

Sigma Xi Today

A NEWSLETTER OF SIGMA XI, THE SCIENTIFIC RESEARCH HONOR SOCIETY

Chapter Award Winners Announced

Sigma Xi's Committee on Qualifications and Membership selected the following chapters for awards based on fiscal year 2018 chapter annual reports and evaluations from regional and constituency directors.

Chapter of Excellence awards are given to chapters that have demonstrated exceptional innovation and quality in their overall annual programming.

First place: National Institute of Standards and Technology

Second place: Columbia–Willamette

Third place: Rice University–Texas Medical Center and Oakland University (tie)

Chapter Program of Excellence awards are given to chapters that have conducted a singularly exceptional program during 2017.

First place: University of Nebraska at Kearney for the Great American Solar Eclipse Panel Discussion

Second place: North Shore for the marine/oceanography cruise and sampling workshop on Sea Shuttle's Endeavour

Third place: Ohio State University for the Meet a Scientist program

The committee recognized the following chapters for **initiating the most new members** in 2017 (in descending order): Brown University, Fordham University, Princeton, Union College, Carleton College, Washington University, Swarthmore College, Oberlin College, Southern Maine, Delta, Denison University, Smith College, Williams College, Worcester Polytechnic Institute, and Amherst College.

From the President

Politicization of Science



Stuart L. Cooper

Political science is a respected field of study that can yield benefits to our understanding of how the political process works, but politicization of science is dangerous to our society. I did not think I would need to speak out on this topic, but developments in Washington, DC, have created an imperative for Sigma Xi to explicitly state its support for rational decision-making by our government. The engineers and scientists in private and public entities who carry out research on issues such as atmospheric chemistry, climate, and health effects, for example, reach their findings based on data. Other scientists and engineers can challenge such research which can be refined

or refuted if necessary, but ultimately there is a need to reach consensus about causation, which should inform what policy evolution and legislation is needed to keep society safe and healthy.

We better understand environmental health issues now, and we as a nation should use that hard-won scientific research to protect ourselves and our children from future debilitating illnesses. For example, we now agree that smoking is a health hazard—there is a consensus on that. While not quite as dramatic as smoking, particulates in the atmosphere create related health issues and shorten life spans. Perfluorocarbon water pollution and hazardous chemicals leaching from mine waste are issues in West Virginia, for example. When needed, regulatory actions in Congress—based on the research findings of scientists in organizations such as the Environmental Protection Agency—can significantly protect society. The last thing we need is to degrade the capability of such organizations, especially by stifling ongoing research and installing new leadership that is at cross-purposes to agency missions of societal protection.

The breakdown today in the linkage between meticulous research-supported conclusions and governmental actions should activate Sigma Xi members to call attention to this serious situation. Local chapters, in their Science Café activities and other outreach with the public, could invite speakers to talk about issues such as climate change, the carbon cycle, water and air pollution, energy production options, and other timely topics. Sigma Xi members are exemplary researchers guided by ethical considerations, integrity, and the search for truth. We need to stand up for those principles in light of what is rapidly becoming a great concern of how business is done in Washington. Look for Sigma Xi leadership to speak out via position papers and statements that address some of the issues I have raised in this letter.

Stuart L. Cooper

Chapter Grant Applications Are Due March 1

Sigma Xi chapters are resources in their communities for promoting and supporting science and engineering research—a task for which the Society provides support. Applications for the following funding opportunities are due on March 1.

Science, Math, and Engineering Education (SMEE) Grant

Amount: \$2,000

How the funds may be used: To provide one-time seed money to help a chapter initiate innovative programs related to science, math, and engineering education

Application tip: Matching support from other resources greatly enhances a chapter's chance of receiving a SMEE grant.

Diversity Grant

Amount: Up to \$1,000

How the funds may be used: To provide one-time seed money for innovative diversity programs that help promote STEM to underrepresented groups in regard to gender, race, ethnicity, mental or physical disability, socioeconomic status, age, religious affiliation, cultural background, national origin, or sexual orientation.

Application tip: Plan to help underrepresented groups achieve sustained involvement in STEM.

Distinguished Lecturer Subsidy

Amount: Varies

How the funds may be used: To subsidize a presentation from a Sigma Xi Distinguished Lecturer

Application tip: Coordinate the visit with nearby chapters to share travel costs.

Multi-Chapter Grant

Amount: Up to \$2,000 for two-year collaborations

How the funds may be used: To support a range of collaborations among Sigma Xi chapters, such as those that develop the science and engineering workforce or promote ethical research practices. Collaborations may be virtual or in person.

Application tip: Incorporate sustainability measures so the collaboration will continue beyond the two years of the grant.

Chapter officers can get more information in the Officer Resource Center at www.sigmaxi.org or by emailing chapters@sigmaxi.org.

