

Sigma Xi Today

A NEWSLETTER OF SIGMA XI, THE SCIENTIFIC RESEARCH HONOR SOCIETY

Judges Needed in Pittsburgh

The world's largest international precollege science competition is coming to Pittsburgh, Pennsylvania, and Sigma Xi is looking for nonstudent members in the area to volunteer as judges.

Sigma Xi judges will be at the Intel International Science and Engineering Fair (ISEF) May 15–16, 2018, to select the life science and physical science projects that best demonstrate teamwork. These winning projects will receive a total of \$6,000 as Special Awards in Team Science. The awards are based on teamwork to reflect Sigma Xi's purpose as a Society that brings together scientists and engineers from all disciplines and fosters collaborations.

Approximately 1,800 high school students from more than 75 countries, regions, and territories earn the opportunity to compete at Intel ISEF after being named a top presenter at local science fairs and then a state or regional fair. To volunteer as a Sigma Xi judge, visit www.sigmaxi.org/volunteer.

Symposium on Interdisciplinary Research in California

Sigma Xi will organize a symposium about the practice, ethics, and communication of interdisciplinary research during the American Association for the Advancement of Science–Pacific Division's Annual Meeting, June 12–15, 2018, at California State Polytechnic University in Pomona, California. For more information, please send an email to meetings@sigmaxi.org.

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

From the President

Sigma Xi's Lifeline

A lifeline, as defined by the *Collins English Dictionary*, is "something that enables an organization or group to survive or to continue...." For Sigma Xi, the lifeline is retaining existing members and inducting new ones, creating a process of continuous renewal.

For my last editorial commentary in *American Scientist* as Sigma Xi president, I want to reflect on my experience upon election to the Sigma Xi board of directors and what I see as a profound challenge to the vitality of our organization. Years ago, when I was an undergraduate researcher at Massachusetts Institute of Technology, my advisor nominated me to membership in Sigma Xi. It was a big deal to me, and I proudly included the honor on my curriculum vitae as I applied to graduate schools and when I interviewed for faculty positions four or so years later. At the time, the traditions of Sigma Xi were strong, it was an organization that had been around for almost a century, it had scores of Nobel Prize winners who were inducted into the organization at the start of their careers, and its credo was that research in science and technology was valuable and important to society. So what has transpired after the many years of my scientific lifetime?

Sigma Xi is still a voice for honoring accomplishments and potential in science and engineering but, compared to a generation ago, research advisors and mentors are not as active in nominating their students for membership in our Society.

I call on our members to double their efforts to identify and nominate promising young researchers for the honor of being elected to Sigma Xi. Members should promote the value of membership, especially in what appears to be a struggle to maintain research-based decision making in areas that are vital to our future. Think of areas such as food safety, water and air quality, and a host of other environmental issues for which ongoing research should support policies that affect us all.

Sigma Xi members are part of the enterprise that carries out such research, and our Society, along with like-minded organizations, is a significant voice in resisting the politicization of science. Indeed, making light of using informed research to develop public policy is close to an existential threat to our well-being. Yet our Society's voice will not be as strong as it could be unless we have a robust and active membership. I encourage all of our members to identify, nominate, and elect our next generation of researchers for membership in Sigma Xi.



Stuart L. Cooper

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Supporting Women in STEM

For Women's History Month in March, Sigma Xi spotlighted its support for women in science, technology, engineering, and math. Three members shared the advice, lessons, and people that helped them build their careers.

Sudharshana Apte



Research scientist at Altria Client Services; president-elect of the Forum for Women in Operations Research and Management Services

On mentors: I have a broad set of individuals (both men and women) as my mentors: my professors, colleagues (both peers and superiors), and people in my field that I have met at conferences. By not limiting myself to one mentor, I have been able to get diverse perspectives to address any questions or concerns that I may have.

The advice that made a difference: Stay authentic and courageous. Do not underestimate the power of networking when you are looking to build your career: Be deliberate and strategic.

Jennifer Patterson



Chief scientific officer of the biomedical start-up BIOFABICS

On mentors: Many mentors have been important to me, including my graduate and postdoctoral advisors who have always been responsive when I reached out to them for career advice or for a reference letter.

The advice that made a difference: Be resilient. Careers in research are tough. Experiments often don't work, leading to unexpected results or requiring additional troubleshooting. The career path can be daunting, with many positions and research funding being highly competitive. Learning how to move forward from setbacks and staying positive are essential.

