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Sigma Xi Today

A NEWSLETTER OF SIGMA XI, THE SCIENTIFIC RESEARCH SOCIETY

Stay in Touch with the Society

Are you a Sigma Xi member who recently moved, graduated, or changed jobs? If Sigma Xi doesn't have your up-to-date contact information, you are not getting the most from your membership. Luckily, updating your profile information is quick and easy if you follow these steps.

1. Go to www.sigmaxi.org and click "Login" in the top-right corner. If you haven't created a password, click "Forgot Your Password"on the next screen. Then enter the email address that Sigma Xi currently has on file for you and follow the steps to create a password.
2. Once logged in, click on your name in the top-right corner. Select "My Sigma Xi" from the drop-down menu.
3. On the My Sigma Xi page, under the Self-Service section, select "Update Profile Information."
4. Update your address, phone number, and email address. The Society prefers a nonwork and nonschool email address.

Benefits of updating your profile

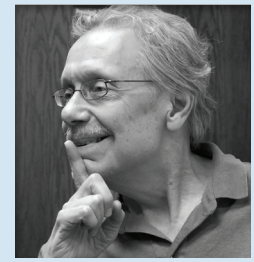
Updated member profiles strengthen the value of the Sigma Xi network. Additionally, if you're an active member, a current mailing address ensures you receive *American Scientist*. A print subscription is included in the cost of annual dues or life membership, unless you opt into receiving digital editions.

Active members also have access to Sigma Xi's online member community, The Lab: Members to Members, and receive a daily email digest if new posts are published. Plus, members receive an e-newsletter every other week with news about programs, members and chapters, volunteer opportunities, and meetings. If you aren't receiving these emails, check your spam folder.

Follow Sigma Xi on Facebook at https://www.facebook.com/SigmaXi and Twitter at @SigmaXiSociety for the latest updates.

From the President

The Critical Role of Sigma Xi Members



President Mark E. Peeples

As I look at Sigma Xi now, at the end of my year as president, I realize that every member needs a reason for joining and remaining active in Sigma Xi. We need a reason for paying dues each year and nominating new members. What is yours? For many the answer is *American Scientist*, and that's a great reason, but there are many more. One is that Sigma Xi fosters a culture in which science and engineering are prized as the path to discovery and to improving the human condition and the condition of our world.

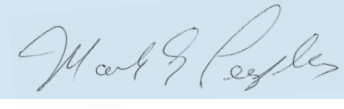
The insights we gain from science and engineering research enhance decision making, increasing the likelihood of success and enabling solutions to be implemented more quickly. In a world where science and engineering are prized, support for the next discoveries would increase. We need to encourage public understanding of what is known, the scientific method, and the results it produces. We need public support for our work.

Sigma Xi chapters can be found in many communities and we cross all science and engineering disciplines. Our chapters can reach the public in a local way to discuss new discoveries and possible solutions to important problems. We can reach students, encouraging them to consider science or engineering careers. And once they do, we can help them reach their maximum potential through our Grants-in-Aid of Research program and student-focused events. New problems, such as the current Zika virus threat, will require new discoveries and new solutions. We need new scientists.

I am more committed than ever to Sigma Xi's role in honoring student and faculty scientists, providing them opportunities to enhance their careers, and enabling them to reach out to the public. I want to thank all of you for your support this year. For my part, I will continue working to strengthen our chapters through Sigma Xi Succeeds, an initiative to collect the best practices from chapters so that our membership team at headquarters can provide them to you when you need them, in a streamlined, simple-to-use form. Please contribute your chapter's successes by logging in to SigmaXi.org. Go to "Chapters" and select "Officer Resource Center" from the drop-down menu to find Sigma Xi Succeeds.

I am proud that as a Society, Sigma Xi is now much stronger than it was two years ago, primarily through the efforts of past president George Atkinson to move our headquarters to more suitable, less expensive space. In addition, our interim executive director, John Nemeth, has initiated important improvements and collaborations that will bear fruit in the next year or so, and he is leading the charge to identify the ideal, permanent executive director who will continue the rise of Sigma Xi.

Finally, I would ask you to continue your support of Sigma Xi. *Sigma Xi is Scientists Supporting Science.* Let's all work to make this more true each year.



