

Sigma Xi, The Scientific Research Society

The Year in Review

A report of activities for the fiscal year ending June 30, 1998

A LETTER FROM THE PRESIDENT



In my last column in *American Scientist* magazine as 1996-98 president of Sigma Xi, I reflected on some of the more prominent themes and issues during my term in office.

Inspired by energetic activities of the chapters in Michigan, groups of Sigma Xi chapters are undertaking a science advocacy role. Entering into a dialogue with legislators, they provide educational opportunities for lawmakers on the nature of research and development, and of the scientific and technological enterprise generally.

There have been ongoing discussions of possible active roles for Sigma Xi and its members in ensuring continued education on ethical issues in science, and in helping to resolve scientific ethics cases, questions and issues. As the honor society of science and engineering, Sigma Xi can and should take a leading role in this area.

The Society now operates the Media Resource Service, which connects journalists with experts on the scientific and technological aspects of developing news stories. In general, Sigma Xi can play an increasingly important role in promoting the public understanding of science, and in scientific education at all levels.

I expect these issues will continue to be important over the next several years, although succeeding presidents will certainly want to lead Sigma Xi into new areas, and time will bring new activities from our chapters and regions.

The interdisciplinary nature of this organization and its emphasis on promoting the flow of information across disciplinary lines offer special advantages in addressing issues in science and technology and in forging links that will advance the boundaries of knowledge.

During my term in office, it has been a pleasure to work with Sigma Xi's distinguished community of scientists and engineers toward some common goals. The direction the Society is taking augers well for the future and for an increasingly important role for Sigma Xi in scientific affairs.

Robert A. Frosch
President, 1996-98

HONORING EXCELLENCE IN RESEARCH

Procter Prize Goes to Philip Morrison

Massachusetts Institute of Technology physicist **Philip Morrison** received Sigma Xi's highest honor, the William Procter Prize for Scientific Achievement, at the annual meeting in November 1997, in Washington, D.C. He designated a young South African colleague, **William M. Lesame**, to receive the \$5,000 Grant-in-Aid of Research that is part of the prize. During World War II, Morrison served with the Manhattan Project, taking part in the test of the first atomic bomb. He is a distinguished theoretical astrophysicist, scholar-philosopher and interpreter of science and technology for the general public, and a leading advocate of nuclear and conventional arms reduction.

Chenming Hu Wins Monie Ferst Award

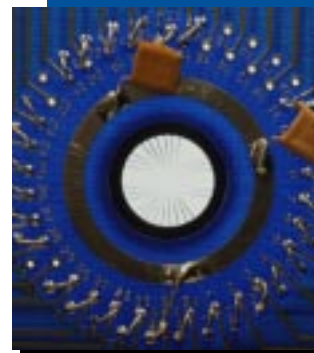
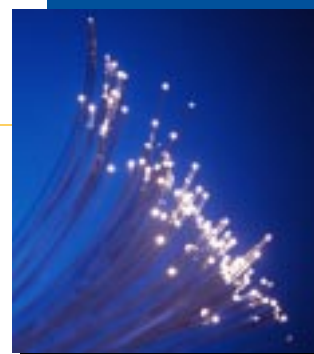
Innovative electrical engineer **Chenming Hu** of the University of California at Berkeley received the 1998 Monie A. Ferst Award from the **Georgia Institute of Technology Chapter**. This national award recognizes contributions to research through education. Hu has focused on the theory of integrated-circuit devices, and especially on metal oxide semiconductor (MOS) device physics and engineering, for which he has achieved world renown. A member of the National Academy of Engineering, he has supervised 60 doctoral students. The Ferst Award features a day-long symposium at Georgia Tech during which the recipient's former students present papers on their work.

Sigma Xi Chapters Honor Excellence in Research

Frank Press received the first Distinguished Scholar Award presented by the **Kappa Chapter of Columbia University**, which recognizes the accomplishments of chapter members and other researchers who are, or have been, associated with Columbia University.

■ The **Centers for Disease Control and Prevention (CDC) Chapter** in Atlanta presented its second annual Sigma Xi Walter R. Dowdle Award to **Gerald R. Cooper** for 43 years of distinguished contributions to public health through research and leadership at the CDC.

