

Sigma Xi Today

A NEWSLETTER OF SIGMA XI, THE SCIENTIFIC RESEARCH HONOR SOCIETY

Important Upcoming Dates for Sigma Xi

SPRING NOMINATIONS: Who will you nominate for Sigma Xi membership this spring? Membership requires two nominators. Sigma Xi staff can help you find a second nominator if you need one. www.sigmaxi.org/become-a-member.

MARCH 1: The Society offers subsidies for chapters in need of financial assistance to host a virtual or in-person visit by a Sigma Xi Distinguished Lecturer. The deadline for Distinguished Lectureships subsidy applications is March 1 at 11:59 p.m. pacific time for lecturer visits that will take place between July 1, 2021, and June 30, 2022. Visit www.sigmaxi.org/lectureships to see a list of the most recent cohort of distinguished lecturers.

MARCH 15: Undergraduate and graduate students may apply by March 15 for research funding from the Grants in Aid of Research (GIAR) program. For more information, visit www.sigmaxi.org/giar.

MARCH 26: Students in high school through graduate school may register and submit an abstract by 11:59 p.m. pacific time on March 26 to compete in the online Student Research Showcase in April. For more information, visit www.sigmaxi.org/srs.

APRIL 26: Online judging begins for the Student Research Showcase, including a discussion period between students and judges. Judging concludes on May 10, 2021.

Sigma Xi Today is managed by
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Chao Hui Tu.

From the President

Wonder Women

This issue of *American Scientist* appears during Women's History Month. As I submit this letter near the end of December 2020, we have just elected the first female vice president of the United States. We will also soon benefit from the results of the work of two female scientists—we will have two vaccines for COVID-19 that are direct results of research conducted by Dr. Kizzmekia Corbett and Dr. Katalin Karikó. This does not diminish the contributions of all those involved in the vaccine, but during Women's History Month, I think the contributions of these women is something to be celebrated.



The story of both of these women is one of perseverance. Dr. Corbett was born in rural North Carolina and attended college on a Meyerhoff scholarship at the University of Maryland, Baltimore County. Her research into virology resulted directly from summer internships at a variety of labs. Dr. Corbett's scientific foundations benefited from the investment by the National Institutes of Health (NIH) and the National Science Foundation (NSF) into summer research programs for undergraduate and high school students. This training and her subsequent postbaccalaureate and postdoctoral training at the National Institute of Allergy and Infectious Diseases (NIAID) positioned her to participate on the team that developed the Moderna COVID-19 vaccine.

Foundational to the Moderna vaccine is the work of Dr. Karikó. Her interest in messenger RNA (mRNA) began when she was working in Hungary in the field of vaccines. After immigrating to the United States, she continued to work on this novel approach to vaccine development, though it was believed at the time to provoke an inflammatory response and was not considered a promising approach. In fact, it has been reported that her promotion to professor at a prominent university was denied for this reason. Nevertheless, she persisted. She continued to conduct experiments, and later, with her collaborator Drew Weissman, she solved the problem with mRNA. Her mRNA research has now led to the development of the Pfizer vaccine and the foundations for the Moderna vaccine.

Here at Sigma Xi, we are committed to equity and inclusion in the scientific pursuit. We celebrate the national investment in the research enterprise, and we invest in research through our Grants in Aid of Research (GIAR) program. We will continue to showcase the contributions of all members of our scientific community, especially those who have been historically under-represented. Kudos to these great women scientists, and to all the women whose shoulders they stand upon.

The end of 2020 saw a prominent newspaper columnist criticizing Dr. Jill Biden's right to be called "doctor" because she has a doctorate degree, but not an MD. Suffice it to say that the research behind the COVID-19 vaccines was conducted by two female PhDs. Thank you, Dr. Corbett and Dr. Karikó!

Sonya T. Smith

Sigma Xi Election Results

Members of Sigma Xi, The Scientific Research Honor Society elected their peers to leadership roles in an online election held November 9 - 22, 2020. Sigma Xi thanks all members who voted or volunteered to run as candidates. Many of the newly elected volunteer leaders will begin their term on July 1, 2021. Nicholas A. Peppas was elected to serve a three-year term comprised of a year each as Sigma Xi president-elect, president, and past-president.

President-elect designee Peppas, a professor at The University of Texas at Austin, is a researcher in biomaterials, drug delivery, and chemical/biomedical engineering with 137,000 citations (H=173). Inducted into Sigma Xi in 1973, he was the Purdue University Chapter president and awarded the Sigma Xi Monie A. Ferst Award. He is a member of the National Academy of Engineering, National Academy of Medicine, National Academy of Inventors, and American Academy of Arts and Sciences, plus European, Chinese, Canadian, French, Spanish, and Greek academies. He is deputy editor of *Science Advances* and past president of groups such as the Society for Biomaterials.