Maria Cruz-Torres



Senior sustainability scientist and associate professor at Arizona State University

On mentors: Mentoring has been key to my academic career because I am the first one in my family to attend college and earn a PhD. I have had two very important mentors: a professor who taught me how to conduct research and encouraged me to pursue graduate studies, and my doctoral advisor. Both people taught me how to be persistent, to never give up, and not let anyone else define me.

The advice that made a difference: Be passionate about what you do even if others do not understand what you are doing or why.

Annual Meeting to Focus on Big Data

Because of advances in technology, data can be collected and aggregated at an ever-increasing pace, but the resulting data load can be too large to handle by standard methods.

The Sigma Xi 2018 Annual Meeting and Student Research Conference will explore big data—the concept of too much data to handle in a traditional way—and how it will affect the future of research. We will address the challenges, opportunities, and ethics of big data and how researchers can work with machines to pinpoint the most important pieces.

The meeting will feature three symposia:

- Big Data in Biology and Medicine
- Big Data in Physics and Astronomy
- Big Data in Energy, Climate, and the Environment

The symposia will follow Sigma Xi's Assembly of Delegates, where representatives from the Society's chapters will gather for meetings about Society business. After the symposia is the Student Research Conference, where graduate, undergraduate, and high school students will compete for research poster presentation awards, network, and attend sessions about critical issues in research. Members are encouraged to volunteer as judges for the Student Research Conference.

Register today at www.sigmaxi.org/amsrc and save 20 percent with early-bird rates.

2018 Sigma Xi Annual Meeting and Student Research Conference

Big Data and the Future of Research

October 25–28, 2018

Hyatt Regency San Francisco Airport, California

Connecting Research and the Public

Sigma Xi Affiliate Circle member Todd Boyette is director of the Morehead Planetarium and Science Center in Chapel Hill, North Carolina.

How did you learn about the Sigma Xi Affiliate Circle?

Richard Watkins, University of North Carolina at Chapel Hill Sigma Xi Chapter president and Sigma Xi board member, contacted me about it and asked if he could nominate me for membership.

Why were you interested in joining?

Sigma Xi is a well-respected organization that I have worked with in the past. This was an opportunity to align myself, formally, to an organization that does good work.

What is the biggest benefit of being part of the Affiliate Circle?

I spend a lot of time encouraging greater engagement between the re-



Todd Boyette

search community and the general public. Being a part of the Affiliate Circle provides another avenue to encourage this engagement.

How are you involved with the local Sigma Xi Chapter at the University of North Carolina at Chapel Hill?

They partner with us on our monthly speaker series, the Carolina Science Café. We also work with many indi-

vidual members on communicating their work to general audiences.

What would you like the Sigma Xi community to know about the Morehead Planetarium and Science Center?

Morehead is dedicated to leveraging the unique resources of the University of North Carolina at Chapel Hill to enhance the public's understanding of science, technology, and health. We can't do this without working with scientists. My staff and I are always looking for new and innovative partnerships with researchers to tell their stories in engaging ways.

The Sigma Xi Affiliate Circle is open to all individuals who value scientific research. Chapters are encouraged to invite science and engineering students and the public to the Affiliate Circle. Learn more at www.sigmaxi.org/affiliate.

Researching the Lives of Slaves



Howard University doctoral candidate Carter Clinton received a grant from Sigma Xi to investigate the African Burial Ground in New York City.

In the 1690s through the 1790s, more than 15,000 free and enslaved Africans found their final resting place at a burial ground in what is today lower Manhattan. Their graves, and lives, were forgotten until 1991, when the cemetery was rediscovered. In 2006 President George W. Bush designated the site as the African Burial Ground National Monument, obligating federal agencies to preserve the site's scientific value to gain a better understanding and "honor

the culture and vital contributions of generations of Africans and Americans of African descent" to the United States.

Sigma Xi member and Howard University doctoral candidate Carter Clinton is investigating the university's collection of 59 cadaver-associated grave soil samples, each from a different burial. His project has three sections: bacterial DNA analysis and elemental analysis of soil samples as well as geospatial analysis.

"The combination of these analyses gives us a snapshot into the lives of this historic population—their diets, cultural practices, possible causes of death, and a look at their surrounding environment," Clinton said. "I'm hoping to learn more about these early African Americans and the underdocumented presence of enslavement in post-colonial New York."

Sigma Xi's Grants-in-Aid of Research program provided Clinton with the first grant of his research career to support this project. He used the \$1,000 award to buy DNA kits to ex-

tract bacterial DNA from each burial sample to help identify human-associated microbiome bacteria, along with the possible disease pathogens that may have been responsible for deaths in this historic community.

