

Sigma Xi Today

A NEWSLETTER OF SIGMA XI, THE SCIENTIFIC RESEARCH HONOR SOCIETY

Sigma Xi 2019 Fall Timeline

Key dates for members and researchers to remember this season.

NOMINATE: Members, who will you recognize this fall with nominations to membership? www.sigmaxi.org/become-a-member

CELEBRATE: August 10–18 is National Science Week in Australia.

APPLY: Undergraduate and graduate student applications for research grants are due by October 1. www.sigmaxi.org/giar

AWARD: Nominations for Sigma Xi's 2020 prizes and awards are due by October 1. www.sigmaxi.org/awards

LEARN: Europe's Science on Stage festival will take place October 31–November 3 in Cascais, Portugal. The festival is the largest European educational fair for STEM teachers. www.sons2019.eu

PARTICIPATE: The Sigma Xi Annual Meeting, Student Research Conference, and STEM Art and Film Festival will take place November 14–17 in Madison, Wisconsin. www.sigmaxi.org/amsrc19

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Sigma Xi Today is
edited by Heather Thorstensen
and designed by Dena Verdesca

From the President

A Call to Action

Each day brings news of how our climate and our environment are historically changing, and research shows that human activities and population growth are the leading factors. With these changes comes an urgency to find solutions to ameliorate the impact of the rising temperatures that are causing extreme weather events, rising sea levels, and the alteration of plant and animal habitats.

From farmlands to forests, the effects of drought and raging forest fires are rising. Chemical and biological changes are happening in the oceans, soil, and atmosphere. It is indeed a call to action for all of us, especially those with science and technical training, to play a role in finding solutions to the complexity of environmental challenges today and into the future.

If you share these concerns, join us at the 2019 Sigma Xi Annual Meeting and Student Research Conference on November 14–17 in Madison, Wisconsin. With the theme "Our Changing Global Environment: Scientists and Engineers Designing Solutions for the Future," the meeting will feature talks from researchers on the forefront of addressing the changing environment. It also is an ideal venue for students and other researchers to share research results and ideas about moving forward.

One of the three scientific symposia themes is on water resource issues. This topic is of high interest, given the critical role that this little triatomic molecule plays in everything from keeping our bodies at a near-constant temperature to nourishing nearly every living thing on this planet. Yet we know that access to drinkable water is increasingly threatened in many parts of the world. Sessions will include emerging research solutions in water science and technology. Water is also the special focus of this issue of *American Scientist*.

How we produce, consume, and store energy is another meeting track that features sessions on the effectiveness of new technologies to power the planet with far less environmental impact than our past practices. A Life and Health track will address how we will be affected and how we will respond. Interwoven into these three tracks are discussions of the political, economic, and societal issues that arise when seeking solutions to environmental challenges. Four additional tracks will focus on STEM professional development, science communication, research ethics, and Sigma Xi chapter development.

The Annual Meeting will conclude on Sunday, November 17, with the first-ever Sigma Xi STEM Art and Film Festival, which explores science through visual arts. The festival is free and open to the public, so come one and all.

I look forward to seeing you in Madison in November!



Geraldine Richmond

Geraldine Richmond

Seven Tracks to Explore at the Annual Meeting

Featuring a wide variety of session topics, the Sigma Xi Annual Meeting and Student Research Conference on November 14–17, 2019, in Madison, Wisconsin, is the place to be for professional and student researchers. The following is a partial list of sessions; see the full schedule at www.sigmaxi.org/amsrc19-schedule.

Our Changing Global Environment Symposia: Life and Health Track

"Challenges of Developing New Vaccines for Neglected Tropical Diseases" by Peter Hotez, Baylor College of Medicine

Our Changing Global Environment Symposia: Energy Track

"On the Road to Sustainable Production of Fuels and Chemicals from Biomass" by Tim Donohue, University of Wisconsin–Madison

Research Enterprise and Professional Development Track

"Transitioning from a Technical Mindset to a Technical Leader Mindset" by Dennis Hess, Georgia Institute of Technology

Our Changing Global Environment Symposia: Water Track

"Mapping the U.S. Food–Energy–Water Nexus at the Mesoscale" by Richard Rushforth, Northern Arizona University



Sigma Xi Chapter Development Track

"Money Doesn't Grow on Trees: Chapter Finances" by Sigma Xi staff and chapter leaders

Research Ethics Track

"Ethical Issues in Conducting Field Research" by Richard Miller, Texas A&M University–Kingsville

Science Communication, Education, and Public Engagement Track

"Principles of Slides-Based Talks" by Darcy Gentleman, DJG Communications, LLC

- Plenary sessions with the "father of the internet" Vint Cerf and National Medal of Science recipient May Berenbaum
- Student research presentations
- Professional headshots
- Business meeting for chapter delegates
- Sigma Xi STEM Art and Film Festival

Award Winners to Speak at the Annual Meeting



Walston Chubb Award for Innovation
Esther Takeuchi
Stony Brook University and Brookhaven National Laboratory
For innovative contributions to the science of batteries and the development of battery-powered implantable cardiac defibrillators



Young Investigator Award
Ariana Sutton-Grier
University of Maryland, College Park
For combining natural and social science to provide federal policy and decision support for coastal ecosystems and human communities facing multiple environmental threats



John P. McGovern Science and Society Award
Ashanti Johnson
Fort Valley State University
For activities that facilitate research and science-related professional development experiences for students representing diverse socioeconomic, cultural, gender, racial, and academic backgrounds



William Procter Prize for Scientific Achievement
Ben Santer
Lawrence Livermore National Laboratory
For leadership in the scientific community in regard to presenting evidence of human influence on global climate change and for efforts to share climate research with the public

Grants in Aid of Research Recipient Profile: Michael Donovan

Grant: \$1,000 in spring 2014

Education level at the time of the grant: PhD student

How the funds were used: Donovan visited the fossil plant collection at the Museo Paleontológico Egidio Feruglio in Trelew, Argentina, to collect data for his research project.