Other newly elected directors, associate directors, and representatives are listed below with their Sigma Xi chapter affiliations. Directors and associate directors serve three-year terms, starting July 1, 2021. Committee on Nominations representatives serve three-year terms, starting immediately after the election.



Nicholas A. Peppas

Director: Baccalaureate Colleges Constituency

Pamela K. Kerrigan
College of Mount Saint Vincent Chapter

Director: Canadian/International Constituency

Jennifer Patterson
Swiss Chapter

Director: Northwest Region

HollyAnn Harris
Omaha Chapter

Director: Southeast Region

Dana A. Baum
Saint Louis University Chapter

Associate Director: North Central Region

Kelly E. Crowe
University of Cincinnati Chapter

Associate Director: Southwest Region

Alli M. Antar
Rice University-Texas Medical Center Chapter

Associate Director: Membership-at-Large Constituency

Heather A. Arnett
Membership-at-Large

Associate Director: Research & Doctoral Universities Constituency

Peizhen Kathy Lu
Virginia Tech Chapter

Committee on Nominations: Mid-Atlantic Region Representative

Francis C. Dane
Radford University Chapter

Committee on Nominations: Northeast Region Representative

Julie B. Ealy
Columbia University Chapter

Committee on Nominations: Area Groups, Industries, State & Federal Laboratories Constituency Representative

Bruce A. Fowler
Centers for Disease Control and Prevention Chapter

Committee on Nominations: Comprehensive Colleges & Universities Constituency Representative

Andrea Ashley-Oyewole
Prairie View A&M University Chapter

2019–2020 Sigma Xi Chapter Awards

The 2019–2020 Sigma Xi Chapter Award winners were announced at the 2020 virtual Assembly of Delegates on November 5. Finalists are chosen by regional and constituency directors based on information in the chapters' Annual Reports, and winners are selected by the Committee on Qualifications and Membership.

Chapter of Excellence Award Winners

The Chapter of Excellence Awards are bestowed on chapters for exceptional chapter activity, innovative programming, and true community leadership.

First Place
Boise State University

Second Place
Greenbrier Valley

Third Place (Tie)
University of Cincinnati
Woods Hole
Calgary

Chapter Program of Excellence Award Winners

The Chapter Program of Excellence Awards are bestowed on chapters that organized or hosted a single outstanding program.

First Place
Northeastern University for Think Like a Scientist, a science outreach program for students in grades 4–8

Second Place
Kansas City for Rendering the Invisible Visible: Student Success in Exclusive Excellence STEM Environments, a Distinguished Lectureship event with Dr. Robbin Chapman

Third Place
Eckerd College for Psychedelics: Out of the Ancient and into 2020, a lecture by Dr. David Nichols

Honorable Mentions
University of Alabama at Birmingham for Alabama's Worst Natural Disaster, Wetumpka Impact Crater

University of New Mexico for Science & Society Distinguished Public Talks Series
Vassar College for Science in Your Life Lectures

Fiscal Year 2020 Top-Electing Chapters

Overall Top-Electing Chapters
Brown University
Fordham University
Princeton

Top-Electing Chapters by Constituency
Area Groups, Industries, State & Federal Laboratories Constituency Group
Delta
Vermont

Baccalaureate Colleges Constituency Group
Swarthmore College
Carleton College

Comprehensive Colleges & Universities Constituency Group
Saint Joseph's University
Fairfield University

Research & Doctoral Universities Constituency Group
Brown University
Fordham University

Canadian/International Constituency Group
Calgary
University of Alberta and Avalon (Tie)

Grants in Aid of Research Recipient Profile: Deidra Jordan

Grant: \$750 (Spring 2019)

Education level at time of the grant: PhD student

Project Description: Jordan's project uses metagenomics to study microorganisms in the soil and surrounding plants—essentially the soil microbiome—and the effects of elevated salinity and nutrients on those communities. This project's soil samples come from two-year mesocosm studies examining freshwater and brackish water sites within the Everglades. Saltwater intrusion is a significant issue in the Everglades due to the impacts of sea-level rise. Since microbes are the first responders to environmental changes and provide numerous benefits to the soil, it is essential to understand how microbes respond to these changing conditions. Monitoring shifts in microbial communities also provides insight into the

soil's health. The second aspect of Jordan's project applies the knowledge gained from forensic science to complement and enhance intelligence gathering for geographic provenance.

How has the project influenced her as a scientist? Jordan says, "It's essential to understand that every experiment may not come out as expected, which is part of the process." Working through the research process and collaborating with other scientists on this project have influenced her to be a more astute scientist.

Where is she now? Inducted into Sigma Xi in 2019, Jordan is currently a PhD candidate in Biology at Florida International University. She is expected to graduate in spring 2022.



