

# Sigma Xi Today

A NEWSLETTER OF SIGMA XI, THE SCIENTIFIC RESEARCH HONOR SOCIETY

## Q & A with Fenella Saunders

Fenella Saunders is the new editor-in-chief of *American Scientist* and director of science communications and publications for Sigma Xi.

### Are there changes to *American Scientist* that readers can expect under your leadership?

*American Scientist* remains a premier publication for longform narrative stories about all areas of science, as told by the researchers themselves. We will continue to work with scientists to bring their process of discovery to a wider audience. In recent years the magazine staff have worked hard to offer our readers articles that convey researchers' unique voices, vividly tell their stories, and feature dynamic layouts with great custom graphics. We'll continue to customize our content to bring readers the best experience possible in print, while also expanding online blogs, features, and multimedia. Watch for more podcasts, as well as live interviews and other opportunities for readers to interact with scientists.

### Where do you hope to focus your efforts as director of science communications and publications?

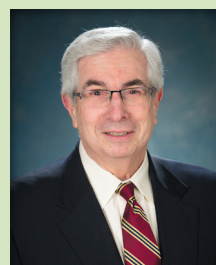
In addition to *American Scientist*, Sigma Xi publishes *Chronicle of The New Researcher* (CTNR), a pioneering journal that gives budding researchers in high school the opportunity to publish professionally reviewed research. This cause is close to my heart, because I started my own research career in high school. So I hope to expand CTNR's reach and impact. Sigma Xi has a great history of involvement in science ethics and nonpartisan policy, and the Society has vast potential to contribute more to these areas.

Sigma Xi Today is  
edited by Heather Thorstensen  
and designed by Justin Storms.

## From the President

### Who is Responsible?

I would like to reflect on some of the core elements of Sigma Xi's reason for being and what members bring to the table. The Society was formed more than a century ago as a means to celebrate accomplishments in research as well as to promote collaboration and companionship throughout the various disciplines. Sigma Xi is an honor society, meaning that peers and mentors nominate members, who must be approved for induction by a well-defined process at the local chapter level or by the Committee on Qualifications and Membership. It is expected that members will hold to the highest standards of research ethics and promote the public understanding of science and technology.



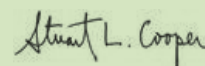
President Stuart L. Cooper

Many of these values are emphasized at Sigma Xi headquarters. An example of this involves our leadership giving voice to concerns of the scientific community in terms of the health and funding of science and technology and the need for research to underpin governmental policy issues. Our involvement in the March for Science this past April exemplified these goals. Other important goals, such as promoting public understanding of the importance of research and encouraging youth toward careers in science and engineering, are driven forward by the joint actions of our headquarters and our local chapters. Finally, after all is said and done by our organizational and local chapter leadership, it is incumbent on individual members to have a role in these endeavors.

What does this mean? Sigma Xi members have been elected to a scientific research honor society and have assumed nontrivial responsibilities of membership in our Society. It is more than just a line on one's resume. Foremost is a requirement that as long as one's career has a research component that the member pursue new discoveries with the same drive and enthusiasm that brought him or her to membership in Sigma Xi. Members should also be active in nomination of the next generation of inductees and, if possible, participate in local chapter activities.

The future workforce needs to be well populated by individuals with science and engineering skills that are applied with diligence and integrity. Get involved wherever possible in K–12 activities, whether by visiting classrooms, judging at science fairs, mentoring, or supporting excellence and innovation in precollege science teaching. Engaging the public about the importance of research is something in which we can all participate and should be willing to do.

Sigma Xi will continue to have a meaningful role as long as individual members are active participants in that for which we stand.

  
Stuart L. Cooper

## Symposium Will Address Climate and Health



High school, undergraduate, and graduate students will compete for poster presentation awards at the Student Research Conference after Sigma Xi's symposium. (Image courtesy of Robb Cohen Photography and Video.)

You are invited to Sigma Xi's 2017 fall symposium, a gathering of climate researchers, Sigma Xi members, and the public on November 11 in Raleigh, North Carolina, to discuss critical issues facing our planet. Join us for in-depth presentations and thought-provoking discussions about the effects of climate change on human health and the environment.

The registration fee is \$75 and includes lunch. Veterans and active military members receive a 50 percent discount in honor of Veterans Day.

The symposium will feature the following sessions:

**The Past Is Prologue: Lessons Learned for Science-Based Policies to Address Air Quality and Climate**

How did science-based policies of the past lead to solutions for air quality and climate? What are some potential paths forward for current problems?

**The Ozone Hole: From Discovery to Recovery**

What science, policies, and actions were successful in putting the ozone layer and ozone hole on the path to recovery?

**Air Pollution and Health: Scientific and Public Policy Controversies**

Does a safe threshold of pollution exist?

