

Sigma Xi Today

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Sigma Xi Summer Institute Supports Undergraduate Education Reform

Sixteen Sigma Xi chapters participated in a four-day workshop at the first Summer Institute on Undergraduate Education Reform, organized in Keystone, Colorado, by Project Kaleidoscope with a track hosted by Sigma Xi.

Part of a continuing effort in science education by Sigma Xi, the summer institute was an outgrowth of the successful 1999 Sigma Xi Forum *Reshaping Undergraduate Science and Engineering Education: Tools for Better Learning*. The goal was for each chapter team to create an action plan to catalyze undergraduate science, mathematics, engineering and technology (SMET) education reform on its campus.

Keynote sessions and smaller facilitated sessions focused on pivotal issues in education reform. With the time demands faculty and administrators face, the four days in Colorado offered a rare opportunity to bring together colleagues for a vigorous exchange about their visions for reform.

The summer institute was just the first step for the Sigma Xi teams, which will continue to work on their action plans with support from Sigma Xi. A Web site and listserv will allow the teams to continue to network, exchange resources and tap the support of consultants involved in the institute.

If appropriate funding can be obtained, Sigma Xi hopes to support campus workshops, visits by consultants and the selection of additional chapter teams next winter. Funding for the Sigma Xi summer institute was provided by the National Science Foundation.

Among the chapters participating were American University, Arizona State University, Bradley University, California State University at Chico, Colorado School of Mines, CUNY/Hunter College, Michigan State University, Ohio State University, Rider University and Tri-Cities (Columbia Basin College).

Other chapter teams included the University of Akron, University of California at Davis, University of Mississippi Medical Center (Mississippi College and Millsaps College), University of Nebraska at Omaha, University of Northern Colorado and Virginia Polytechnic Institute and State University.

Sigma Xi's annual meeting in Albuquerque on November 9-12 will include a workshop for delegates titled "Chapter-Based Workshops on Undergraduate Education," continuing discussions about Sigma Xi's role in undergraduate education reform and chapter activities that can support the dissemination of effective practices and tools for better learning.

Sigma Xi continues to explore the range of program opportunities that take advantage of the strengths of its chapters to improve science and mathematics education. Chapters are invited to submit applications for "seed" grants of up to \$1,000 to support innovative science education projects.

Applications may be submitted at any time in care of the Committee on Programs, Sigma Xi, P.O. Box 13975, Research Triangle Park, NC 27709. Visit the Web at <www.sigmaxi.org> for complete guidelines and an application form.

Help Expand Our Chapter Network

The Packard Initiative to increase international science networking offers established Sigma Xi chapters an opportunity to support new chapters in developing countries while participating in international scientific exchanges.

This new effort is supported in part by a grant from the David and Lucile Packard Foundation. Companion chapters can assist new chapters in developing countries by:

- Introducing Sigma Xi to colleagues in developing countries;
- Nominating researchers for membership in Sigma Xi;
- Paying dues for new members;
- Collaborating on research activities;
- Sending journal subscriptions to the chapter;
- Hosting visits by researchers from developing countries;
- Assisting researchers in getting published in prominent journals;
- Exchanging graduate students.

For more information on becoming a companion chapter, please contact Lisa Rhoades at lrhoades@sigmaxi.org or 800-243-6534, ext. 204 or visit <www.sigmaxi.org>.

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Engineer, Crop Scientist Receive Canada's Highest Honor

Sigma Xi members **Robert H. Clark** and **Douglas R. Knott** have been appointed to the Order of Canada, the country's highest honor for lifetime achievement.

Established in 1967, the Order of Canada recognizes people who have made significant contributions to their country. All Canadians are eligible for the honor.



Robert H. Clark

Appointed an Officer of the Order of Canada, Clark is an engineer known nationally and internationally as an expert in the field of hydrology and tidal energy. He established the first hydrology course in Canada at the University of Manitoba and also played a key role in development of the Red River Floodway.

Clark has represented Canada on numerous federal, provincial and international boards and committees. Since his retirement, he has continued to act as a consultant to various organizations, both at home and abroad. He was elected to Sigma Xi by the McGill Chapter in 1943.

Appointed a Member of the Order of Canada, Knott is a professor emeritus of crop science and plant ecology at the University of Saskatchewan and is internationally recognized for major contributions to the understanding of rust resistance in wheat.

He is also credited with the development of several improved varieties of durum wheat. Over the years, his work has had a direct impact on the production and export of this crop.

