

Presidential Medal of Freedom Recipients

We are excited to announce that three of this year's 16 recipients of the Presidential Medal of Freedom are Sigma Xi Members. The year 2013 also marked the 50th anniversary of this award, first instituted by President John F. Kennedy in 1963, as the nation's highest civilian honor, "presented to individuals who have made especially meritorious contributions to the security or national interests of the United States, to world peace, or to cultural or other significant public or private endeavors."

The awards will be presented at a ceremony at the White House later this fall. Please join us in congratulating these outstanding Sigma Xi members in this wonderful accomplishment.



Mario Jose Molina (SX 1973) earned the Nobel Prize in Chemistry in 1995 for discovering how chlorofluorocarbons deplete the ozone layer. Molina currently serves as a professor at the University of California, San Diego; director of the Mario Molina Center for Energy and Environment; and a member of the President's Council of Advisors on Science and Technology. He is the recipient of the 1983 Tyler Environmental Prize,

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From the President



Let's Blog!

Dr. John Marburger, Science Advisor to the President and Director of the Office of Science and Technology Policy (OSTP) from 2001 to 2009, was a member and a great fan of Sigma Xi. One role he thought especially promising for Sigma Xi was that of facilitating the public understanding of science. He felt acutely the frustration of making sense of conflicting findings in research studies. He was passionately committed to shaping policy with the illumination of science and was instrumental in establishing the National Science Foundation's Science of Science and Innovation Policy Program. Marburger is also credited with defending the concept of scientific exchanges across national borders.

I met with him about six years ago to discuss Sigma Xi's future, and I recall well his commendation of *American Scientist*, our chapter science cafés, our leadership in honor in science, and his enthusiasm as we contemplated the role of our organization in creating social media portals to conversations about science.

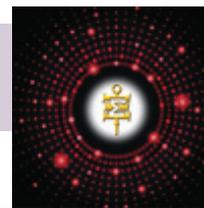
Sadly, Dr. Marburger died in 2011. But about two weeks ago I found myself again at OSTP, this time discussing Google+ Hangouts, and Twitter with an exceptionally bright, creative, and very young professional. She is a producer of "We the Geeks," a new series of OSTP Google+ Hangouts to highlight the future of science, technology, and innovation. Topics have included commercial space exploration, STEM, and turning science fiction to science fact. One of the most popular has been "The Stuff Super Heroes Are Made Of," about materials research. Sigma Xi is conceptualizing a series that we hope will echo the success of "We the Geeks."

The day I visited OSTP, I also visited the National Academies and the National Science Foundation. A recurring thread in our discussions was the impact of science. Federal agencies are very keen to support researchers in science and engineering in explaining the benefits and impact of their work. As important as explaining a scientific concept so that others, in other fields, in other walks of life, can understand it is explaining the contribution the research will make. This is vital to connecting science and policy.

To this point, I learned that NASA has 3.7 million Twitter followers and that millions watched the Mars Rover landing via Ustream. This is where Sigma Xi is poised to become a cyber beacon itself—500+ to the *n*th power (number of chapters and the numbers they reach), 500,000+ to the *n*th power (members inducted since its founding). Join the Sigma Xi conversations on Twitter and Facebook. However, don't just follow. Create your own following! Let's blog!

Your own thoughts are most welcome, fellow companions.

Linda Meadows



Presidential Medal of Freedom Recipients

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the 1987 NASA Exceptional Scientific Achievement Medal, the 1999 Sasakawa Environmental Prize, the 2003 Heinz Award, and the 2004 Volvo Environmental Prize. Sigma Xi has been especially proud of his service as a Society Distinguished Lecturer and in **2002, honored him with the prestigious John P. McGovern Science and Society Award.**



Daniel Kahneman (SX 1982) is a pioneering scholar of psychology and winner of the 2002 Nobel Prize in Economics for his work in prospect theory. After escaping Nazi occupation in

1940 as a resident of Paris, France, Kahneman and his family immigrated to Israel, where he served in the Israel Defense Forces and trained as a psychologist. He is currently a professor at Princeton University and has served in recent years as a Sigma Xi Distinguished Lecturer.