A Project to Inspire Student Interest in Science and Math

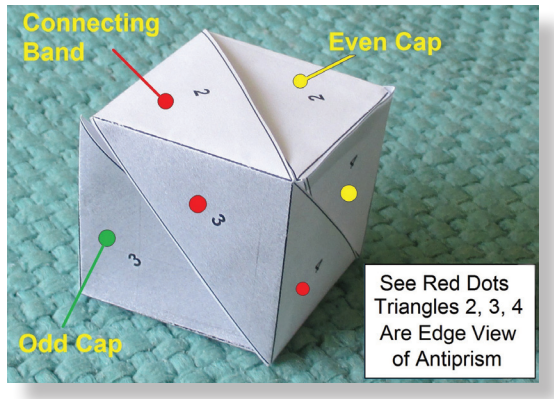
Sigma Xi member Allen Fuhs is retired from his job as a professor, but he still wants to teach. He has an idea to inspire students around the United States about science and math by putting a geometry-based activity on the back of cereal boxes.

"We can reach a million students, parents, and teachers," he said.

Fuhs brought his idea, and a generous donation, to Sigma Xi. The Society will use the donation to prepare a grant proposal to get the project off the ground.

"Sigma Xi is the organization that can make it happen," said Fuhs.

The idea is students would cut out a pattern from a cereal box to form a cube containing a special geometric shape known as an antiprism. Seeing the antiprism while researching stealth technology, Fuhs thinks this activity will capture the attention of students because it has concepts that may be new to them.



A picture of a geometry-based activity that makes an antiprism cube. (Image courtesy of Allen Fuhs.)

Teachers could bring the activity into classrooms with the help of online lesson plans. One lesson could be to find the third, hidden hexagon once the cube is made, and another could be to discuss the physics of mirror images.

"The other aspect is that this antiprism cube is a wonderful tool for introducing students to the ability to think in three dimensions," Fuhs said.

Additionally, Fuhs donated 50 copies of his book-on-CD-ROM, *Tsunami*, so the Society could benefit from its sales. The book covers the causes of tsunamis, how their waves propagate, and what happens once a tsunami hits shore.

A Sigma Xi member since 1957, Fuhs was a professor for nearly 25 years at the Naval Postgraduate School in Monterey, California. He was chairman of the school's mechanical engineering and aeronautics departments, and is a distinguished professor emeritus. He is also a past president and an honorary fellow of the American Institute of Aeronautics and Astronautics. In 1992, he was inducted into the International Space Hall of Fame at the New Mexico Museum of Space History. He now lives in Carmel, California.

Sigma Xi Plans to Launch the First High School Virtual Chapter

A high-quality, well-trained, and effective workforce of science teachers is vital for boosting the national science, technology, engineering, and mathematics (STEM) pipeline and for enhancing student achievement. Partnerships between scientists and teachers are a unique contribution to the professional development of science teachers, providing both teachers and students opportunities for mentorship and engagement in inquiry-based learning and teaching experiences. Such collaborations are equally beneficial to scientists, enabling them to engage with the public and gain a new perspective on their research. Sigma Xi has always recognized high school researchers by inviting them to participate in the annual Student Research Conference and the online science communication competition, the Student Research Showcase, and by publishing their research in *Chronicle of The New Researcher*.

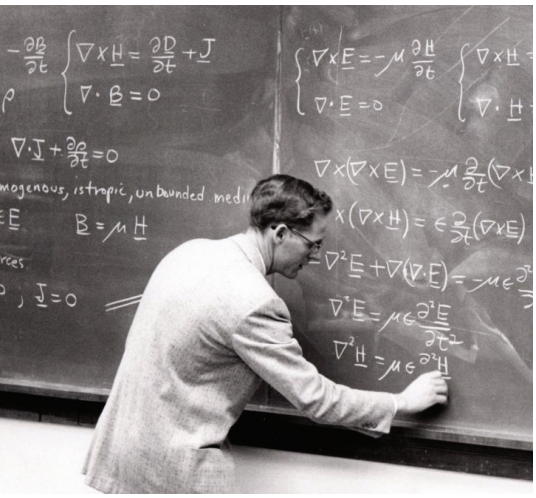
However, high school campuses are not recognized as local Sigma Xi chapters. With the increasing number of research facilities in high schools across the country, we would like to change that policy. Sigma Xi is planning to launch the first high school virtual chapter that would connect high school researchers and their teachers with local Sigma Xi chapters. The initiative is spearheaded by Sigma Xi member Jeffery Wehr, the principal investigator for the Advanced STEM Research Laboratory and an educator at Odessa High School in Odessa, Washington. Participants in the virtual chapter will receive Sigma Xi benefits and privileges based on qualifying as a member or affiliate member and will be supported by the participating local chapters.

