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Sigma Xi Today
A NEWSLETTER OF SIGMA XI, THE SCIENTIFIC RESEARCH SOCIETY

Sigma Xi Moves to New Headquarters

Sigma Xi, The Scientific Research Society has moved its international headquarters within Research Triangle Park, North Carolina. The Society's staff, as well as the staff of its magazine *American Scientist* and journal for pre-college research *Chronicle of The New Researcher*, moved over the July 4 weekend next door from their former building. The Society is now located in the Cape Fear Building, Suite 300, 3200 Chapel Hill Nelson Highway, Research Triangle Park, North Carolina, 27709.

The Society has been located in Research Triangle Park for 25 years and made this move from a building that served as its headquarters since 2003. Sigma Xi's Board of Directors sold that building so the Society could focus more financial resources on the needs of members.

During the move, 553 books about science, technology, engineering, and math were donated from *American Scientist*'s libraries to the North Carolina State University Libraries. Approximately 6,000 copies of scientific journals, 300 copies of a collection of *American Scientist* articles on ecology, and several hundred back issues of *American Scientist* were donated to Kestrel Heights School, a public charter K–12 school in Durham, North Carolina.

"All members should feel proud of the efforts being made by many to chart a new course for the Society in times of rapidly changing expectations," said George Atkinson, Sigma Xi's immediate past president who led the move.

Sigma Xi's international headquarters moved to the Cape Fear Building in Research Triangle Park, North Carolina.

From the President

Share Your Chapter's Success Stories

President Mark E. Peeples

When I think of Sigma Xi, I think of my chapter. I mean no disrespect to our outstanding national organization with its ever-expanding programs and opportunities and our terrific *American Scientist* magazine for the science savvy. But my first thought is of my chapter: our most recent field trips to Serpent Mound to collect 450-million-year-old fossils, our most recent banquet, or our local Grants-in-Aid of Research program.

My second thought is that we can do more to improve the health of the scientific enterprise. How can we connect with nonscientists to help them understand what we do, how we do it, why we do it, and why it's important? How can we better encourage and support young scientists and engineers? How can we better encourage collaborations across disciplines?

These are the questions I will be exploring throughout my presidency, and I need your help. What program has your chapter developed that works well? How did you do it? I know from experience that successful programs are not born that way. They develop over years, with tweaking along the way to make them more attractive and successful. Just as important as a completely new program is a tried-and-true program with a twist that improves its effectiveness. How about this one: holding your chapter's Science Café in a doughnut shop during a slow time late in the day? Or contacting a local science-based company for an industry open house? Imagine all the great things that could lead to.

My first goal is to collect your wisdom and provide it to all of our chapters in a form that is easy to adopt. I hereby challenge you or your chapter to submit a description of your most successful or unique program (or two or three) to me. We will coordinate and post your information in the Officer Resource Center on the national Sigma Xi website, www.sigmaxi.org, with credit to you, your chapter, and your institution. You can help another chapter avoid the pain and reap the gain of a successful program, and you can learn about other exciting chapter programs so that you can start or strengthen one.

We have developed a form for you to describe your program under "Sigma Xi Succeeds" in the Officer Resource Center at www.sigmaxi.org. Please complete it and email it to me at peeples.15@osu.edu. To find the Officer Resource Center, login at www.sigmaxi.org, hover your mouse over "Chapters" in the top navigation bar and select "Officer Resource Center" in the drop-down menu. I will also be initiating a discussion in Sigma Xi's online member community, The Lab: Members to Members. Join the conversation at community.sigmaxi.org about the high points and problems of different programs, and decide what to try next.

We will be discussing many more of these inspiring ideas this year at our Annual Meeting October 22–25 in Kansas City, Missouri. I'm looking forward to your chapter's participation!

Mark E. Peeples

Join Us in Kansas City!

Scientists and engineers will gather in Kansas City, Missouri, October 22–25, for the highlight of Sigma Xi's year: the Annual Meeting. Chapter delegates make governance decisions for the Society and attend leadership development workshops, award winners speak about their important work, students and professional researchers share their research, and new members are welcomed into the Society.

Register today! Reserve hotel rooms and submit research abstracts by September 15. Look for more details at www.sigmaxi.org/meetings-events/annual-meeting.

Students, Show Us Your Research!

High school, undergraduate, and graduate students are invited to present their research October 23–24 alongside professional researchers in Sigma Xi's Student Research Conference, held as part of the Annual Meeting.

