

# Peter J. Adams

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**Research Interests:** Aerosol chemistry, thermodynamics, and microphysics; global and regional scale chemical transport models; aerosols and climate; process-based emissions models; air quality in developing countries.

## Education

Ph.D., Chemical Engineering, California Institute of Technology, 2001  
MS, Chemical Engineering, California Institute of Technology, 1998  
BS, Chemical Engineering, Cornell University, 1996

## Professional Experience

Carnegie Mellon University, Department of Civil and Environmental Engineering and Department of Engineering and Public Policy, Assistant Professor (August 2001-June 2006) and Associate Professor (July 2006-present).  
Sandia National Laboratories, Co-op Intern, Combustion Research Facility, Fall 1994 and Summer, 1995.

## Teaching Experience

Professor, Carnegie Mellon University: Fluid Mechanics, Engineering and Public Policy Project, Air Quality Engineering, Climate Change Science and Policy.  
Teaching Assistant, Caltech: Atmospheric Chemistry, Thermodynamics.  
Teaching Assistant, Cornell: Introduction to Chemical Engineering.  
Tau Beta Pi volunteer tutor for new engineering students at Cornell, 1995-1996

## Honors

American Association for Aerosol Research: Sheldon K. Friedlander Award (Outstanding Dissertation), 2004.

Journal of Geophysical Research Excellence in Refereeing (2003); Fannie and John Hertz Foundation Graduate Fellow (1996-2001); AIChE Twin Tiers Outstanding Undergraduate Scholar (1996); Cornell Alumni Association of Greater Rochester Scholarship (1995-1996).

## Journal Articles

Adams, P. J., J. H. Seinfeld, and D. M. Koch, Global concentrations of tropospheric sulfate, nitrate, and ammonium aerosol simulated in a general circulation model, *J. Geophys. Res.*, 104, 13,791-13,823, 1999.  
Adams, P. J., J. H. Seinfeld, D. M. Koch, L. J. Mickley, and D. J. Jacob, General circulation model assessment of direct radiative forcing by the sulfate-nitrate-ammonium-water inorganic aerosol system, *J. Geophys. Res.*, 106, 1097-1111, 2001.

