

# Environmental Engineering Seminar

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*The Department of Civil and Environmental Engineering presents*



## **Professor John Seinfeld Caltech**

Date: April 13, 2018

Time: 3:00 – 4:00 pm

Place: RRI 101

### **Title: Aerosols and Climate**

**Abstract:** Airborne particles (aerosols) have both climatic and human health effects. These particles consist of complex mixtures of inorganic and organic substances that arise from both direct emissions and generation in the atmosphere as a result of gas-phase oxidation chemistry. Roughly one-half of the mass of airborne aerosols consists of organic compounds that reach the particle phase as a result of exquisitely complex gas-phase organic chemistry that produces compounds of extremely low volatility. Here, we will explore the nature of such particles, and their climatic effects.

#### **About the Speaker**

John H. Seinfeld is the Louis E. Nohl Professor of Chemical Engineering at the California Institute of Technology. He received a B.S. from the University of Rochester and a Ph.D. from Princeton University. Both degrees are in Chemical Engineering. He has spent his entire professional career at Caltech. From 1990-2000 he served as Chair of Caltech's Division of Engineering and Applied Science.

Seinfeld is one of the world's leading authorities on atmospheric chemistry and airborne particles. Seinfeld and his Ph.D. students developed the first computational models of urban air pollution and worked out both the chemistry of ozone formation and the elaborate thermodynamic equilibria that govern atmospheric gas-particle distributions. He established a major program aimed at understanding the origin and chemistry of organic airborne particles that are produced from the atmospheric oxidation of volatile organic compounds. This class of airborne material, which comprises as much as 80% of the mass of airborne aerosols worldwide, became known as "secondary organic aerosol". Together with Professor Richard Flagan at Caltech, he established the first transparent outdoor smog chamber as a means to simulate atmospheric chemistry and aerosol formation under controlled conditions.

Seinfeld has mentored 93 PhDs and 45 postdoctoral fellows, about half of whom occupy faculty positions worldwide. He is the author of approximately 800 papers and 7 books. His book co-authored with Spyros Pandis, *Atmospheric Chemistry and Physics*, now in its 3<sup>rd</sup> edition, is considered the definitive text on the subject. He is a member of the National Academy of Sciences, the National Academy of Engineering, and the American Academy of Arts and Sciences. He received the American Chemical Society Award for Creative Advances in Environmental Science and Technology and the Colburn, Walker, and Lewis Awards of the American Institute of Chemical Engineers. He received the NASA Public Service Award, the Haagen-Smit Clean Air Award from the State of California, and is a Fellow of the Japan Society for the Promotion of Science. He is the recipient of the Fuchs Award, given internationally every four years and considered the highest honor in the field of aerosol science. He received the Nevada Medal, the Aurel Stodola Medal of the Swiss Federal Institute of Technology, and the 2012 Tyler Prize. He is the recipient of honorary doctorates from Carnegie Mellon University, Clarkson University, and the University of Patras, Greece.