

Food Safety Theme of Annual Meeting

Food Safety & Security: Science & Policy is the timely theme for the 2010 Sigma Xi Annual Meeting and International Research Conference in Raleigh, North Carolina, November 11-14.

“The health and socio-economic impact of issues around food safety and security are enormous,” said Joseph A. Whittaker, Sigma Xi president-elect. “As such, any reasonable attempt towards addressing the enormous complexities, challenges and opportunities involved will require multi-level, multi- and interdisciplinary approaches to find needed consensus.”

He said the conference will provide a forum for experts and key players from academe, industry and government to begin a dialogue that will ultimately inform as well as raise the awareness of policymakers and the general public of the implications and critical importance of these issues.

News headlines have raised public awareness of food safety issues, as salmonella in salami and E. coli-tainted produce have sickened hundreds. In the U.S. alone, a recent study found that food-borne illnesses cost \$152 billion a year. It's estimated that 76 million Americans annually are sickened by the food they eat.

Meanwhile, the federal government has pledged to step up efforts to enhance food safety. Technology was brought to bear earlier this year when frequent-shopper cards were used at grocery stores for the first time to trace the source of a salmonella outbreak.

Unfortunately, the public-health debate often neglects the science behind such outbreaks.

In an award-winning *American Scientist* article called “Safer Salads” (November-December 2007), the authors found that sanitation can break down during growth, harvest, washing, storage, transport or display of fruits and vegetables. They described new research into postharvest treatments that could minimize consumer risk in the near future.

Food security has emerged as the unprecedented challenge of feeding the world's growing population. This complex topic stands at the intersection of many disciplines.

Challenges include the physical, biological and socio-economic constraints that limit food production and the ability of people to obtain a healthy diet. Chronic food insecurity often means famine and hunger. •

From the President

The Road Ahead

Having had the opportunity to chart the course for the Society over this past year, it has become even more evident to me that membership is our major concern; however, there seems to be no easy answer to our dilemma. We share this membership problem with many other societies, but this shouldn't make our fate any more palatable.

We have, in our considerations of changing the membership curve, looked at values of the Society that we believe to be sacrosanct to our membership, and we have sought advice as to what the next generation of young scientists might consider as value for membership. We have scoured our database in an attempt to identify trends that may provide us with new insight to attract and retain membership in Sigma Xi.

Finally, we have even looked at what a leaner Society might look like if we were to continue with the numbers at least flattening out to a Society the size we are now. These exercises have been both rewarding and frustrating, but they have set some paths of action.

The first is the continued belief that the founders of Sigma Xi got it right when they set the goals and objectives of our Society in place. The values of Sigma Xi, in my mind, still resonate, but we may have to change how we deliver that message. In order to deliver the appropriate message, I believe it is vital to get our younger members more involved in the running of the Society, giving them a louder voice in delivering that message.

We will strive to bring more balance in appointments to committees to ensure our younger members are better represented, and try to make it clear to them that this is their Society to take into the future.

Secondly, as we plan for the future, we often look to our past. Sigma Xi has had a leadership role in many areas, including ethics, the promotion of science literacy and the understanding of science and in science education. We have initiated a new program to reestablish our leadership role in the field of ethics, which we hope to move forward shortly.

We have also committed ourselves to a leadership role in reinvigorating science education from K-12, making the scientific method a classroom component of science teaching. We are developing prototypes of this program that can be delivered at the chapter level that will allow Sigma Xi to have an impact on the way science will be taught to the next generation of students.

Finally, establishing an online journal to publish high school science will have a valuable role to play in the future of science literacy.

My year as president has gone past very quickly, and like the presidents who have come before me, I would have liked to have accomplished more. I will forever be grateful to Jerry Baker for the leadership he has provided to Sigma Xi; his dedicated efforts on behalf of our Society must be acknowledged.

The support I have received from the Board of Directors is much appreciated. The many changes in governance that the board has ushered in will serve the Society well in the future. Finally, I know that our next president, Joseph Whittaker, will be a great leader for Sigma Xi, and it will be my pleasure to support him as past president of the Society.