- Adams, P. J., and J. H. Seinfeld, Predicting global aerosol size distributions in general circulation models, *J. Geophys. Res.*, 10.1029/2001JD001010, 2002.
- Adams, P. J., and J. H. Seinfeld, Disproportionate impact of particulate emissions on global cloud condensation nuclei concentrations, *Geophysical Research Letters*, 10.1029/2002GL016303, 2003.
- Dawson, J. P., P. J. Adams, and S. N. Pandis, Sensitivity of ozone to summertime climate in the eastern USA: A modeling case study, *Atmos. Environ.*, doi: 10.1016/j.atmosenv.2006.10.033, 2006.
- Dawson, J.P., P.J. Adams, and S.N. Pandis, Sensitivity of PM<sub>2.5</sub> to climate in the Eastern US: a modeling case study, *Atmospheric Chemistry and Physics*, 7, 4295-4309, 2007.
- Dawson, J.P., P.N. Racherla, B.H. Lynn, P.J. Adams, and S.N. Pandis, Simulating present-day and future air quality as climate changes: model evaluation, *Atmospheric Environment*, 42 (19), 4551-4566, 2008.
- Dawson, J. P., P. N. Racherla, B. H. Lynn, P. J. Adams, and S. N. Pandis, Impacts of climate change on regional and urban air quality in the Eastern US: The role of meteorology, *J. Geophys. Res.*, submitted, 2008.
- Gilmore, E. A., L. B. Lave, and P. J. Adams, The costs, air quality and human health effects of meeting peak electricity demand with installed backup generators, *Environ. Sci. Tech.*, 40, 6887-6893, 2006.
- Jung, J.G., P.J. Adams, and S.N. Pandis, Simulating the size distribution and chemical composition of ultrafine particles during nucleation events, *Atmos. Environ.*, 40 (13), 2248-2259, 2006.
- Jung, J.G., S.N. Pandis, and P.J. Adams, Evaluation of nucleation theories in a sulfur-rich environment, *Aerosol Science and Technology*, 45 (7), 495-504, 2008.
- Lee, Y.H., K. Chen, and P. J. Adams, Development of a global model of mineral dust aerosol microphysics, submitted to *Atmospheric Chemistry and Physics*, 2008.
- Liao, H., P. J. Adams, S. H. Chung, J. H. Seinfeld, L. J. Mickley, and D. J. Jacob, Interactions between tropospheric chemistry and aerosols in a unified general circulation model, *J. Geophys. Res.*, 10.1029/2001JD001260, 2003.
- Liao, H., Seinfeld, J. H., Adams, P. J., and L. J. Mickley, Global radiative forcing of coupled tropospheric ozone and aerosols in a unified general circulation model, *J. Geophys. Res.*, 109 (D16), Art. No. D16207, 2004.
- Morgan, M.G., P.J. Adams, and D.W. Keith, Elicitation of expert judgments of aerosol forcing, *Climatic Change*, 75 (1-2), 195-214, 2006.
- Pierce, J.R., and P.J. Adams, Global evaluation of CCN formation by direct emission of sea salt and growth of ultrafine sea salt, *J. Geophys. Res.*, 111, 10.1029/2005JD006186, 2006.
- Pierce, J.R., and P.J. Adams, Efficiency of cloud condensation nuclei formation from ultrafine particles, *Atmospheric Chemistry and Physics*, 7, 1367-1379, 2007.
- Pierce, J.R., K. Chen, and P.J. Adams, Contribution of carbonaceous aerosol to cloud condensation nuclei: Processes and uncertainties evaluated with a global aerosol microphysics model, *Atmospheric Chemistry and Physics*, 7, 5447-5466, 2007.
- Pierce, J. R., G. J. Engelhart, E. A. Weitkamp, R. K. Pathak, S. N. Pandis, N. M. Donahue, A. L. Robinson, and P. J. Adams, Constraining particle evolution from wall losses, coagulation, and condensation-evaporation in smog-chamber experiments: optimal estimation based on size distribution measurements, *Aerosol Science and Technology*, in press, 2007.
- Pierce, J. R., G. Theodoritsi, P. J. Adams, S. N. Pandis, Parameterization of the effect of sub-grid scale aerosol dynamics on aerosol number emission rates, submitted to *Journal of the Atmospheric Sciences*, 2008.
- Pierce, J.R., and P. J. Adams, A computationally efficient aerosol nucleation/condensation method: Pseudo-steady-state sulfuric acid, submitted to *Aerosol Science and Technology*, 2008.

- Pierce, J.R., and P. J. Adams, Uncertainty in global CCN concentrations from uncertain aerosol nucleation and primary emission rates, submitted to *Atmospheric Chemistry and Physics*, 2008.
- Pinder, R. W., Anderson, A. J., Davidson, C. I., Adams, P. J., A process based model of ammonia emissions from dairy cows: improved temporal and spatial resolution, *Atmospheric Environment*, 38, 1357-1365, 2004.
- Pinder, R. W., Strader, R., Davidson, C. I., Adams, P. J., A temporally and spatially resolved ammonia emission inventory for dairy cows in the United States, *Atmospheric Environment*, 38, 3747-3756, 2004.
- Pinder, R. W., P. J. Adams, S. N. Pandis, and A. B. Gilliland, Temporally resolved ammonia emission inventories: Current estimates, evaluation tools, and measurement needs, *J. Geophys. Res.*, 111, D16310, doi:10.1029/2005JD006603, 2006.
- Pinder, R. W., P. J. Adams, and S. N. Pandis, Ammonia emission controls as a cost-effective strategy for reducing atmospheric particulate matter in the Eastern US, *Environ. Sci. Tech.*, 41, 380-386, 2006.
- Racherla, P. N., and P. J. Adams, Sensitivity of global ozone and fine particulate matter concentrations to climate change, *J. Geophys. Res.*, 111, doi:10.1029/2005JD006939, 2006.
- Racherla, P.N., and P.J. Adams, The response of surface ozone to climate change over the Eastern United States, *Atmospheric Chemistry and Physics*, 8 (4), 871-885, 2008.
- Racherla, P. N., and P. J. Adams, The relative importance of various factors influencing future ozone air quality in the United States, *Environ. Sci. Tech.*, submitted, 2008.
- Raes, F., R. Van Dingenen, E. Vignati, J. Wilson, J.-P. Putaud, J. H. Seinfeld, and P. J. Adams, Formation and cycling of aerosols in the global troposphere, *Atmos. Env.*, 34, 4215-4240, 2000.
- Sotiropoulou, R.E.P., A. Nenes, P.J. Adams, and J.H. Seinfeld, Cloud condensation nuclei prediction error from application of Köhler theory: Importance for the aerosol indirect effect, *Journal of Geophysical Research*, doi:10.1029/2006JD007834, 2007.
- Trivitanurak, W., P.J. Adams, D.V. Spracklen, and K.S. Carslaw, Tropospheric aerosol microphysics simulation with assimilated meteorology: model description and intermodel comparison, *Atmospheric Chemistry and Physics*, 8 (12), 3149-3168, 2008.

