

## Sigma Xi Volunteers Needed for Conrad Innovation Awards

The Conrad Foundation of San Francisco has named Sigma Xi as the official science advisor for the Pete Conrad Spirit of Innovation Awards, a nationwide competition for high school students.

Sigma Xi members will provide scientific mentorship to teams competing in the annual awards program and serve as online judges for the initial round of the competition.

As the official science advisor, Sigma Xi will also award the winners of the 2010 Spirit of Innovation Awards a one-year Sigma Xi Affiliate Circle Membership in recognition of their achievement.

"The Pete Conrad Spirit of Innovation Awards bring the Sigma Xi philosophy to a new generation of innovators," said Jerome F. Baker, executive director of Sigma Xi. "With the help of the Conrad Foundation, we will have the opportunity to support young scientists and connect them with the people and the resources they will need for success."

The upcoming 2009-2010 competition will focus on projects in aerospace, nutrition, renewable energy and green buildings. High school teams vie for more than \$100,000 in prize money and opportunities to pursue the commercialization of their products. They may also participate in the annual Innovation Summit held at NASA's Ames Research Center in Mountain View, California.

In the first round, volunteer judges will review and score concept proposals for up to five teams each online during the months of December and January, providing approximately 10 hours of invaluable volunteer scientific expertise to the competition. In the second round of the competition, online volunteers will provide advise the finalist teams with the science component of their proposals from January through April in 2010.

If you would like to volunteer, visit [www.conradawards.org](http://www.conradawards.org) and click on **Judges** or **Advisors**.

## From the President

### Giving Back

There are many reasons to become a member of Sigma Xi: honor, camaraderie with colleagues, support of ethics in science, but to me the major issue has always been giving back to science and society for the opportunity I received to live such a rewarding and meaningful life. To be able to influence in a meaningful way the lives of so many students who come through our university programs should not be considered a burden but a wondrous opportunity.

Further, it is critical to reach out beyond the university to help our many committed teachers instill in the next generation of young minds a desire to become involved in the scientific endeavor. We must be able to create an interest in science and engineering in this next generation, which has so many more options for the future, or we will never see them in our classrooms.

We need to find a way to counteract the loss of interest in higher education by young males, increase interest in young women to become involved in science and engineering and reassure under-represented minority students that there is a place for them in science.

While many of us hold true to these values, the ever-increasing workloads and the demands of tenure take up all the time in our lives, such that just finding balance in our family lives is a struggle. K-12 teachers share these pressures and still attempt to inspire students about the scientific endeavor--typically many years removed from their own scientific adventures during their education.

If we feel the stress of keeping up with the rapid progress made in science, how can they remain current, how can they have the answers to the questions students may ask, how can they maintain their credibility in the classroom without expending enormous effort to maintain their knowledge level. It is critical that our teachers be given support to allow them to maintain their own interest and commitment so that they can maintain the enthusiasm needed to encourage our youth to pursue science.

How can Sigma Xi help? What can we do to build bridges with our educators that can form lasting partnerships to enhance their knowledge base of current developments in science and provide the confidence to maintain their enthusiasm for the teaching of science? This is where our chapter-based organization can pay huge dividends, allowing us to reach out into our own communities to build these bridges and initiate these dialogs in partnership with dedicated teachers to sustain an interest in science and engineering in the next generation that is so important to us personally and to our national interests.

One way would be to provide *American Scientist* to teachers, to encourage teachers to join the Sigma Xi Affiliate Circle and to invite local Affiliate Circle members to chapter activities. Many chapters have initiated programs such as judging in science fairs or serving as mentors for high school science projects. How do we better reach out to teachers and encourage students?

Sigma Xi, along with many of our brother societies and those representing teachers are looking for ways to build these bridges to enhance science education. Our chapters can play a vital role in this process. Let us know about any ideas or programs that you already run to enhance science education. Sigma Xi, for example, in partnership with Epsilon Pi Tau, The Ewing Marion Kauffman Foundation and the National Consortium for Specialized Secondary Schools of Mathematics, Science and Technology, is working to publish an online journal for high school students that will provide mentoring in the scientific approach and communication of science. These can be exciting times; all it takes is your commitment.

Howard Ceri



## Kokotovic Honored with 2009 Monie Ferst Award

**P**etar V. Kokotovic, a professor of engineering at the University of California, Santa Barbara, will receive the 2009 Monie Ferst Award from the Georgia Institute of Technology Chapter of Sigma Xi.

