

Sigma Xi Today

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Rush Holt Receives McGovern Award

U.S. Rep. Rush D. Holt (D-New Jersey), a Princeton University physicist who was elected to Congress this year, will receive the 1999 John P. McGovern Science and Society Award and present the McGovern Lecture at Sigma Xi's annual meeting in Minneapolis in November.

The McGovern Award and Lecture have been highlights of Sigma Xi's annual meeting since 1984. The award includes a medal and an honorarium of \$2,500. Recipients are selected by the Society's Committee on Programs and over the years have represented a broad spectrum of people involved with varied science and society activities.

Holt inherited his interest in politics from his parents. His father was the youngest person ever to be elected to the Senate, at age 29. His mother served as Secretary of State of West Virginia, the only woman to hold that position.

Congressman Holt received his B.A. in physics from Carleton College and his M.S. and Ph.D. degrees at New York University. He joins fellow Sigma Xi member Vernon J. Ehlers of Michigan as the only members of Congress to hold doctorates in physics. Holt has been a teacher, Congressional Scientist Fellow, research scientist and an arms control expert for the U.S. State Department. He has conducted research on solar wind and received a patent for a solar energy device.

From 1989 until he began his 1998 Congressional campaign, Holt was assistant director of the Princeton Plasma Physics Laboratory, where he created an award-winning office of science education. The lab is the largest of Princeton's research facilities and the largest center for research



in alternative energy in New Jersey. He was co-chair of the Princeton University Sigma Xi Chapter's successful Science Advisor Program.

In addition, Holt has served in the U.S. State Department as acting chief of the nuclear and scientific division within the Office of Strategic Forces Analysis, where his responsibilities included participating in the Geneva arms control talks and directing analysis of space activities, international science and nuclear weapons proliferation.

He has also been a professor of physics at Swarthmore College, an American Physical Society Congressional Science Fellow and a teaching fellow at New York University.

In Congress, Holt won key assignments on the Committee on Education and the Workforce, the Committee on Resources and the powerful Committee on the Budget. His legislative priorities include protecting our environment and guaranteeing the livability of our communities, improving our schools, reforming health care and saving Social Security.

Congressman Holt is married to Margaret Lancefield, a physician and medical director of the Princeton Charity Care Clinic. They have three grown children, Michael, Dejan and Rachel, and two grandchildren, Noah and Niala.

Meeting Explores Ethical Challenges

While the public and Congress seem less concerned today with ethical issues in science, many research institutions have come to realize that misconduct is a low probability, high impact problem that merits serious attention.

At the same time, university/industry partnerships have proliferated to an extent that conflicts of interest, commitment and effort have added new complexities to ethical concerns in research.

These were among the views expressed at a conference in September called "Ethical Challenges and Practical Solutions for Managers in Research," cosponsored by Sigma Xi and the U.S. Public Health Service's Office of Research Integrity (ORI).

The one-day conference in Albuquerque, New Mexico, raised a number of issues that fueled discussion the next day at a planning conference for the 2000 Sigma Xi Forum on ethics in science and technology.

The conference featured talks by Sigma Xi and ORI officials, academic research directors and national laboratory managers. For a complete report, visit the Sigma Xi site on the Web at <www.sigmaxi.org>.

I N S I D E

1999 Sigma Xi Forum and Annual Meeting	582
Journal of Young Investigators	583
NSF Grant Funds Workshops	583
1998 Forum Proceedings	584
Chapters Sponsor Activities	584

1999 Sigma Xi Forum and Annual Meeting November 4-7 Highlight Interactive Learning and Undergraduate Research

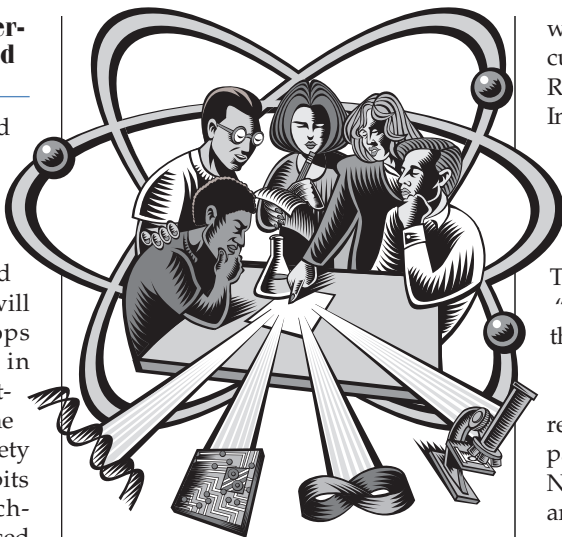
Sigma Xi Forum Features Interactive Workshops, Posters and Demonstrations