Students Research Grant Applications Are Due March 15

Beginning December 15, undergraduate and graduate students in the sciences or engineering can apply for funding of up to \$1,000 each from Sigma Xi's Grants-in-Aid of Research (GIAR) program. Submit the online application at www.sigmaxi.org/programs/grants-in-aid/apply by March 15. The website also has tips for submitting a successful grant application.

Designated funds from the National Academy of Sciences support GIAR and allow for grants of up to \$5,000 for astronomy research projects and up to \$2,500 for vision-related projects.

Students may use the grants to pay for travel expenses to or from a research site or to purchase non-standard laboratory equipment and supplies needed for a specific project.



Students who apply in this cycle should know by mid-May if they will receive funding. In the March 2017 grant cycle, 150 students from seven countries received grants totaling \$120,354.

Support Student Researchers

The Grants-in-Aid of Research program will reach its centennial year in 2022, thanks to donors and funds from the National Academy of Sciences.

If you would like to support student research, donate to the program at www.sigmaxi.org/support-giar

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

Sigma Xi Hosts Symposium on Climate and Student Research Conference

The climate is changing, but how are those changes affecting people's health and the environment? Sigma Xi invited its members and the public to the Symposium on Atmospheric Chemistry, Climate, and Health on November 10 at the Raleigh Convention Center in Raleigh, North Carolina, to learn about this topic.

Five researchers discussed previous policies that led to climate successes, potential paths forward to address climate change today, the impact of society's current energy decisions on generations to come, the controversies surrounding air pollution and health, and environmental determinants of pathogens. The symposium included two public events: a town hall session where attendees asked a panel questions related to climate change, and a screening and scientific critique of the documentary *An Inconvenient Sequel: Truth to Power*.

Sigma Xi President Stuart Cooper proposed the idea of this symposium in part because solving issues related to climate change will draw on multiple research disciplines, which aligns with the Society's multidisciplinary membership.

"As a chemical engineer and researcher," he said, "I could see the relevance of this theme to a broad swath of our membership and to society at large."

The climate change theme continued the next day with the Student Research

Conference. Local meteorologist for WRAL and Sigma Xi member Greg Fishel delivered the keynote address, discussing how he came to understand the science behind climate change.

Approximately 135 high school, undergraduate, and graduate students representing 56 institutions from 19 states plus Washington, DC, attended. Students competed for poster presentation awards, and 26 students were named as top presenters. These winners received a \$150 cash prize and a medal. Additionally, top presenters who were not already Sigma Xi members were inducted into the Society with their first year of membership dues waived. Fifteen top presenters were already Sigma Xi members and received an extended year of membership dues. All other primary presenters received nominations for associate membership in the Society.

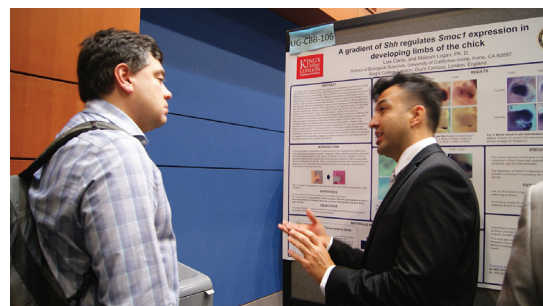
The District of Columbia Chapter sponsored the Student Choice Awards, which were given to three presenters voted by their peers as having the top presentations. The conference also included sessions on best practices to communicate science, how scientists can prepare to talk with policymakers, how to use social media to promote science, and how high school students can take steps toward publishing their research.

Save the Date:

**Sigma Xi Annual Meeting and Student Research Conference
October 25–28, 2018 • Hyatt Regency • Burlingame, California**



University of North Carolina at Chapel Hill undergraduate students, from left, Kasey Norton, Maebelle Mathew, and Cherrel Manley presented posters in the human behavioral and social sciences category during the Student Research Conference.

