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Dr. Athanasios Nenes is Assistant Professor and Blanchard-Milliken Young Faculty Chair in the Schools of Earth & Atmospheric Sciences and Chemical & Biomolecular Engineering at the Georgia Institute of Technology. There, he leads a research group that focuses on multiscale modeling and parameterization of aerosol-cloud interactions, thermodynamic modeling of tropospheric aerosols, development of instrumentation and techniques for characterizing organic-water interactions, hygroscopicitiy and CCN activity of aerosols, field-based observations of aerosol-cloud interactions and, effects of marine ecosystem productivity on clouds and climate.

He has received numerous awards, including the Sigma Xi Young Faculty Award, Sheldon K Friedlander Award, a NASA New Investigator Award, and an NSF CAREER Award. Dr. Nenes has served on numerous panels and is an editor of *Atmospheric Chemistry and Physics*. He received a Ph.D. in Chemical Engineering from the California Institute of Technology, an M.S. in Atmospheric Chemistry from the University of Miami, and a Diploma in Chemical Engineering from the National Technical University of Athens, Greece.

Symposium title: Transforming Our Ability to Predict Climate Change and Its Effects: http://www.pnl.gov/aaas/track_climate.stm

Abstract

"From Emissions to Impacts: Insights from and Advances in Atmospheric Chemistry"

The effects of airborne particulate matter ("aerosols") on clouds (known as the "aerosol indirect effect") are potentially one of the largest impacts humans have on climate. Even more important, the indirect effect is currently thought to have a net climatic cooling effect, largely offsetting the warming from greenhouse gases. Despite its importance, the indirect effect is one of the most uncertain components of climate change. This uncertainty originates from the complex and multi-scale nature of aerosol-cloud interactions, which often forces climate models to use empirical approaches to the problem.

This talk will present assessments of the aerosol indirect effect using a state-of-the-art global climate model framework and physically-based approaches of representing aerosol-cloud interactions. We present methods for constraining and evaluating these novel modeling approaches with *in-situ* observations of aerosol size distribution, chemical composition, and cloud droplet formation potential. Finally, we present work on robustly constraining important sources of predictive uncertainty by coupling the *in situ* observations with global climate modeling.