



Tyler Prize

FOR ENVIRONMENTAL ACHIEVEMENT

For Immediate Release

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Leading Air Pollution Experts Awarded Prestigious 2012 Tyler Environmental Prize

John Seinfeld, PhD, and Kirk R. Smith, MPH, PhD, recognized for their work to advance understanding of air pollution and its impact on the health of humans and the planet

Los Angeles, CA (March 20, 2012) – The Tyler Prize for Environmental Achievement honors two experts on air pollution with the 2012 Tyler Prize for their work to advance the scientific understanding of air pollution, and develop solutions to reduce the danger to human health and the impact on climate change.

Kirk R. Smith, MPH, PhD, of the University of California at Berkeley is recognized for his work identifying that household air pollution in developing nations is responsible for nearly two million premature deaths per year, disproportionately among women and children. John H. Seinfeld, PhD, of the California Institute of Technology, is recognized for his groundbreaking work leading to understanding of the origin, chemistry, and evolution of particles in the atmosphere. The fundamental understanding of the physics and chemistry of urban and regional air pollution that emerged from his research served as the basis for action to control the effects of air pollution on public health.

Since its inception in 1973 as one of the world's first international environmental awards, the Tyler Prize has been the premier award for environmental science, environmental health and energy, given to those who confer great benefit upon humankind through environmental restoration and achievement. The Tyler Prize is administered by the University of Southern California.

"The Tyler Prize is the highest recognition in the field of environmental science," said Seinfeld. "It's a humbling honor."

Previous laureates include Edward O. Wilson, recognized for his early work on the theory of island biogeography; Jane Goodall, selected for her seminal studies on the behavior and ecology of chimpanzees and her impact on wildlife awareness and environmental conservation; Jared Diamond, a renowned author who gave birth to the discipline of conservation biology; and Thomas Lovejoy, a central figure in alerting the world to the critical problem of dwindling tropical forests.

"Professors Smith and Seinfeld are giants in the efforts to understand and reduce the devastating impacts of air pollution," said Tyler Prize Executive Committee Chair Owen T. Lind, Professor of Biology at Baylor University. "Their respective research has dramatically advanced our understanding of the ways in which air pollution threatens our health as individuals and the health of the planet."

The Tyler Prize for Environmental Achievement
University of Southern California

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This year each Tyler Prize laureate will receive a \$100,000 cash prize and a gold medal. The Prize honors exceptional foresight and dedication in the environmental sciences – qualities that mirror the prescience of the Prize’s founders, John and Alice Tyler, who established it while the environmental debate was still in its infancy.

John Seinfeld

Louis E. Nohl Professor and Professor of Chemical Engineering

Chemical Reactions Leave Microscopic, Oily Droplets in the Air We Breathe

Originally trained in chemical engineering, Seinfeld was quickly captivated by the chemistry of air pollution after moving to Los Angeles in the late 1960s. “It became very clear to me that the atmosphere is really just a big chemical reactor and that was fascinating, so I changed my research direction to try to understand this reactor within which we live,” recalled Seinfeld.

Seinfeld’s research on the complicated interactions between pollutants, and the new molecules they produce, helped to launch an entirely new field of research on organic aerosols that continues to expand today.

“The atmosphere is really just a big chemical reactor.”

His research started with a large transparent Teflon bag on the top of his laboratory and today includes a new “smog chamber” and the use of airplanes to study this chemistry. Seinfeld points to new tools for

studying these complicated chemical reactions as the driving force behind our constantly increasing understanding of this science.

“It’s like peeling an onion. With each new tool to measure and study these molecules, we see more layers and learn more about what is actually contained in these particles,” said Seinfeld.

The Impact on our Health and Climate

While it is known that these pollutants contribute to heart and lung disease, air pollution is estimated to cause 50,000 deaths in America each year, a better understanding of what is contained within these particles will help biologists and physicians understand and address the impact on human health, argues Seinfeld.

Seinfeld points to the interaction between man-made emissions like exhaust and natural emissions like the chemicals that give plants their scent as an example of the complexity of the atmosphere’s chemistry.