Project objective and results: Donovan's research team was testing a hypothesis that the Southern Hemisphere may have provided a refuge for life on Earth after an asteroid collision 66 million years ago that caused the last mass extinction. They examined fossilized leaves from Patagonia and the western United States dating from before and after the asteroid's collision to look for evidence of insect feeding. The team found the diversity of insect damage

on the Patagonia fossils returned to preextinction levels in 4 million years after the asteroid hit, while herbivorous insects in the western U.S. took 9 million years to do the same. Their results suggest that life on land in southern latitudes recovered much more quickly than in the western U.S.

How this project influenced him as a scientist: Donovan collaborated with international scientists and learned new analytical techniques. News media interviewed him after he published the research in *Nature Ecology and Evolution*, which helped him learn to communicate to a broader audience.

Where is he now? Donovan earned his PhD and works as the senior collections manager of paleobotany and paleoecology at the Cleveland Museum of Natural History.



Michael Donovan's Sigma Xi grant supported his trip to Argentina to collect data for his research project on fossilized leaves, which hold evidence of insect feeding after the last mass extinction. Here he is working in the fossil preparation laboratory at the Museo Paleontológico Egidio Feruglio. (Photo by Peter Wilf.)

Chesapeake Chapter Tradition Supports High School Students

When Jayce Turner receives his high school diploma next year, he will wear the Sigma Xi blue and white graduation cords around his neck, a sign of support from the world's largest scientific and engineering research honor society.

Sigma Xi's Chesapeake Chapter recognized Turner this year for his outstanding performance as a science student at The Highlands School in Bel Air, Maryland, which educates children with dyslexia, attention-deficit/hyperactivity disorder (ADHD), and other language-based learning



Jayce Turner receives a certificate of recognition as an outstanding science student from Sigma Xi Chesapeake Chapter President Michael Simini.

differences. The chapter has a tradition of inviting all high schools in Harford County to pick a science student for recognition during their junior year, which provides time for the students to

list the honor on their college applications. Fifteen schools participated this year. Each school receives a plaque to display with the names of their honored students, and the students receive a certificate of recognition and Sigma Xi graduation cords.

"The chapter hopes the honor encourages the students to continue their STEM (science, technology, engineering, and mathematics) education and become active members in the greater STEM community once they have graduated from college," said Michael DeZearn, chapter secretary.

Turner's learning differences include ADHD, anxiety, and a writing challenge called dysgraphia. As a young child, he loved nature and could name almost any butterfly species, said his mom, Cheryn Turner. He plans to study environmental science in college and then pursue a career in that field.

"Getting the recognition definitely means a lot to me," Turner said, "as it shows that a lot of the hard work I did in school paid off. I have always enjoyed science, so I am honored to be recognized by Sigma Xi."

Advice for Poster Presentations

Sigma Xi members in The Lab online community recently shared the following advice for students giving their first research poster presentation.

“The American Astronomical Society (AAS), of which I am a full member, has recently given the option for its members to present digital iPosters* instead of traditional posters at their conferences. You create a web-based template for an electronic poster that is displayed on large interactive touchscreens at the meetings. Visitors can enlarge images on screen and play accompanying videos. The iPosters can be downloaded by anyone who is interested.”

—Robert Elowitz, Beaver Creek, Ohio

“If you're asked a question and don't know the answer, slowly take a breath and think about the question. You can always say, 'Well I am not sure but I think...' This response has stimulated a lot of positive conversations and debates where I learned a lot.”

—Jennifer Carr,
Wenham, Massachusetts

“My advice to students giving presentations: Know your material and practice in front of friends and other students.”

—Robert Buntrock, Orono, Maine

“The most important function of conferences is to provide informal contact among the participants. The most important sessions are the coffee breaks, meals, and other social events. Next are the poster sessions, when you can have serious discussions with the few participants who are really interested in your work. Be present at your poster throughout the poster session. Be proactive: Buttonhole each passerby, and give them a two-minute 'elevator talk' highlighting your most important result and its significance. If the participant is really interested, continue with a more detailed conversation. If your lab can afford it, print the poster on cloth rather than poster board. This allows the poster to be folded without degradation and carried in your backpack.”

—Raymond Boxman, Tel-Aviv, Israel

***Editor's note:** Electronic posters will be an option for poster presenters at the 2019 Sigma Xi Annual Meeting and Student Research Conference, November 14–17, 2019, in Madison, Wisconsin.

Active Sigma Xi members can access The Lab for more conversations at community.sigmaxi.org.

“I have judged student poster competitions in my discipline society. It is not always made clear that a poster is not a consolation prize (to not giving a talk) and certainly not a regurgitation of a journal article, but rather it's a chance to graphically and succinctly express a *story* of your research. Type should be large enough to read comfortably from a meter or two away and text should be minimized to emphasize/underline points. White space is valuable to the esthetic and approachability. For viewers who want to be reminded of what you said, provide a link to a PDF or a page-sized printout of the poster along with your card or contact information so someone passing by can contact you for more details if you are not there at the time.”

—Gail Kampmeier, Savoy, Illinois