



SIGMA XI NEWSLETTER

Iowa State University
September 2008

CALENDAR 2008-2009

SIGMA XI NATIONAL LECTURER

*Environmental Impacts of Ethanol Production:
The Good, the Bad and the Alternatives*

Professor Felicia Wu
University of Pittsburgh &
The Society for Risk Analysis

Thursday, October 16, 2008
8:00 p.m., Gallery, Memorial Union

Global improvement in living standards has meant a vastly increased demand for energy. Yet we face a finite and vulnerable supply of fossil fuels, particularly crude oil. In the last several years, corn-based ethanol has been promoted in the United States as a renewable transportation fuel that may reduce our dependence on foreign oil sources. However, many questions have arisen regarding ethanol's environmental impacts. Proponents of ethanol claim that it can contribute to environmental goals because of its net carbon balance and energy return. Opponents claim that ethanol production leads to adverse effects on air and water quality, and that the benefits are overstated.

This presentation covers the spectrum of potential environmental impacts associated with ethanol production. It starts with defining basic terms used in the ethanol debate, to ground the audience in key environment-related issues. It then describes the current state of supply and demand for energy worldwide, and uncertainties in future fossil fuel supply. Next, basic statistics on ethanol production in the U.S. are given. The key effects of ethanol that are discussed in the following sections include:

- "Food vs. Fuel" debate: impacts on food and feed supply
- Air quality impacts
- Water quality impacts
- Greenhouse gas emissions and "carbon neutrality"
- Land use changes
- Ethanol co-products and their potential impacts on animal health

The talk ends with a discussion of alternative energy solutions, including lignocellulosic feedstocks, transgenic technologies, new biofuels, combustion and gasification technologies, algae, wind and solar power, and more energy-efficient lifestyles.

LOCAL HONOR LECTURER

Magnetic Refrigeration & Cooling: An Energy Efficient & Green Cooling Technology for the 21st Century

Professor Karl Gschneidner
Ames Laboratory & Department of
Materials Science & Engineering, ISU

Thursday, November 20, 2008
8:00 p.m., Gallery, Memorial Union

Magnetic refrigeration (MR) offers the promise of improved energy efficiencies to be competitive with and eventually replace conventional gas-compression refrigeration technologies. This includes household uses: refrigerators/freezers, air conditioning, automotive climate control, wine chillers, etc. Large scale cooling would include: industrial gas liquefaction, frozen food processing and storage, supermarket chillers, and large building air conditioning. In the past ten years there have been two significant advances: (1) that MR is a viable technology that achieved a cooling power of 20 to 100 times larger than had been attained heretofore, and (2) the discovery of the giant magnetocaloric effect in several families of alloys which should make MR even more competitive. To date about 30 MRs have been built to test various concepts and ideas, including a proof-of-principle device, and several prototype near room temperature cooling machines. These various aspects will be discussed.

October 16, 2008 (Thursday). Professor Felicia Wu, University of Pittsburgh, will deliver a National Sigma Xi Lecture at 8:00 p.m. in The Gallery, Memorial Union – see page 1. Reception will follow.

November 20, 2008 (Thursday). Professor Karl Gschneidner, Ames Laboratory and Materials Science & Engineering, ISU, will deliver the Local Honor Lecture at 8:00 p.m. in The Gallery, Memorial Union – see above. Reception will follow.

December, 2008. Forms for the nomination of Associate and Full Members, for Undergraduate Research Scholars and for the Promotion of current Associate Members will be available from the Secretary-Treasurer; they will be sent to Department Executive Officers and Department Representatives early in January. Nominations are to be sent to the Secretary-Treasurer, Harry Weiss, 1200 Howe Hall. Preferred deadline for receipt of nominations is February 16, 2009, for timely review by the Committee on Membership. Questions on procedures or qualifications can be addressed at any time to Harry Weiss, 294-5666 or 296-5051. The Winter Newsletter (early January) will contain a reminder, a summary of the nomination procedures and a nomination form. Guidelines for nomination are a part of the nomination form. Nomination forms are available online via the National Sigma Xi Website: details will be noted in the January 2009 Newsletter.

February 16, 2009. Nominations for Promotion, Associate and Full Membership and Undergraduate Research Scholars are due: c/o H.J.Weiss, Sigma Xi, Aerospace Engineering, 1200 Howe Hall, ISU.

February 26, 2009: National Sigma XI Lecturer John Carberry, Director Environmental Technology, DuPont & Member, National Academy of Science, will present a lecture *Sustainable Industry in a Changing Society*. 8:00 p.m., Pioneer Room, Memorial Union. Reception will follow.

