michigan, Ann Arbor*  
 LAWRENCE J. MARNETT, *Vanderbilt Univ.*  
 LINDA B. MCGOWN, *Duke Univ.*  
 MARIO J. MOLINA, *Massachusetts Institute of Technology*  
 JOHN H. MOORE, *Univ. of Maryland, College Park*  
 ALEXANDER PINES, *Univ. of California, Berkeley*  
 LAWRENCE QUE, JR., *Univ. of Minnesota, Minneapolis*  
 RONALD T. RAINES, *Univ. of Wisconsin, Madison*  
 DEBRA R. ROLISON, *Naval Research Lab., Washington, DC*  
 RICHARD J. SAYKALLY, *Univ. of California, Berkeley*  
 JEFFREY SKOLNICK, *Danforth Plant Science Center, St. Louis, MO*  
 AMOS B. SMITH, III, *Univ. of Pennsylvania*  
 OLKE C. UHLENBECK, *Univ. of Colorado, Boulder*  
 PAUL A. WENDER, *Stanford Univ.*  
 ROBERT MARK WIGHTMAN, *Univ. of North Carolina, Chapel Hill*  
 TODD O. YEATES, *Univ. of California, Los Angeles*  
 FRANCISCO ZAERA, *Univ. of California, Riverside*

### **Dentistry and Oral Health Sciences**

MARTHA J. SOMERMAN, *Univ. of Michigan, Ann Arbor*  
 JOAN S. WILENTZ, *Chevy Chase, MD*

### **Education**

DAVID W. BROOKS, *Univ. of Nebraska, Lincoln*  
 JOHN SEELY BROWN, *Xerox Corp., Palo Alto, CA*  
 JAMES J. GALLAGHER, *Michigan State Univ.*  
 JOSEPH S. KRAJCIK, *Univ. of Michigan, Ann Arbor*  
 ALAN H. SCHOENFELD, *Univ. of California, Berkeley*

### **Engineering**

J. EDWARD ANDERSON, *Taxi 2000 Corp., Fridley, MN*  
 JOHN L. ANDERSON, *Carnegie Mellon Univ.*  
 WILLIAM E. BENTLEY, *Univ. of Maryland, College Park*  
 LEONARD J. BRILLSON, *Ohio State Univ., Columbus*  
 MELVIN W. CARTER, *Dunwoody, GA*  
 PAUL D. COLEMAN, *Univ. of Illinois, Urbana*  
 KENNETH R. DILLER, *Univ. of Texas, Austin*  
 AUDEEN WALTERS FENTIMAN, *Ohio State Univ., Columbus*  
 MORTON H. FRIEDMAN, *Duke Univ.*  
 ERIC W. KALER, *Univ. of Delaware*  
 TARALD O. KVÁLSETH, *Univ. of Minnesota, Minneapolis*  
 JEAN-PIERRE LEBURTON, *Univ. of Illinois, Urbana*  
 HENRY R. LINDEN, *Illinois Institute of Technology, Chicago*  
 MARK R. MATSUMOTO, *Univ. of California, Riverside*  
 JOHN W. POSTON, SR., *Texas A&M Univ., College Station*

RONALD W. ROUSSEAU, *Georgia Institute of Technology, Atlanta*  
 BERTRAM WOLFE, *Monte Sereno, CA*  
 NOVAK ZUBER, *Rockville, MD*

### **General Interest in Science and Engineering**

FELICE FRANKEL, *Massachusetts Institute of Technology*  
 BARBARA GASTEL, *Texas A&M Univ., College Station*  
 THOMAS H. MOSS, *Alexandria, VA*

### **Geology and Geography**

WILLIAM D. CARLSON, *Univ. of Texas, Austin*  
 MICHAEL H. CARR, *U.S. Geological Survey, Menlo Park, CA*  
 SANKAR CHATTERJEE, *Texas Tech Univ., Lubbock*  
 MARY L. DROSER, *Univ. of California, Riverside*  
 JOHN M. FERRY, *Johns Hopkins Univ.*  
 GEORGE W. FISHER, *Johns Hopkins Univ.*  
 BRYAN L. ISACKS, *Cornell Univ.*  
 JOSEPH L. KIRSCHVINK, *California Institute of Technology*  
 H. JAY MELOSH, *Univ. of Arizona*  
 JOSÉ ANTONIO RIAL, *Univ. of North Carolina, Chapel Hill*  
 DAVID R. STODDART, *Univ. of California, Berkeley*

### **History and Philosophy of Science**

DAVID A. HOUNSHELL, *Carnegie Mellon Univ.*  
 BARBARA HERRNSTEIN SMITH, *Duke Univ.*  
 VASSILIKI BETTY SMOCOVITIS, *Univ. of Florida*

### **Industrial Science and Technology**

HARVEY D. KUSHNER, *Kushner Management Planning Corp., Palos Verdes Estates, CA*  
 RUDOLPH PARISER, *R. Pariser & Co., Inc., Hockessin, DE*

### **Information, Computing, and Communication**

ELWYN BERLEKAMP, *Univ. of California, Berkeley*  
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