Sally Ride (SX 1978) was the first American female astronaut and youngest person to travel to space. As a role model to generations of

young women, she advocated passionately for science education, stood up for racial and gender equality in the classroom, and taught students from every background that there are no limits to what they can accomplish. Ride partnered frequently with Sigma Xi through her “Sally Ride TOYchallenge”; an event that introduces kids to engineering by challenging them to develop an idea for a toy, which was held for two years at the Sigma Xi Headquarters in Research Triangle Park. Ride’s family will receive her posthumous Presidential Medal of Freedom on her behalf, as she died from complications related to pancreatic cancer on July 23, 2012. •

Annual Meeting

The focus of the **2013 Virtual Annual Meeting** will be all things science communication—from Tumblr to Twitter, Facebook to blogging, the methodology of science is changing daily and Sigma Xi is determined to keep you up to date and prepared for success.

In addition to the Society Governance portions of the meeting, the agenda features an outstanding panel of science communicators, including Dennis Meredith, Corey Powell, Bora Zivkovic, and Rosalind Reid. Our panel will engage in lively discussions on the state of science communication in the 21st century and beyond.

Please remember that in order to make the Annual Meeting more accessible and cost-effective, we are hosting the Meeting virtually. Members may join chapter delegates and attend the 2013 meeting online. For more information, please visit our website today. •

Kathryn D. Sullivan Nominated to Lead NOAA

We are pleased to announce that on August 1, Sigma Xi Sustaining Member **Kathryn D. Sullivan** (SX 1989) was nominated by President Barack Obama to serve as the National Oceanic and Atmospheric Administration (NOAA) administrator and undersecretary of commerce for oceans and atmosphere. Sullivan has held both of these positions on an acting basis since the retirement of Jane Lubchenco in February 2013. In conjunction with these nominations, Sullivan continued in her roles as the assistant secretary of commerce for environmental observation and prediction, as well as deputy administrator for NOAA, positions she has held since 2011.



A former member of the astronaut corps, Sullivan was the first American woman to walk in space in 1984. She was a member of the mission to deploy the Hubble Space Telescope in 1990 and in recognition of her many contributions to exploration in space, was inducted into the Astronaut Hall of Fame in 2004. She was appointed NOAA’s chief scientist in 1993 and has

also served as an oceanography officer in the United States Naval Reserve with the rank of captain. Other career notes include time as president and CEO of the Center of Science and Industry (COSI) interactive science center in Columbus, Ohio, as well as director of The Ohio State University’s Battelle Center for Mathematics and Science Education Policy.

Sullivan has been a dedicated Sigma Xi member since 1989 and stayed involved with both the Society and her former career as an astronaut with the Sally Ride TOYchallenge at Sigma Xi Headquarters. She was also the **2011 recipient of the John P. McGovern Science and Society Award.** Her McGovern lecture, entitled “Looking at Earth,” is available in full on Sigma Xi’s YouTube page. •

Sullivan’s appointment by President Obama was contingent upon Senate confirmation as this issue went to press.

France Córdoba Nominated Director of the National Science Foundation

American astrophysicist **France Córdoba** (SX 1993) has been nominated by President Barack Obama to the directorship of the National Science Foundation. The former president of Purdue University, Córdoba served as the chair of the Board of Regents for the Smithsonian Institution based in Washington, D.C.

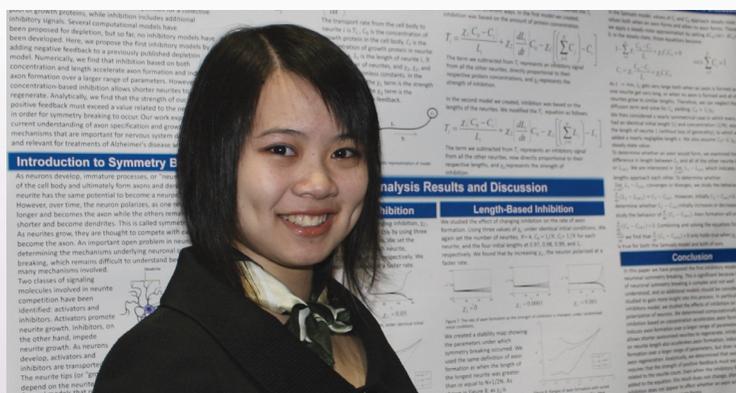
Originally born in Paris, France, Córdoba moved to the United States and graduated with a bachelor's degree from Stanford before completing her Ph.D. in physics at the California Institute of Technology in 1979. Throughout her career as a pioneering woman in science, she has held prestigious posts in astronomy and astrophysics at the Los Alamos National Laboratory and Pennsylvania State University. In 1993, she was named the youngest and first female NASA chief scientist and held that post until 1996.



