

The Year in Review 2001

Addressing Ethics in Research

Ethics Forum Proceedings Online

Publication of an online proceedings for the 2000 Sigma Xi Forum *New Ethical Challenges in Science and Technology* features digital video of forum plenary sessions, available for viewing on demand through the Programs link at www.sigmaxi.org. Forum speakers included **William Wulf**, president, National Academy of Engineering; **Robert C. Dynes**, chancellor, University of California, San Diego; **Cliff Stoll**, author and computer maven; **David C. Clark**, director of research affairs, Rush-Presbyterian-St. Luke's Medical Center; **Francisco J. Ayala**, professor of biological sciences, University of California, Irvine; and **David L. Goodstein**, vice provost, California Institute of Technology. A printed proceedings volume was also published, with support from the **U.S. Department of Energy**. The **Burroughs Wellcome Fund** and **Sandia Corporation** were among forum sponsors.

Chapter Ethics Workshop Series Begins

Supported by a grant from the **National Science Foundation**, a series of five pilot ethics workshops began this year at Sigma Xi chapters around the country, an effort that is expected to expand to other chapters in the years ahead. Promoting dialogue about developing and refining institutional capacity to deal with ethical issues was among workshop goals. This initiative is part of Sigma Xi's ongoing ethics program. The initial series includes: **Clemson University**, *Research Ethics and Graduate Education* ■ **Illinois Institute of Technology**, *Tools for Transforming the Science and Engineering Classroom*. ■ **University of South Carolina**, *Creating an Ethical Dialogue Across Disciplines*. ■ **Saint Louis University**, *Ethics in the Education of Scientists, Clinicians and Engineers*. ■ **Michigan State University**, *Ethics in the Education of Scientists, Clinicians and Engineers*.

Honoring Excellence in Science

Procter Prize Awarded to Alexander Rich

Massachusetts Institute of Technology biophysicist **Alexander Rich** received Sigma Xi's highest honor, the William Procter Prize for Scientific Achievement. Long recognized as a preeminent researcher in structural molecular biology, he is best known for his discovery of left-handed DNA, or Z-DNA, and the three-dimensional structure of transfer RNA, key discoveries that have led to an understanding of the role and function of RNA and DNA molecules in heredity.

Roald Hoffmann Receives McGovern Award

Nobel Prize-winning chemist, frequent *American Scientist* columnist and esteemed educator, **Roald Hoffmann** received Sigma Xi's 2001 John P. McGovern Science and Society Award. He shared the Nobel Prize in 1981 for work that provided new and useful ways to look at the geometry and reactivity of molecules. Considered one of the nation's most important chemists, Hoffmann has also received the National Medal of Science, the Arthur C. Cope Award of the American Chemical Society and the Priestly Medal.

Monie Ferst Award Goes to Michael Chamberlin

A professor emeritus of biochemistry and molecular biology at the University of California at Berkeley received the Monie A. Ferst Award in recognition of his life-long promotion of research through teaching and supervising students. **Michael J. Chamberlin** was one of the discoverers of bacterial and bacteriophage specific RNA polymerases. His research has informed our present views of the structure, function and mechanism of this crucial enzyme. A national honor, the Ferst Award is administered by the Georgia Institute of Technology Chapter.

IT IS AT THE CHAPTER LEVEL, WORKING WITHIN THE LOCAL COMMUNITY, THAT SIGMA XI HAS ITS GREATEST INFLUENCE AND POTENTIAL.