"[Receiving this grant] means there is an organization out there who took the time to consider my ideas and not only found them interesting but valuable enough to fund in order for these ideas to become a concrete project," Clinton said.

Clinton presented this research at Sigma Xi's 2017 Student Research Conference in Raleigh, North Carolina. He was named the Graduate Division's top presenter in anthropology.

The project's principal investigator, Fatimah Jackson of Howard University, is also a Sigma Xi member and past Sigma Xi grant recipient.

"I believe that Sigma Xi's support for Carter is an essential and major boost for his research career," she said. "Carter has the background, personality, and tenacity to successfully take on and complete this research."

Sigma Xi's Pathway to the Future

Sigma Xi is conducting a tour across the United States to share the plan for the Society's future. The following are excerpts from Executive Director and CEO Jamie L. Vernon's remarks at the tour stop during the American Association for the Advancement of Science (AAAS) Annual Meeting in Austin, Texas, on February 17, 2018.

"Science serves everyone, and everyone has a right to the benefits of science."

I don't have to tell you that these are interesting times for science. ... At the federal level, these challenges include the politicization of research funding, the removal of qualified scientific advisors, plus unprecedented restrictions on the use and dissemination of science at federal agencies, and the rejection of evidence in policy making. ...

We must ask ourselves, what is the role for organizations like Sigma Xi under these circumstances? ... It's important that we use global, multidisciplinary organizations like Sigma Xi and AAAS to deliver a message to those who can fix this problem of politicization. That message is that science serves everyone, and everyone has a right to the benefits of science. ...

Scientists and engineers fear that public trust in science is wavering, science is becoming less valued by our leadership, the desire to understand the mysteries of the universe will be diminished, and society will ultimately suffer due to this drift away from science. ...

"The pathway to the future for Sigma Xi is to work toward the goal of restoring and preserving trust in science." — Jamie L. Vernon

Sigma Xi will stay true to its historical role of recognizing and promoting excellence in the scientific enterprise. The definition of excellence will be broadened to include not only integrity but also inclusivity and accessibility. ...

"It's time for Sigma Xi to shape the future through new initiatives focused on integrity, inclusivity, and accessibility."

Integrity: Sigma Xi will continue to recognize researchers based on their demonstrated commitment to ethical research. ...

Inclusivity: Sigma Xi has established a Diversity Task Force to study the diversity climate within the Society and to make recommendations that improve Society experiences for all members. ...

Accessibility: Sigma Xi is committed to making science accessible to all. As part of its mission, Sigma Xi promotes the public understanding of science through the publication of *American Scientist* magazine and through communication workshops for its members. We recently began offering services to researchers to help them more effectively share their work with the public through digital and print channels. Sigma Xi also organizes the annual Student Research Showcase to help students develop effective communication skills. ...

I hope you will join with Sigma Xi in creating the future we need through science and engineering.

Next Tour Stop

**Sigma Xi's Annual Meeting and Student Research Conference
Hyatt Regency San Francisco
Airport, California
October 25–28, 2018**

Chapter Spotlight: Prairie View A&M University

Yolander Youngblood, president of the recently revitalized Prairie View A&M University Sigma Xi Chapter, shares news about the chapter's research symposium, how the chapter helps to improve diversity in research, and how Sigma Xi can improve diversity within its membership. Prairie View A&M University is a historically black university in Prairie View, Texas. Youngblood is an assistant professor in the Biology Department.

What does the Prairie View A&M University Chapter do to promote and improve diversity in research?

Sigma Xi's outreach is key to promoting diversity. Partnerships promote diversity better than anything else. By partnering with institutions and departments that have a commitment to diversity, all benefit. It is especially important to



The Prairie View A&M University Sigma Xi Chapter and the university's Biology Department hosted a Scientific Research Symposium in November 2017.

partner with minority institutions.

Our chapter first partnered with departments who sponsor symposia. This is a way to promote excellence and to locally promote the chapter. For our chapter's local event, the university's associate vice president of research as

well as the top undergraduate student researchers from chemistry, physics, and biology were present. Other larger schools looking to recruit these students for graduate school were also present.

What suggestions does the chapter leadership have for how the Society can improve diversity within its membership and within the scientific research community in general?

I like that the Sigma Xi president is making regional visits (see article above). I would continue that and make sure that historically black colleges and universities as well as other minority institutions are included on the stops. I would also make calls to the research vice presidents of minority institutions to encourage them to revitalize their chapters.