

Sigma Xi Today

A NEWSLETTER OF SIGMA XI, THE SCIENTIFIC RESEARCH HONOR SOCIETY

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2. Click on your name in the top-right corner, and select “My Sigma Xi” from the drop-down menu.
3. Under the Self Service section on the My Sigma Xi page, select “Update Profile Information.”
4. Update your email address, phone number, chapter affiliation, and more. Please provide a nonwork and nonschool email address. Scroll to the bottom of the page, and click the “Submit” button.
5. Return to the My Sigma Xi page, and select “Manage Addresses” to edit or change your mailing address.

Providing your current information ensures you receive *American Scientist* and the Sigma Xi Newsletter, which are benefits included for active members, affiliates, and explorers. Active members also have access to Sigma Xi’s online member community, The Lab: Members to Members.

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From the President

Art and Science: Achieving More Together

As I write this first letter as president of Sigma Xi, we are amid stay-at-home orders in response to the COVID-19 pandemic. I hope you and your families are safe. As this issue of *American Scientist* goes to press, Sigma Xi has just announced that the November 2020 Annual Meeting will be held virtually. I hope you will fully participate in this new format.

I chose the theme for our 2020 Annual Meeting, *Hacking the Brain: The Intersection of Art and Neuroscience*, due to my love of art, music, and dance, as well as connections to my own research. My interest began when I learned about the work of 17th century naturalist and scientific illustrator Maria Sibylla Merian while volunteering as a docent at the National Museum of Women in the Arts (NMWA). Merian decided to leave her home in Amsterdam and set sail for Suriname. While there, she studied the plant and insect life of the area and published a book on the subject. Merian used her artisanship to help others visualize her research; she made the copper plate engravings for the book’s illustrations, which are on display at NMWA.

There are clearly many more discoveries to be found at the intersection of art and science. For example, there is a rich body of research investigating the influence of music and sound on the brain. The *whispering gallery effect* is an architectural phenomenon that takes advantage of the concave curvature of walls within a space to enhance sound transmission. If one whispers into a section of the wall, someone else standing hundreds of feet away can hear the whisper as clearly as if spoken directly to them. Hearing research by Richard Chadwick at the U.S. National Institute on Deafness and Other Communication Disorders demonstrates that the cochlea improves upon the *whispering gallery effect* by focusing wave energy at its apex, where low frequencies are processed. The lower frequency sound waves (the whisperers) use this architectural effect of the spiral cochlear wall to transmit their signals to the brain.

Replicating the fluidity of human movement presents a significant challenge in robotics. Forward-thinking programs in the area of design and robotics have collaborated with dancers and choreographers to address this problem. The Robotics, Automation, and Dance (RAD) Laboratory at the University of Illinois at Urbana-Champaign applies the agility of dance to robotics. The RAD lab has developed control algorithms for expressive robotic systems to improve robot performance in non-rote tasks.

More interdisciplinary discoveries are outlined in the articles in this issue of *American Scientist*. I look forward to serving you as president of Sigma Xi.



Sonya Smith

Sonya T. Smith

The Sigma Xi Community Responds to COVID-19

Members, chapters, and staff continued their support for research and the public understanding of science during the pandemic. Here are a few examples.

Preparedness Kit and Science Expert Interviews

The Society has published a list of resources online for members to use and share. These resources focus on helping people adjust to lifestyle changes and finding evidence-based information during the COVID-19 pandemic. The kit includes a series of videos in which scientists answer questions about COVID-19, such as whether pets can get the virus and if it is safe to order takeout. Sigma Xi produced the videos in partnership with science communicator Brian Malow. <https://www.sigmaxi.org/covid-19>

Virtual Events for Student Research Presentations

Because of canceled campus events and conferences, students had fewer opportunities to present their research this spring. In response, Sigma Xi reopened its abstract submission period for the online Student Research Showcase, which then had 200 high school through graduate students give online presentations comprised of an abstract, slideshow, and video. The Society also hosted a new event, the Virtual Student Scholars Symposium (VS³), which had 132 students virtually present their research in poster or oral format. Members served on the organizing committee or volunteered as judges, and Sigma Xi president (Fiscal Year 2020) and National Medal of Science recipient Geraldine Richmond presented the keynote session.

Promoting the Public's Understanding of COVID-19

The Sigma Xi community made its support for science communication clear on Giving Tuesday Now, held on May 5, by raising \$10,267! The total exceeded our \$10,000 goal. The money will go toward providing science-based messages to the public about COVID-19, by creating an awards fund for Sigma Xi's new



The Fairfield University Sigma Xi Chapter sponsored a group of virtual student research presentations over Zoom as part of the university's Innovative Research Symposium. Sigma Xi member Michael Andreychik interviewed a student, Emma Antoine-Portinari, about her research presentation during the symposium.

platform, #SciCommMake. Together with Science Talk, a nonprofit for science communicators, Sigma Xi is hosting #SciCommMake with the goal of gathering teams of scientists and artists that create innovative science communications projects. The Giving Tuesday Now donations went to a special session of #SciCommMake to create COVID-19 communications projects that will help thousands of people worldwide prepare for the next wave of challenges. Thank you to all the donors!

Chapters Shift to Virtual Events

The Fairfield University Chapter hosted 57 student research presentations in 11 faculty-moderated Zoom sessions as part of the university's Innovative Research Symposium. During the symposium, the chapter's Zoom sessions were visited 400 times. The chapter also held its spring induction ceremony virtually and inducted 17 new members. The

Fordham University Chapter also held a virtual induction ceremony for approximately 70 new members.

