

Sean P. Cohen

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RESEARCH INTERESTS

- Idealized modeling, tropical convection, atmospheric radiation, hydrological sensitivity

EDUCATION

Columbia University

PhD in Applied Math and Atmospheric Science

Dissertation Topic: Idealized Models of Rainfall

Graduated August 2024

GPA: 4.00/4.00

University of Pennsylvania

Masters in Mechanical Engineering and Applied Mechanics

Concentration: Heat Transfer, Fluid Mechanics, and Energy Science and Engineering

Honors: Rachleff Scholar | 2018 Honorable Mention Outstanding Academic Award

Graduated December 2017

GPA: 4.00/4.00

Bachelors in Mechanical Engineering and Applied Mechanics

Honors: Rachleff Scholar | 2017 Hugo Otto Wolf Memorial Prize | Dean's List 2013-2017

Graduated May 2017

GPA: 4.00/4.00

EXPERIENCE

Lamont-Doherty Earth Observatory

Researcher in Dr. Robert Pincus' Clouds, Radiant Energy, and Water Group

August 2024 - Present

- Investigated changes in the stratospheric lapse rate with increases in atmospheric CO₂

Columbia University

Researcher in Dr. Adam Sobel's Tropical Meteorology Group

August 2020 - August 2024

- Implemented parameterizations of large-scale dynamics into NCAR's single column model
- Modified a dynamics parameterization to account for boundary layer effects
- Created an analytical model for spectrally resolved radiative cooling sensitivity

Ball Aerospace & Technologies

Associate Thermal Engineer

February 2018 - June 2020

- Supported various space and RF programs via thermal analysis and testing:
 - Created FEA, CFD and reduced dimensionality models (ANSYS, TD, MATLAB)
- Pursued personal research projects on the cooling of pin fin arrays

University of Pennsylvania

Researcher in Dr. Katherine Kuchenbecker's Haptics Lab

Summer 2015

- Designed a system that allows surgeons to tactically sense the steady-state forces they apply during practice surgical tasks on the Da Vinci Surgical System

Researcher in Dr. Dani Bassett's Complex Systems Group

Summer 2014

- Analyzed how sound propagated through two-dimensional force chains in granular materials

PUBLICATIONS

- S. Cohen, R. Pincus, L. Polvani, 2025: Why increases in CO₂ cool the stratosphere and how this amplifies radiative forcing, *Nature Geoscience* (under review).
- S. Cohen, A. Sobel, M. Biasutti, 2025: Modeling Tropical Precipitation in a Single Column with a Boundary Layer Forcing, *Journal of the Atmospheric Sciences*, 82, 8, DOI: 10.1175/JAS-D-24-0111.1
- S. Cohen, R. Pincus, 2025: A spectroscopic theory for how mean rainfall changes with surface temperature, *Science Advances*, 11, 9, DOI: 10.1126/sciadv.adv6191
- S. Cohen, 2024: Using Single Column Models to Understand the Mechanisms Controlling Rainfall, *Columbia University ProQuest Dissertations and Theses*.

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- S. Cohen, A. Sobel, M. Biasutti, S. Wang, I. Simpson, A. Gettelman, I. Hu, 2024: Implementation and Exploration of Parameterizations of Large-Scale Dynamics in NCAR's Single Column Atmospheric Model SCAM6, *Journal of Advances in Modeling Earth Systems*, 16, 6, 2024. DOI: 10.1029/2023MS003866
- S. Cohen, K. Weed, J. Lambert, 2020: An Analytical Approximation for Temperature Distributions in Micro Pin Fin Arrays, *AIAA SciTech Forum and Exposition*, 6, DOI: 10.2514/6.2020-0980
- J. D. Brown, J. N. Fernandez, S. P. Cohen, K. J. Kuchenbecker, 2017: A Wrist-Squeezing Force-Feedback System for Robotic Surgery Training, *World Haptics Conference (WHC)*, 107-112, DOI: 10.1109/WHC.2017.7989885
- S. Cohen, 2014: Research Methods in Educational Equity and Educational Policy, *3808: A Journal of Critical Writing*, 9, 78-82.

AWARDS

- Honorable Mention Outstanding Academic Award (2018)
- Hugo Otto Wolf Memorial Prize (2017)
- Rachleff Scholarship (2013-2017)
- Dean's List (2013-2017)

CONFERENCE PRESENTATIONS

- "Why increases in CO₂ cool the stratosphere and how this amplifies radiative forcing", **Oral**. ECS Symposium; Virtual; September 2025
- "Modifying a Weak Temperature Gradient Parameterization to Include a Boundary Layer Mass Flux Forcing", **Oral**. AGU Fall Meeting; San Francisco, CA; December 2023
- "The Spectral Roots of Hydrological Sensitivity", **Oral**. AGU Fall Meeting; San Francisco, CA; December 2023
- "The Spectral Roots of Hydrological Sensitivity", **Poster**. WCRP Open Science Conference; Kigali, Rwanda; October 2023
- "The Water Vapor Continuum Creates Nonlinearities in the Sensitivity of Mean Precipitation to Surface Temperature", **Oral**. CERES Team Meeting; New York, NY; October 2023
- "Implementation and Exploration of Parameterizations of Large-Scale Dynamics in NCAR's Single Column Atmospheric Model SCAM6", **Oral**. AMS Tropical Meeting; New Orleans, LA; June 2022

TEACHING AND MENTORSHIP

Columbia University

Undergraduate Research Advisor for Sylvia Whang

Fall 2025

- Investigated stratospheric temperature biases in CMIP6 models

Teaching Assistant for Numerical Methods

Fall 2022

- Held weekly recitations, graded midterms, projects, and assignments

University of Pennsylvania

Chair of Local Committee of Engineers Without Borders

Fall 2015 - Fall 2017

- Taught weekly lessons at Saul High School in Philadelphia
- Aided students in SAT prep and college applications

Teaching Assistant for Direct Energy Conversion

Fall 2017

- Held weekly recitations, graded assignments

Teaching Assistant for Statics and Mechanics of Materials

Fall 2016

- Held weekly recitations, graded assignments

Teaching Assistant for Thermodynamics

Spring 2016

- Held weekly recitations, graded assignments

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Teaching Assistant for Energy Systems

Fall 2015

- Held weekly recitations, graded assignments

OUTREACH

National Council of Jewish Women New York Hunger Program

Volunteer

Spring 2021 - Present

- Served food, translated for Spanish speakers

Metropolitan Detention Center, Brooklyn

Volunteer

Spring 2025 – Fall 2025

- Presented a course on climate sensitivity and the carbon cycle

Boulder Homeless Shelter

Volunteer

Spring 2017 - Spring 2020

- Prepared and served food