Sigma Xi member Jeffery Wehr is leading the initiative to start Sigma Xi's first high school virtual chapter.

The initiative is already gaining traction at schools in Washington, Florida, Montana, Wyoming, and Georgia. We hope that this model will inspire professionals in higher education institutions to assume a greater role in improving STEM education and fostering the rising generation of scientists and engineers. More to come!

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

Claude Barnett Honored with Grants-in-Aid of Research Endowment



Claude Barnett taught physics at Walla Walla University in College Place, Washington.

We see people's names on street signs, buildings, and scholarships—a tangible reminder of those who came before us. What are the stories behind the names? In the case of a new Sigma Xi endowment fund named for member Claude Barnett, we have the answer.

Barnett was a teacher who encouraged his students to follow their curiosity and to think creatively. He was a physicist who liked to have fun, in research and in life. When he died last July, friends, colleagues, and students expressed deep appreciation for how he had influenced their lives and enlivened their educational experiences. These discussions, along with letters of gratitude collected over the years, generated the idea of honoring and continuing Barnett's work with a donation to create a permanent endowment fund.

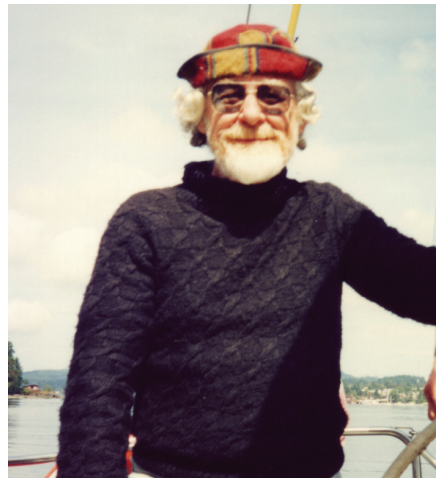
The Claude C. Barnett Grants-in-Aid of Research Endowment Fund will add to the funds that are available for Sigma Xi's Grants-in-Aid of Research program, which has been awarding grants to students since 1922. The program is also funded by the National Academy of Sciences and Sigma Xi donors.

Barnett's daughter, Jeanie Barnett, said supporting Sigma Xi's grant program appealed to her because it rewards innovative and multidisciplinary research, both of which were pillars of what Barnett demonstrated as a researcher and teacher. Barnett's wife, Betty, said she appreciated that the fund will encourage students to try something new and enable them to follow their own ideas.

Barnett stated that a prime goal of his teaching was "to inspire students to think for themselves and not be mere reflectors of other people's thoughts and opinions." When students asked, "What do you want me to do?" he would turn it around and ask, "What do you want to do for yourself, and how may I help you?"

The endowment will award projects that reflect what Barnett practiced: independent thought coupled with hands-on experimentation. After a year of allowing the funds to grow, the first grant from the endowment will be awarded in 2017 to undergraduate and graduate research in physics, biophysics, astronomy, computer science, or Earth science. Of special interest are projects that explore fresh ideas, especially those that draw from multiple disciplines, including the arts and humanities.

Barnett believed that weaving together ideas and methodology in novel ways leads to discoveries. He frequently collaborated with colleagues in art, music, engineering, languages, history, and philosophy. Betty noted that his teaching often went beyond the textbook, incorporating ideas from his own research and from his life experiences, including art, music, and sailing.



Barnett enjoyed sailing. Here he is at the helm on a cruise in the San Juan Islands. (Images courtesy of the Barnett family.)

Walla Walla University named Barnett the Distinguished Faculty Lecturer for 1995–1996.

Barnett was a professor of physics at Walla Walla University for 43 years and chaired the physics department for more than two decades. He directed a National Science Foundation-funded summer conference in 1966 on teaching relativity in undergraduate physics courses. He was an early advocate of using microcomputers in undergraduate education, and in the 1980s he developed micro PASSIM, a simulation and modeling package for the then-nascent personal computer.

Barnett was a Sigma Xi member for 60 years. He was a founding member and officer of the Society's Whitman College-Walla Walla University Chapter in Washington state and served as its president for three years: 1962–1963, 1966–1967, and 1984–1985. With his zest for discovery, the Society's motto "companions in zealous research" resonated with him, as did the focus on well-formulated, high-quality research.