A Fellow of the Agricultural Institute of Canada, Knott is a member of the Saskatchewan Agricultural Hall of Fame. He was elected to Sigma Xi by the University of Wisconsin Chapter in 1951.



Douglas R. Knott

Biologist Walter Gehring Wins Prestigious Japanese Prize

Sigma Xi member **Walter J. Gehring**, an internationally renowned developmental biologist, will receive the 2000 Kyoto Prize in Basic Sciences in a ceremony on November 10.

The annual Kyoto Prizes, Japan's highest private awards for lifetime achievement, are presented to individuals or groups who have contributed significantly to the scientific, cultural and spiritual betterment of humankind. The prizes include a cash gift of about \$470,000.

Gehring, 61, is a professor at the University of Basel in Switzerland and a former faculty member at Yale University, where he was elected to Sigma Xi membership in 1970.

In 1983, Gehring applied a molecular biological approach to his experimental studies of *Drosophila* and found a specific base sequence conserved within all homeotic genes, which he named the homeobox.

Later, he expanded the scope of his research to analyze the role of homeobox-containing genes in developmen-



tal processes, and to elucidate the molecular mechanisms by which DNA-binding proteins (termed homeodomains) are regulated by the homeobox.

Through his research, he discovered that the homeobox exists universally in species ranging from lower organisms to humans.

Taking note of the surprisingly similar base sequences present in even distantly related organisms, Gehring hypothesized

that the genes involved in developmental control had been conserved throughout evolution, and that all organisms essentially undergo a developmental process based on these conserved molecular mechanisms.

These discoveries represented major advances in developmental biology, contributing to the establishment of a new paradigm for the fundamental understanding of evolution, biological phylogeny and diversity.

The Inamori Foundation, which administers the Kyoto Prizes, was established in 1984 by Kazuo Inamori, founder and chairman emeritus of Kyocera Corporation. To date, 48 individuals and one group have received the awards.

2000 Sigma Xi Forum November 9-10, 2000 • Hyatt Regency, Albuquerque, NM

New Ethical Challenges in Science and Technology

In conjunction with the Sigma Xi Annual Meeting November 10-12, 2000

Sigma Xi's two-day forum in Albuquerque on November 9-10 will focus on a variety of new and emerging ethical issues in research from the perspectives of academia, industry and government.

Among forum topics are the new federal research misconduct policy, ethics in medical research, oversight of research staff by the principal investigator, intergenerational ethics and some new wrinkles on faculty conflicts of interest.

Plenary speakers include **William Wulf**, president of the National Academy of Engineering; **Robert C. Dynes**, chancellor, University of California at San Diego; **Arthur Rubenstein**, dean, Mount Sinai School of Medicine; **Francisco J. Ayala**, professor of biological sciences and philosophy, University of California at Irvine; and **David Goodstein**, vice provost and professor of physics, California Institute of Technology. Astrophysicist **Cliff Stoll**, author of *Silicon Snake Oil: Second Thoughts on the Information Highway* and *The Cuckoo's Egg: Tracking a Spy Through the Maze of Computer Espionage*, will give a plenary talk on cybereithics.

In addition, nine concurrent breakout sessions will focus on a variety of issues. Breakout topics and leaders are listed below. For the full two-day schedule and additional program information, visit <www.sigmaxi.org>.

Intellectual Freedom and the National Laboratories

John C. Browne, director, Los Alamos National Laboratory

The culture of intellectual freedom has served the national laboratories well, allowing employees to pursue professional interests, participate in open debate, disseminate the results of their research, collaborate with external researchers and contribute to the public understanding of science and technology. But intellectu-



al freedom must be tempered by the need for national security.

Principal Investigator Oversight of Staff

David C. Clark, director of research affairs, Rush-Presbyterian St. Luke's Medical Center

Who is to blame when research staff engage in scientific misconduct and the principal investigator has been lax or inadequate in some or all of his/her oversight responsibilities?

New Wrinkles on Faculty Conflicts of Interest

Paul Fleury, dean of engineering, University of New Mexico

The rise of university/industry/government partnerships has led to diverse funding sources, many of which are demanding more "outcomes-oriented" proposals. This session will look at the temptations and confusions surrounding multiple sponsors of research, ownership and development of intellectual property and the involvement of students and university facilities in the pursuit of marketable products.

The New Federal Research Misconduct Policy

Sybil Francis, senior analyst, White House Office of Science and Technology Policy

Government officials will discuss the rationale for the new federal research misconduct policy, issues raised during its development and challenges to its implementation.