Evan Ferguson, Acting Executive Director

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Improving Science Education

Chapters Sponsor Education Programs

The **Princeton University Chapter** sponsored a conference at which women scientists discussed careers in science, math and technology with about 150 young women. ■ The **University of Oklahoma Chapter** sponsors an ongoing series of talks aimed at informing students about career options in science. ■ Law enforcement personnel attended a lecture sponsored by the **University of Kansas Chapter** on "Studies of Decomposing Cadavers." ■ The annual Sigma Xi Research Day sponsored by the **University of Houston Chapter** gave graduate students an opportunity to present and receive recognition for their research. ■ A seminar featuring four students who had attended the Global Climate Conference in The Hague was among the highlights of the year for the **Carleton College Chapter**. ■ Nearly 100 students were among those who attended a talk by Sigma Xi Distinguished Lecturer Ron J. Doyle sponsored by the **Central Michigan University Chapter**. ■ The **University of Idaho Chapter** contributed both time and money to the Moscow School District Science Fair. ■ The **South Dakota State University Chapter** held summer training workshops for teachers. ■ About 200 people visited student posters during a session sponsored by the **Western Washington University Chapter**. ■ Ninety-four sixth graders participated in hands-on physics workshops organized on campus by the **Oakland University Chapter**. ■ The **University of California at Riverside Chapter** held a two-week summer science institute at Wells Intermediate School for a dozen K-12 teachers. ■ The **Nalco Chemical Chapter** and ONDEO-Nalco cooperated in presenting a series of science demonstrations at 58 elementary schools.

Chapter Activities Encourage Innovative Undergraduate Teaching

A grant from the **National Science Foundation** supported Sigma Xi chapter activities this year as part of a developing effort to encourage institutions to adopt innovative undergraduate teaching practices in science and engineering. This is the latest effort reflecting Sigma Xi's long-standing commitment to science education. Thanks to the NSF grant, Sigma Xi is exploring possible collaborative efforts with **Project Kaleidoscope** and the **Council on Undergraduate Research**.

Encouraging Young Researchers

Rodriguez Wins Young Investigator Award

Molecular and cell biologist **Henry Rodriguez** at the National Institute of Standards and Technology (NIST) received the 2001 Sigma Xi Young Investigator Award in the life sciences. Rodriguez has been at NIST since 1998, where he is a project leader in the Biotechnology Division. Among his scientific accomplishments are a variety of molecular biological methods with exciting potential applications in basic research and medicine.

\$3.5 Million Bequest Supports Education

An innovative electrical engineer from Portland, Oregon, left an extraordinary legacy this year through a bequest to Sigma Xi of more than \$3.5 million, the largest gift in the Society's history. **Leroy E. Record** stipulated that his bequest be used to assist gifted, needy and motivated students in engineering and science. It followed a separate gift of \$262,000 from his estate earlier in the year for the Sigma Xi Grants-in-Aid of Research fund that bears his name.

Grants to Young Researchers

Since 1922, Sigma Xi has invested in the future of research by awarding grants to more than 30,000 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** received 1,834 applications during 2001, of which 610 received full or partial funding. A total of more than \$352,000 was awarded.

Annual Meeting Features Student Symposium

More than 120 undergraduate and high school students participated in a student research symposium held in conjunction with the 2001 Sigma Xi Annual Meeting in Raleigh, NC. Sponsored by GlaxoSmithKline, the symposium highlighted the work of talented young researchers. Sigma Xi president, Marye Ann Fox, North Carolina State University Chancellor, presented the awards. Shown with her are (left to right) Marc Edwards, Matt Whaley, Carl Seward, Nick Featherstone, Fox, Jamica Wilkerson, Greg Barlow, Anne Fabricius, Aaron Maye, Steve Wallace, Jane Mabe, Shelton Jones II, Hinda Boutrid and James Bernstein of the RTP Chapter and GlaxoSmithKline.





Promoting the Health of the Research Enterprise

Diversity Awards Recognize Chapter Efforts

The Sigma Xi Committee on Diversity established a new chapter award this year to recognize special efforts and achievements in the area of diversity. Ten chapters were nominated, and three were singled out for the award.

Academy of Natural Sciences Chapter members participated in a weekly program that encourages young minority women in the Philadelphia area to pursue science and contributed to another program that enables minority students to work with Academy scientists. ■ In addition to sponsoring student research awards, the **California State University Dominguez Hills Chapter** invited a minority scientist to speak at its annual banquet and also co-sponsored the annual Students Trained in Academic Research (STAR) Symposium at which all of the presenters this year were minority students. ■ The **San Diego Chapter** is supporting the development of a Sigma Xi chapter in Ensenada, Mexico and encouraged students from schools not traditionally known for science achievement to enter projects in the San Diego Science Fair.