February 28, 2009. Invitations will be sent to those whose nominations have been approved by the Committee on Membership.

March 23, 2009. Deadline for receipt of acceptances from nominees for membership or promotion.

April 13, 2009. Deadline for receipt of ballots for election of committee members.

April 30, 2009 (Thursday). The Annual Initiation Banquet will be held in the Scheman Building. At this event, the initiates (who are the Chapter's guests at the Banquet) are installed as members of Sigma Xi; Undergraduate Research Scholars are recognized and awarded the Lester Earls prize; the Zaffarano Prize for Graduate Student Research is awarded; the Karas Dissertation Award is announced; and the new President is installed. The evening begins with a social hour at 5:30, followed by dinner and the necessary initiation formalities. The evening will conclude with an address by the retiring President, William Simpkins, at 8:00 p.m., *The Future of the Ames Aquifer Through the Eyes of Computer Modeling*.

PRESIDENT'S MESSAGE

As your President of the ISU Chapter of Sigma Xi for 2008-09, I welcome you to a new academic year full of exciting opportunities to participate in chapter activities. Actually, we have already begun. We hosted the first-ever Science Café at Legends on September 3rd; we had three speakers and 76 people discuss the timely topic of "Extreme Water and Weather in Iowa." There is much interest in continuing the Cafés, so stay tuned. In addition, President-Elect and Program Chair Steve Kawaler has organized an excellent slate of lectures for the year. We will host Dr. Felicia Wu from the University of Pittsburgh on October 16th and Dr. John Carberry from the National Academy of Science on February 26th as our Distinguished National Sigma Xi lecturers. Our local Honor Lectures will be presented on November 20th by Dr. Karl Gschneider, Professor of Materials Science and Engineering at ISU and by me on April 30th. I hope that you mark your calendars to attend these events – they are great opportunities to hear about cutting-edge research and a time to socialize with colleagues possessing wide-ranging interests. Excellent refreshments are always available, of course.

Attending the lectures is one way to support Sigma Xi. Another path is to nominate qualified faculty, staff, and students for membership. Basically, the chapter and organization don't grow much if we don't nominate new people. Last year we inducted 28 into associate and full membership. My personal goal has been to nominate at least one deserving student every year to Sigma Xi, so I have nominated at least 20 students to the organization in my time at Iowa State. Just think what would happen to the organization if we all did that! Nomination forms will be included in the Winter Newsletter, but the form is also available online from www.sigmaxi.org. The benefits of Sigma Xi membership are numerous - our local lecture series, small research grants to young scientists, the well-written and richly illustrated *American Scientist*, and fellowship with a group of "research zealous" colleagues (check our motto!). It is certainly worth a few minutes of our time once a year to nominate someone for membership.

Another way to support Sigma Xi is to become involved in our Executive, Membership, or Nominating Committees. We extend a welcome to new committee members and thank you for your willingness to serve (see the committee composition later in the newsletter). We thank especially President Tom Loynachan, Executive Committee members Ed Braun and Joel Coats, and Membership Committee members Doug Finnemore and Steve Martin who completed their terms last year and provided exceptional service and leadership to the chapter. We thank Steve for agreeing to continue on with the Executive Committee.

In closing, we predict an exciting year with national and local honor lectures, Science Cafés, and hopefully a new web page to disseminate information electronically, so there is much to be excited about with Sigma Xi. If you are interested becoming more involved (or becoming re-involved) with the chapter, please contact me or any committee member for more information.

Best wishes for a great academic year and I hope to see you at our activities.

Bill Simpkins
President, Sigma Xi, 2008-09

GENERAL COMMENTS

We need to have you begin to think about those graduate students and colleagues whom you would wish to nominate for either Associate or Full Membership in Sigma Xi, or for Promotion from Associate To Full Membership. We also encourage you to consider those outstanding undergraduates who have had a research experience and whom you would wish to honor by nomination as Undergraduate Research Scholars. Generally, these Scholars would be initiated as Associate Members; however, an especially research-productive undergraduate might well qualify for Full Membership. General requirements for nomination as an Undergraduate Research Scholar are a good GPA (3.50 or better) and contribution to an original research investigation which has led to a written report, a presentation at an appropriate meeting and/or (preferably) a publication. Details will be given in the *Guidelines for Nomination* which you will receive together with a nomination form in the Winter, 2009 Newsletter. Nomination forms may also be obtained electronically via the Sigma Xi Web site:

<http://www.sigmaxi.org/membership/nompromoinfo.htm>. Note also, that recognition as an Undergraduate Research Scholar carries with it not only a certificate but also a monetary award, the Lester Earls Award, made possible by a generous contribution to the ISU Chapter by Professor Emeritus Lester Earls. We do publicize this honor to undergraduates, so do not be surprised by questions you may be asked.

