



SIGMA XI NEWSLETTER

Iowa State University
January 2013

SIGMA XI DISTINGUISHED LECTURER

Demons and Butterflies -- Weather predictability and predictions

Dr. Richard Anthes

University Corporation for Atmospheric Research

Thursday, March 28, 2013

8:00 p.m., Sun Room, Memorial Union

The concept of predictability of complex systems has fascinated scientists for centuries. In the 17th century Gottfried Leibnitz speculated that everything proceeds mathematically, and so someone who had sufficient understanding and could take into account everything, "would be a prophet and see the future in the present as in a mirror." About a hundred years later the Marquis de Laplace dreamed of an intelligent being (an intellect, later dubbed Laplace's Demon) who knew the positions and velocities of every single atom and used Newton's equations of motion to predict the future of the entire universe. In 1972 Edward Lorenz gave a talk on atmospheric predictability with the title "Does the flap of a butterfly's wing in Brazil set off a tornado in Texas?" This rhetorical and provocative question has intrigued scientists and the public ever since, and "the butterfly effect" has come to mean chaos and lack of predictability of chaotic nonlinear systems. Examples of successful numerical weather forecasts suggest that in some cases there is useful predictability of high-impact weather systems far beyond what classical predictability theory might suggest. In this talk I show examples that provide optimism for continuing to increase the forecast lead time of significant weather and indicate how this progress can continue.

Richard Anthes is President Emeritus of the University Corporation for Atmospheric Research (UCAR), which manages the National Center for Atmospheric Research (NCAR). He is a highly regarded atmospheric scientist, author, educator and administrator. Dr. Anthes has published over 100 peer-reviewed articles and books and participated on or chaired over 40 different U.S. national committees. He has also received numerous awards for his sustained contributions to the atmospheric sciences. In October 2003 he was awarded the Friendship Award by the Chinese government, the most prestigious award given to foreigners, for his contributions over the years to atmospheric science and weather forecasting in China. He was co-chair in 2004-2007 of the first ever National Research Council "Decadal Survey" for Earth Science observations from space. Dr. Anthes served as President of the American Meteorological Society in 2007..

CALENDAR

January 2013: Forms for the nomination of Associate and Full Members, and for the promotion of current Associate Members, in either PDF or MS Word format, may be found at the Sigma Xi website, see www.sigmaxi.org/member/join/nom.shtml. Guidelines for the various categories of membership may be found at www.sigmaxi.org/member/join/qualification.html, and see further discussion below in this newsletter. Please type or print when filling out the nomination form. Nominations may be sent to Paul Sacks, Secretary-Treasurer of the ISU chapter by e-mail (psacks@iastate.edu) or by sending paper copies to Paul Sacks, 396 Carver Hall, Iowa State University, Ames, IA 50011. Please contact Paul Sacks by e-mail or by telephone at 515-294-8143 if you have any questions about the nomination procedures.

February 18, 2013: It is requested that nominations should be submitted, as described above, by this date for timely review by the Committee on Membership.

March 6, 2013: Invitations to membership will be sent to those whose nominations have been approved by the Committee on Membership.

March 28, 2013, 8:00PM: National Sigma Xi Lecturer Richard Anthes will deliver the lecture '*Demons and Butterflies – Weather predictability and predictions*' in the Sun Room of the Memorial Union. A reception will follow. See details on page 1 of this newsletter.

March 29, 2013: Deadline for receipt of acceptances from nominees for membership or promotion.

Mid-March, 2013: The Spring Newsletter will contain Initiation Banquet details, and information about a ballot for the election of members of the Executive, Membership and Nominating Committees. Let President Chris Minion or any other member of the Executive Committee have your suggestions for candidates (including yourself).

May 2, 2013: 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) formally become members of Sigma Xi, and the following awards are presented: the Zaffarano Prize for Graduate Student Research, the Karas Dissertation Award, and the Lester Earls Awards for Undergraduate Research Scholars. We start 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, Chris Minion, at 8:00PM, *Mycoplasmas: Great Things Come in Small Packages*.

