

Sigma Xi Today

A NEWSLETTER OF SIGMA XI, THE SCIENTIFIC RESEARCH HONOR SOCIETY

Upcoming Key Dates for Sigma Xi

ATTEND: The 2019 Annual Meeting, Student Research Conference, and STEM Art and Film Festival take place November 14–17 in Madison, Wisconsin. www.sigmaxi.org/amsrc19

VOTE: Active members will receive an email on November 18 from elections@vote-now.com with instructions to vote for the Society's future leaders. Read candidate statements at www.sigmaxi.org/2019elections.

GIVE: The Giving Tuesday campaign returns December 3 to support STEM education. www.sigmaxi.org

LEARN: Human Rights Day is December 10. The Society is a member of the American Association for the Advancement of Science's Science and Human Rights Coalition to advance the role of scientists and engineers in human rights. www.aaas.org/programs/science-and-human-rights-coalition

APPLY: The deadline for chapter leaders to apply for grants to support their programs is March 1. www.sigmaxi.org/chapter-grants

REGISTER: Register by March 6 for the Student Research Showcase presentation competition. www.sigmaxi.org/srs

NOMINATE: Members, who will you nominate for membership this spring? www.sigmaxi.org/become-a-member

SUBMIT: Students, apply by March 15 for Sigma Xi research grants. www.sigmaxi.org/giar

Sigma Xi Today is
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From the President

The Power of Diversity

Why is diversity so important in science and technology?

This question, whether asked or implied, is one we need to counter at all levels. Our growing diversity in science and engineering is our strength. And given the global challenges we face today, we need all the mental muscle power we can get.

Ultimately, our goal must be *cognitive diversity*—the grand assembly of different perspectives and skills in laboratories and classrooms. This aspiration can be reached only through a diversity of race, gender, sexual orientation, age, experience, and geography. Examples abound that show how a diverse team can identify and address issues that a like-minded and a look-alike team might miss. For instance, countless lives of women and children have been saved after airbag engineers realized the mistake of basing the force of deployment on the size of the average adult male. Lives are being improved and saved as medical and pharmaceutical researchers take into full account the differences in racial, gender, and ethnic physiology.

For those who thrive on data, substantial research shows the economic benefit of an inclusive environment. Companies with ethnically and culturally diverse executives, boards of directors, and rank-and-file workers are 35 percent more likely to show profitability above their industry medians, according to the *Diversity Matters* report by McKinsey & Company, which compiled data from 366 public companies across a range of industries in the United States, Canada, Latin America, and the United Kingdom.

A large and expanding gap exists between how older generations and younger millennials define diversity and inclusion. Baby boomers and Gen Xers tend to consider workplace diversity in legal and moral terms, regardless of whether it benefits the bottom line. It's simply a matter of fairness.

Millennials, however, take a much broader view, according to *Unleashing the Power of Inclusion*, a study by Deloitte and the Billie Jean King Leadership Initiative. Millennials consider diversity to be a necessary building block for innovation. They believe an inclusive culture—built on teamwork—is also essential to competitiveness and financial growth. According to this study, the disconnect between the generations is already causing hardships as upper management resists attempts by millennials to express themselves freely.

The generations that follow will likely amplify these views. Diversity is a requirement for the future. If scientists and engineers are to continue their claim of always being at the forefront of innovation, they also must fully embrace the growing understanding of the power of diversity.



Geraldine Richmond

Geraldine Richmond

Grants in Aid of Research Recipient Profile: Sydney Hope

Grant: \$700 in fall 2014

Education level at the time of the grant: PhD student

Project: Sydney Hope studied how the incubation temperature of wood duck eggs affected the behavior of the ducklings once they hatched. The temperature at which eggs are incubated is one of the most important aspects of the developmental environment for avian offspring. Parental behavior regulates incubation; thus, any factor that influences the parent will affect the developmental environment of the offspring. Anthropogenic changes such as urbanization (i.e., human disturbance) and climate change (i.e., increased levels of extreme weather events and food shortages) can result in parents spending less time incubating, which leads to lower egg temperatures. A small decrease ($<1^{\circ}\text{C}$) in average incubation temperature leads to offspring with suboptimal morphology and physiology. Very little is known, however, about how incubation temperature influences important offspring behaviors.

Hope's results showed that ducklings incubated at the lowest temperature displayed more proactive (e.g., bolder) behaviors than those incubated at the two higher temperatures studied. This suggests that ducklings incubated at low temperatures may be able to compensate behaviorally for their suboptimal morphology and physiology, because proactive



Jennifer Cacciola



Gloria Schoenholtz

Sydney Hope turned her Sigma Xi grant into published research about wood ducks.

behaviors may benefit food acquisition or competitive ability. Further, the results identify incubation temperature as a mechanism that contributes to the development of behavior and explains in part how multiple behavioral types may be maintained within populations.

How the project has affected

Hope as a scientist: "This was the first major project that I was completely in charge of," Hope said. "I gained technical skills in animal husbandry, hormone assays, and animal behavior analysis. More important, however, I gained skills in experimental design through ample methodological trial and error and in team management through mentoring five undergraduates."

Where is she now? Hope, a Sigma Xi member, is a PhD candidate at Virginia Polytechnic Institute and State University. She has made significant progress toward completing her dissertation, including publishing the Sigma Xi grant-supported study.¹ After completing her PhD, she plans to continue to conduct research, focusing on animal behavior in a faculty position at a research-focused university.