Each of us needs to contribute the small amount of time necessary to recognize deserving colleagues through election to membership in Sigma Xi. Please take a little time to identify individuals who have impressed you with their achievements or the research aptitudes necessary for membership.

Please let us know of any new faculty or graduate students who are Sigma Xi members and who should be on our mailing list. Also, please let us know if your address is incorrect. We wish to encourage inactive members to pay their current dues and become active (past arrears in dues need not be made up; payment of 2008-09 dues will reactivate your status). We encourage ISU members and active Ames residents who have other affiliations to join the ISU Chapter. If you wish to change your affiliation or return to active status, please contact me for assistance.

Harry Weiss, Secretary-Treasurer
Aerospace Engineering
1200 Howe Hall
4-5666, 296-5051

2006-2007 MEMBERSHIP ACTIONS

There were 62 in attendance at the Initiation Banquet, including 22 initiates or promotees. However, there was a total of 28 initiates, who fell into the following categories: 20 new Full Members, 3 promoted to Full Membership and 5 new Associate Members; no Undergraduate Research Scholars; 11 graduate students, 1 faculty from elsewhere, 1 from industry and 15 ISU faculty. Of the new Full Members, one was the Zaffarano Prize Winner, one was a Karas Award winner, and one each was a Zaffarano and Karas Honorable Mention; and one of those promoted was a Zaffarano Honorable Mention. There were two new Golden Anniversary Members recognized.

The Banquet and Initiation Ceremonies were followed by the Retiring President's Address, Thomas Loynachan, Professor of Agronomy, ISU, *Mycorrhizae: The Helpful Fungi in Iowa Soils*.

2008 INITIATES

FULL

William T. Abraham ++	Inst. for Social/Behavioral Research
Scott J. Emrich *	Comp Science/Engr, Notre Dame
Jose A. Gerde	Food Science & Human Nutrition
Michelle A. Ihmels +	Kinesiology
Gap-Yong Kim	Mechanical Engineering
Song-Charng Kong	Mechanical Engineering
Jae-Hyung Lee	GDCB

FULL (continued)

Zhiqun Lin	Mtls. Science & Engineering
JianXiang Liu	Plant Sciences Institute
John B. Mertz	Chemical & Biological Engr
Terrence R. Meyer	Mechanical Engineering
Sudipta Roy	Chemistry
Sujata Roy	Chemistry
Igor I. Slowing	Chemistry
Sriram Sundararajan	Mechanical Engineering
Baris Unal **	Mtls. Science & Engineering
Eliot H. Winer	Mechanical Engineering
Rungtiwa Wongsagonsup	Food Science & Human Nutrition
Hui Zhang	Pfizer, Inc.
Qingze Zou	Mechanical Engineering

* Zaffarano Prize

** Zaffarano Prize Honorable Mention

+ Karras Award

++ Karras Award Honorable Mention

PROMOTIONS

LeAnn E. Faidly	Mechanical Engineering
Keri Lynn D. Henderson **	Entomology
Gretchen Paluch	Entomology

** Zaffarano Prize Honorable Mention

ASSOCIATE

Jennifer L. Abrahamson	Geo & Atmospheric Sciences
Paul C. Ebert	Geo & Atmospheric Sciences
Aaron D. Gross	Entomology
Mohamed A. Osman	Animal Science
Shilpa A. Worlikar	Chemistry

OFFICERS OF THE CHAPTER

President	William Simpkins
President Elect	Steven Kawaler
Secretary-Treasurer	Harry J. Weiss

COMMITTEE ON MEMBERSHIP

Chris Minion``	2006-09
Allen Trenkle	2006-09
Jeanne Stewart	2007-10
Patricia Thiel	2007-10
Mark Gleason	2008-11
Carol Vleck	2008-11

Executive Committee

Ruth MacDonald	2006-09
William Simpkins	2006-09
P. Jeffrey Berger	2007-10
Steven Kawaler	2007-10
Harry Horner	2008-11
Steve Martin	2008-11
Harry Weiss	1992-

**NOMINATING COMMITTEE
(one-year terms)**

Amy Bix Cinzia Cervato
Nick Christians