**Humanity and Global Warming: Views from the Carbon Cycle**

How will today's energy decisions impact the future?

**Symposium on Atmospheric Chemistry, Climate, and Health Featuring a Public Town Hall about Climate Change**  
November 10, 2017  
**Student Research Conference**  
November 11, 2017  
**Raleigh Convention Center**  
Raleigh, North Carolina: [www.sigmaxi.org/fallsymposium-src](http://www.sigmaxi.org/fallsymposium-src)

**Simulation and Forecast of Infectious Disease: Environmental Determinants and Transmission Dynamics**  
How do scientists predict the spread, growth, and timing of disease outbreaks?

**Student Research Conference**

Science and engineering students are invited to the 17<sup>th</sup> Annual Student Research Conference on November 11 for a poster presentation competition, professional development workshops, networking, and a chance to connect with the world's largest research honor society.

Get the group discount! Groups of 25 students or more from the same institution receive a 10 percent registration discount.

## Members Share Solar Eclipse Stories



Brian C. Lee watched the total solar eclipse on August 21 from his driveway in Corvallis, Oregon.

**Game Day...for Science!**

The College of Charleston in Charleston, South Carolina, threw an eclipse party for 1,500 students, faculty, and staff members, and the party served as a staging area for NASA TV's national total solar eclipse coverage. The excitement led Alicia Caudill, College of Charleston executive vice president of student affairs, to say, "It looks like game day...for science!" Astronomy faculty and students took the event off campus to 16 locations, including parks and retirement homes. —Jon Hakkila, associate dean of the Graduate

*School and professor of physics and astronomy, College of Charleston*

**We Drove 700 Miles**

My wife and I traveled some 700 miles from Fort Lee, New Jersey, to Madisonville, Tennessee, to see the total solar eclipse. We now want to do the same thing again in 2024! —Dickson Despommier, emeritus professor of public and environmental health, Columbia University

Read more eclipse stories at [www.sigmaxi.org/2017-eclipse](http://www.sigmaxi.org/2017-eclipse).

## Hiding Where There Is No Place to Hide



A hyperiid amphipod (Image courtesy of Laura Bagge.)

Most people never see one of Laura Bagge's favorite animals, a crustacean called *Phronima* that is nearly transparent to hide itself from predators in the open sea. Bagge finds them by looking for the one part of their body they can't camouflage—the four tiny black dots of the animals' eyes.

"My colleagues often joke that I can't be sure if I've actually caught one of the clear crustaceans in a jar because you can't see anything in there," she said.

Sigma Xi awarded Bagge, a Society member who recently received her PhD in biology from Duke University, funding from its Grants-in-Aid of Research program to support her study on seven species of transparent crustaceans called hyperiid amphipods. She published her research in *Current Biology* in 2016, and her work has been featured in the popular press, such as *National Geographic*.

She found these crustaceans carry an antireflective optical coating that may be made of living bacteria. The coating reduces surface reflections, similar to the thin-film coatings that can be applied to eyeglasses to reduce glare. It helps make the clear crustaceans even harder for predators to find.

Learning how organisms make their bodies transparent is interdisciplinary work, requiring expertise in biology, chemistry, physics, and nanoengineering. Bagge hopes what she and others learn can be applied to nanomedicine, the physics of imaging systems, and even military defense.

As a postdoctoral associate in the

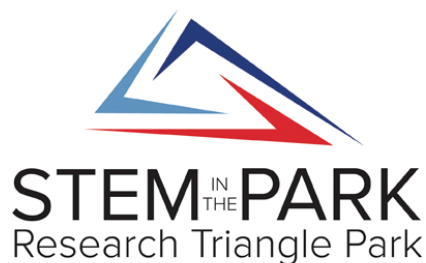


Duke University PhD graduate Laura Bagge in the submersible Alvin.

Department of Chemical Engineering and Materials Science at University of California, Irvine, she will continue her research on how ocean animals use camouflage.

"I am most inspired and motivated by placing myself in the environment where these animals live," she said, "because it helps me understand the pressures these animals face, such as trying to camouflage themselves in the open water where there is nowhere to hide."

## New Partnership Will Support STEM Professionals and Students



A new partnership between Sigma Xi and STEM in the Park will work toward the goal of ensuring that every science, technology, engineering, and math (STEM) professional has career support and that every child is given a fair opportunity to pursue a career in STEM.

STEM in the Park is a program of the Research Triangle Foundation in

Research Triangle Park (RTP), North Carolina, and a US2020 city coalition site. Its mission is to unlock and share STEM knowledge and experiences from local STEM companies and higher education institutions to K–12 students and educators in the Triangle region of central North Carolina.

"We are looking forward to working with STEM in the Park to create new outreach opportunities for our members and to help increase diversity in STEM," said Jamie L. Vernon, executive director and CEO of Sigma Xi.