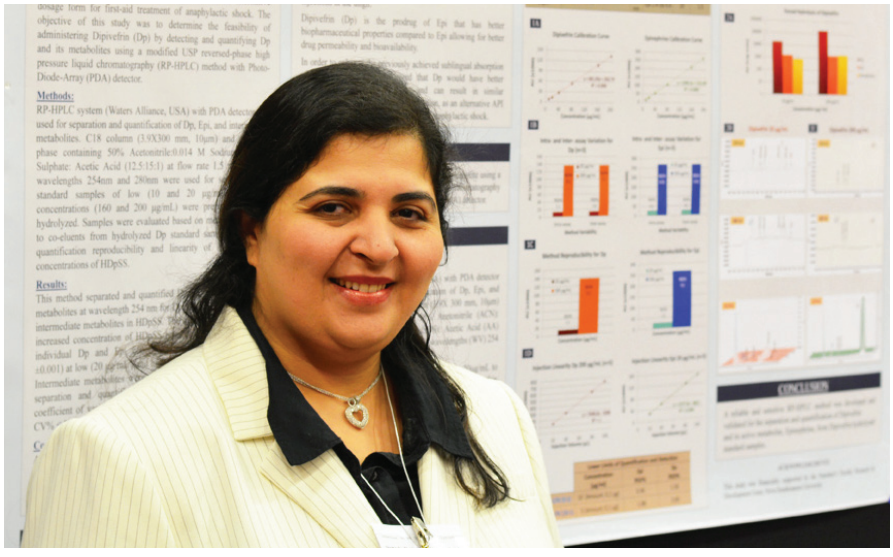
Presentations are accepted in:

- Behavioral and social sciences
- Cell biology and biochemistry
- Chemistry
- Ecology and evolutionary biology
- Engineering
- Environmental science
- Geo-sciences
- Math and computer science
- Physics and astronomy
- Physiology and immunology

Presentations are evaluated by leading career scientists. Participants meet professional scientists and engineers from around the world, attend career development workshops, and network with graduate school recruiters and employers.

How to Participate

- Submit your research abstract by September 15 at https://www.sigmaxi.org/meetings-events/student-research-conference.
- Prepare for your presentation by listening to students who participated in the conference last year. The interviews are available at www.sigmaxi.org/2014/irc.
- Get the latest updates by following @SigmaXiSociety and #SigmaXimtg on Twitter.



Lina Alaydi of Nova Southeastern University presented her research at the 2014 conference. (Image by Katie-Leigh Corder/Sigma Xi.)

American Scientist Earns Awards

American Scientist was recognized as a leader in the publishing industry by earning four awards in June. Two came from the APEX Awards for Publication Excellence. The November–December 2014 issue earned an Award of Excellence for print magazines, journals, and tabloids with 32-plus pages. The September–October 2014 issue brought home this year's Award of Excellence for design and layout in magazines, journals, and tabloids. APEX Awards, sponsored by Communications Concepts, Inc., are given as Grand Awards or Awards of Excellence to recognize outstanding communication materials.

The EXCEL Awards recognized *American Scientist* with two Silver Awards, one for Journals–General Excellence and the other for Journals–Feature Article. The winning article was "How to Fight Back Against Antibiotic Resistance," by Gautum Dantas and Morten O. A. Sommer in the January–February 2014 issue. Association Media & Publishing's EXCEL Awards are given in bronze, silver, and gold tiers to recognize excellence from nonprofit associations.

Sigma Xi has published *American Scientist* since 1913. Members receive their choice of a print or digital subscription included with membership dues.

Sigma Xi Today is edited by Heather Thorstensen and designed by Spring Davis.

An Award for His Service

Dr. Larry Johnson has held every officer position there is for the Texas A&M University Sigma Xi Chapter. For his service to Sigma Xi and its mission, he will receive the 2015 Evan Ferguson Award at Sigma Xi's Annual Meeting October 22–25 in Kansas City, Missouri. Here, he shares his tips and experience as a chapter leader.

If I've had any success at all, it's been because others have done the work for me and that we have been able to master getting people to do things for their reason as opposed to my reason. You try to make it match what they want to do. If you ask scientists to organize an activity, they won't do it. But if you organize it and ask them to tell a bunch of teachers how they use the scientific process in their research, they would love to do it. We wanted kids to be involved in a writing and essay contest, and so the teachers were partners because that's what they wanted to do.

What motivates me is success, that you see interest in others, that you see other faculty members come on board and become proactive in Sigma Xi. It's always refreshing to see other people take leadership roles. And also, the mission of Sigma Xi: to promote science and reward scientists who have been productive. You continue to see things on a more university level and communicate with people that are in a different college or that have a different perspective than you have.

I think the people of Sigma Xi do a lot more than what is claimed to be "Sigma Xi activities." College of Engineering—they have a whole youth science promotion program, the College of Science does that, you have the College of Agriculture working with 4-H. Chapters could partner with other departments at their university under the name of Sigma Xi. It would be good if you would tell the 4-Hers, "here is a professional society that you could aspire to be in."

These are excerpts from a Sigma Xi Google Hangout with Dr. Johnson. To hear his insight into the Annual Meeting and his advice for other chapter leaders, visit https://www.sigmaxi.org/programs/prizes-awards/ferguson-award/award-winner/larry-johnson.

Dr. Larry Johnson is on the Texas A&M University Sigma Xi Chapter's Executive Committee and Youth Science Promotion Committee. He is a professor of veterinary integrative biosciences at Texas A&M University. (Image courtesy of Larry Johnson.)

Journalist Miles O'Brien to be Inducted into Sigma Xi

For cultivating an award-winning career of reporting on science, technology, and aerospace, journalist Miles O'Brien will be inducted as an honorary member into Sigma Xi at the 2015 Annual Meeting. On a Google Hangout, he shared his tips on science communication.