Support Student Researchers: Be a Judge for the Student Research Showcase

What motivated you when you were a student? Who encouraged you to pursue your goals? How did your mentors inspire you?

You can support the research careers of current high school, undergraduate, and graduate students by volunteering as a judge for the 2021 Sigma Xi Student Research Showcase. This online showcase is a unique opportunity for students to develop effective science communications skills and tailor their presentations to different audiences. Scientists who can successfully communicate the importance of their research to a broad audience are better equipped to secure financial and social support for their work. Participating students build a website containing an abstract, a slideshow, and a short video about their research.

From the comfort of their homes or offices, judges will evaluate students' presentations and leave questions and comments on their websites, from April 26 to May 10, 2021. Judges will evaluate presentations

based upon communication, scientific thought, and scientific method. Judges will then collectively select division winners, who will receive up to \$1,000 in monetary awards and a nomination for associate membership in Sigma Xi.

Qualified Sigma Xi members can sign up as judges by completing the volunteer form at www.sigmaxi.org/judge21. Nonstudent members are qualified if they have experience in the research field that they are judging.

Those who can't judge may still follow the competition and leave comments on participants' websites at www.sigmaxi.org/srs. The more constructive feedback students receive, the more they will learn. After judging ends, the public will vote for the People's Choice Award; that student winner will receive an additional \$250.

[Sigma Xi 2021 Student Research Showcase](http://www.sigmaxi.org/judge21)

[Learn more at www.sigmaxi.org/srs](http://www.sigmaxi.org/srs)

Virtual STEM Art and Film Festival Showcased Science–Art Collaborations

The 2020 STEM Art and Film Festival, held virtually on November 8, celebrated the visual and performing arts as tools that help teach the public about science, technology, engineering, and math. Featuring over 40 works of art and over 20 films, the public festival was the final event of the virtual 2020 Annual Meeting and Student Research Conference held by Sigma Xi, The Scientific Research Honor Society.

Juniper Harrower, founder and director of SymbioArtlab, walked away with the festival's top two honors: Best Artwork and Best Film. Harrower's installation, *The Joshua Tree Soil series*, was inspired by scientific findings from her ecological research. To create her

art, Harrower integrates elements of her research such as Joshua tree fibers, seed oil, and the spines of trees as paint brushes. Data is also a key component in Harrower's work—she uses intricate algorithms from her research to establish all the mechanisms of her artwork. Harrower's film, *A Joshua Tree Love Story*, is a stop-motion short film that follows a female scientist as she investigates the effects of climate change on the ecology of Joshua trees and their life cycle.

The festival featured artwork and films presented by winners of #SciCommMake, a new competition hosted by Sigma Xi and Science Talk. The program forms collaborations between

scientists and artists to create projects that communicate evidence-based scientific research findings to the public.

The agenda also included a panel discussion with the creators of the *As Above As Below* art exhibit. This collection features six collaborative multimedia exhibits created by teams of artists, astrophysicists, and neuroscientists. This panel highlighted two of the exhibits and discussed different aspects of each collaboration.

In addition to the special events, attendees of the virtual STEM Art and Film Festival enjoyed screenings of short films, documentaries, and animations. Judges selected the following artwork and films to receive the 2020 awards.

Film Awards

Best Film Overall

A Joshua Tree Love Story submitted by
Juniper Harrower

Best Documentary

The Missfits submitted by **Ellie Wen**

Best Short Film

Origami in STEM submitted by
Claire Morton

Best Animation

Cellular Senescence submitted by
Nitya Ayyagari

People's Choice Award

COVID-19 Doesn't Care submitted by
Jeffrey Toney and Stephanie Ishack



Artwork Awards

Best Artwork Overall

The Joshua Tree Soil series submitted by
Juniper Harrower

Honorable Mention

Chaos at the Crest submitted by
Philip Schein

Distinguished Recognition

Zoom in on STEAM submitted by
April Bartnick

People's Choice Award

Forest of Life submitted by **Julia Miao**

Best Performing Arts

Stethophone submitted by **Anika Fuloria and Barbara Nerness**

Art and Film Competition Judges

Sigma Xi thanks the following judges for viewing and evaluating each film and artwork submission.

Film Judges

Clare Gibson

Filmmaker
Allegorical Alchemy

Kirsten (Kiki) Sanford

Principal
Broader Impacts Productions, LLC

Myrna Jacobson Meyers

Assistant Research Professor of
Biological Sciences
University of Southern California

Art Judges

David Goodsell

Professor of Computational Biology
The Scripps Research Institute
Research Professor
RCSB Protein Data Bank

Kimberly Moss

Associate Professor of Art and
Visual Culture
Iowa State University

Fenella Saunders

Director of Science Communications
and Publications
Editor-in-Chief of *American Scientist*
*Sigma Xi, The Scientific Research
Honor Society*

Esther Mallouh

Art Liaison
Keen on Art