We still face many difficult decisions, but I must say that I feel more optimistic about the future of the Society than I have in a long while. The value of Sigma Xi will endure.

Howard Ceri



Cognitive Scientist to Receive 2010 Procter Prize



Michael J. Spivey is known for his innovative studies of language and visual perception at the University of California, Merced, where he is a

professor of cognitive science.

He will receive Sigma Xi's 2010 William Procter Prize for Scientific Achievement, presented annually since 1950 to an outstanding scientist or engineer who is known for effective communication of complex ideas.

Spivey was considered the driving force in creating a new line of research in psycholinguistics. His research has blazed new paths into understanding how people perceive, think and act.

He uses eye-tracking and computer mouse-tracking equipment to study how humans perceive and respond to what they hear and see. Historically, a common method of evaluating cognition has been based on how subjects respond to questions

on surveys. There is only one problem with the accuracy of such responses: people have a tendency to bend the truth.

Motion-tracking software and hardware document not only the subjects' final answers but also the answers they considered along the way. The end result is a more accurate representation of how the human brain processes information. This and related work is described in his book, *The Continuity of Mind* (Oxford University Press, 2007).

By tracking people's eye movements in natural tasks, Spivey and his colleagues have demonstrated a strong connection between spoken language and visual perception. In cognitive science, linguistics and psychology, his work is seen as revolutionary because it was a clear demonstration that language processing is not the byproduct of an autonomous language module, which was the longstanding view held by Noam Chomsky and his long line of followers.

Spivey received a B.A. in psychology

from the University of California, Santa Cruz, and an M.A. in psychology and Ph.D. in brain and cognitive sciences from the University of Rochester.

He taught at Cornell University from 1996-2008 and has served as a visiting professor at the Max Planck Institute for Psychological Research. He is the author or co-author of more than 100 articles, book chapters and conference papers.

Spivey is associate editor of *Language and Cognitive Processes* and serves on a number of editorial and governing boards, as well as a reviewer for more than 25 journals.

His many honors include the UCM Academic Senate Award for Distinction in Research, the Sigma Xi Distinguished Scientist Award, the Sproull Fellows Award for Scholarly Excellence from the University of Rochester and two Merrill Presidential Scholar's Outstanding Educator awards from Cornell University. He is a member of Sigma Xi, among other professional organizations. •

In Memoriam

We were saddened by the news in February of the tragic shooting deaths of three Sigma Xi members on the biology faculty at the University of Alabama at Huntsville.

Our thoughts and sympathies go out to the families, friends and colleagues of **Gopi K. Podila** (SX 1991), **Maria R. Davis** (SX 2003) and **Adriel D. Johnson** (SX 1990). Podila was chair of the department.

Among those seriously injured in the incident was **Joseph G. Leahy** (SX 1990). They were reportedly attacked on campus by a disgruntled colleague during an afternoon faculty meeting. •

Conrad Award Winners Online

Visit Sigma Xi online to learn about the winners of this year's Pete Conrad Spirit of Innovation Awards, for which the Society served as the official science advisor.

Sigma Xi members provided mentorship to high school teams competing in the annual awards program and served as judges for both the online and finalist stages.

We also awarded the winners a one-year Sigma Xi Affiliate Circle Membership, which includes a subscription to *American Scientist*.

The 2009-2010 competition focused on projects in aerospace, nutrition, renewable energy and green buildings. High school teams competed for more than \$100,000 in prize money and opportunities to pursue the commercialization of their products.

They also participated in the annual Innovation Summit at NASA's Ames Research Center in Mountain View, California. •

Procter Grant Winner



An appealing feature of Sigma Xi's annual Procter Prize is the selection by the recipient of a young colleague to receive a special \$5,000 Grant-in-Aid of Research.

Adam Kaufman, this year's Procter GIAR recipient, attained his undergraduate degree at Amherst College, where he worked in David Hall's laboratory studying atomic Bose-Einstein condensates.