On using social media to promote science to the public

"I would encourage scientists who have any inclination in this regard to get in the game and get out there and start telling your own story as much as you can."

On getting people interested in science through storytelling

"There is an audience out there, there are people interested in this subject, and if the stories are well told the audience will find you."

On emphasizing the human side of science

"Scientists focus on specific findings, things, developments, whatever and a lot of time what's most interesting to people is the hunt itself, is the process, and the person driving that hunt, what motivates them."

To watch the full interview with Miles O'Brien, visit https://www.sigmaxi.org/programs/prizes-awards/honorary-membership/award-winner/miles-obrien.

Miles O'Brien is a producer and correspondent for *PBS NewsHour*, a producer and director for the PBS science documentary series *NOVA*, and a correspondent for the PBS documentary series *Frontline* and the National Science Foundation *Science Nation* series. (Image courtesy of Miles O'Brien.)

A Better Bug Cleanse

Renowned entomologist and National Medal of Science Award winner Dr. May Berenbaum will be honored at Sigma Xi's Annual Meeting with the Society's McGovern Award. The award recognizes an outstanding contribution to science and society. We spoke with her about her research and how she captures the public's attention about insects.

Dr. May Berenbaum, a professor and head of the Department of Entomology at the University of Illinois at Urbana-Champaign, joined Sigma Xi in 1981. She received the National Medal of Science from U.S. President Barack Obama in 2014. (Image courtesy of May Berenbaum.)

You're doing research with the United States Department of Agriculture about honeybees and how they regulate toxins. What are your goals for that project?

The first images that were drawn based on microscopic examination were those of honeybees back in 1625. So honeybees have been subject to extensive scientific investigation but in all that time very little was known about how honeybees metabolize poisons or toxins. This has become important because in contemporary American agriculture, they can't forage in American cropland without encountering pesticides. Moreover, ever since the mid-1980s when a parasitic mite was accidentally introduced in the United States, called the varroa mite, it caused massive mortality and beekeepers have very few tools for dealing with this pest, which kills honeybees. What they've been using are pesticides. But it's very difficult to design a pesticide that kills mites that doesn't also kill insects because mites and insects are closely related. For the first time in their long, evolutionary history honeybees have been encountering a toxin-drenched environment. They evolved in the context of being partners, or mutualists, with plants. They feed on nectar and pollen which, unlike most other plant parts, are not heavily defended by chemicals.

One thing that got us really interested in this was in 2006, the honeybee genome was completely sequenced and that sequence was published and there were big surprises. One was that honeybees have a smaller inventory of genes involving detoxification. So what got me interested is: How are they coping with this chemically different world?

[This research includes toxins that are naturally in plants and toxins that are applied to plants.] Bees, like most insects, are stuck with the biochemical equipment that they acquired over long evolutionary histories to deal with these chemicals.

What have you found?

We were surprised to find out there's a chemical called p-coumaric acid which is present in honey and pollen. It's the building unit of the polymer that makes up pollen cell walls, called sporopollenin. When bees ingest p-coumaric acid it turns on their detoxification enzymes.

Now that made us sit back and think: What happens when beekeepers feed their bees not honey to get them through the winter, but high-fructose corn syrup or sugar because it's cheaper than honey? And for years this was a practice among beekeepers, since the late 1970s. But what happens to bees who are not consuming honey or pollen, [that] don't get this [detoxification] signal?

As it turns out, if you feed bees just sugar instead of honey, they are less able to metabolize pesticides. That suggests a potential application. If beekeepers are economically strapped or don't have the honey to provide to their bees, maybe just adding these inducers of detoxification might help bees cope better with pesticides. We didn't start out with the idea of developing dietary supplements for honeybees but that's where the research led us unexpectedly.

It sounds like you're doing similar projects with the navel orangeworm.

This is a caterpillar that, name notwithstanding, is a major pest of nut crops in California. It has an extraordinary broad range of host plants. Ninety-plus percent of caterpillars that feed on plants, feed on plants in only one or two host families. But then there are the breakout artists like navel orangeworm that figured out a way to feed on dozens of very chemically different families. I'm trying to figure out how they biochemically deal with so many different types of chemicals.

You are the organizer of the Insect Fear Film Festival at University of Illinois at Urbana-Champaign. It draws in hundreds of people to learn about bugs with a bug petting zoo and student art contest. How is that going?

It's going great. We are entering our 32nd year. The idea is to show insect science fiction films, which draws a crowd, and then explain to them what they're about to see can't possibly happen. And this way we can acquaint people with the biology of insects, their insect physiology, and insect ecology in an entertaining way and it's been a lot of fun. You couldn't draw a crowd advertising insect physiology but you can draw a crowd advertising a film featuring giant ants in the sewers of Los Angeles.

To learn Dr. May Berenbaum's opinion on the first national strategy to help pollinators, as well as her thoughts on The X-Files *character and cockroach species that is named after her, watch the full interview at https://www.sigmaxi.org/programs/prizes-awards/john-mcgovern/award-winner/may-berenbaum.*