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# Aerosol-Cloud Interactions: The Elusive Component of Climate Change

Frontiers in Global Change  
Seminar Series

Presented by...

## Dr. Thanos Nenes

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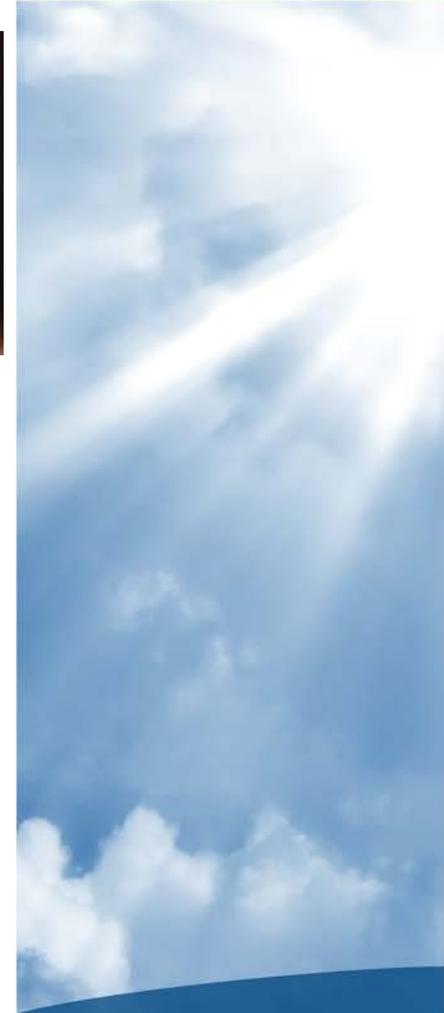
### Abstract:

The effect of human activities on climate is one of the most important issues facing society. Humans influence climate in many ways. Emissions of greenhouse gases (GHGs) tend to warm climate, by reducing the amount of infrared radiation that is emitted to space. Increased levels of suspended atmospheric particles (“aerosols”) exert a net cooling effect by directly scattering and absorption of solar radiation (the “aerosol direct climatic effect”). Aerosols also affect clouds by acting as the seed for droplet (or ice crystal) formation; polluted clouds tend to have more droplets than their pristine counterparts, and affect their reflectivity, size, lifetime and ability to precipitate. It is thought that aerosol impacts on clouds (known as “aerosol indirect climatic effects”) have a net cooling effect on climate.

Despite their importance, aerosol impacts on clouds constitute one of the most uncertain components of climate, significantly affecting predictions of climate sensitivity to GHG levels. This uncertainty originates largely from the complex and multi-scale nature of aerosol-cloud interactions, which truly challenges the description of all processes involving aerosols and clouds. A major focus of our research is to improve the description of aerosol-cloud interactions in climate model frameworks through a combination of observations, theory and modeling. We will present key findings and demonstrate how modeling can be combined with in-situ observations to constrain process uncertainty. We will also demonstrate new approaches (based on adjoint sensitivity analysis) to quantitatively understand sources of variability in model simulations, and the spatiotemporal sensitivity of cloud parameters & processes to aerosol.

See <http://nenes.eas.gatech.edu/>

Please join us for a meet and greet opportunity  
with Dr. Nenes after the seminar.  
~Refreshments will be served~



Date: Thursday,  
August 1

Location: EMSL  
Auditorium

Time: 10:00 AM