

STUDENT RESEARCH CONFERENCE SCHEDULE OF EVENTS

FRIDAY, NOVEMBER 11

7:00 a.m.–7:00 p.m. **Registration** Centennial Foyer

7:00 a.m.–2:30 p.m. **Poster and Exhibitor Setup** Grand Hall West

Research poster setup begins. If you are presenting a professional, chapter, or student poster, you may begin to prepare it for your presentation. Exhibitors may begin to setup their exhibit tables.

12:00–1:30 p.m. **Walston Chubb Award Luncheon and Keynote Lecture** Centennial II

Ticket required for entry
Filamentary Materials for Optics, Terahertz, Acoustics, Forensics, and Biomimicry

Akhlesh Lakhtakia, Walston Chubb Award for Innovation Winner, recognized to honor and promote his creativity as a researcher; Charles Godfrey Binder (Endowed) Professor of Engineering Science and Mechanics and Professor in the Graduate Program in Materials at The Pennsylvania State University.

Filamentary materials are simultaneously homogeneous and porous, depending on the length scale of a physical process. Additionally, with the availability of a huge surface area per unit volume, the roles of surface-dominated processes can be greatly enhanced over those of volume-dominated processes. With exquisite engineering of the filamentary morphology nowadays possible with nanotechnology and microtechnology, filamentary materials are multifunctional metamaterials with electromagnetic, electronic, ultrasonic, forensic, and biomedical applications.



1:30–2:30 p.m. **Concurrent Sessions**

Science Communication I Grand Hall A & B

Jamie Vernon, Sigma Xi Director of Science Communications and Publications, Editor-in-Chief of *American Scientist*

In this workshop, you will learn why you may want to develop skills in science communication.

Science Entrepreneurship Grand Hall C & D

Brian McGreggor, Director of Georgia Institute of Technology's VentureLab

Check the program update for more details about this session.

2:30–6:00 p.m. **Poster and Exhibitor Area Opens** Grand Hall West

Visit Grand Hall West to see exhibitors and research posters.

STUDENT RESEARCH CONFERENCE SCHEDULE OF EVENTS

2:45–3:45 p.m.	Concurrent Sessions	
	Science Communication II Barry Mitsch , Coach at the Pyramid Resource Group and for Sigma Xi’s Science Communication Laboratory Learn the nuts and bolts of science communication.	Grand Hall A & B
	Trickle Down Science Policy: How Decisions Made in Washington, DC, Affect Scientists in the Lab Moderator: Suzanne Ffolkes , Vice President of Communications at Research!America Brion Bob , Science and Technology Policy Fellow at SunShot Initiative at U.S. Department of Energy Randall Guensler , Professor in Georgia Institute of Technology’s School of Civil and Environmental Engineering Asegun Henry , Assistant Professor of Heat Transfer, Combustion and Energy Systems at Georgia Institute of Technology University Mohammad Khan , Assistant Professor in the Department of Radiation Oncology at Emory University School of Medicine Researchers and policy-makers operate in what sometimes seem to be separate worlds. Differences in values, languages, time-frames, reward systems, and professional affiliations often create challenges when launching new policy initiatives. Researchers who understand the policymaking process and how to prepare for new research priorities have a unique advantage. Bold initiatives, such as the National Institutes of Health’s Cancer Moonshot, the BRAIN Initiative, and the Department of Energy’s SunShot Initiative represent opportunities to learn how to participate in the achievement of national research goals. The panelists, both policymakers and researchers, will discuss the challenges and opportunities presented by federal science policies. Policymakers will address how policy decisions are made and researchers will discuss how these decisions affect their research strategies.	Grand Hall C & D
4:00–6:00 p.m.	Sigma Xi Research Symposium Poster Session with Poster Talks Professional researchers and Sigma Xi chapters share their posters.	Grand Hall West
6:00–7:30 p.m.	Dinner on Your Own Students travel together for dinner at The Varsity.	
7:30–8:00 p.m.	Travel Back to the Hyatt Regency Atlanta	

STUDENT RESEARCH CONFERENCE SCHEDULE OF EVENTS

8:00–9:30 p.m.	<p>Special Viewing of Part II of the PBS Documentary <i>The Truth About Trees</i> Enjoy coffee and dessert Ross Spears, Filmmaker</p>	Centennial II
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The Truth About Trees is the first full-length documentary film series to explore the indispensable role of trees for all life on Earth. Part Two explores the profound interconnection between humans and trees, from the oxygen we breathe and water we drink, to foods and medicines, tools and building materials, and even ceremonies and symbols. The very words “tree” and “truth,” we learn, both have roots in an ancient word for “endure.”

