



SIGMA XI NEWSLETTER

Iowa State University
October 2013

CALENDAR 2013-2014

SIGMA XI DISTINGUISHED LECTURER

The Science of Speed: Faster, Stronger and Safer

Diandra Leslie-Pelecky
Department of Physics
West Virginia University

Thursday, October 24, 2013
8:00 p.m., Sun Room, Memorial Union

A group of racecars piloted by the best drivers in NASCAR enter Turn 4 at Charlotte Motor Speedway going almost 200 mph. Without warning, one of the cars wiggles, and then slams into the wall. None of the cars touched, there were no engine failures, no flat tires, so what happened? This is the question that took Professor Diandra Leslie-Pelecky from the lab to the racetrack, speeding around Texas Motor Speedway (she calls it 'research') in an effort to understand why going fast is so hard. In her quest for understanding the science of speed, she met the mechanical engineers, aerodynamicists, chemical engineers, and physicists who have become critical participants in the high-stakes world of motorsports. Even drivers without engineering degrees develop an intuitive understanding of physics, "you don't keep your job long without a working knowledge of Newton's Laws of Motion." What she learned is that you can't win races without getting the math and science right. Here's where all the science you learned in high school (and wondered when you'd ever use) hits the road. If you've ever thought about knocking Lewis Hamilton or Jeff Gordon out of their ride, you might want to hear this talk before you make your move: without knowing the science, you're more likely to see the yellow flag than the checkered one.

*Diandra Leslie-Pelecky earned undergraduate degrees in physics and philosophy from the University of North Texas and a Ph.D. in condensed matter physics from Michigan State University. After fourteen years at the University of Nebraska, she recently became Director of the West Virginia Nano Initiative and Professor of Physics at West Virginia University. There, her research seeks new ways to apply magnetic nanoparticles to make chemotherapy more efficient and decrease the side effects. Her passion for making science understandable and relevant to the average person brought her to a second laboratory: the racetrack. The fact is that you can't win races without getting the math and science right. Her book, *The Physics of NASCAR*, was excerpted by TIME magazine and her work has been featured in everything from the New York Times to Sporting News magazine. She blogs at www.buildingspeed.org, explaining the math and science behind current events in motorsports.*

COMING EVENTS

October 24, 2013 (Thursday). Professor Diandra Leslie-Pelecky, West Virginia University, will deliver a National Sigma Xi Lecture at 8:00 p.m. in the Sun Room of the Memorial Union– see page 1 for details. Reception will follow.

December, 2013. 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, Paul Sacks, 396 Carver. Nominations may be submitted at any time, but the preferred deadline for receipt of nominations is February 14, 2014, for timely review by the Committee on Membership. Questions on procedures or qualifications can be addressed at any time to Paul Sacks, 294-8143 or psacks@iastate.edu. The Winter Newsletter (late January) will contain a reminder, and details of the nomination procedures. Guidelines for nomination are a part of the nomination form, which is also available online via the National Sigma Xi Website www.sigmaxi.org.

March 6, 2014 (Thursday): National Sigma Xi Lecturer Professor John Shea, SUNY Stony Brook, will present a lecture, *Myths of 'Modern' Human Origins*

March 7, 2014: Invitations to accept membership in Sigma Xi will be sent to those whose nominations have been approved by the Committee on Membership at its February meeting.

March 28, 2013. Deadline for receipt of acceptances from nominees for membership or promotion.

May 1, 2014 (Thursday). The Annual Initiation Banquet will be held in the Scheman Building. At this event, the year's 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 of the ISU Sigma Xi chapter 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 a lecture by the retiring President, Lee Burras, at 8:00 p.m.

PRESIDENT'S MESSAGE

Dear Sigma Xi Colleague,

The early 21st century is an incredible time to be a scientist. Every discipline is advancing at an accelerating pace. Discoveries historically considered basic are routinely finding immediate application, which is creating new, intellectually enriching collaborations for all of us. And this is exactly what Sigma Xi is about. We are an honorary society dedicated to excellent research. We promote inclusivity across the scientific community. So my first message is to encourage all of us at Iowa State University to keep doing exactly what we are doing. We are making a difference to the citizens of Iowa and the world. We are advancing knowledge. But my second message is one of caution. The very success of science at ISU and around the world is creating opportunities and challenges. I want to remind us of three of those challenges.

Challenge 1 is internal. We must always be modest, honest and ethical. This seems obvious but we are in the business of discovery and we are always seeking more support to continue to discover. Hence, when we do find something we really want to tout it. We almost need to. After all, funding agencies reward big impacts. So does the promotion and award system here, at every other university and across all scientific societies. That is right and reasonable; however, if the public or policy makers think we are overstating our case – which can be as simple as failing to adequately communicate limitations in our findings - we risk undermining the

credibility of all science. An occasional lapse in judgment – whether intentional or not - risks damaging our entire community, especially in a world of instantaneous communication and feedback.

Our second challenge is showing that public-funded science remains relevant. Our very success is driving this. So, why should the public invest when basic discoveries are resulting in patents? Doesn't this mean good scientists will find funding through venture capitalists instead of pestering an already overtaxed populace? Never mind most research never will result in patents yet is clearly beneficial to society. The trend is shrinking public dollars and declining recognition of the value of scientific discoveries. This is ironic given the rapidity at which the public expects better cures for diseases, cleaner fuels for our power plants, etc.