His undergraduate thesis investigated how radio waves and magnetic fields can cooperate to provide refined control of atomic interactions.

Recently, he joined the lab of Cindy Regal at JILA, a joint institute between the University of Colorado at Boulder and the National Institute of Standards and Technology.

They will study ultracold neutral atoms strongly coupled to photons for applications in quantum information and quantum optics. •

Sigma Xi Featured by National Education Report

Sigma Xi has been featured by the televised series National Education Report for its distinguished contributions to the advancement of education nationally and internationally.

The short documentary aired on public and cable television stations in the U.S. and abroad and is also available online via the Sigma Xi Web site and YouTube. Cable networks on which the segment aired include CNN, Fox News, MSNBC, CNBC, Family Net and CNN Headline News.

The video features highlights of the Society's history and activities in support of science and engineering since its founding at Cornell University in 1886.

An overview of the Society is provided through interviews with Executive Director Emeritus **John F. Ahearne**, former *American Scientist* Associate Editor **Christopher Brodie**, Sigma Xi Programs Manager **Elsa Youngsteadt** and **Ryan Mills**, Sigma Xi

member and recipient of a Grant-in-Aid of Research.

Topics include the importance of the Society's network of more than 500 chapters. *American Scientist*, Sigma Xi's award-winning magazine of science and technology, also receives prominent attention.

The Grants-in-Aid of Research program is among featured activities. Since 1922, Sigma Xi grants have provided a helping hand to more than 30,000 student researchers.

Other program highlights include science podcasts, e-newsletters and Science Cafés, all designed to engage and inform Sigma Xi members and the public.

Sigma Xi gratefully acknowledges the support of the following donors who made this video possible: **Kenneth B. Armitage**, **James F. Baur**, **David Paul Brown**, **Dean S. Edmonds, Jr.**, **James F. Campbell, Jr.**, **Nathaniel Chafee**, **Charles A. Lawson**, **James W. Porter**, **Maarten van Swaay** and **Gerald H. Takei**. •

Harry Weiss Receives Evan Ferguson Award

Harry J. Weiss, Iowa State University professor emeritus of mathematics and engineering mechanics, has been selected to receive the 2010 Evan Ferguson Award for service to Sigma Xi.

Described in his nomination as a "champion for Sigma Xi," Weiss has served as a member of the society for more than 60 years. He has been the secretary/treasurer for the ISU chapter since 1992 and twice has served as interim president.

Sigma Xi President Howard Ceri said that Weiss received this recognition due to his "long service to the Iowa State University Chapter, support of society activities and service to the local community."

"Harry's service to Sigma Xi goes above and beyond. Though his title has been secretary/treasurer, he really has been the force behind the continued success of Sigma Xi at ISU in providing a forum for intellectual exchanges among all of the sciences and engineering over the past two decades," said Steve Kawaler, president of the ISU Chapter and a professor of physics and astronomy. "He has kept the organization humming along by handling all of the 'under the hood' details as well as by participating in all events."

Weiss' name will be added to the Evan Ferguson Award plaque on permanent display at the Sigma Xi Center in North Carolina. He also will receive a certificate of recognition, as well as a lifetime subscription to *American Scientist*. Weiss is the second person to receive the Evan Ferguson Award, following Peter D. L. Roper of McGill University in 2009. •



Canadian Broadcaster Named Honorary Sigma Xi Member

Bob McDonald, one of Canada's best-known science journalists, will be inducted as an honorary life member of Sigma Xi at the Society's Annual Meeting and International Research Conference in Raleigh, North Carolina, November 11-14.



McDonald has been communicating science internationally through television, radio, print and live presentations for more than 30 years. He is the host of CBC Radio's award-winning science program *Quirks and Quarks*.

He is also a regular science commentator on the CBC News Network, science correspondent for CBC TV's *The National* and the award-winning host and writer of the children's series *Heads Up!* Bob has also hosted the television mini-series *The Greatest Canadian Invention* and the seven-part series *Water Under Fire*.

