

# Sigma Xi, The Scientific Research Society The Year in Review

# 2000

## From the Executive Director

In the past decade we have seen Sigma Xi transformed into an organization that is very active in terms of program initiatives that build on our core mission of honoring scientific achievement. During the past several years, in particular, the programs constituting the Sigma Xi Center have emerged with the support of key sponsoring organizations building on the interest, commitment, energy and investment of officers, chapters, members and a very dedicated staff. It has been a special pleasure for me to watch this evolution.

A key objective of the Sigma Xi Center is to serve as an incubator for program initiatives that build on the Society's strengths, traditions and mission of supporting and nurturing the research enterprise. The emerging Center activities focus on the areas of assessing and promoting the value and impact of scientific research in society and of evaluating and promoting the highest of ethical standards in scientific research. Other key areas of involvement include improving science education and public understanding of science and monitoring and enhancing the health of the research enterprise. The Center's activities are being designed to build on and leverage the activities of Sigma Xi's international network of more than 500 chapters and 75,000 members to play a key role in improving our ability to get the most out of what science and technology have to offer.

Sigma Xi has a unique role to play in helping to shape the future of the science and technology enterprise. The ability to build on and draw from the local chapters' perspectives and energy continues to be crucial to the Society's future.

Sigma Xi deeply appreciates those individuals and organizations providing funding for the Society's programs this year.

Peter D. Blair  
Executive Director

## Program Opportunities for Chapters & Members

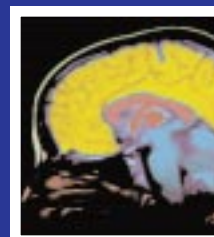
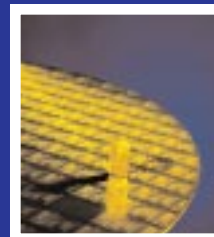
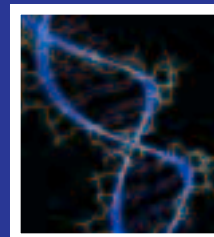
### Education Program Draws Interest

As part of a new education initiative, pilot workshops on undergraduate science and engineering education reform were held by Sigma Xi chapters at **California State University at Long Beach** and **North Carolina State University**. With the support of a planning grant from the National Science Foundation, a variety of discussions and events to pilot this program have taken place. The next phase of the project calls for workshops and follow-up activities aimed at showcasing effective practices in undergraduate science and engineering education, exploring the relationship between research and education and catalyzing institution-wide reform at the host institutions. More than 40 Sigma Xi chapters have expressed interest in hosting future workshops.

### Packard Grant Funds Global Networking Effort

A three-year grant of more than \$570,000 from the **David and Lucile Packard Foundation** has allowed Sigma Xi to initiate a pilot program designed to facilitate interaction between scientists in developing countries and research colleagues around the world. The grant will also help enable scientists in developing countries to gain better and more timely access to the primary scientific literature via the Internet. "Because of its multidisciplinary nature and international reach, Sigma Xi is well positioned to contribute to our strategy of capacity building for scientific research and education in developing countries," said Packard Foundation Director of Science Jaleh Daie.

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## Honoring Excellence in Science

### Ayala Receives Procter Prize

**Francisco J. Ayala**, a biologist at the University of California at Irvine noted for his contributions to population and evolution genetics, received the 2000 William Procter Prize for Scientific Achievement. Sigma Xi's highest honor, the annual Procter Prize recognizes research accomplishments and an ability to communicate their importance to others. Ayala has made singular contributions not only to his discipline, but also to education, philosophy, ethics, religion and national science policy.

### Goodstein is McGovern Award Winner

The 2000 John P. McGovern Science and Society Award, which honors excellence in science and technology, went to **David L. Goodstein**, vice provost and professor of physics at the California Institute of Technology. His book, *States of Matter*, first published in 1975, was hailed by *Physics Today* as the book that launched the new discipline of condensed-matter physics. Goodstein was also the host and project director of *The Mechanical Universe*, a physics telecourse based on his popular lectures at Caltech. In recent years, he has been interested in some of the larger issues that affect science as a profession, including ethics in research.

### Sigma Xi Members Receive Honors

Marine scientist and deep-sea exploration pioneer **Robert D. Ballard** received the 2000 Common Wealth Award for Science and Invention, which recognizes outstanding lifetime contributions. Sigma Xi nominates the recipients of this annual award.