Following her time with NASA, Córdoba moved into more administrative roles; first as a vice-chancellor at the University of California—Santa Barbara, then as chancellor of the University of California, Riverside, and finally as the 11th president of Purdue University.

Córdoba's additional contributions in research have spanned all areas of astrophysics, including multispectral research on x-ray and gamma ray sources and space-borne instrumentation.

Córdoba's appointment by President Obama was contingent upon Senate confirmation as this issue went to press. •



Student Research Conference

Discover Your Path this November 8–9 in Research Triangle Park, North Carolina, with Sigma Xi's Student Research Conference.

Students have the opportunity to learn critical skills in communicating science, grant writing, and funding their graduate educations. Thanks to Sigma Xi's partners in the Research Triangle Park area, students will also be able to meet researchers, tour government and corporate facilities, participate in career panels across industries, network, and enjoy presentations from Sigma Xi's 2013 Procter Prize, Chubb and Young Investigator Award Winners Rita Colwell, Chad Mirkin, and Michael Tobler, respectively.

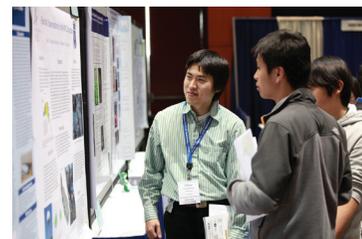
We hope you will encourage students in your circles to engage with Sigma Xi at this year's Student Research Conference. Registration is open on our website. •

Virtual Student Research Showcase

Can't join us for this year's Student Research Conference in Research Triangle Park? Then start looking forward to the **2014 Virtual Student Research Showcase**—a one-of-a-kind opportunity to present your research to judges from around the world, all without having to leave your home or dorm room.

Let us help you build your CV by gaining invaluable experience in virtual presentation platforms—a critical skill for research scientists in the new millennium. The Showcase is open to high school, undergraduate, and graduate students around the world. Please note that you do not have to be a member of Sigma Xi to participate, though your preliminary abstract submission will have to be approved to engage in the competition. Awards will be presented in every field of research and at every level of education, with overall winners for divisions.

Visit www.sigmaxi.org for more details. Until then, we'll be looking forward to "seeing" you online for the 2014 Student Research Showcase! •



meet your fellow companion

Meet Your Fellow Companion: Jill Pruetz



Photograph courtesy of Bob Elbert, Iowa State University

Sigma Xi members hail from diverse fields of academia, government, and industry. Our motto is the Greek “Spoudon Xynones,” or “Companions in Zealous Research.” With that thought in mind, each issue in Sigma Xi Today, we like to take a moment to highlight a different “Fellow Companion”—to learn more about their work and what the honor of induction into Sigma Xi has meant for their career.

Dr. Jill Pruetz, a leading primatologist and the Walvoord Professor of Liberal Arts and Sciences at Iowa State University, has studied the behaviors of nonhuman primates including chimpanzees, spider monkeys, howler monkeys, tamarins, and vervets in her fieldwork around the world. Pruetz’s current research on the influence of ecology on primates and early human behavior has been funded by the National Geographic Society, where she is considered an Emerging Explorer, and the National Science Foundation.

What is the focus of your current research?

I study the behavioral ecology of chimpanzees in a savanna environment in Senegal. I use these chimps as a model of sorts, in order to better understand early hominid behavior millions of years ago. I compare my study subjects, the Fongoli chimps, to those that live in forested habitats in order to assess which pressures affect apes most in savannas. Much of my research is also what you might term natural history studies, as apes have never before been habituated to the presence of human observers in a savanna.

Tell us about something we might see in our daily lives that directly correlates to your work.

Many aspects of human behavior are similar to other primates’. Although we should be careful about direct comparisons between humans and other primates, I do believe they can provide insight into our own behavior in certain circumstances.

Give us an example of how multi-disciplinary research directly contributed to your work.

I work with archaeologists and other biological anthropologists as well as parasitologists. By collaborating with other scientists, we are able to examine things like diet content via isotopic analyses, health via dental morphology, and the natural parasite load.

Describe the patent/publishing experience—were there any bumps along the way for you?

I was lucky to be involved in publishing early on as student—at that time immediately following my work as an undergraduate student. In today’s world, I would encourage students to become involved with publishing their work even earlier. It was somewhat difficult to adjust to writing scientifically after learning to write well for very different audiences for several years. I think many students have this same problem, and practice is a vital part of bettering oneself in this regard. I also highly recommend identifying a mentor to give you feedback.