■ **William C. Krueger** received the **Oregon State University Chapter's** 1998 Research Award for his "pioneering research in riparian ecosystems, wildlife interactions, agro-forestry, restoration ecology and biological diversity."





THE YEAR IN REVIEW

ENCOURAGING YOUNG INVESTIGATORS

Physicist Wins Young Investigator Award

John D. Gillaspy, a physicist at the National Institute of Standards and Technology (NIST) in Gaithersburg, Maryland, was selected to receive the first Sigma Xi Young Investigator Award, which includes a \$5,000 prize.



John D. Gillaspy

Presented annually beginning in 1998, the award alternates between the physical sciences, including engineering, and the life and social sciences. Under Gillaspy's leadership, a collaborative group of NIST and Harvard University researchers developed a new method of creating nanoscale patterns on surfaces, which has breakthrough implications for microelectronic circuits. Regional finalists included **Mickey Kutzner** at Andrews University, **Courtney A. Young** at Montana Tech of the University of Montana, **Metin Akay** at Dartmouth College and **George Hademenos** at the University of California at Los Angeles.

75 Years of Grants-in-Aid of Research

This year marked the 75th anniversary of Sigma Xi's Grants-in-Aid of Research Program. Since it began, more than 25,000 young researchers have received Sigma Xi grants, which often have enabled them to compete successfully for other research funds. In the fiscal year ending June 30, 1998, Sigma Xi awarded 581 Grants-in-Aid of Research to undergraduate and graduate students, totaling more than \$393,000.

Sigma Xi Chapters Honor Young Researchers

The **University of Cincinnati Chapter's** Outstanding Young Investigator Award went this year to chemical engineer **Jerry Yue-Sheng Lin**. ■ **Katrina Tschakert** of Florence High School won a Sigma Xi Award for her research project "The Udder Truth: Testing Antibiotic Sensitivity" at the 44th Eastern South Dakota Regional Science & Engineering Fair. The fair was co-sponsored by the **South Dakota State University Chapter**. ■ **The Long Island University C.W. Post Chapter** presented a certificate of recognition to graduating high school senior **Leslie Greenberg** for demonstrating "an exceptional aptitude for scientific research."

COMMUNICATING SCIENCE

John H. Gibbons Wins McGovern Award

The 1997 John P. McGovern Science and Society Award went to **John H. (Jack) Gibbons**, who at the time was President Clinton's chief science advisor and director of the White House Office of Science and Technology Policy. Gibbons is an internationally recognized scientist and expert in energy and environmental issues who has demonstrated a deep interest and concern about the support of science and the impact of technology on society.

Ansley, Kurtis Elected Honorary Members

David Ansley, science editor for *Consumer Reports* magazine, and award-winning television broadcaster **Bill Kurtis** were elected honorary members of Sigma Xi. As science editor of *Consumer Reports*, Ansley is responsible for the magazine's coverage of health, medicine and the environment. A former anchor for "The CBS Morning News," Kurtis is executive producer and host of the Peabody Award-winning science documentary series "The New Explorers with Bill Kurtis." Honorary membership recognizes individuals who have made outstanding contributions to science or to Sigma Xi, but who are not otherwise eligible for membership.

American Scientist Garners Recognition

Sigma Xi's bimonthly magazine of science and technology, *American Scientist*, won a Gold Award from the Society of National Association Publications for a feature article in the July-August 1997 issue on "Condoms and the Prevention of AIDS" by **Steven D. Pinkerton** and **Paul R. Abramson**. Also during the year, a new collection of 27 *American Scientist* articles focusing on ecology and a second edition of *Exploring Animal Behavior* were published by Sinauer Associates. Both books are designed to provide vivid supplementary readings for undergraduate science courses.