### **Other Publications**

Contributing Author, Intergovernmental Panel on Climate Change Third Assessment Report, Chapter 5, Aerosols: Their Direct and Indirect Effects

### **Selected Presentations**

- Cloud Aerosol Feedbacks and Climate Annual Workshop (Invited), “Assessing the aerosol indirect effect with a global aerosol microphysical models”, Toronto, March 2008.
- NitroEurope Conference (Invited Keynote Speech), “Aerosol-Climate Interactions and the Nitrogen Cycle”, February 2008.
- Workshop on Aerosol-Climate Interactions in Tropical Regions (Invited Talk), “Impacts of Primary Emissions and Nucleation on Global CCN”, February 2008.
- Workshop on Aerosol-Climate Interactions in Tropical Regions (Invited Talk), “Global Aerosol Microphysics Models: Tools for Assessing Uncertainties in the Indirect Effect”, February 2008.
- Fourth Accent Barnsdale Expert Workshop (Invited), “Effect of Climate Change on Particulate Matter”, November 2007.
- National Atmospheric Deposition Program Annual Meeting (Invited Talk), “Air Quality and Climate Change”, September 2007.

American Chemical Society Annual Meeting (Invited Talk), “Agricultural Ammonia Emissions, Uncertainty, and Applications to Air Quality Modeling”, September 2006.

Telluride Workshop on Organic Particles in the Atmosphere (Invited Talk), “Organic Aerosols as CCN: Magnitude of Contribution and Key Uncertainties”, August 2006.

Electric Power Research Institute (Invited Talk), “Ammonia: Environmental Impacts, Emissions, Inorganic PM<sub>2.5</sub>, and the Clean Air Interstate Rule”, July 2006.

Santa Fe Climate Prediction Uncertainties Workshop (Invited Talk), “Aerosol-cloud interactions: What do in-situ observations tell us and how can it constrain and improve modeling of the indirect effect?”, July 2006.

Climate Decision-Making Center (Invited Talk), “Effects of Airborne Particles on Climate: an Expert Elicitation”, March 2006.

European Aerosol Conference (Invited Talk), “Factors Controlling the Tropospheric CCN Budget”, August 2005.

National Oceanic and Atmospheric Administration (Invited Seminar), “Efficient Computational Modeling of Aerosol-Climate Interactions”, May 2005.

University of New Hampshire (Invited Seminar), “Tropospheric CCN Formation”, March 2005.

National Center for Atmospheric Research Workshop on Chemistry-Climate Interactions (Invited Talk), “Aerosol Formation and Chemistry: Sensitivity of CCN to Chemistry and Microphysics”, February 2005.

Society of Environmental Journalists, “Airborne Particulate Matter: An Update on Recent Research”, October 2004.

Forum on Aerosol Science and Technology (Invited Talk), “Making Progress Towards Understanding Aerosol-Climate Interactions”, June 2004.

Georgia Institute of Technology (Invited Seminar), “Insights into Aerosol Climate Forcings from Global Microphysics Models”, February 2004.

American Association for Aerosol Research PM Meeting (Invited Talk), “Aerosols and Climate”, April 2003.

National Center for Atmospheric Research Workshop on Chemistry-Climate Interactions (Invited Talk), “Aerosols: What are we missing? What should we do in the future?”, February 2003.

Goddard Institute for Space Studies (Invited Seminar), “Representing tropospheric aerosols in global climate models”, February 2002.

Northern Aerosol Regional Climatological Model Workshop (Invited Talk), “Size-resolved aerosol microphysics in global models: sensitivity to nucleation and primary particles”, March 2001.

### **Memberships and Professional Service**

American Association for Aerosol Research (AAAR): member and Internet Committee chair  
American Geophysical Union (AGU)  
American Society of Civil Engineers (ASCE)  
Commonwealth of Pennsylvania Department of Environmental Protection Air Quality Technical Advisory Committee (PA DEP AQTAC)