SATURDAY, NOVEMBER 12

7:00 a.m.–7:00 p.m.	Registration	Centennial Foyer
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7:30 a.m.–4:00 p.m.	<p>Exhibit Hall Open</p> <p>Stop in Grand Hall West to see professional and student research posters, learn about Sigma Xi chapters, and visit with exhibitors at the Sigma Xi College, Career, and Trade Fair.</p>	Grand Hall West
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7:30–8:30 a.m.	<p>Concurrent Orientations for the Student Research Conference</p> <p>Judge Orientation</p> <p>Judges receive an orientation for the evaluation of student presentations and awards selection.</p>	Grand Hall A & B
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	<p>Student Orientation</p> <p>Presenters receive an orientation for the evaluation of student presentations and awards selection.</p>	Centennial I
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8:00–9:00 a.m.	<p>Concurrent Breakfasts</p> <p>Power-up Continental Breakfast</p> <p>Everyone is invited to enjoy a breakfast before student presentations begin.</p>	Grand Hall West
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	<p>Breakfast about Forming a Sigma Xi Diversity Task Force</p> <p>An introductory meeting by invitation. A briefing about this task force will be presented at Sunday’s breakfast.</p>	Chicago C & D
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STUDENT RESEARCH CONFERENCE SCHEDULE OF EVENTS

9:00 a.m.–11:45 a.m. Student Research Poster Presentations **Grand Hall West**
Question and answer judging session for student awards.

Noon–1:30 p.m. Young Investigator Award Luncheon and Keynote Lecture **Centennial II**

Ticket required for entry

A Tale of Two Disciplines: How Multimedia and Biomedical Technologies can come Together for the Betterment of Human Kind

Tiago Falk, Recipient of Sigma Xi's 2016 Young Investigator Award, given to recognize excellence in research by an active member of Sigma Xi within 10 years of his or her highest earned degree; Associate Professor and Director of the Multimedia/Multimodal Signal Analysis and Enhancement (MuSAE) Lab at the Institut national de la recherche scientifique, (INRS-EMT) in Montreal, Quebec

At a first glance, multimedia and biomedical signal processing seem to be two completely unrelated research fields, with video streaming and medical diagnostics applications coming to mind, respectively. In this talk, Falk will describe how our interdisciplinary research proposes to marry these two fields in a unique manner not only to advance each domain individually, but, ultimately, to improve our everyday lives. Representative examples will range from the use of so-called neuro-games to help diagnose Alzheimer's disease in the elderly or to treat attention deficit hyperactivity disorders in children, to machines that adapt to their users' mental and affective states, thus enriching the man-machine interaction. The many challenges and (far greater) rewards of such interdisciplinary research will also be discussed.



1:30–2:45 p.m. STEM Mixer **Grand Hall West**
Students and professionals meet and mingle.

3:00–4:00 p.m. Concurrent Sessions **Grand Hall A & B**

Mentorship in Research

Moderator: **Mark Peeples**, Professor in the Department of Pediatrics, The Ohio State University College of Medicine; Sigma Xi Past-President;

Jan Achenbach, Walter P. Murphy and Distinguished McCormick School Professor Emeritus of Civil and Environmental Engineering, Engineering Sciences and Applied Mathematics and Mechanical Engineering, Northwestern University; recipient of the Sigma Xi's William Procter Prize for Scientific Achievement;

Eman Ghanem, Sigma Xi Director of Membership, Chapters, and Programs

Jeanette Gray, Undergraduate Student, Unity College

Emma Perry, Professor of Marine Biology, Unity College; Chair of the Sigma Xi Committee on Qualifications and Membership; Past Chair of the Sigma Xi Committee on Grants-in-Aid of Research

STUDENT RESEARCH CONFERENCE SCHEDULE OF EVENTS

Mentorship is instrumental in the development of a successful career, in transmitting technical and ethical standards, and in training the next generation of research professionals. A mentor can be a teacher, an advisor, a research advisor, or a role model. The panel will address topics related to initiating and sustaining a good mentor-mentee relationship and explore possibilities for mentorship in increasing creativity and productivity. Panelists will discuss the responsibilities and expectations of both the mentor and the protégé, reflecting on their own experience.