ANYTHING SIGMA XI CAN DO TO TELL THE STORIES OF THE SUCCESSFUL PROGRAMS THAT HAVE ATTRACTED YOUNG PEOPLE TO SCIENCE WILL BE A GREAT HELP IN BUILDING A DIVERSE SCIENTIFIC COMMUNITY.

Marye Anne Fox, 2001-2002 Sigma Xi president, chemist and chancellor of North Carolina State University

Chapters Receive Certificates of Excellence

Ten Sigma Xi chapters were recognized with certificates of excellence for overall outstanding activity during the past fiscal year. The activities highlighted below are among a wide range in which these chapters participated.

The **Chesapeake Chapter** honored outstanding high school students and teachers who were special guests at a banquet featuring NASA's principal investigator for the Deep Impact Mission. ■ The success of programs featuring Sigma Xi Distinguished Lecturers led the university's president to establish a permanent fund to assist the **Eastern New Mexico University Chapter** in organizing future series. ■ The **Hope College Chapter's** Sigma Xi Distinguished Lecturer series coincided with Science Day on campus, attended by 450 high school students. ■ The **Loyola Marymount University Chapter** promoted undergraduate research through a series of brown-bag lunch seminars and an annual poster session and also organizes talks on issues in research or public policy. ■ Members of the **Mayo Foundation Chapter** served as judges at regional and state science fairs, and the chapter established grants and awards to assist and recognize students. ■ In memory of chapter founder Gene Saccomanno, the **Mesa State College Chapter** collaborated with a local hospital on a lecture series and on research grants to deserving students. ■ Activities during the **National Institute of Standards and Technology Chapter's** 25th year included a program on the Sigma Xi Packard Initiative and a series of eight public lectures on wide-ranging topics. ■ A **Quinnipiac Chapter** program on the use of modern imaging techniques to study mummy remains in Peru and Egypt is the subject of a public television series currently in production. ■ The **San Diego Chapter** established a new grant fund this year to encourage and honor four middle school science fair winners. ■ The **University of Southern Mississippi Chapter** received 25 nominations this year for its Excellence in High School Science Teaching Award.

Packard Initiative Promotes Networking in Developing Countries

Started in 2000 and funded by a major grant from the **David and Lucile Packard Foundation**, the Sigma Xi Packard International Science Networking Initiative was designed to create networks of scientists and engineers in developing countries and to foster long-term partnerships among those communities, Sigma Xi chapters, and researchers throughout the world. During the past year, Sigma Xi has administered an International Science Networking Survey and has built connections with several international organizations. Representatives from networking groups in Africa, Asia, Eastern Europe and Latin America recently participated in the 2001 Sigma Xi Forum and Annual Meeting to create plans of action for their groups and to inform Sigma Xi members about the status of research in their respective countries.

Surveys Added to Science Advocacy Program

This year, Sigma Xi partnered with the Washington, DC-based organization **Research!America** to deliver electronic surveys to the science community and the public on key issues relating to science. Comparison of survey results between the public and scientists will help to guide efforts to improve the public understanding of science and may also reveal key differences on how issues are perceived. Thus far, e-mail surveys have received high response rates from Sigma Xi members in Alaska, Delaware, Texas and Ohio. Highlights of results have been featured in the Society's newsletter, "Sigma Xi Today," in *American Scientist*.

WWW.SIGMAXI.ORG



Chapters Sponsor Programs to Promote Science

Scientists from around the world attended the **Louisiana State University Chapter's** international symposium on "Quantitative Genetics and Plant Breeding in the 21st Century." ■ The **University of the Sciences in Philadelphia Chapter** sponsored a Sigma Xi Day, which included a public talk and an undergraduate research symposium. ■ The **Arkansas State University Chapter** helped sponsor a visit on campus by Sigma Xi's 2000 Young Investigator Award-winner Sherry Yennello. ■ Politicians and representatives from the Ministry of Education attended a debate sponsored by the **Hungarian Chapter** on the question of research resources in Hungary. ■ The **Villanova University Chapter** awarded its prestigious Mendel Medal to pioneering heart surgeon Michael E. DeBakey, whose talk on "The Ventricular Assist Device" drew a large audience. ■ The **University of Minnesota Chapter** began a new seminar series this year on topics of general interest that included talks on El Niño and on genetic engineering. ■ This year there were four winners of the Sigma Xi Prize for Excellence in Science, sponsored by the University of **Chicago Chapter**, for seniors who have demonstrated outstanding achievement in undergraduate research.