Purdue University chemist **Dale W. Margerum** received the 2000 Monie A. Ferst Award in recognition of promoting research through teaching and supervising students. The annual award is administered by the Georgia Institute of Technology Chapter of Sigma Xi.

Over the years, 185 Sigma Xi members have been honored with the Nobel Prize, and four were among the 2000 Nobel laureates. **Alan J.**

**Heeger** of the University of California at Santa Barbara and **Alan G. MacDiarmid** of the University of Pennsylvania were two of the three scientists who shared the chemistry prize.

**Herbert Kroemer** at the University of California at Santa Barbara shared the Nobel Prize in physics. **Paul Greengard** of Rockefeller University shared the prize in medicine.

In January 2000, nine Sigma Xi members were among those to receive the 1999 National Medal of Science and National Medal of Technology, the nation's highest science and technology honors. National Medal of Science awardees included **Jared Diamond** of the University of California at Los Angeles, 1999 Sigma Xi Procter Prize winner **Lynn Margulis** of the University of Massachusetts at Amherst, **Stuart A. Rice**, **James W. Cronin** and **Leo P. Kadanoff** of the University of Chicago, **John Ross** of Stanford University, **Kenneth N. Stevens** of the Massachusetts Institute of Technology and **Felix E. Browder** of Rutgers University. National Medal of Technology awardees included **Glen Culler** of Culler Scientific Systems Corporation.

### Yennello Wins Young Investigator Award

Nuclear chemist **Sherry J. Yennello**, an associate professor at Texas A&M University (TAMU), was the winner of Sigma Xi's 2000 Young Investigator Award in the physical sciences. Yennello's work relates to fundamental questions about the evolution of the universe, the nature of neutron stars and supernovae, the origins of heavy elements and the thermodynamic nature of nuclear matter.

### Grants to Young Researchers

Since 1922, Sigma Xi has invested in the future of research by awarding grants to more than 25,000 young scientists and engineers. These small grants often provide the seed money that allows beginning scientists to gather the initial data they need to apply for other grants. The volunteer Committee on Grants-in-Aid of Research reviewed 2,150 applications during 2000, of which approximately 780 received full or partial funding. A total of more than \$520,000 was awarded.

## Communicating Science and Exploring Issues

### 2000 Forum Focuses on Ethics

Through plenary addresses and breakout group sessions, the 2000 Sigma Xi Forum *New Ethical Challenges in Science and Technology* revisited some topics from the 1993 Forum – such as conflicts of interest – and also addressed ethical issues that were just beginning to surface then. Overriding all issues was that of mentoring and consideration of the practices being taught to tomorrow's scientists and engineers. The two-day conference in Albuquerque, New Mexico, included talks by **William Wulf**, president of the National Academy of Engineering; **Robert C. Dynes**, chancellor of the University of California at San Diego; author **Cliff Stoll**; and **David C. Clark**, director of research affairs at Rush-Presbyterian-St. Luke Medical Center. A conference proceedings will be published in 2001 and video of plenary talks is available on the Sigma Xi web site. The forum was supported by the Burroughs Wellcome Fund, Sandia Corporation, the Department of Energy and the U.S. Environmental Protection Agency.

### New Sigma Xi Publications

The proceedings volume for the 1999 Sigma Xi Forum *Reshaping Undergraduate Science and Engineering Education: Tools for Better Learning* was published in July. It includes many of the plenary addresses, as well as some 80 abstracts on innovative teaching tools and methods being used around the country.

Among new Sigma Xi publications during the year was a proceedings booklet for a 1999 workshop titled "Ethical Challenges and Practical Solutions for Managers in Research." Held in Albuquerque, the one-day workshop was co-sponsored by Sigma Xi and the **U.S. Public Health Service's Office of Research Integrity**.

### American Scientist Wins EXCEL Award

This year *American Scientist* was once again recognized by the Society of National Association Publications (SNAP) in its annual EXCEL awards competition, garnering a Bronze Award for General Excellence. The judges considered 810 "very, very competitive" entries from

association-based magazines and journals. Executive Director Laura D. Skoff wrote: "Congratulations on your fine work and exemplary product; your efforts have truly identified Sigma Xi, The Scientific Research Society as a leader in the field!"

