

Program Update

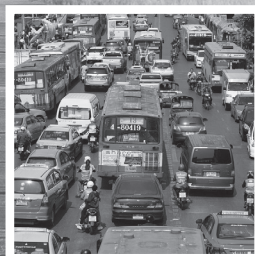
Symposium on Atmospheric Chemistry, Climate, and Health

November 10, 2017

Student Research Conference

November 11, 2017

Updated Schedules • Additional Speaker Biographies • Additional Research
Abstracts • Full Index of Student Presenters • Map of Poster Presentations





Raleigh Convention Center • Raleigh, North Carolina • #SigmaXimtg



SIGMA XI

THE SCIENTIFIC RESEARCH HONOR SOCIETY

SYMPOSIUM SCHEDULE - NOVEMBER 10

7:00 a.m.–5:00 p.m.	Registration	Ballroom AB Foyer
8:00–8:30 a.m.	Opening Remarks Stuart L. Cooper, Sigma Xi President	Meeting Room 402
8:30–9:30 a.m.	The Past is Prologue: Lessons Learned for Science-Based Policies to Address Air Quality and Climate Barbara Finlayson-Pitts, Professor of Chemistry at University of California, Irvine <p>Humanity faces enormous challenges in the coming decades. The Earth’s population is projected to increase by about 50 percent between now and the year 2100, with associated increases in demand for energy, food, and water. History has shown that such increases are accompanied by increased emissions into the atmosphere, affecting air quality and climate. Direct impacts of declining air quality on human health, visibility, and ecosystems are well established, and impacts due to climate change are becoming increasingly clear and undeniable. While the magnitude of these problems might seem overwhelming, past successes in atmospheric chemistry point to paths forward to address them on scales from local to regional to global. Examples of these past problems and how science-based policies led to solutions will be summarized, and some current challenges in air quality, climate, and atmospheric chemistry will be presented in the context of some potential paths forward.</p>	Meeting Room 402 
9:30–10:30 a.m.	The Ozone Hole: From Discovery to Recovery A. R. Ravishankara, Professor of Chemistry at Colorado State University <p>The ozone hole, the springtime large-scale depletion of the stratospheric ozone layer above the Antarctic, was discovered in the early 1980s by Farman and colleagues from the UK. This unexpected ozone layer depletion was diagnosed and “understood” in a matter of a decade or so. The ozone hole played a pivotal role in bringing the ozone layer depletion theorized by Molina and Rowland to the forefront and the actions of the world culminated in the Montreal Protocol. Now, due to the success of the Montreal Protocol, the ozone layer and the ozone hole are on their way to “recovery.” I will recount the science, policy, and actions that led to this success story in global environmental science and human action.</p>	Meeting Room 402 
10:30–10:45 a.m.	Refreshment Break	Foyer Outside Meeting Room 402

SYMPOSIUM SCHEDULE - NOVEMBER 10

10:45–11:45 a.m.

Air Pollution and Health: Scientific and Public Policy Controversies

C. Arden Pope III, Mary Lou Fulton Professor of Economics at Brigham Young University

Almost unbelievably, it is estimated that air pollution is the fifth largest risk factor contributing to global burden of disease. Breathing fine particulate air pollution contributes to cardiopulmonary disease and mortality. Short-term exposure exacerbates existing cardiovascular and pulmonary disease and increases the risk of becoming symptomatic, requiring medical attention, or even dying. Long-term repeated exposures increase the risk of chronic pulmonary and cardiovascular disease. Recent research has attempted to evaluate potential mechanistic pathways that link exposure to particulate air pollution and cardiopulmonary disease and mortality. This presentation will review the top ten scientific and public policy controversies pertaining to the health effects of air pollution.

Meeting Room 402



11:45 a.m.–1:00 p.m.

Lunch

Ticket required for entry

Jamie L. Vernon, Sigma Xi Executive Director and CEO

Greg Fishel, Chief Meteorologist on WRAL-TV and Mix 101.5 WRAL-FM for Capitol Broadcasting Co., will be recognized as the Guest of Honor. Fishel is also the Student Research Conference's keynote speaker.