In addition to plenary talks and invited presentations, the 1999 Sigma Xi Forum *Reshaping Undergraduate Science and Engineering Education: Tools for Better Learning*, to be held November 4-5 in Minneapolis, will feature 20 interactive workshops demonstrating best practices in undergraduate science, mathematics and engineering education. The conference will also include a variety of contributed posters and exhibits that demonstrate tools and techniques associated with inquiry-based learning. Posters, demonstrations and workshops were selected by organizers from more than 80 presentation proposals.

Plenary presentations will explore major issues associated with undergraduate education reform. Bruce Alberts, National Academy of Sciences president, will open the forum on November 4 by exploring the question, "Why Inquiry?" Mel George, president emeritus, St. Olaf College and president emeritus, University of Missouri, will offer a retrospective of the NSF "Shaping the Future" report, for which he chaired the advisory committee.

The forum will close on November 5 with a panel discussion, moderated by National Science Foundation Division of Undergraduate Education head Norman Fortenberry, titled "Bridges to the Future." Shirley Strum Kenny, president of the State University of New York at Stony Brook and chair of the Boyer Commission, will open the session with a few words about the future of undergraduate education reform, and a distinguished panel will accept questions from the audience for an open discussion of the issues.

Invited sessions during the forum feature individuals who have imple-



mented reform at their own institutions or who dedicate their professional careers to supporting and facilitating educational reform. Each session features two or three speakers and is followed by a moderated discussion group. Topics include: inquiry in large and small classes, project-based learning, research experiences, effecting the cultural change needed to implement inquiry-based learning, building inquiry into the curriculum, developing partnerships, accessing databases for inquiry-based learning and tools for assessing inquiry-based learning. A complete program for the forum appears on the Sigma Xi Web site at <www.sigmaxi.org>.

Annual Meeting Includes Undergraduate Research Symposium, Explores Diversity Issues

In conjunction with the 1999 Sigma Xi Annual Meeting, chapters in the North Central region of Sigma Xi will host an all-day symposium of poster presentations of undergraduate research. Up to 100 presentations will be accepted by the organizers at the University of Minnesota. Student presenters will receive free registration to the Sigma Xi meeting, and the poster session will be centrally located in the meeting facility. Students will be invited to participate in annual meeting

workshops, including the panel discussions "Promoting Undergraduate Research" and "Exploring the Influence of Gender and Ethnicity on Student Learning in the Physical Sciences," both of which will include student speakers on their panels.

The annual meeting will also include "Student Day" activities, hosted by the Sigma Xi Committee on Diversity. Local undergraduate science and engineering students from under-represented groups were invited to participate in activities on Saturday, November 6, as guests of the Society, and chapter delegates to the annual meeting were asked to serve as mentors to one or two students for the day. The activities for the day include a lunch-time workshop titled "Overcoming Obstacles in Academia," and an afternoon panel discussion on "Issues for Graduate Students from Under-represented Groups."

Other annual meeting workshops will explore a variety of issues, including: Exploring Ethics in Science and Engineering: Planning Discussion for 2000 Sigma Xi Forum; Developing Programs in Your Sigma Xi Chapter; K-12 Outreach Programs in Sigma Xi Chapters; A Sigma Xi Program for Dissemination of Best Practices in Undergraduate Education Reform; Professional Networking; and Science Advocacy Programs in Sigma Xi Chapters.

Three Sigma Xi awards will also be a highlight of the annual meeting. U.S. Rep. Rush Holt will receive the John P. McGovern Award and present the McGovern Lecture, University of Massachusetts biologist Lynn Margulis will receive the William Procter Prize for Scientific Achievement and present the Procter Prize Address, and Princeton University biologist Laura Landweber will talk about aspects of her work as the recipient of Sigma Xi's 1999 Young Investigator Award.