PEOPLE NEED TO APPRECIATE HOW SCIENCE ENRICHES THEIR LIVES AND HELPS THEM TO UNDERSTAND THE FORCES THAT AFFECT THEM.

Jack Gibbons, 2000-2001 Sigma Xi president, physicist and former presidential science advisor

Chapters Host Public Science Programs

The **Black Hills Regional Chapter** held a public information session on efforts to convert the Homestake Gold Mine to an underground physics laboratory. ■ 600 people attended a talk by neurologist and best-selling author Oliver Sacks that was co-sponsored by the **Washington College Chapter**. ■ The **Swiss Chapter** offered experts to answer questions during a hiking excursion to a mountain research station. ■ Several members of the **University of Wisconsin at La Crosse Chapter** met with their congressmen and senators to discuss the importance of undergraduate research. ■ The **Columbia-Willamette Chapter** sponsored talks at various local colleges by five Sigma Xi Distinguished Lecturers. ■ The **Lynchburg Chapter** provided science support, exhibit planning and workshop training programs for the new Amazement Square Museum.

Chapters Organize Outstanding Programs

Program Awards were presented to the following chapters for organizing and/or hosting a particularly outstanding program during the year.

The **Charleston Chapter** celebrated Charles Darwin's birthday by sponsoring an entire week of activities that included public lectures and demonstrations. ■ The **Chesapeake Chapter's** program of classic science films appealed to a large cross-section of the staff from this government research facility. ■ The **Geneva Chapter** participated in the Partner in Science Education program and in a program aimed at introducing fifth grade students to career options. ■ The **Georgia Southern University Chapter's** public panel discussion on "Science and the Media: Relaying Research to Reporters and the Public" sparked lively exchange among participants. ■ About 400 middle school students participated in the **Greensboro Chapter's** 15th annual puzzle contest. ■ The **University of Michigan Chapter's** forum on "The Internet and the Research University" included panel discussions on the impact of distance learning on the mission of the research university and on tenure and intellectual property rights. ■ The **Whitman College-Walla Walla College Chapter's** ever-growing listserv for area teachers provides announcements about math and science lectures on campus.

Communicating Science and Engineering

2001 Forum on Science and the Arts

The 2001 Sigma Xi Forum *Science, the Arts and the Humanities: Connections and Collisions* offered a lively mix of performances, exhibits, demonstrations, talks and panel discussions by more than 50 scientists, artists and writers. Held in Raleigh, North Carolina, in conjunction with the Society's Annual Meeting, the forum featured a keynote address by **George Bugliarello**, chancellor of Polytechnic University. Eight forum plenary presentations and a dozen concurrent sessions covered a wide range of topics. Special events included the production of *Oxygen*, a play by **Carl Djerassi** and **Roald Hoffmann**. A sampling of presentations and images from the two-day conference is available at www.sigmaxi.org. Forum support was provided by the **American Chemical Society Matching Gift Fund, Burroughs Wellcome Fund, Duke University, GlaxoSmithKline, North Carolina Section of the American Chemical Society, North Carolina State University Chapter of Sigma Xi** and the **Phi Beta Kappa Society**.

American Scientist Web Redesign

A major redesign of the *American Scientist* Web site this year at www.americanscientist.org contributed to increased traffic on Sigma Xi's site. Plans include the addition of a searchable archive of *American Scientist* articles and enhanced online content for Sigma Xi members.

Jukofsky Named Honorary Member

Environmental journalist and activist **Diane Jukofsky** was elected an honorary member of Sigma Xi. She is director of the Rainforest Alliance's Conservation Media Center, based in San José, Costa Rica, which publicizes Latin American conservation efforts and issues, trains journalists in environmental reporting skills and also helps conservation leaders learn from their colleagues, share information about their projects and design effective communications strategies.