What has the honor of induction into Sigma Xi meant to you?

I found it professionally rewarding to be accepted into Sigma Xi as a graduate student. Being honored for my accomplishments and publications at that time was very encouraging.

Has Sigma Xi helped further your career? If so, how?

Networking within my local chapter has allowed me to build a system of support with my fellow academics, as well as given me valuable leadership experience through my service on a committee. Learning from more experienced colleagues via the interdisciplinary nature of Sigma Xi was

especially helpful when I first began my tenure-track position.

What books are you currently reading for pleasure?

I have a bad habit of sometimes not being able to finish the books I’ve started until a later date, so I often have several I’m reading at the same time. One of the books I’m currently reading is *Fire: The Spark that Ignited Human Evolution* by Frances Burton.

What is your favorite motto?

“Success isn’t permanent and failure isn’t fatal.”—Coach Mike Ditka

What advice would you give a young researcher just starting out in your field?

Follow your passion, get experience, and never give up!

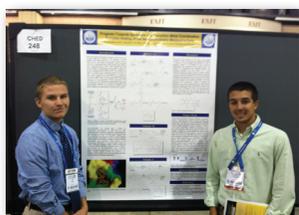
Sigma Xi just celebrated its 125th year. What advances do you see in your field of research over the next 125 years?

I see the advances in my field of primatology following closely with the goals of conservation biology, since most primate species, including the apes I study, are currently endangered. Most field researchers will and should include aspects of conservation biology in their studies out of necessity as well as ethical responsibility. •

Please note that the text above is just a small excerpt of all Dr. Pruetz had to say in response to our questionnaire. To read her interview in full, please visit Sigma Xi’s website at <http://www.sigmaxi.org>.

meet your fellow companion

Meet Your Fellow Companion: Craig Streu



Dr. Craig Streu is an assistant professor of biochemistry at St. Mary's College of Maryland and the former recipient of a National Institute of Health fellowship in biophysics at the University of Pennsylvania Medical School. His interdisciplinary work in synthesizing compounds to study biomolecules has far-reaching implications in the search for cures for diseases ranging from HIV to cancer. His engaging perspective on the future of his field—and his outstanding advice for future researchers—is not to be missed.



What is the focus of your current research?

Currently, I work in a field known as chemical biology. Broadly speaking, chemical biologists are interested in developing chemical solutions to biological problems. As a chemical biologist, I have been able to work on many different systems, including opportunistic microbial infections, sweet proteins, lipid particles, redox proteins, and single-stranded RNA. The projects are tied together through the chemical solutions that we employ to improve their study and/or modulate their function.

Tell us about something we might see in our daily lives that directly correlates to your work.

My work is easily applicable to daily life. Although only a fraction of 1 percent of lead compounds end up as FDA-approved drugs, these compounds may still be useful. We have synthesized compounds that allow us to study a variety of biomolecules more closely. The biomolecules that we study have been implicated in everything from HIV to cancer. We are using our compounds to get a more complete picture of the molecular mechanisms of each of these diseases.

Give us an example of how multi-disciplinary research directly contributed to your work.

As a chemical biologist, my work is by definition a multidisciplinary mix of techniques borrowed heavily from chemistry and biology. More specifically, my lab uses organic, inorganic, biochemical, biophysical, and molecular biology techniques to study the molecular mechanisms of disease. Still, despite the breadth of our research capabilities, science is by its very nature interdisciplinary and we have developed numerous collaborations with individuals outside our primary areas of expertise to

more completely investigate a number of our research questions. In just the past year, my small research lab has collaborated with a microbiologist, a computational biologist, a medicinal chemist, an immunologist, and a chemical engineer. In each and every case, these experts contributed essential insights that have positively affected the respective project.

What are your thoughts on the future of STEM education?

Although I myself am a purveyor of the liberal arts, there is no question that STEM education will be an increasingly important part of our future. Our planet faces a host of imminent environmental, resource, and energy crises. There is no question that science and technology, and by extension STEM education, will play a critical role in any potential solution to these impending situations. At the same time, to remain a leader in these fields, the United States must continue to invest in innovation and education in these areas.

Describe the patent/publishing experience—were there any bumps along the way for you?