1. Hope, S.F., R.A. Kenamer, I.T. Moore, and W.A. Hopkins. 2018. Incubation temperature influences the behavioral traits of a young precocial bird. *Journal of Experimental Zoology Part A: Ecological and Integrative Physiology* 329:191–202. doi: 10.1002/jez.2176.

New Ethics Committee Established

The Society's newly formed Committee on Scientific Conduct and Professional Ethics will help determine the most effective ways to promote ethical scientific practices among Sigma Xi members and within the broader research enterprise.

The Sigma Xi Board of Directors approved the establishment of the committee, which will also form policies and procedures for reporting and make formal judgment about acts of scientific misconduct and violations of professional ethics by the Society's members, affiliates, and awardees to determine the proper course of action related to membership, recognition, and participation in Sigma Xi events.

For more information, contact executiveoffice@sigmaxi.org.

Vote in Sigma Xi's Elections

Active Sigma Xi members will vote in online elections from November 18 to December 17 to select the Society's future leaders. The following are abbreviated statements from the president-elect candidates. Learn more at www.sigmaxi.org/2019elections.



John C. Nemeth, President, Education and Research Consulting—CGJC Enterprises and Associates

As a longtime member, scientist, and former Sigma Xi CEO and executive director, this is what I know: The Society was broken, but it is now on the mend and is armed with a plan that has legs. Now, we need a widespread commitment from the membership and leadership of Sigma Xi

to work for measurable results. Beyond membership and fiscal stability, I see three realms of opportunity and concern for us and for science overall: 1) recognizing the beleaguered research enterprise and supporting it in all aspects, 2) leading, as an absolute necessity, the effort to reclaim the high ground of representing ethical excellence in science, and 3) waging all-out war on the daunting crisis that is climate change. We must be better, stronger, and more frequent advocates—within our legal construct—for evidence-based truth and real actions that will ameliorate and then avert climate change disaster, taking positions and leading movements compatible with nature's reality.



Robert T. Pennock, University Distinguished Professor at Michigan State University

As a past chapter president, Annual Meeting delegate, and distinguished lecturer, I'd want to focus on three aspects as president. The first concerns Sigma Xi being a light for science as a discipline. Sigma Xi is a voice that commands moral authority as a Society that has no

special agenda but simply stands for excellence, honor, and integrity in science. As science is becoming politicized and the value of scientific truth is too often dismissed, it is time for Sigma Xi to bring back its program for members to visit congressional representatives.

The second aspect involves the values of science. Sigma Xi has been a consistent voice for ethics and scientific integrity, and I would use the presidency as a platform for advancing the Society's leadership in this area. The third feature is for Sigma Xi to be seen as a locus for mentoring. I want to recast it in terms of service to the profession.

Gordon Moore Receives Sigma Xi's Highest Honor

Intel Corporation co-founder Gordon Moore is the 2019 recipient of Sigma Xi's highest honor, the Gold Key Award, which the Society's Executive Committee and Board of Directors present to recognize a member's extraordinary contributions to his or her profession and for carrying out the values in Sigma Xi's mission—fostering critical

innovations, cultivating integrity in research, or promoting the public understanding of science.

Moore was Intel's president, chief executive officer, and chairman of the board of directors. He devised Moore's law, which has guided long-term planning in the semiconductor industry for decades. He and his wife established the

Gordon and Betty Moore Foundation to support pathbreaking scientific discovery, environmental conservation, patient care improvements, and preservation of the San Francisco Bay area.

The award, which is a medal in the shape of a gold key, the symbol of Sigma Xi, was presented to Moore at his home in Hawaii on May 29.



Gordon Moore receives the Gold Key Award at his home in Hawaii.

Six Ways to Improve Your Leadership Skills for Research

Jamie L. Vernon

Researchers with strong leadership skills, in addition to understanding the technical aspects of their job, are able to motivate team members, strategize, advance projects, and stick to a budget. In today's competitive job market, acquiring leadership skills can also facilitate promotions, earn salary increases, and open new career options.

Choosing to develop one or more of the following leadership skills will make you a more competitive and more productive researcher.

- 1. Communication.** Leaders must be able to clearly articulate goals and expectations and communicate them effectively to team members and stakeholders. Furthermore, leaders should solicit feedback, recognize and reward the contributions and successes of team members, and provide reassurance when the team fails at something.
- 2. Building relationships.** Relationships are about building trust with others in order to establish a network in which knowledge is shared and support is given and received. Try to find a mentor who can help you. The biggest challenge for me in developing leadership skills was that I did not have a mentor who had followed a career path similar to my own.
- 3. Strategic thinking.** Having a strategic plan in place ensures that your team knows your expectations.
- 4. Project management.** I realized how inefficiently I had managed my research projects the day that I learned about Gantt charts (a widely used management tool for scheduling and control). Delegation is necessary. Failure to delegate elicits frustration and self-doubt in team members who have specialized skills.
- 5. Time management.** Time management is critically important to being efficient and effective in any workplace.
- 6. Financial discipline.** Knowing where to find funding, how to stay within a restrictive budget, and what type of financial reporting is required will help you get the next budget approved for your research.

Jamie L. Vernon is the chief executive officer and executive director of Sigma Xi, The Scientific Research Honor Society.

Donate to Support STEM Education

On Giving Tuesday in 2018, 199 supporters donated a total of \$15,165 to provide a free one-year *American Scientist* subscription to 650 high schools identified as being in areas where science education is vulnerable. This year's Giving Tuesday campaign is December 3, and Sigma Xi's goal is to offer free subscriptions for as many schools as possible. Please give to support science, technology, engineering, and mathematics (STEM) education. Watch www.sigmaxi.org for details.

2018 GIVING TUESDAY CAMPAIGN



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