### Helping Journalists Report on Science

The year 2000 marked the 20th anniversary of the Media Resource Service (MediaResource), the Sigma Xi program aimed at enhancing and enriching science-related journalism by serving as a resource for reporters and producers diligent in their duty to inform the public. The service, which helps print and broadcast journalists locate experts in science and technology for timely commentary and perspective, is free and specifically designed to facilitate the interaction between scientists and journalists. MediaResource also provides "Science in the News," a daily e-mail update of news stories on science and technology appearing in the mainstream media. Approximately 10,000 subscribe to the service, including many who praise the daily digest as a valuable teaching tool—and many others who share interesting items with colleagues, friends and family.

### Sigma Xi Sponsors Distinguished Lecturers

For the 63rd consecutive year, Sigma Xi sponsored its College of Distinguished Lecturers, a program that provided stipends to help support hundreds of visits by 27 outstanding scientists to Sigma Xi chapters, communicating the latest developments in science and technology to faculty and public audiences alike.

### Bugliarello Prize Established

The Greenwall Foundation of New York this year endowed a prize in honor of Sigma Xi Past President **George Bugliarello** that will be awarded periodically for the best article published in *American Scientist* dealing with interdisciplinary connections involving biology, society and machines. One of Sigma Xi's longstanding interests has been the communication of important developments in science and technology across disciplinary lines, and this new award will contribute to continued attention to this topic in *American Scientist*.





## Honoring Outstanding Chapters

### Chapters Receive Certificates of Excellence

Thirteen Sigma Xi chapters were recognized at the annual meeting in Albuquerque with certificates of excellence for overall outstanding activity during the past fiscal year.

The **Alaska Chapter's** range of activity included research programs for high school, undergraduate and graduate students, and numerous programs devoted to public understanding of science.

The **Clemson University Chapter** worked closely with other organizations and departments on campus to provide programs, research awards and a Nobel laureate address on campus.

In cooperation with Ford's High School Science and Technology Program, the **Ford Motor Company Chapter** hosted a Saturday session on "Invention and Intellectual Property" for approximately 200 local students and their teachers, including 65 minority students from the Detroit area.

This year's highlights for the **National Institute of Standards and Technology Chapter** included the annual Postdoctoral Poster Presentation, a popular public colloquium series and promotion of research and education through participation in area science fairs.

A variety of programs characterized the activity of the **Northern Michigan University Chapter**, including lectures, awards for outstanding science teachers and a poster presentation event for undergraduate and graduate students.

The **Northwestern Pennsylvania Chapter's** public forum on evolution attracted an audience of about 70, plus television and newspaper coverage. The chapter also hosted a panel discussion for high school students on being educationally prepared for careers in science and medicine.

In addition to its annual bioethics forum, the **Pace University Chapter** sponsored a number of lectures, a workshop for science teachers and a high school science day.

Reflecting a diverse membership, the **Research Triangle Park Chapter** hosted a half-day roundtable discussion on risk assessment. The chapter also focused programming on the environmental impacts of weather, with particular interest in three recent major hurricanes in North Carolina.

The **San Diego Chapter** supported a new chapter in Ensenada, Mexico, launched a chapter newsletter and raised \$6,000 from a charitable trust to support both middle and high school science fairs and a news bureau.

The **Texas A&M University Chapter** promoted science education with an essay and drawing contest for K-12 students and a workshop on alternatives to the traditional teaching of science at the undergraduate level.

In addition to its successful High School Enrichment Program, the **University of Calgary Chapter** has sponsored a thematic lecture series for more than 20 years that is widely recognized and attended.

Science education was a top priority for the **University of Hawaii-Hilo Chapter**. Activities included co-sponsoring and judging the state science fair and a science open house on campus for more than 250 students and teachers.

The **University of Minnesota at Duluth Chapter** organized a science equipment fair for more than 500 attendees. The chapter's annual poster session attracted 35 posters, with more than 150 people attending the opening ceremony.

### Chapters Organize Outstanding Programs

Chapter Program Awards were presented to seven chapters for organizing and/or hosting a particularly outstanding program during the last year. Detailed descriptions of these award-winning programs are available on the Sigma Xi Web site at <[www.sigmaxi.org](http://www.sigmaxi.org)>. The recipients were the:

- **Louisiana State University Chapter**
- **Middle Tennessee State University Chapter**
- **Pace College Chapter**
- **San Diego Chapter**
- **University of Calgary Chapter**
- **University of New Mexico Chapter**
- **Whitman College–Walla Walla College Chapter**