Intergenerational Ethics

John Gibbons, former presidential science advisor

Concerns about social equity across geographical regions and economic classes are now clearly on the public agenda, as is concern for environmental quality and security. But the same concern across time (intergenerations) is only slowly taking form and is struggling with deeply embedded paradigms such as economic discount rates. This session will address the opportunities for science and technology to create options to preserve and/or provide successors to our natural and created wealth and health.

Bioethical Challenges on the Horizon

Robert T. Pennock, associate professor, Michigan State University

Today we face ethical choices that were merely hypothetical a decade or two ago. What new bioethical problems are likely to emerge in the next decade? This session will include an exercise in "educated prognostication" to try to identify ethical issues on the horizon, and then begin to consider what our professional duties are as scientists with regard to them.

Teaching the Responsible Conduct of Research

Vivian Weil, director, Center for Study of Ethics in the Professions

Conflicts often arise when research

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groups lack explicit understandings about forms of credit, the basis for credit and grounds for assigning authorship. This session will cover suggestions for handling these issues and look at a study of graduate student attitudes on ethics in science and whether the mentoring process is working. Background information can help provide a context for the discussion of real-life scenarios and cases.

Web Resources for Solving Problems About Conduct

Caroline A. Whitbeck, director, Online Ethics Center for Engineering & Science

This session will give a guided tour of online materials to support research ethics education for group learning. This method is engaging, builds the group's competence for handling issues in research ethics, makes very modest demands on faculty time and provides information when people are ready to learn it.

Responsibilities of Researchers to Society

Robert J. Eagan, vice president, Sandia National Laboratories

Should researchers consider possible implications and applications of their research before they undertake it? Should they become involved in developing restrictions on the use or the boundaries of their research? These questions arise with regard to work on nuclear weapons, biological agents, stem cells and genetic engineering.

Educational Resources to Increase Ethical Awareness for Scientists

John P. Perhonis, program officer, National Science Foundation

This session will feature a scenario-based video used to stimulate classroom discussion and help develop ethical reasoning skills, and a CD-ROM on computer ethics, both of which were outgrowths of National Science Foundation awards in ethics education.

Dale Margerum Receives Monie Ferst Award

Purdue University chemist Dale W. Margerum received the 2000 Monie A. Ferst Award from the Georgia Institute of Technology Chapter of Sigma Xi.



This national award has been presented annually since 1977 to those who have made outstanding contributions to research through teaching and supervising graduate students.

It consists of a medal and \$5,000 and recognizes scientists who have inspired their colleagues to significant scientific achievements.

Margerum is the Harvey Washington Wiley Distinguished Professor of Chemistry at Purdue. The author of 235 research publications, he has served as research director for 83 Ph.D. graduates and 20 M.S. graduates.

He received his Ph.D. from Iowa State University in analytical chemistry. His research interests include studies of the kinetics and mechanisms of inorganic and bioinorganic reactions in solution, the development of new analytical methods to measure fast reactions, and the characterization and analysis of reactive species.

Margerum has been at Purdue since 1954, rising through the ranks to full professor in 1965. He served as head of the inorganic chemistry division from 1968-73 and as head of the chemistry department from 1978-83. He is a past president of the Purdue University Chapter of Sigma Xi.

His many honors include Purdue's Sigma Xi Research Award, Herbert Newby McCoy Award for Science Research and Wetherill Medal. In 1996, he received the American Chemical Society Award for Distinguished Service in Advancement of Inorganic Chemistry.

Margerum has served on the editorial boards of *Analytical Chemistry*, the *International Journal of Chemical Kinetics* and the *Journal of Coordination Chemistry*, among others. He has also served in a variety of capacities for the Research Corporation, the National Institutes of Health, the Gordon Research Conferences, the American Chemical Society and the National Science Foundation.

The Monie Ferst Award is named for an outstanding engineer and businessman who received his B.S. in mechanical engineering from Georgia Tech in 1911. The recipient is selected by a committee of three members of the Georgia Institute of Technology Chapter, the chair of Sigma Xi's Committee on Awards and the Society's senior Southeast Regional Director.

Complete award guidelines are available on the Web in the Programs section at <www.sigmaxi.org>. Nominations should be sent by November 30 to Mark G. White, School of Chemical Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0100. He also welcomes inquiries at 404-894-2822 or mark.white@che.gatech.edu.