As a print journalist, McDonald has written three science books and contributed to numerous textbooks, newspapers and magazines, including *The Globe and Mail*, *Owl Magazine* and many others.

His latest book is *Measuring the Earth With a Stick*, a collection of essays reflecting on his many years as a science journalist. He wrote the introduction to *The Quirks & Quarks Question Book* and the *Guide to Space: 42 Questions (and Answers) About Life, the Universe and Everything*.

McDonald has been honored for his outstanding contributions to the promotion of science in Canada as the recipient of the Michael Smith Award from the Natural Sciences and Engineering Research Council, the Sir Sanford Fleming Medal from the Royal Canadian Institute and the McNeil Medal from The Royal Society of Canada.

He also received a 2008 Gemini Award for Best Host in a Pre-School, Children's or Youth Program Series. He has received four honorary degrees, from the University of Guelph, Carleton University, Laurentian University and McMaster University. •

National Academy of Engineering Elects 32 Sigma Xi Members

Thirty-two Sigma Xi members were among the 68 new members and nine foreign associates elected in February to the National Academy of Engineering.

New Members

Ihlan A. Aksay (SX 1974), professor of chemical engineering, Princeton University. For advances in ceramic processing methods, biologically inspired materials processing and field-induced layering of colloidal crystals.

Lisa Alvarez-Cohen (SX 1991), Fred and Claire Sauer Professor and chair of civil and environmental engineering, University of California, Berkeley. For discovery and application of novel microorganisms and biochemical pathways for microbial degradation of environmental contaminants.

John David Anderson Jr. (SX 1962), curator of aerodynamics, National Air and Space Museum, Smithsonian Institution, and professor emeritus of aerospace engineering, University Maryland, College Park. For aerospace engineering and history textbooks and for contributions to hypersonic gas dynamics.

Daniel N. Baker (SX 1974), director, Laboratory for Atmospheric and Space Physics, University of Colorado, Boulder. For leadership in studies, measurements, and predictive tools for the Earth's radiation environment and its impact on U.S. security.

Jacobo Bielak (SX 1966), university professor of civil and environmental engineering and director, Computational Seismology Lab, Carnegie Mellon University. For advancing knowledge and methods in earthquake engineering and in regional-scale seismic motion simulation.

Clyde Leonard Briant (SX 1995), Otis E. Randall University Professor and vice president for research, Brown University. For elucidation of microstructural effects on high-temperature mechanical performance of metals.

Andrei Z. Broder (SX 1984), fellow and vice president, search and computational advertising, Yahoo! Research. For contributions to the science and engineering of the World Wide Web.

Gang Chen (SX 1993), Warren and Towneley Rohsenow Professor of Mechanical Engineering, Massachusetts Institute of Technology. For contributions to heat transfer at the nanoscale and to thermoelectric energy conversion technology.

Robert E. Cohen (SX 1974), St. Laurent Professor of Chemical Engineering, Massachusetts Institute of Technology. For research on polymer morphology and surfaces, commercial products and processes, successful entrepreneurship and novel educational programs.

John P. Connolly (SX 1977), senior technical advisor, Anchor QEA LLC, Montvale, New Jersey. For development of integrated water-quality models used for remediation and management planning for large, contaminated water bodies.

Richard C. Flagan (SX 1970), executive

officer of chemical engineering, Irma and Ross McCollum-William H. Corcoran Professor of Chemical Engineering and professor of environmental science and engineering, California Institute of Technology. For leadership in invention, measurement, production and technology of aerosols.

Paul G. Gaffney II (SX 1991), vice admiral, U.S. Navy (retired); and president, Monmouth University. For technical leadership in naval research and development and its impact on U.S. defense, ocean policy and the Arctic.

Arthur Gelb (SX 1960), president, Four Sigma Corp.; and co-founder, retired chairman and CEO, TASC (The Analytic Sciences Corp.), Belmont, Massachusetts. For leadership in applying Kalman filtering techniques to the solution of critical national aerospace problems.