“In the southeastern part of the US there are vast areas of vegetation in which there are large urban centers,” said Seinfeld. “Understanding how this mixture of man-made and natural emissions behaves in the atmosphere is one of the current challenges.”

The impact of the pollutants that result from the mixing of man-made and natural emissions, called secondary organic aerosols, is not limited to human health. These particles also play an important role in the earth’s climate.

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“These particles in our air can have two effects on climate. They reflect sunlight away from the earth and cool its surface, and also serve as the building blocks of clouds, which play a huge role in determining our climate,” explained Seinfeld. “When the chemistry of clouds changes, so does our climate.”

Kirk Smith

Professor of Global Environmental Health, School of Public Health

Identifying an Unlikely Killer in the Developing World

Smith was the first to identify the harm caused by smoke from the burning of fuels like wood or dung in homes in the developing world in 1981. For the last 30 years, Smith’s research has focused on measuring the damage it does to people’s health and looking for solutions.

“Most people recognize that smoking is the worst thing you can do for your health,” explained Smith. “The next worst thing you can do is be around smoke, and indoor fires are like being around a thousand burning cigarettes per hour. Babies may not smoke, but they are in these homes.”

“The impact of household air pollution is on scale with any other major health risk in developing countries, including exposure to HIV, mosquitoes or dirty water.”

Recognizing the harm this does to the health of individuals, especially women and children, Smith’s research has also identified the scale of the problem.

“We now understand that the deadly effects of these fuels that are used by nearly half the world,” said Smith. “The impact of household air pollution is on scale with any other major health risk in developing countries, including exposure to HIV, mosquitoes or dirty water.”

Household Air Pollution as a Driver of Climate Change

In addition to recognizing the impact of this cooking and heating practice on the health of women and children, his work has led to the recognition of the role household pollution plays in climate change. This smoke contains partially burned materials that contribute pollutants like black carbon and greenhouse gases to the atmosphere, which contributes to global warming.

“We were the first in the early 1990s to do research showing that this kind of combustion also contributes to climate change,” said Smith. “If you improve combustion in households you improve health directly and you get a climate protection benefit. There’s a global benefit to improving combustion in developing countries.”

The recognition of this co-benefit to both health and climate has led to increased support to get improved stoves out into these countries. Through international carbon offset markets, NGOs that Smith helped launch with former students now work independently to provide stoves in Uganda and other nations and sell tools to better measure air quality in developing nations.

Smith’s work has shifted now to quantify the actual health benefits of these stoves. One program in India provides stoves to poor pregnant women as part of their prenatal health services and will track improvements in birth weights to measure the benefit to health.

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“This is not just a technical challenge, but it’s a behavioral challenge,” explained Smith. “We have improved stoves, but now we must focus on how to pay for these stoves, get them out to people, and make sure people are using them. It’s like bed nets for malaria - the benefits aren’t fully realized until effective ones are developed and people use them correctly.”

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Lecture and Award Ceremony

On Thursday, April 26, at 2 p.m., Seinfeld and Smith will deliver public lectures at The Forum at The Tutor Campus Center at the University of Southern California. These lectures are open to the public.

And in a private ceremony, on Friday, April 27, at 7 p.m., the Tyler Prize Executive Committee and the international environmental community will honor Seinfeld and Smith at a banquet and ceremony at the Four Seasons Hotel in Beverly Hills.

About the Tyler Prize

The Tyler Prize for Environmental Achievement is one of the first international premier awards for environmental science, environmental health and energy.

It was established by the late John and Alice Tyler in 1973 and has been awarded annually to sixty-one individuals and four organizations associated with world-class environmental accomplishments. Recipients encompass the spectrum of environmental concerns including environmental policy, environmental health, air and water pollution, ecosystem disruption and loss of biodiversity, and energy resources. The Tyler Prize is administered by the University of Southern California.

For more information on the Tyler Prize and its recipients, go to:

<http://www.tylerprize.usc.edu/laureates.html>