Daniel A. Rothenberg

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Education

Massachusetts Institute of Technology, Cambridge, MA
Ph.D., Atmospheric Science, Dept. of Earth, Atmospheric and Planetary Sciences — February, 2017

Cornell University, Ithaca, NY
B.S., Atmospheric Science, *magna cum laude*, Honors in Research — 2010

Research Experience

Center for Global Change Science, MIT, Cambridge, MA
Postdoctoral Associate — 2016-present

- Studying interactions between air quality, climate variability and climate change funded through an EPA Air Quality, Climate, and Energy Center grant, supervised by Noelle Selin and Susan Solomon
- Analyzed large ensemble of IGSM/GEOS-Chem simulations to understand state-dependence of climate penalty calculations
- Studied potential short-term policy impacts on air quality, health and the economy using a novel integrated assessment framework

Program in Atmospheres, Oceans, and Climate, MIT, Cambridge, MA
Research Assistant — 2011-2016

- Used novel uncertainty quantification techniques to develop emulator of droplet activation for parameterization in global models
- Developed an open-source, modular parcel modeling framework for studying droplet activation from diverse aerosol populations and for evaluating activation schemes
- Used global climate models (CESM, CMIP5 archive, AEROCOM Indirect Effects Experiment) to study aerosol indirect effects and aerosol-cloud interactions
- Participated in Fifth Ice Nucleation Workshop Part 2 in Karlsruhe, Germany; assisted with the operation of the Spectrometer for Ice Nucleation (SPIN) and developed software for automating the instrument and designing experiment setups

Department of Earth and Atmospheric Sciences, Cornell University, Ithaca, NY
Undergraduate Research Assistant — 2008-2011

- Studied biogeochemical/climate processes and interactions with a coupled carbon-climate model
- Performed and analyzed fully-coupled model simulations studying transient climate change in the 20th century

Center for Multiscale Modeling of Atmospheric Processes, Colorado State University, Fort Collins, CO
Summer Intern — summer 2010

- Implemented end evaluated a baroclinic instability test case on a very high resolution global atmospheric dynamical core, identifying numerical problems
- Developed novel visualization tools for analyzing model data on geodesic computational meshes

Teaching Experience

Global Warming Science (12.340x) — spring 2016
MIT-EdX and MIT, Department of Earth, Atmospheric and Planetary Sciences
Teaching Assistant

- Moderated discussion forum for general-audience MOOC on climate science
- Deployed single-column model to online cloud infrastructure for student problem set

Atmospheric Physics and Chemistry (12.806/12.306) SPRING 2014-2015
MIT, Department of Earth, Atmospheric, and Planetary Sciences
Teaching Assistant
Guest-lectured on aerosol and cloud microphysics modeling
Developed computational methods exercise to teach critical modeling and analysis skills

Leadership and Service

Annual Meeting Oversight Committee
American Meteorological Society
Member 2017-PRESENT

Graduate Climate Conference Executive Committee
MIT/Woods Hole Oceanographic Institution/University of Washington
Co-Chair 2013
Steering Committee Member 2014-2015
Advisor; Fundraising Chair 2015

Selected Publications

1. **Rothenberg, Daniel** and Chien Wang: An aerosol activation metamodel of v1.2.0 of the pyrcel cloud parcel model: Development and offline assessment for use in an aerosol-climate model, Geosci. Model Dev. Discuss., doi:10.5194/gmd-2016-228, *in review*, 2016.
2. **Rothenberg, Daniel** and Chien Wang: Metamodeling of Droplet Activation for Global Climate Models, J. Atmos. Sci., 73, 1255–1272. doi:10.1175/JAS-D-15-0223.1, 2016
3. **Rothenberg, D.**, Mahowald, N., Lindsay, K., Doney, S. C., Moore, J. K., and Thornton, P.: Volcano impacts on climate and biogeochemistry in a coupled carbon–climate model, Earth Syst. Dynam., 3, 121-136, doi:10.5194/esd-3-121-2012, 2012.

Selected Presentations and Talks

Invited Talks

Rothenberg, D., Avramov, A., Wang, C., Garimella, S., Wolf, M., and Cziczo, D. Understanding Fundamental Aerosol-Cloud Interactions and their Contributions to the Aerosol Indirect Effect. NOAA Geophysical Fluid Dynamics Laboratory. Princeton, NJ. 2016

Conference Talks

Rothenberg, D., Wang, C., and Avramov, A. Contributions of Uncertainty in Droplet Nucleation to the Indirect Effect in Global Models. AGU Fall Meeting. San Francisco, 2016. | PPTX

Rothenberg, Daniel. A Python-based Parcel Model Framework for Studying Aerosol-Cloud Processes. Sixth Symposium on Advances in Modeling and Analysis Using Python. New Orleans, 2016. | PDF

† **Rothenberg, Daniel**, Chien Wang and Alexander Avramov. Evaluating Advanced Aerosol Activation Treatments in a Coupled Climate/Mixing-State Resolving Aerosol Model. 95th Annual Meeting of the American Meteorological Society, 7th Symposium on Aerosol-Cloud-Climate Interactions. Phoenix, AX. 2015. | PDF

Honors and Awards

Outstanding Student Presentation Award (†), AMS 2015
National Science Foundation Graduate Research Fellowship, NSF 2012
Father James B. Macelwane Award in Meteorology, AMS 2011
Klein Fellowship, MIT-EAPS 2011
Charney Prize, MIT-EAPS 2011
Academic Excellence Award - Atmospheric Science, Cornell/CALS 2011