Diversity in STEM: Benefits, Challenges, and Possible Solutions

Grand Hall C & D

Moderator: **Tee Guidotti**, International Consultant on Health, Safety, and the Environment; Sigma Xi President

Drew Coleman, Professor of Geology and Assistant Dean for First Year Seminars, University of North Carolina at Chapel Hill

Clark Gantzer, Professor Emeritus of Soil Science, University of Missouri

M. Virginia McSwain, Associate Professor of Physics, Lehigh University

Kecia M. Thomas, Senior Associate Dean and Founding Director of the Center for Research & Engagement in Diversity at the University of Georgia

Diversity in experience, cultural and social background, and perspective drives innovation, stimulates imagination, and improves productivity. Low engagement of women, first-generation graduates, underrepresented minorities, LGBTQIA (lesbian, gay, bisexual, transgender, questioning, intersex, and asexual) individuals, and people with disabilities in STEM disciplines is an inequity and limits opportunity. Lack of inclusiveness harms the research enterprise in all STEM disciplines by limiting imagination, and blocking contributions from people who may have different ideas arising from their life experience. Scientists and engineers who are now in mid- or late career came of age in an earlier era when exclusion and barriers discouraged diversity. Despite progress, lack of diversity is still a problem, and financial and social barriers are still too high. This session will examine strategies to create a new and positive legacy of inclusion, diversity, and respect for emerging and coming generations of scientists. The faces of science should reflect the faces of our people (in America and the world).

4:30–5:00 p.m.

McGovern Award Keynote Lecture

Explore, Discover, and Move Forward

Paul R. Sanberg, Winner of the Sigma Xi 2016 John P. McGovern Science and Society Award in recognition of his outstanding contribution to science and society; University of South Florida's Vice President for Research, Innovation, and Economic Development, Distinguished University Professor, and Executive Director of the Center for Excellence for Aging and Brain Repair

What prompts the urge to explore and discover the unknown? Paul Sanberg shares his journey—how early experiences led him toward neuroscience, family tragedy

Centennial I



STUDENT RESEARCH CONFERENCE SCHEDULE OF EVENTS

propelled him to study brain repair and regeneration, and a fascination with solving practical problems turned him into a prolific inventor. The barriers he encountered ignited a passion to build a culture of innovation in academia to help others discover their inventive talents and be recognized for innovative work. Founding the National Academy of Inventors and Florida Inventors Hall of Fame has helped stimulate national interest in academic invention and share the joy of inventing with the next generation.

5:00–6:00 p.m.

Student Awards Presentation

Centennial I

Superior presenters in the Student Research Conference will be announced and awarded medals, a \$130 prize in honor of Sigma Xi's 130th year, and nominations to join Sigma Xi in recognition of their exemplary work. These presenters are invited to be inducted into Sigma Xi later this evening during the banquet. The Student Choice Award, sponsored by the District of Columbia Sigma Xi Chapter, and the Executive Director Award will also be presented.

7:00–7:30 p.m.

Banquet Reception

Centennial Foyer

Mingle and enjoy a cash bar before the banquet.

7:30–10:00 p.m.

Sigma Xi Banquet

Centennial II

Ticket required for entry

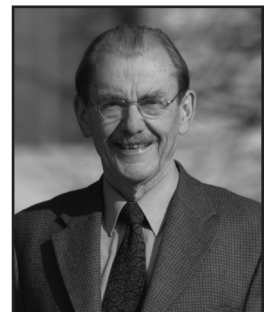
Remarks will be made by Sigma Xi Past-President Mark Peeples, Sigma Xi President Tee Guidotti, and President-Elect Stuart Cooper. Enjoy the kickoff of the Grants-in-Aid of Research Centennial Campaign and the induction ceremony of new Sigma Xi members. Also, hear two keynote lectures.

