

# Tristan Abbott

tristana@princeton.edu // tristan.abbott@noaa.gov // thabbott.github.io

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## CURRENT POSITION

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**Postdoctoral Research Associate**, Princeton University/NOAA GFDL 2022-present  
Hosted by Nadir Jeevanjee (NOAA GFDL)

## EDUCATION

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**Program in Atmospheres, Oceans and Climate (PAOC)** 2016-2021  
Department of Earth, Atmospheric and Planetary Sciences (EAPS), MIT  
Doctor of Philosophy in Atmospheric Science  
Thesis advisor: Timothy W. Cronin

**University of Wisconsin-Madison** 2012-2016  
Bachelor of Science in Computer Sciences with Honors in the Major  
Thesis advisor: Samuel N. Stechmann

## EMPLOYMENT AND RESEARCH EXPERIENCE

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**Postdoctoral Associate**, Cronin Group 2021-2022  
Department of Earth, Atmospheric and Planetary Sciences, MIT

**Graduate Research Assistant**, Cronin Group 2016-2021  
Department of Earth, Atmospheric and Planetary Sciences, MIT

**Staff Research Associate**, Climate Systems Interactions Group 2016  
Department of Atmospheric and Oceanic Sciences, UCLA

**Undergraduate Research Assistant**, Stechmann Group 2014-2016  
Department of Mathematics, University of Wisconsin-Madison

**Undergraduate Research Assistant**, Behavioral and Experimental Economics Lab 2013-2014  
School of Human Ecology, University of Wisconsin-Madison

**Undergraduate Research Assistant**, Jin Group 2013  
Department of Chemistry, University of Wisconsin-Madison

**Undergraduate Research Assistant**, Weibel Group 2012  
Department of Biochemistry, University of Wisconsin-Madison

## AWARDS

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**Carl-Gustaf Rossby Award** 2021  
Best doctoral thesis completed in the Program in Atmospheres, Oceans and Climate

**MIT School of Science John W. Jarve (1978) Seed Fund for Innovation** 2020  
\$110,000 grant for postdoctoral work at MIT

**Outstanding Student Poster Award** 2019  
AMS Conference on Atmospheric and Oceanic Fluid Dynamics

## PUBLICATIONS

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**Abbott** and Cronin (2023): “Multiple Equilibria and Soil Moisture-Precipitation Feedbacks in Idealized Convection-Permitting Simulations With an Open Hydrological Cycle”. *Journal of Advances in Modeling Earth Systems* 15. doi:10.1029/2023MS003719

**Abbott** and Cronin (2021): “Aerosol invigoration of atmospheric convection through increases in humidity”. *Science* 371. doi:10.1126/science.abc5181

**Abbott**, Cronin, and Beucler (2020): “Convective Dynamics and the Response of Precipitation Extremes to Warming in Radiative-Convective Equilibrium”. *Journal of the Atmospheric Sciences* 77. doi:10.1175/JAS-D-19-0197.1

Hausfather, Drake, **Abbott**, and Schmidt (2020): “Evaluating the performance of past climate model projections”. *Geophysical Research Letters* 46. doi:10.1029/2019GL085378

Beucler, **Abbott**, Cronin, and Pritchard (2019): “Comparing Convective Self-Aggregation in Idealized Models to Observed Moist Static Energy Variability Near the Equator”. *Geophysical Research Letters* 46. doi:10.1029/2019GL084130

**Abbott**, Stechmann, and Neelin (2016): “Long Temporal Autocorrelations in Tropical Precipitation Data and Spike Train Prototypes”. *Geophysical Research Letters* 43. doi:10.1002/2016GL071282

## PRESENTATIONS

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*Seminars and invited talks*

**Batsheva de Rothschild Seminar on Cloud-Climate Interactions Across Scales**, February 2023 (Eilat, Israel): “Assessing drivers of the land-ocean contrast in convective intensity with global cloud-resolving models”.

**AGU Fall Meeting**, December 2021 (virtual, hybrid with New Orleans, LA): “A Humidity-Entrainment Mechanism for Aerosol Invigoration of Convection”.