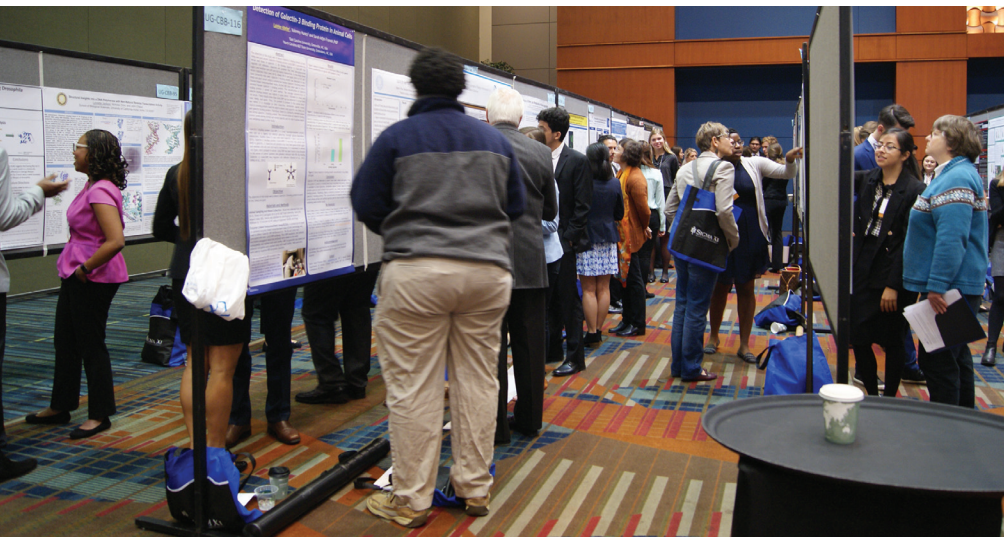


Luis Cantu, on right, an undergraduate student from University of California, Irvine, presents his research in the cell biology and biochemistry category to judge and Sigma Xi member Michael Wolyniak, an associate professor of biology and director of undergraduate research at Hampden-Sydney College.



Speakers for the Symposium on Atmospheric Chemistry, Climate, and Health included, from left, A. R. Ravishankara of Colorado State University; Barbara Finlayson-Pitts of University of California, Irvine; Jeffrey Shaman of Columbia University; and C. Arden Pope III of Brigham Young University.

At left: Students presented their research posters to judges and each other during the Student Research Conference.



Students Hone Science Communication Skills in Online Competition

Many different diseases, such as dengue and malaria, have similar fever symptoms. Sigma Xi member Xiangkun (Elvis) Cao, a graduate student at Cornell University, is part of a team that is developing FeverPhone: a device that would work with a smartphone to help physicians distinguish and diagnose six fever-causing infections.

He presented his work at the 2017 Sigma Xi Student Research Showcase, an online science communication competition, and won first place in the graduate division. He received \$500 and, like all presenters, feedback on his presentation from professional researchers.

High school, undergraduate, and graduate science and engineering students can sign up for the 2018 Student Research Showcase through February 26. Sigma Xi members, affiliates, and explorers receive a registration discount. Projects must be submitted by March 26; judges will review the projects April 16–30.

Sigma Xi asked Cao for his advice for the 2018 showcase hopefuls.

What is your advice for students who will compete in the 2018 showcase?

Don't be shy, because if you never register, you can never win. When I was registering for this, I didn't think I would win, but this was a huge opportunity for me. I just registered and submitted what I had, and suddenly they told me I was the winner for the graduate division. This actually opens a lot of opportunities for me. After this competition, I went to some other conferences using similar stuff. I think this was a huge motivation for me to reach out to other possibilities. I recommend people do this and at least give it a shot because you never know what will happen.

What do you think helped your presentation stand out to the judges?

The most helpful advice is to be concise and to the point. I recommend



Xiangkun (Elvis) Cao, a PhD student at Cornell University, was the graduate division winner at Sigma Xi's 2017 Student Research Showcase.

students look at another competition called Three Minute Thesis (3MT), for which you have to condense what you do in a whole PhD into three minutes, which is similar to what the Student Research Showcase is about. Also, don't use any technical items (in the video); make it more reachable to a general audience.

Learn more about the Student Research Showcase at www.sigmaxi.org/student-research-showcase.

Sigma Xi Members Win Nobel Prizes

The 2017 Nobel Prize laureates include two members.

Sigma Xi member **Kip S. Thorne** of the California Institute of Technology shares the 2017 Nobel Prize in Physics with Barry C. Barish, from the same institution, and Rainer Weiss from Massachusetts Institute of Technology. All three were part of the collaboration between the two Laser Interferometer Gravitational-Wave Observatory (LIGO) detectors in the US and the Virgo detector near Pisa, Italy. The trio earned the prize for "decisive contributions to the LIGO detector and the observation of gravitational waves." In an interview with Adam Smith, chief scientific officer of Nobel Media, Thorne called the prize a remarkable team effort.

"We live in an era where some huge discoveries are really the result of giant collaborations, with major contributions coming from very large numbers of people," Thorne said. "I hope that in the future the Nobel Prize committee finds a way to award the prize to the large collabora-

tions that make this, and not just to the people who may have been seminal to the beginning of the project, as we were."

Member **Jeffrey C. Hall** of the University of Maine shares the 2017 Nobel Prize in Physiology or Medicine with Michael Rosbash of Brandeis University and Howard Hughes Medical Institute as well as Michael W. Young of Rockefeller University. They earned the prize for their "discoveries of molecular mechanisms controlling the circadian rhythm."

In his Nobel interview, Hall said fruit flies should be the fourth awardee of the prize because he used them in his research.

"It's just one of a zillion examples of how basic research on a supposedly irrelevant organism can have broader significance, with regard to what's going on in terms of that organism itself," Hall said.