The publishing experience can be both the most exciting and the most humbling part of scientific research. For me, the publication process got off to a rough start after my first submission was flatly rejected. While the experience was a bit demoralizing for a graduate student needing papers to graduate someday, this was my first sense of the broader impact of my work. For the first time, I was being asked questions about the usefulness and exhaustiveness of my work. Generally speaking, peer reviewers have the best interest of science in mind. Hard knocks aside, learning to think as a reviewer early

in my career has been one of the most positive lessons I've ever learned.

What has the honor of induction into Sigma Xi meant to you?

Sigma Xi is an excellent resource for professional development. It provides an arena for meeting like-minded individuals. Additionally, I am proud to be associated with an organization whose mission is the promotion of STEM fields and education.

When you're not working on your research, what do you do in your free time?

When I'm not researching, teaching, or writing grants, I like to hike with my dogs. It's good exercise and their enthusiasm is a bit contagious.

What is your favorite motto?

"If we knew what we were doing, we wouldn't call it research, would we?"—Albert Einstein

What advice would you give a young researcher just starting out in your field?

I have two pieces of advice for any young researcher. The first is to be self-motivated. Research is hard work and the vast majority of scientific advances go unrecognized. As a result, you have to do the work because you enjoy it, not because you expect recognition for your brilliance and hard work. Additionally, any successful researcher must be doggedly determined. Grants and papers will get rejected, experiments will fail—sometimes epically—and research directions will change. Your ability to learn from these experiences is a key predictor of long-term success as a scientist. •

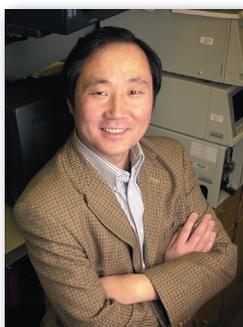
Please note that the text above is just a small excerpt of all Dr. Streu had to say in response to our questionnaire. To read his interview in full, please visit Sigma Xi's website at <http://www.sigmaxi.org>.

Sigma Xi Distinguished Lecturers Series

One of the most outstanding and timeless programs in Sigma Xi's 126-year history has been the Distinguished Lecturers Series. Our participants for the 2013–2014 year are no less exceptional, and it is our sincere hope that you and your chapter or institution will consider bringing a Sigma Xi Distinguished Lecturer onsite to provide thought-provoking content for your next meeting or program.

Among our more than 20 Distinguished Lecturers this year, we're excited to include the following two individuals. To learn more about the many speakers available to you, please visit www.sigmaxi.org.

Among this year's Lecturers, we are proud to present:



Dr. Yi Lu is the Jay and Ann Schenck Endowed Professor of Chemistry and HHMI Professor in the Departments of Chemistry, Biochemistry,

Bioengineering and Materials Science, and Engineering at the University of Illinois at Urbana-Champaign. Lu is also a member of the Center for Biophysics and Computational Biology and Beckman Institute for Advanced Science and Technology. His research interests lie at the interface between chemistry and biology. His group is currently developing new chemical approaches to provide deeper insight into biological systems. Lu has received numerous research and teaching awards, including the Fellow of the American Association for the Advancement of Science (2007); Early Career Award, Society of Biological Inorganic Chemistry (2007); Howard Hughes Medical Institute Professor Award (2002); Camille Dreyfus Teacher-Scholar Award (1999); Alfred P. Sloan Research Fellowship (1998); Research Corporation Cottrell Scholars Award (1997); and the Beckman Young Investigators Award (1996).



Dr. Gilda Barabino is the professor and associate chair for graduate studies in the Department of Biomedical Engineering at Georgia Institute of

Technology and Emory University. She recently served as the inaugural vice provost for academic diversity and established a legacy to strengthen diversity and inclusion at Georgia Tech. Prior to her appointments at Georgia Tech and Emory, she rose to the rank of full professor of chemical engineering and served as vice provost for undergraduate education at Northeastern University. Her research focuses on sickle cell disease, orthopedic tissue engineering, and diversity in science and engineering. She received her B.S. degree in chemistry from Xavier University of Louisiana and her Ph.D. in chemical engineering from Rice University. She is a Fellow of the American Association for the Advancement of Science, the American Institute for Medical and Biological Engineering, and the Biomedical Engineering Society. •

Connect with Your Community

Offer thoughtful, timely, critical content to your institution. Raise the visibility of your local chapter and recruit members. Host a Sigma Xi Distinguished Lecturer.

Information on hosting and applying for a small subsidy can be found at www.sigmaxi.org.



**Subsidy Application Deadline:
March 1**

The 2014–2015 Distinguished Lecturers will be announced in the January/February issue of *American Scientist* magazine.