MediaResource Web Site Adds Features

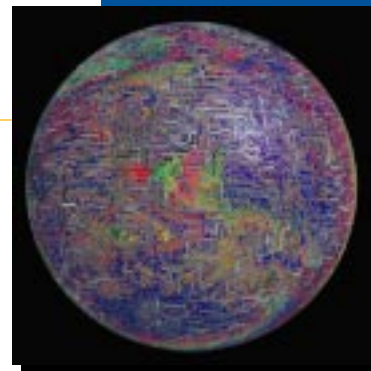
The Media Resource Service (MediaResource) home page <www.mediaresource.org> added two new features. "SciStacks" is a reference library of links to reliable information on such subjects as biology, chemistry and physics. "In the News" is a daily guide to online science stories, with links to related sites and is available free to Sigma Xi members. The service's database includes scientists and engineers who have agreed to provide expert commentary to journalists on short notice.

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Sigma Xi awarded prizes to six high school students for outstanding research projects at the 49th International Science and Engineering Fair in Fort Worth, Texas.

CHAPTERS SPONSOR VARIETY OF ACTIVITIES

Sigma Xi's more than 500 chapters conduct a variety of activities, ranging from awards programs and research symposia, to partnerships with local teachers to improve K-12 science education and lecture series that promote the public understanding of science. The home pages of nearly 100 chapters are accessible from the Sigma Xi Web site at <www.sigmaxi.org>. The following represent a small sampling of chapter activities during the year.

- Among other ongoing activities, the **Abbott Laboratories Chapter** supports Explorer posts in science and computing for boys and girls from high school through age 20 that meet regularly with Abbott investigators in their labs to learn about pharmaceutical research.
- The **North Carolina State University Chapter** was among the sponsors this spring of the seventh annual Undergraduate Research Symposium, with awards in the biological sciences, engineering and technology, humanities and social sciences, and physical and mathematical sciences.
- The **Quinnipiac College Chapter** awarded its 1998 High School Teacher Award to **Melissa A. Conrad**, who received a certificate, a bond for \$200 and a subscription to *American Scientist*.
- The **Santa Clara University Chapter's** annual banquet featured a poster session—co-sponsored by Women In Science, Engineering and Mathematics (WISE)—in which 16 new Sigma Xi associate members presented their research results.
- Each year the **Oneonta Chapter** at the State University of New York honors a librarian or science teacher for their efforts to promote science education. **Roseanne Pirone** of Oneonta High School was this year's honoree.
- The **U.S. Naval Academy Chapter** provides subscriptions to *Dragonfly* magazine for science teachers at Annapolis Elementary School. Funded by the National Science Foundation, Project Dragonfly links children and scientists to promote and improve science education.
- The **Villanova Chapter** co-sponsored a talk this winter on "Reading Our Own Blueprint: The Human Genome Project" by 1998 Mendel Medallion Honoree **Francis S. Collins**, director of the National Human Genome Research Institute.
- This year's lecture series at the **University of Calgary Chapter** revolved around the theme "Multidisciplinary Views of Environmental Issues" and included talks on air pollution, the ecological effects of forest fires and industrial groundwater contamination.
- University of Oregon psychologist **Ray Hyman**, who has served on National Research Council committees to evaluate paranormal phenomena, gave a talk sponsored by the **University of California at Santa Cruz Chapter** that focused on human error and how people come to believe what isn't so.
- At a **University of Colorado Chapter** meeting, physicist **Joseph Romig** discussed methods used to determine the origin and cause of a fire or explosion, pointing out some common but frequently unrecognized hazards in the home and workplace.
- Abstracts on recent seminars sponsored by the **New Jersey Institute of Technology Chapter**, on such topics as the ethical implications of medical technology, are on its Web site, available via <www.sigmaxi.org>.
- Members of the **Mayagüez Chapter at the University of Puerto Rico** visited the renowned radio-telescope at the Arecibo Observatory and were given access to areas normally restricted to observatory personnel.
- The **Washington University Chapter** sponsors colloquia on campus and frequently collaborates with the **St. Louis University Chapter** to sponsor activities for the larger community, such as a recent teleconference on biodiversity.
- In a talk on "The Emerging Golden Age of Astronomy" sponsored by the **Ohio University Chapter**, OU astronomer **Joseph Shields** described how a new generation of large ground-based telescopes is changing our view of the universe.
- The Fifth Sustainable Development Forum held by the **Chicago Area Chapters of Sigma Xi** focused on Northwest Indiana, a region of contrasts in which diverse natural areas lie in close proximity to extensive industrial areas.
- A joint meeting of the **District of Columbia, Food and Drug Administration** and **University of Maryland** chapters featured a talk by **Scott R. Woodward** of Brigham Young University on "The Genealogy of New Kingdom Pharaohs and Queens," in which he described the use of DNA analysis to confirm the lineage and identity of Egyptian mummies.