Since 1977, this national award has honored science and engineering teachers who have inspired their students to significant achievements.

Kokotovic's impact as an educator is evident in the success of his students, who say that his lively and dynamic style inspires innovation while instilling the value of using engineering to solve real problems.

Kokotovic's career as an engineer, researcher and educator spans five decades. He received his B.S. and M.S. from the University of Belgrade, Yugoslavia, and his Ph.D. from the Institute of Automation and Remote Control, USSR Academy of Sciences, Moscow.

From 1959 to 1966, he worked as a control engineer at the Pupin Research Institute in Belgrade. He then joined the Department of Electrical and Computer Engineering and the Coordinated Science Laboratory at the University of Illinois, Urbana-Champaign, where he held the endowed Grainger Chair.

In 1991 he moved to the Electrical and Computer Engineering Department of the University of California, Santa Barbara, where he directed the Center for Control Engineering and Computation until 2003.

Kokotovic is known for several pioneering contributions to control engineering. In the 1960's, he developed the sensitivity points method, a precursor to adaptive control, used for automatic tuning of industrial controllers.

In the 1970's, he introduced singular perturbation techniques for multi-time-scale design of control systems and flight trajectories, which found widespread applications. In the 1980's, Kokotovic and coworkers identified the main forms of adaptive systems instability and introduced redesigns that made adaptive controllers more robust.

In the 1990's, he initiated the development of a popular nonlinear recursive design known as 'backstepping,' now widely used in robust and adaptive nonlinear control.

Kokotovic contributed to the design of automotive computer controls at Ford and to power system stability analysis at General Electric. He led a five-year collaborative research project (with United Technologies)

on nonlinear control of axial compressors for jet engines.

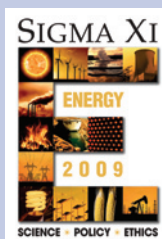
Kokotovic is a popular mentor, having supervised 35 Ph.D. students and 25 postdoctoral researchers, most of whom have pursued successful academic or industrial careers. With them he co-authored numerous papers and eight books.

Kokotovic is a Life Fellow of the IEEE, a Fellow of the International Federation of Automatic Control (IFAC) and a member of the National Academy of Engineering. He is the recipient of the three highest control engineering awards: 1990 IFAC Quazza Medal, 1995 IEEE Control Systems Field Award and 2002 AACC Richard E. Bellman Control Heritage Award.

For his contributions to graduate education, he was recognized with the 2002 IEEE James H. Mulligan Jr. Education Medal. •



## Energy Symposium Highlights Annual Meeting in Texas



A special Energy Symposium on Saturday afternoon, November 14, will be a highlight of Sigma Xi's 2009 Annual Meeting and International

Research Conference in The Woodlands, Texas, near Houston.

Plenary speakers have been invited to address science and public policy concerns regarding the critical issue of energy. Among the speakers are:

**John F. Ahearn** - Moderator, Executive Director Emeritus of Sigma Xi, former Chairman of the U.S. Nuclear

Regulatory Commission, U.S. Deputy Assistant Secretary of Energy and Acting Assistant Secretary of Defense.

**Christine A. Ehlig-Economides** - Professor and A. B. Stevens Endowed Chair, Harold Vance Department of Petroleum Engineering, Texas A&M University.

**Michal C. Moore** - Senior Fellow, Institute for Sustainable Energy, Environment and Economy, University of Calgary in Alberta.

**Hans B. Püttgen** - Energy Systems Management Chair and Director of the Energy Center at the Ecole Polytechnique Fédérale de Lausanne (EPFL) Swiss Federal Institute of Technology in Lausanne. Georgia Power Professor

Emeritus of the Georgia Institute of Technology.

**Vernon P. Roan, Jr.** - Director Emeritus, University of Florida Fuel Cell Laboratory, and Professor Emeritus of Mechanical and Aerospace Engineering, University of Florida.

The symposium culminates a year-long focus on the scientific, environmental and public policy aspects of energy as a continuation of Sigma Xi's Critical Issues in Science series.

Activities during the year have included white papers, a blog and podcasts, special Science Cafes and a student short film competition.

Visit [www.sigmaxi.org](http://www.sigmaxi.org) for more information and online registration. •