STEM in the Park will provide meeting space and consult on programming for *American Scientist's* Pizza Lunches, monthly public presentations about cutting-edge scientific research. Made possible by funds

from the N.C. Biotechnology Center, Sigma Xi, and the Research Triangle Park Chapter of Sigma Xi, the Pizza Lunches are held in RTP.

Additionally, STEM in the Park will become a consultant on Sigma Xi's K–12 programming, which currently includes a scientific journal for high school research, an opportunity to network with professional researchers as a Sigma Xi Explorer, an in-person research presentation competition, and an online research presentation competition.

STEM in the Park will also provide Sigma Xi's members with new opportunities to mentor and reach out in other ways to 5<sup>th</sup>- through 12<sup>th</sup>-grade students, especially minority groups, girls, and students from low-income backgrounds.

## New Quarterly Conversations

*Last quarter's conversation was about the reproducible science issue; this quarter's topic is open access*

Sigma Xi launched an initiative in July to promote and cultivate quarterly conversations about critical issues in research. Executive Director and CEO Jamie L. Vernon prompted members to discuss how Sigma Xi can contribute to solving the reproducible science crisis, in light of recent findings about the irreproducibility of many published studies that have hurt the public perception of science.

"Not only should Sigma Xi members be calling on all of their qualified students and colleagues to take the Sigma Xi pledge, but also we can take meaningful steps toward addressing the problem of reproducibility," he wrote in his monthly Sigma Xi Speaks message.

Members sent in their thoughts and contributed in the online community, The Lab: Members to Members. The ideas so far include taking the following steps toward a solution:

- **Create a certified reviewers group.** As opposed to reviewing submissions for publication, this group would write critiques of published papers, acting as a watchdog for the research enterprise.

- **Start a Best Papers Club** wherein membership requires excellence in scientific writing.
- Find ways to address the problem that **too many researchers are chasing too little funding.**
- **Create a website** that documents the number of times a given result has been replicated. Provide attribution to the researchers involved and the details of the replication process.
- **Educate the public** about the challenges and processes of scientific reproducibility, including scientific methods and analysis, so they understand why studies sometimes contradict each other or may fail to be reproduced.

Though some of these ideas draw from existing initiatives, they represent Sigma Xi's first foray into this area. We will explore ways to put these recommendations into action, possibly as a report that could be shared with the research community or as a conversation during the 2018 Sigma Xi Annual

Meeting. We encourage all members to gather together to discuss this important topic.

### Q2 FY2018 Topic: Open Access

The process of making scientific results freely available to anyone could improve the dissemination and use of scientific results, especially for students, who often can't afford subscriptions to research publications, and for the public, who through taxes pay for much of the research conducted at universities and government laboratories. Publishers, however, add infrastructure and validity to the publishing process, which requires a viable business model. Should Sigma Xi promote open access, and to what extent? What can Sigma Xi do to help improve access to scientific results for the public and students? How should scientific publishers be compensated for their work in an open access system?

*Contribute to quarterly conversations in Sigma Xi's community, The Lab: Members to Members, at [community.sigmaxi.org](http://community.sigmaxi.org) or email [executiveoffice@sigmaxi.org](mailto:executiveoffice@sigmaxi.org).*

## Vote in the Sigma Xi 2017 Elections

All active Sigma Xi members are encouraged to vote in the Society's 2017 elections. Voting takes place online and opens at 8 a.m. EST on November 8. Active members will receive an email from [elections@vote-now.com](mailto:elections@vote-now.com) that day with instructions on how to vote. The polls will close at 11:59 p.m. EST on December 7.

Active members may vote for president-elect, treasurer, and other open positions in the region and constituency assigned to their chapter. Members-at-large will vote for open positions in the Membership-at-Large Constituency.

The Society will announce the results on its website, [www.sigmaxi.org](http://www.sigmaxi.org). Mem-

bers with questions or concerns should contact the executive office by emailing [elections@sigmaxi.org](mailto:elections@sigmaxi.org) or calling (800) 243-6534.

Open positions in this election are the following:

- President-elect
- Treasurer
- Directors: Baccalaureate Colleges Constituency, Canadian/International Constituency, Northwest Region, Southeast Region
- Associate Directors: Baccalaureate Colleges Constituency, Membership-at-Large Constituency, Research and Doctoral Universities Constituency, North Central Re-

gion, Northeast Region, Southwest Region

- Representatives for the Committee on Nominations: Area Groups, Industries, State, and Federal Laboratories Constituency; Baccalaureate Colleges Constituency; Comprehensive Colleges and Universities Constituency; Membership-at-Large Constituency; Mid-Atlantic Region; Northeast Region; Northwest Region

*Information about the candidates is available on the Sigma Xi website at [www.sigmaxi.org/about/2017-society-elections](http://www.sigmaxi.org/about/2017-society-elections).*