Virginia Tech Chapter Promotes the Society Virtually

The Virginia Tech Chapter hosted a virtual table at the university's Spring Undergraduate Research Conference to promote the chapter's presence on campus and to recognize qualified students with nominations for membership. The chapter nominated 19 students for associate membership from the event. The chapter also invited six high school students to join the Sigma Xi Explorers program for K-12 students and continued to support Science on Tap-New River Valley, which continued their science talks online.

Students Get Relief Funds

Rebecca Jones, president of the George Mason University Chapter, led efforts to secure rapid, emergency financial

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Sigma Xi Chapters Awarded Grants to Develop Diversity and Educational Programs

Three Sigma Xi chapters have received grants to carry out the Society's mission to enhance the health of the research sector in their local communities. The grants are provided by Sigma Xi's international headquarters. The chapters were selected by the Committee on Qualifications and Membership.

Diversity Grants

Diversity Grants provide up to \$1,000 in seed money for chapters to create innovative programs that encourage participation by individuals from underrepresented groups in science and engineering. Diversity may reflect gender, race, ethnicity, mental or physical disability, and/or socioeconomic status.

The **University of Alabama at Birmingham Chapter** will receive \$985.90 to partner with the university's Science, Technology, Engineering, and Mathematics Outreach (STEMO) Club to help students of color learn about STEM. The club partners with a summer camp for girls and is expanding its work to local schools to provide students with hands-on activities, education in the scientific method, and exposure to, and mentorship from, people in STEM fields. The grant will help the chapter purchase activity supplies and recruit more diverse undergraduate student outreach volunteers with a Meet and Greet luncheon. Volunteers' work and stories will be featured on Instagram. Lastly, the chapter will livestream their lectures to STEMO students, including three speakers from underrepresented backgrounds, and feature the speakers on Instagram.

The **Rockford University Chapter** will receive \$1,000 to pilot a project in partnership with the Jane Addams Center for Civic Engagement. The project aims to build literacy and STEM skills for students at Lewis Lemon Elementary School in Rockford, Illinois. Last year, 88 percent of the school's students were low-income. Fifteen students will



Samiksha Raut is the Fiscal Year 2020 president of the University of Alabama at Birmingham Chapter, which has received a Diversity Grant to help students of color learn about science, technology, engineering, and math.

participate and alternate weeks in book clubs and STEM workshops facilitated by university faculty, students, and Sigma Xi members, with occasional visits from speakers. Participants will also build a community vegetable garden for the school. The grant will cover the cost of books, STEM supplies, and gardening tools. Program goals include introducing students to people from the university to help them consider higher education in their future.

Science, Math, and Engineering Education (SMEE) Grant

SMEE Grants provide up to \$2,000 for chapters to fund innovative educational programs.

The **University of Delaware (UD) Chapter** will receive \$2,000 to create a program called Learning with All Your Senses. Funding will be used to offer a two-day workshop for STEM teachers from eight Delaware high schools, with the aim of developing curricular materials for use in their classrooms. The project will bring

together UD community members such as faculty, staff, students, and high school teacher-partners to work on three goals: developing interdisciplinary collaborative teams in schools; better serving students by integrating knowledge across subject matters and helping build connections to complex problems of the world; and developing learning environments that engage students from historically underrepresented groups.

How Chapters Get Grants

Sigma Xi chapters may apply for grants by March 1 each year. Learn more at <https://www.sigmaxi.org/chapter-grants>.

New Sigma Xi Leaders

Sigma Xi greets a new president, directors, and associate directors on July 1 with the start of Fiscal Year 2021. See who is taking office at <https://www.sigmaxi.org/2019-election-results>.



PhD student Dawn Crawford received funding from Sigma Xi's Grants in Aid of Research program to travel to Guatemala for her fieldwork.

Grants in Aid of Research Recipient Profile: Dawn Crawford

Grant: \$500 in Spring 2015

Education level at the time of the grant: PhD student

Project description: I used the grant to support my travel to Holtun, located in the Petén district of Guatemala, where I excavated three structures in a household group as part of a pilot study related to my PhD dissertation. The project focused on a middle-class Maya household and how they responded to the economic challenges related to the Classic Maya collapse. Often the Classic Maya collapse is discussed as a period of instability and failure for the Maya as their political and economic systems fell apart, but my research instead focused on how the

average person survived the collapse and was resilient in the face of such major changes.

It appears that individuals living in this household group continued to import obsidian and make pottery for daily activities during the abandonment of larger cities in the region. This is significant because it shows that all members of Maya society, regardless of wealth and status, had an active role in their economic decisions during this period of instability.

How the project influenced you as a scientist: This project facilitated the beginning of my dissertation data collection. It gave me the chance to set up connections and network for my larger dissertation project in

Guatemala. It also allowed me to work with newer scientific techniques, like portable x-ray fluorescence, and develop skills useful for future research.

Where are you now? I am completing my dissertation and will graduate with my PhD in the fall of 2020 from Southern Methodist University. Because of this grant and a National Geographic Young Explorer grant, I was able to complete a pilot study that also led to additional funding, including a Doctoral Dissertation Improvement Grant from the National Science Foundation.

I am currently working as part-time faculty, teaching archaeology to undergraduates while I finish writing my dissertation.

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support for the university's students from the FAST Fund, administered by the nonprofit Believe in Students. The fund gave Jones \$5,000 that was used to provide 27 university students in need with emergency financial support, such as funds for paying bills or

rent, buying groceries, and covering moving expenses to leave campus.

Chapters Share Science Online

Many Sigma Xi chapters host talks by researchers, who share their work with the public. Two chapters that took

talks virtual were the Research Triangle Park Chapter and the University of North Carolina at Chapel Hill Chapter. Speaker topics included the genetic underpinnings of anorexia, the health effects of e-cigarettes and vaping, and living well during pandemic times.