This leads into our third challenge - educating the public about how science really works. We need to instill in our students and in the public that discoveries routinely take decades to happen. And they generally are built from knowledge gained through many failed experiments. Getting people to accept this is difficult when the answer to everything seems to be in Wikipedia and its ilk. But it is essential we make sure they do.

In conclusion my message is one of enthusiasm. Science is thriving. Discoveries are occurring at a level never seen before. This makes Sigma Xi more relevant than ever. Our mission is to recognize outstanding scientists while facilitating communication and community among all of us. It is a fun mission. But my message is also a reminder. We must always exhibit the highest level of modesty and integrity. And we must instill in our students and the public the very exciting and necessary and public role that science has in societal advancement.

C. Lee Burras President, ISU Sigma Xi Chapter 2013-14

GENERAL ANNOUNCEMENTS

- Within the next few weeks, a ballot will be sent to the active chapter members to approve a change to the chapter constitution, adding the following provision: *"If the chapter goes inactive and remains dormant over 5 years or dissolves, any funds the chapter possesses which were the direct result of local dues and chapter support will go back to the Sigma Xi the Scientific Research Society."* This is a new requirement of the national Sigma Xi organization, and is supported by the Executive Committee of the ISU Chapter.
- At the end of this academic year, Paul Sacks will step down after four years as Secretary/Treasurer of the chapter. Thus we are need of someone to take over this position for the next few years. Paul will work with the new Secretary/Treasurer during the 2014-15 academic year to help ease the transition. This position is not an elected one, rather the Secretary/Treasurer is appointed each year by the Executive Committee. It is not necessary that the new Secretary/Treasurer be a currently active chapter member, but he/she would be expected to resume active membership upon taking the position. Please consider if you would be interested in doing this service to the ISU Sigma Xi chapter, and contact Paul (psacks@iastate.edu) or Chapter president Lee Burras (lburras@iastate.edu) if you would like to discuss the possibility or with any questions.
- The national Sigma Xi 2013 Annual Meeting will take place on Saturday, November 9, and like last year will be an on-line meeting. The ISU chapter will have a registered delegate for the meeting, Jim Raich of the EEOB department, who has made arrangements for an internet connection to the meeting in Room 188c of Parks Library. Other chapter members are welcome to come by and view any or all of the proceedings. Please get in touch with Jim (jraich@iastate.edu) with any other questions. Information about the meeting may also be found on the national Sigma Xi web site, <http://www.sigmaxi.org/meetings/annual/index.shtml>.
- Tom Sauer has agreed to fill out the Executive Committee term of Michelle Ihmels, who has left ISU. Tom was the runner-up in last Spring's election for the Executive Committee.

- 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. Please take a little time to identify individuals who have impressed you with their achievements or research aptitude necessary for 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. More details will be given in the *Guidelines for Nomination* in the Winter 2014 Newsletter. Nomination forms may also be obtained electronically via the Sigma Xi Web site: <http://www.sigmaxi.org/member/join/nom.shtml>. 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.
- 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 2013-14 dues will reactivate your status). We encourage ISU members and active Ames residents who have other affiliations to join the ISU Chapter. The Secretary/Treasurer may be contacted for assistance with this.

2012-2013 MEMBERSHIP ACTIONS

The annual initiation banquet took place on Thursday, May 2, 2013 at the Scheman building. For the year there were a total of 21 initiates, see below for details. The Graduate College recognized one 1 Zaffarano Prize Awardee, 1 Zaffarano Prize Honorable Mention, and one Karas Award Winner.

The Banquet and Award and Initiation Ceremonies were followed by the Retiring President's Address, Chris Minion, Professor of Veterinary Microbiology and Preventive Medicine, ISU: *Mycoplasmas: Great things come in small packages.*

2013 INITIATES

FULL MEMBERSHIP

J. Gordon Arbuckle Jr.	Sociology
James Dickson	Animal Science
Yuanyuan Huang	Mathematics
Dawn Koltjes	Animal Science
James Koltjes	Animal Science
J. Dustin Loy+	Vet Med and Biomed Sci, U of Nebraska
Cheng Ma**	Oak Ridge National Laboratory
Joseph Miller*	Wright-Patterson AFB
Matthew Rowling	Food Science and Human Nutrition
Ganesh Ram Santhanam	Computer Science
Jing Wang	Mathematics

* Zaffarano Prize

** Zaffarano Prize Honorable Mention

+ Karas Award

ASSOCIATE MEMBERSHIP

Emily Artz	Nat Resources, Ecology and Management
Erik Christian	Agronomy
Stefan Gailans	Agronomy
Erich Hodges	Dairy Science
Phil McGuire	Ecology, Evolution and Organismal Biology
Bridget Nelson	Food Science and Human Nutrition
Chris Pelzer	Agronomy
Fritzie Rivas	Agronomy
Victoria Scott	Agronomy
Mary Tiedeman	Agronomy

OFFICERS OF THE CHAPTER

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

COMMITTEE ON MEMBERSHIP

L Keith Woo	2011-14
Susan Lamont	2011-14
Leslie Hogben	2012-15
Thomas Jurik	2013-16

Executive Committee

F. Chris Minion	2010-14
C. Lee Burras	2011-14
Maynard Hogberg	2011-14
James Raich	2012-15
Thomas Sauer	2013-15
Paul Sacks	2010-14
David Holger	2013-16
Curtis Struck	2013-16

NOMINATING COMMITTEE (one-year terms)

Suzanne Hendrich
Ian Schneider
Patricia Thiel