"He wanted to do good science and reach across boundaries," said Jeanie. "His approach to science was very much aligned with Sigma Xi."

To donate to the Claude C. Barnett GIAR Endowment Fund, go to https://meeting.sigmaxi.org/barnett-fund.asp

How to Engage More African Americans in STEM

What could help more African Americans participate in science, technology, engineering, and math (STEM)? Sigma Xi hosted a Google Hangout to discuss solutions to this aspect of the STEM diversity gap. The following are main points from that conversation, edited for length.

1. Isolation can be a barrier to keeping African Americans in STEM.

Melanie Harrison Okoro: In particular for [Earth system science], there are not a lot of women of color, and it could have been a point of isolation for me. As a graduate student, I thought, "I don't know if this is the career path for me," because it played such a large role in my perception of the community, the science, and the support behind it. Because I was able to go through the Minorities Striving and Pursuing Higher Degrees of Success in Earth System Science program as well as other programs—such as the National Oceanic and Atmospheric Administration's Graduate Sciences program and the National Science Foundation's Research Experiences for Undergraduates program—I had the support to continue in a field that I absolutely love and to own it, not feel isolated in it.

2. A supportive network can help students overcome isolation.

Danielle Lee: A network is something you build before you need it. You need to think about cultivating genuine relationships, not just with your professors, but also consider teaching assistants, students who are senior to you, and those in different majors or courses. What the network does is expand your reach to get information about opportunities. I recommend undergraduate students join at least one club in your major as well as one that goes across multiple disciplines. Professors can encourage students to participate in these clubs, to try out a research experience, and invite students to seminars.

Ashanti Johnson: One of my mentors told me you have a composite mentor. You can never have too many parts that make up what you need. Sometimes a mentor might not be on campus. You need to have people who love you and tell you the truth. If they care enough to tell you the truth, they want you to succeed.

3. Outreach is needed.

Johnson: A lot of people of color want to see that they're impacting their community. For that, science is a wonderful thing to do. One of the things that we need to do as a STEM community is to be able to make those connections clearer.

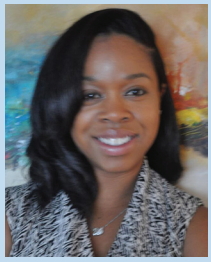
Lee: It's really important that we have a multigenerational approach to outreach and engagement. We need to let the moms and fathers and grandparents and community leaders know that there is a variety of opportunities out there and let them create the environment of encouraging students to play around and tinker. We need to have barbershop, beauty shop, after-church conversations about STEM. While growing up, no one had actually explained to me that a career in science that was divorced from medical practice was a possibility. Everyone kept telling me to be a doctor or a veterinarian and I didn't know that I could do what I was doing all along, which was studying animals and playing outside.

4. Organizations that are predominately white can play a welcoming role.

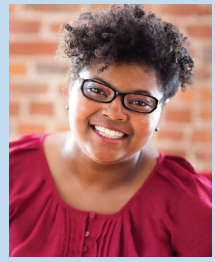
Okoro: You have to have that awareness that there is an issue. You have to be honest about whether or not you care. And you have to put a process in place to make sure you meet your goals. Bring in individuals from different backgrounds to talk about the issues, be honest about those, not threatened by them. Hear what those individuals have to say, but then go back and do something with that information. It's about the act of doing.

To watch the full conversation, go to https://www.sigmaxi.org/programs/critical-issues-in-science/diversity.

Meet the Speakers



Melanie Harrison Okoro is a water quality specialist with the National Oceanic and Atmospheric Administration. She and Ashanti Johnson co-wrote the article "How to Recruit and Retain Underrepresented Minorities," in the March–April 2016 issue of *American Scientist*.



Danielle Lee is a postdoctoral research associate at Cornell University, a TED fellow, and blogger at *The Urban Scientist*, part of the Scientific American Blog Network. Her science outreach efforts emphasize sharing science, particularly to under-served groups, via outdoor programming and social media.

Ashanti Johnson is the assistant vice provost for faculty recruitment and associate professor of environmental science for the University of Texas at Arlington. She is president of the Institute for Broadening Participation and founder and director of the Minorities Striving and Pursuing Higher Degrees of Success in Earth System Science program.