William Procter Prize for Scientific Achievement Lecture

Waves that Discover

Jan Achenbach, Recipient of the 2016 Sigma Xi William Procter Prize for Scientific Achievement to honor his outstanding contribution to scientific research and his demonstrated ability to communicate this research to scientists in other disciplines; Walter P. Murphy and Distinguished McCormick School Professor Emeritus of Civil and Environmental Engineering, Engineering Sciences and Applied Mathematics and Mechanical Engineering, Northwestern University

Waves propagate at a finite velocity in gases, fluids and solids. There are good waves and bad waves. Seismic waves and tsunamis are bad waves that can cause a great deal of damage. Good waves, such as ultrasound can be used to explore the internal structure of a material, to discover problematic anomalies. Ultrasound has many applications, such as sonar, range finding, medical imaging and non-destructive testing. Devices have been developed to generate and receive ultrasound. Achenbach will discuss quantitative non-destructive evaluation and structural health monitoring for safety-critical structures such as aircraft, bridges and nuclear reactors.



STUDENT RESEARCH CONFERENCE SCHEDULE OF EVENTS

Gold Key Award Lecture

Do the Merits of Science Speak for Themselves?

Norman R. Augustine, Inaugural Recipient of the Sigma Xi Gold Key Award for his extraordinary contributions to his profession and innovations; Retired Chairman and CEO of Lockheed Martin Corp.

There are few investments that offer a higher return than those dedicated to the conduct of scientific research. Yet, throughout history, science has occasionally found itself at the center of questions as to merits. Today is no different, with funding for scientific research, writ large, being the target of funding reductions, and certain scientific endeavors even having their very worthiness challenged. Further threats exist in the form of an underperforming primary and secondary education system insofar as science and its related fields are concerned and science is becoming politicalized in our nation's Congress. Some now ask whether there are in fact too many scientists. If such issues are to be beneficially addressed the science community itself will need to do a far better job of explaining the benefits of science to the average person. This should be far less difficult than the tasks scientists take on every day.



SUNDAY, NOVEMBER 13

7:00–8:00 a.m.

Breakfast

A continental breakfast will be provided.

Centennial I

8:00–9:00 a.m.

Putting Your Degree to Work: Career Options for STEM Graduates

Moderator: **Richard Watkins**, Program Coordinator, Chancellor's Science Scholars Program, University of North Carolina at Chapel Hill; CEO and Founder, The Science Policy Action Network, Inc.

Teresa Evans, Director of Workforce and Career Development, University of Texas Health Science Center San Antonio

Robert Frederick, Digital Managing Editor of *American Scientist*

Robert Kaita, Physicist at Princeton Plasma Physics Laboratory

John Nemeth, Executive Director and CEO of Sigma Xi, The Scientific Research Society

Want to know more about career choices in STEM fields? Did you know that over 60% of STEM doctorate holders pursue non-academic careers? There is a myriad of science and engineering professional paths to consider. This panel represents different science sectors and aims to provide attendees with information and ideas to broaden their perception of possible STEM careers. Panelists will also discuss preparation strategies for entering and thriving in the growing STEM workforce.

Grand Hall A & B

STUDENT RESEARCH CONFERENCE SCHEDULE OF EVENTS

9:00–9:30 a.m.	Assembly of Delegates III Hear the results of the changes to the Sigma Xi Constitution and bylaws as well as the report of the Credentials Committee.	Centennial I
10:00 a.m.	Buses to Airport <i>Tickets purchase required</i> Buses will depart at 10 a.m. and 10:15 a.m. to take participants to the Hartsfield-Jackson Atlanta International Airport. Have a safe trip home!	By Grand Hall

Policy on Respect

Sigma Xi is a multidisciplinary society of scientists and engineers. Our members have diverse professional backgrounds, genders, ages, and ethnicities. It is expected that every Sigma Xi member will treat other members, staff, and everyone that they meet with courtesy, respect, and professionalism at all times. The Sigma Xi Annual Meeting and International Research Conference should be a positive experience for all. Sigma Xi, as a professional society, does not tolerate unprofessional conduct, discrimination, intimidation, or sexual harassment.

While approaching the research of others with a critical eye is essential to the research enterprise, it is expected that delegates, student-presenters, judges, staff, and other event attendees will treat each other with the highest level of respect. This extends to the evaluation of student work in that the relationship between judge and student is similar to mentor and protégé, teacher and student.

Any incident that runs contrary to the Sigma Xi culture of collegiality and this Policy on Respect should be reported immediately to a member of the event staff.