Irene Greif (SX 1971), IBM Fellow and director, collaborative user experience, IBM Thomas J. Watson Research Center. For founding the field of Computer-Supported Cooperative Work and for leading research teams to shape and commercialize the field.

Eugene E. Haller (SX 1992), professor of materials science and Liao-Cho Innovation Endowed Chair of Materials Science and Engineering, University of California, Berkeley. For improvements in semiconductor performance through contributions to synthesis of ultrapure and doped crystals.

Brewster Kahle (SX 1983), digital librarian, director and co-founder, Internet Archive, San Francisco. For archiving and making available all forms of digital information.

Thomas F. Kuech (SX 1992), Milton J. and A. Maude Shoemaker Professor and past chair of chemical and biological engineering, University of Wisconsin, Madison. For contributions to chemical vapor deposition of compound semiconductors.

Hau L. Lee (1984), Thoma Professor of Operations, Information and Technology, Graduate School of Business, Stanford University. For contributions demonstrating the impact of information-sharing on supply chain design and management.

Anthony Leonard (SX 1962), Theodore von Kármán Professor of Aeronautics Emeritus, California Institute of Technology. For contributions to simulation of turbulence, new vortex methods of flow simulation and understanding of flow-induced vibration.

Dennis P. Lettenmaier (SX 1976), Robert and Irene Sylvester Professor of Civil and Environmental Engineering, University of Washington, Seattle. For contributions to hydrologic modeling for stream water quality and hydro-climate trends and models for improved water management.

David L. Morse (SX 1976), senior vice president and director of corporate research, Corning Inc. For contributions to photochromic materials and leadership in fiber-optic technology.

William New Jr. (SX 1980), principal, The

Novent Group, Palo Alto, California. For developing applications of pulse oximetry technology to clinical problems of blood oxygen monitoring and for innovations in neonatal audiology.

Paul D. Nielsen (SX 2003), CEO and director, Software Engineering Institute, Carnegie Mellon University. For leadership of the systems engineering and design of advanced national satellite programs, including restructuring and upgrades of MILSTAR.

Gregory Hammond Olsen (SX 1969), principal, GHO Ventures, Princeton, New Jersey. For research and commercialization of optical components for fiber communications and national defense.

Roderic I. Pettigrew (SX 1976), director, National Institute of Biomedical Imaging and Bioengineering, National Institutes of Health. For the use of MRI in human blood-flow studies and leading advancements in bioengineering research and education as the initial director of NIBIB.

George F. Pinder (SX 1966), director, Research Center for Groundwater Remediation Design and professor of civil and environmental engineering and of mathematics, University of Vermont. For leadership in groundwater modeling applied to diverse problems in water resources.

Stephen B. Pope (SX 1982), Sibley College Professor of Engineering, Cornell University. For contributions to the modeling of turbulent flow, including the development of probability distribution function methodologies for turbulent combustion.

Arthur H. Rosenfeld (SX 1953), commissioner, California Energy Commission. For leadership in energy efficiency research, development and technology deployment through the development of appliance and building standards and public policy.

John C. Wall (SX 1975), vice president and chief technical officer, Cummins Inc., Columbus, Indiana. For leadership and management of research, design, development and production of low-emission, fuel-efficient heavy-duty diesel engines.

Alan S. Willsky (SX 1973), Edwin S. Webster Professor of Electrical Engineering and Computer Science and co-director, Laboratory for Information and Decision Systems, Massachusetts Institute of Technology. For contributions to model-based signal processing and statistical inference.

New Foreign Associates

José M. Aguilera (SX 2003), professor of chemical engineering and bioprocesses, Pontificia Universidad Católica de Chile, Santiago. For advancing food material technology and the understanding of structure functions in foods.

L.K. Doraiswamy (SX 1994), Anson Marston Distinguished Professor Emeritus of Chemical and Biological Engineering, Iowa State University. For outstanding leadership in the development of the Indian chemical industry and contributions to organic synthesis engineering, heterogeneous reactions and reactors. •