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A popular field trip
for the Swiss Chapter
during the year
involved a two-day visit
to the Swiss Institute
for Snow and Avalanche
Research that included
a hike along the
Landwasser and into
the Albulatal.



THE YEAR IN REVIEW

ADDRESSING ISSUES SHAPING RESEARCH

1997 Forum: Trends in Industrial Research

Nearly half of the 60 speakers and panelists for the 1997 Sigma Xi Forum *Trends in Industrial Innovation: Industry Perspectives and Policy Implications* were current or former high-level industry officials. They were joined on the program, held November 20-21 in Washington, D.C., by leaders in academia and government to address current global trends and what they mean for the future of research in biotechnology, telecommunications, energy, health and transportation, among other areas. The forum proceedings volume includes plenary talks and panel session summaries.

Chapters Link to NASA Video-conference

In February 1998, many Sigma Xi chapters established satellite downlinks for a National Aeronautics and Space Administration (NASA) "town meeting" video-conference on the commercial research potential of the International Space Station. During the two-hour program, science and engineering students and university faculty, as well as representatives of hospitals, government agencies and commercial organizations, participated in a discussion with a diverse panel of top NASA researchers, international investors and other experts. This was the latest in a series of video-conferences on issues in science and technology that Sigma Xi has either co-sponsored or promoted.

Science Policy Initiatives Spread

The **Michigan Chapters** of Sigma Xi have continued to meet with Michigan Congressional representatives, inspiring other chapters to become involved in science policy initiatives. Arkansas Congressman **Vic Snyder**, a former family practice physician and attorney, was the guest speaker at the **Central Arkansas Chapter's** annual banquet, as part of the chapter's science policy efforts. Members of the **Research Triangle Park Chapter** are working with the North Carolina Board of Science and Technology to provide advice to state government.

This 1998 Year in Review is an abbreviated version of Sigma Xi's 1998 Annual Report, which reports on the fiscal year ending June 30, 1998. For a copy of the full report, contact Sigma Xi's administrative offices.

A WORD OF THANKS

Financial support from Sigma Xi members and friends continues to be very gratifying. This year, contributions to Grants-In-Aid of Research totaled more than \$206,000. ■ The estate of the late Roland Queneau, a long-time member of Sigma Xi, has provided an additional payment to Sigma Xi, bringing the total to more than \$550,000 to support the Grants-in-Aid program and the Sigma Xi Center to be built in Research Triangle Park, North Carolina. ■ Sigma Xi members and friends, including over 50 members of the Companions Club who have made sizeable contributions to the Society, contributed more than \$196,000 to the Society's annual giving program. ■ Sigma Xi received two grants of \$20,000 from the Burroughs Wellcome Fund in support of the 1997 and 1998 Forums and an additional \$25,000 to support an equipment update for MediaResource. ■ The latest in a series of gifts to Sigma Xi, The Communities Foundation of Texas contributed \$5,000 this year to the endowment for the John P. McGovern Award. The membership, leadership and staff of Sigma Xi are grateful to the many individuals and organizations who support the Society.

Sigma Xi Members Receive Nobels

Election to Sigma Xi has been an early milestone in many distinguished careers. In the Society's history, more than 175 members have gone on to receive the Nobel Prize. Three members joined this illustrious group in 1997. They were physicists **Steven Chu** at Stanford University and **William D. Phillips** at the National Institute of Standards and Technology, and biochemist **Paul D. Boyer** at the University of California, Los Angeles. Steven Chu's research was featured in the January-February 1988 and 1998 issues of *American Scientist*.

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A highlight of the
Portland State
University Chapter's
year was a talk by
physicist Gertrude
Rempfer about
her exciting work
in developing
an electron-optical
achromat that
overcomes the
inherent imperfections
of electron microscope
lenses.