Journal of Young Investigators to Videotape Forum

In a partnership with Sigma Xi, the *Journal of Young Investigators, Inc.* (JYI), will videotape much of the forum and selected sessions from the annual meeting for later broadcast on both the JYI and Sigma Xi Web sites. Additionally, more than half a dozen editors of the online undergraduate research journal will spend Saturday recruiting authors during the undergraduate research symposium being hosted by local Sigma Xi chapters.

JYI, <www.jyi.org>, is a new, exciting, student-led initiative to broaden the scope of the undergraduate scientific experience. JYI's undergraduate staff members, currently representing more than 30 different institutions, operate a peer-reviewed journal for undergraduate research. JYI has been featured in *EurekAlert!*, *Chemical Engineering News* and *The Chronicle of Higher Education*. An article highlighting JYI appeared in *The New York Times* (February 17, 1999).

JYI provides undergraduates an opportunity to communicate their scientific interests and endeavors and aims to showcase high quality undergraduate research. By providing a national opportunity for undergraduates to participate in the entire scientific enterprise, JYI broadens student awareness of current scientific issues and undergraduate opportunities, engage undergraduates in discussions on science education, and brings the inter-institutional community to undergraduate science majors. JYI uses the fresh perspectives and technological expertise of undergraduates to innovate new ways to publish scientific information on the Web.

NSF Grant Funds Education Workshops

Two pilot Sigma Xi chapter workshops are planned this winter as part of a developing effort to encourage institutions to adopt innovative undergraduate teaching practices in science and engineering. The education workshops and related activities are being funded by a grant of \$146,000 from the National Science Foundation (NSF).

The new project is an extension of the 1999 Sigma Xi Forum, *Reshaping Undergraduate Science and Engineering Education: Tools for Better Learning*, to be held November 4-5 in Minneapolis, and will likely become a key facet of an ongoing program in science education under development for the Sigma Xi Center in Research Triangle Park, North Carolina.

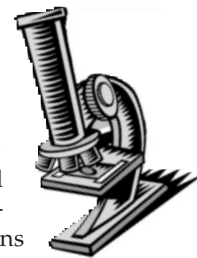
The NSF grant will enable Sigma Xi to explore the possibility of launching a collaborative effort involving its extensive network of chapters and Project Kaleidoscope, an informal national alliance of individuals, institutions and organizations committed to strengthening undergraduate science, mathematics, engineering and technology education (SME&T).

Begun in 1989 and based in Washington, D.C., Project Kaleidoscope is dedicated to transforming the learning environment for undergraduate students in SME&T by building institutional teams that focus on what works and who are committed to action. Project Kaleidoscope also seeks to foster public understanding about how a strong undergraduate science community serves the national interest.

"Promoting science literacy has long been among Sigma Xi's primary missions and is now a priority in the United States and elsewhere around the world," said Peter D. Blair, executive director of Sigma Xi. "Leaders in both science and education have recognized that this is a key to dealing with many of the challenges that lie ahead."

"Effective teaching methods are now established and many examples of

best practice are available," he continued. "The current challenge is twofold: faculty must embrace and employ these methods, and institutions must create a climate and a curriculum structure that supports quality science education."



Blair said that Sigma Xi is embarking on a four-phase dissemination program. The 1999 Forum in Minneapolis will showcase state-of-the-art educational practices, programs and products, emphasizing the importance of science for all students and of active, inquiry-based learning techniques (see story page 582).

The series of campus-based workshops will initiate local discussions of institution-wide reform. Follow-up activities sponsored by the host Sigma Xi chapters and supported by the Society's administrative staff through existing programs and Web resources will ensure that discussion and reform efforts continue.

A second Sigma Xi forum in 2003 will highlight successful reform efforts and will serve as a basis for initiating the next phase of Sigma Xi activities addressing undergraduate science education.

"Both forums and each of the workshops will be evaluated by an external educational evaluator for meeting their objectives and for measuring their effectiveness in catalyzing institutional reform," Blair said.

He said a dissemination program of best practices will become one of the cornerstones for the new Sigma Xi Center, which will focus on science education, the public's understanding of science, ethics and honor in science and the health of the research enterprise. Details on the 1999 Sigma Xi Forum appear on the Sigma Xi Web site at <www.sigmaxi.org>. Chapters interested in hosting a workshop may contact pblondin@sigmaxi.org.