NOMINATIONS

This is the call for nominations for the promotion of Associate Members to Full Membership, and for the initiation of new Associate and Full Members. We urge you to recognize the achievements of colleagues, and of students who are well along in Ph.D. or M.S. programs, by nominating them for the appropriate membership level, or for promotion. Undergraduates may also be nominated, usually as an Associate Member, and will be designated as Undergraduate Research Scholars.

In principle, nominations can be submitted any time of the year, but it has long been the practice of the ISU chapter to encourage the bulk of the nominations to be made around this time of the year, which may then be collectively evaluated by the Committee on Membership, usually around the end of February. This allows enough time for the process to be completed in time for the Sigma Xi banquet which takes place during the last week of the semester. For this reason we request nominations to be submitted, if at all possible, by Monday February 18.

Guidelines for the various categories of membership may be found at www.sigmaxi.org/member/join/qualification.html. Criteria for initiation, for an undergraduate, is a GPA of 3.50 or better, and evidence of research potential by recognized involvement in a research project by at least part authorship of a research report, a presentation at a technical meeting or an actual reviewed research paper in which the student appears as one of the co-authors. A letter of recommendation from the faculty member in charge of the research is also useful. Both nominators and students (graduate or undergraduate) should be aware that membership in Sigma Xi can be listed on the student transcript as recognition of the student's research accomplishments.

Sigma Xi is the only national honorary society which has research experience as a condition for membership. However, Sigma Xi does not confine its interests solely to science- or technological-related research, but addresses issues of concern to many outside the immediate research community. Thus, Sigma Xi should have significant appeal not only to those directly involved in research, but also to those who are interested in solutions to science-related social, economic and/or educational problems - e.g., environmental issues, or the quality of science and mathematics education in the elementary and secondary schools. On a more personal level, each dues-paying member has a subscription to the *American Scientist* which carries articles covering a broad spectrum of topics.

The nomination form may be downloaded from www.sigmaxi.org/member/join/nom.shtml and filled out by hand or electronically and sent to the Secretary-Treasurer. Two nominators are required for a nomination; the President of the chapter or the Secretary- Treasurer will normally be happy to serve as a second nominator.

NOTES and ANNOUNCEMENTS

- The 2012 Annual Sigma Xi meeting (the 113th annual Assembly of Delegates) was held for the first time in an on-line format, on November 3, 2012. The 2013 meeting will also take place by means of a webcast.
 - The chapter is obliged to be officially represented at the annual meeting at least once every three years, and since this hasn't been done since 2010, we will need to have someone this year. There is a small charge for access to the webcast which will be paid by the chapter, and any number of interested members can otherwise gather together to observe the meeting. Please get in touch with one of the chapter officers if you have any interest in this. The exact time and date for the 2013 meeting will be announced later this year.
 - Sigma Xi dues have been slightly modified for next year (2013-14). They are: \$90 for regular membership, \$60 for retired members, \$45 for transitional members and \$25 for student members.
 - Sigma Xi elections took place in November. George Atkinson, Professor Emeritus at the University of Arizona, is the new president-elect designate, who will therefore serve as president from July 2014 to June 2015. The current president-elect is Linda Meadows, former Vice President of the Ohio State University Research Foundation, and the current president is Kelly Sullivan of the Pacific Northwest National Laboratory.
 - The URL for the Sigma Xi ISU chapter website has changed to <http://sigmaxi.las.iastate.edu>. The old address will continue to work for a while.
-

OFFICERS OF THE CHAPTER

President	F. Chris Minion
President Elect	C. Lee Burras
President Emeritus	Diane Birt
Secretary-Treasurer	Paul Sacks

COMMITTEE ON MEMBERSHIP

Thomas Sauer	2010-13
Curtis Struck	2010-13
L Keith Woo	2011-14
Susan Lamont	2011-14
Leslie Hogben	2012-15

Executive Committee

Diane Birt	2009-13
W. Sue Fairbanks	2010-13
F. Chris Minion	2010-14
C. Lee Burras	2011-14
Maynard Hogberg	2011-14
James Raich	2012-15
Michelle Ihmels	2012-15
Paul Sacks	2010-13

NOMINATING COMMITTEE (one-year terms)

Carl Jacobson Kenneth Koehler
Lester Schmerr