Ballroom A

1:00–2:00 p.m.

Humanity and Global Warming: Views from the Carbon Cycle

David Archer, Professor of Geophysical Sciences at The University of Chicago

Two stories illustrate the interplay between humanity and the carbon cycle. One about the past: it turns out that if the atmospheric CO₂ concentration had been lower in the natural world, the climate impacts we are starting to see today would have happened sooner, making it much more challenging for humanity to figure out what was going on in time to prevent it. One about the future: on the Social Cost of Carbon, a comparison of the present-day value versus a new geologically-based estimate of the ultimate costs, to all future generations impacted by our energy decisions.

Meeting Room 402



Note: David Archer will present via teleconference.

SYMPOSIUM SCHEDULE - NOVEMBER 10

2:00–3:00 p.m.

Simulation and Forecast of Infectious Disease:

Environmental Determinants and Transmission Dynamics

Jeffrey Shaman, Associate Professor of Environmental Health Sciences and Director of the Climate and Health Program at the Mailman School of Public Health of Columbia University

Dynamic models of infectious disease systems are often used to study the epidemiological characteristics of disease outbreaks, the ecological mechanisms affecting transmission, and the suitability of various mitigation and intervention strategies. I will describe investigations of the environmental determinants and transmission dynamics of influenza and other pathogens. Much of the research centers on the development of model systems and combined model-inference frameworks designed for the simulation and forecast of disease outbreaks. We identify meteorological drivers of influenza survival and transmission, demonstrate that accurate and reliable predictions of seasonal influenza outbreaks can be made using an optimized mathematical model representing population-level transmission dynamics, and apply these methods to the study of other infectious diseases.

Meeting Room 402



3:00–3:30 p.m.

Refreshment Break

Foyer Outside
Meeting Room 402

3:30–5:00 p.m.

Town Hall about Climate Change

Moderator: **Brian Southwell**, Director of the Science in the Public Sphere Program for the Center for Communication Science at RTI International

Panelists:

Ashley A. Anderson, Assistant Professor in the Department of Journalism and Media Communication at Colorado State University

Daniel Costa, Adjunct Professor of Environment Sciences and Engineering at University of North Carolina, and National Research Program Director for the Air, Climate, and Energy Research Program at the U.S. Environmental Protection Agency

Adam Terando, Research Ecologist with the U.S. Geological Survey at the Southeast Climate Science Center and Adjunct Professor with the Applied Ecology Department at North Carolina State University

Q & A with panelists. This event is open to the public.

Meeting Room 402



Brian Southwell

5:00 p.m.–7:00 p.m.

Dinner on Your Own

Downtown Raleigh

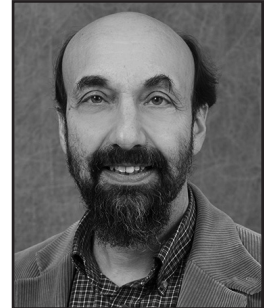
SYMPOSIUM SCHEDULE - NOVEMBER 10

7:00 p.m.–9:00 p.m. **Screening and Scientific Critique of the Documentary *An Inconvenient Sequel: Truth to Power***

Walter A. Robinson, Professor of Atmospheric Sciences at North Carolina State University

A decade after *An Inconvenient Truth* brought climate change into the heart of popular culture comes the follow-up that shows just how close we are to a real energy revolution. Former Vice President Al Gore continues his tireless fight traveling around the world training an army of climate champions and influencing international climate policy. Cameras follow him behind the scenes—in moments both private and public, funny and poignant—as he pursues the inspirational idea that while the stakes have never been higher, the perils of climate change can be overcome with human ingenuity and passion. This event is open to the public.

Ballroom A



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 meeting participant will treat other members, staff, and everyone that they meet with courtesy, respect, and professionalism at all times. Sigma Xi meetings 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 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.