1998 Forum Proceedings Focuses on International Cooperation

In recent years, technological developments and declining government sponsorship have encouraged the science and technology community to consider the economic advantages of international collaboration. The 1998 Sigma Xi Forum chronicled cooperative experiences in areas such as high energy physics, space, global environment, health sciences and global security.

The 214-page proceedings volume for the 1998 Sigma Xi Forum *International Cooperation in Science and Technology* is now available for \$10 a copy (plus shipping and handling). It can be ordered by writing to Sigma Xi Publications, P.O. Box 13975, Research Triangle Park, NC 27709, or by visiting the "Publications and Merchandise" page on the Web at <www.sigmaxi.org>.

This proceedings volume comes from the seventh in a series of Sigma Xi forums addressing topics of spe-

cial interest to the scientific community and especially to the membership of Sigma Xi. Recent forum topics have included science education reform, ethics and values in science, the future of federal funding for research and trends in industrial innovation.

The 1998 Forum was convened in Vancouver, British Columbia, and was the first Sigma Xi forum to be held outside the United States. The plenary talks and panel presentations addressed virtually every dimension of international cooperation, from scientist to scientist collaboration facilitated by telecommunications and transportation advances, to inter-laboratory collaboration exchanges, to industry partnerships, to multi-university and large-scale multinational ventures.

The topics also spanned many disciplines of science and engineering and thus comprise a fascinating cross

sectional view of how quickly and completely the science and technology enterprise is being transformed by international partnerships.

The proceedings includes some 23 plenary talks and panel presentations, including papers by Nobel laureate Michael Smith; Kathryn I. Clark, International Space Station; Verena Tunnicliffe, University of Victoria; Constantin Rudyk, Ministry for Environmental Protection and Nuclear Safety of Ukraine; Charles A. Doswell, National Severe Storms Laboratory; Alexandra Levitt, Centers for Disease Control and Prevention, among others.

Sigma Xi owes a special thanks to the Forum Steering Committee, speakers and panelists for making this conference successful, and also to the Burroughs Wellcome Fund, the U.S. Department of Energy and the U.S. Department of Commerce for their financial support.

Chapters Sponsor Variety of Activities

The following news items were taken from Sigma Xi chapter annual reports and are representative of the breadth of activities in which chapters engage.

Attendance at the **National Institute of Standards and Technology Chapter's** monthly colloquium series totaled 1,700 this year, including staff scientists and the general public, from senior citizens to entire high school science classes and their teachers. Topics included "Mathematics in the Music of J.S. Bach" and "A History of Light." Short abstracts of the eight talks appeared in the "Science and Learning" section of the *Washington Post*. ■ The **University of Minnesota Chapter** has initiated a Science Communication and Education Award to recognize excellence in presenting scientific research and promoting science literacy among the general public. The first award was presented to James L. Dawson, science writer for the *Minneapolis Star Tribune*. ■ In conjunction with the **Mississippi State Chapter's** monthly seminar series, speakers are interviewed for a local radio program called "Conversations with Scientists," which allows the general public as well as the scientific community to get to know them better. ■ The **Whitman College/Walla Walla College Chapter** this year became faculty sponsor for a new student group called the Skeptics' Club, with the goal of ensuring that scientific issues and viewpoints are included in the club's open panel discussions on controversial topics. ■ The **Montana Tech Chapter** sponsored a day-long symposium in April on "Butte Mining: Problems and Solutions" as part of the 1999 annual meeting of the Montana Academy of Sciences. The symposium featured speakers from industry, government and academia and concluded with a late-afternoon field trip to view and discuss the current status of mining in the Butte area. ■ The **University of California at Santa Cruz Chapter** took an active role in a community debate over fluoridation of public water supplies in response to a special city referendum on the issue. The chapter published an op-ed article in the *Santa Cruz Sentinel* and participated in a public forum on the scientific merits of fluoridation. Despite these efforts, the measure prohibiting fluoridation passed by less than one percent of the vote. ■ A talk by science writer Rob Barker, author of the book *And the Waters Turned to Blood*, about the *Pfiesteria piscidica* outbreak in the waters of North Carolina, was a highlight of the year for the **Knox College Chapter**. The talk got a lot of local attention because of the possible connection between agricultural run-off from hog farms and the *Pfiesteria* outbreak. Mega-hog farms are becoming established in that region of Illinois, and people are concerned about the possible environmental effects.