**Simons Foundation Solar Geoengineering Workshop**, September 2022 (New York, NY): “Aerosols and the land-ocean contrast in convective intensity”.

**MIT Sack Lunch Seminar Series**, December 2020 (virtual): “Interactions between Convection and its Environment: Microphysical Invigoration and Multiple Equilibria of Idealized Land-Atmosphere Systems”.

**GFDL Lunchtime Seminar Series**, October 2020 (virtual): “Aerosol Invigoration of Convection through Changes in Atmospheric Humidity”.

### *Contributed talks*

**Abbott**, Jeevanjee, Harris, Zhou, and Cheng: “Do global cloud-resolving models reproduce the observed land-ocean contrast in convective intensity?”. AGU Fall Meeting, December 2022 (Chicago, IL).

**Abbott** and Cronin: “A Humidity-Entrainment Mechanism for Aerosol Invigoration of Convection”. AMS Conference on Hurricanes and Tropical Meteorology, May 2021 (virtual).

**Abbott** and Cronin: “Large-Scale Tropical Dynamics Enable Microphysical Invigoration of Convection”. Northeast Tropical Meteorology Workshop, June 2019 (Dedham, MA).

**Abbott**, Cronin and Beucler: “How do Changes in Convective Dynamics Impact Tropical Precipitation Extremes in a Warming World?”. AGU Fall Meeting, December 2018 (Washington, DC).

**Abbott** and Cronin: “Toward a Simultaneous Scaling for Mean and Extreme Precipitation”. AMS Conference on Hurricanes and Tropical Meteorology, April 2018 (Ponte Vedra, FL).

### *Contributed posters*

**Abbott** and Cronin: “Multiple Equilibria in Weak Temperature Gradient Simulations over a Land Surface”. AGU Fall Meeting, December 2020 (virtual).

**Abbott** and Cronin: “A Humidity-Entrainment Mechanism for Aerosol Invigoration of Convection”. AGU Fall Meeting, December 2019 (San Francisco, CA).

**Abbott** and Cronin: “Large-Scale Tropical Dynamics Enable Microphysics Invigoration of Convection”. AMS Conference on Atmospheric and Oceanic Fluid Dynamics, June 2019 (Portland, ME).

**Abbott**, Cronin and Beucler: “How do Changes in Convective Dynamics Impact Tropical Precipitation Extremes in a Warming World?”. AMS Conference on Atmospheric and Oceanic Fluid Dynamics, June 2019 (Portland, ME).

**Abbott**, Cronin and Beucler: “Understanding the Scaling of Tropical Precipitation Extremes with Warming”. Lorenz Center Workshop on Water and Climate Change, June 2018 (Dedham, MA).

**Abbott** and Cronin: “Precipitation Extremes and Convective Dynamics”. AMS Conference on Atmospheric and Oceanic Fluid Dynamics, June 2017 (Portland, OR).

## **TEACHING**

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**Assistant Instructor**, Princeton Department of Geosciences  
Junior Colloquium (instructor: Adam Maloof)

Fall 2022

**Lead Instructor**, MIT Department of Earth, Atmospheric and Planetary Sciences  
Weather and Climate Laboratory (co-instructor: Glenn Flierl)

Spring 2022

**Teaching Assistant**, MIT Department of Earth, Atmospheric and Planetary Sciences  
 Weather and Climate Laboratory (instructors: Lodovica Illara and John Marshall) Spring 2021  
 Introduction to Atmosphere, Ocean and Climate Dynamics (instructor: Tim Cronin) Fall 2019  
 Atmospheric Radiation and Convection (instructor: Tim Cronin) Spring 2019

**Curriculum Assistant**, MIT Department of Mathematics 2021  
 Wrote climate-related problem sets for first year math courses

**Instructor**, Practical Computing Tutorials for Earth Scientists 2021  
 Led workshops on compilers and high-performance computing for fellow graduate students

**Graduate Assistant**, “Discover EAPS” first-year pre-orientation program 2017-2019  
 5 day program for incoming first-year students, including weekend trip to Mt. Washington, NH

## FIELD EXPERIENCE

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**NCAR Advanced Study Institute**, RELAMPAGO-CACTI field campaign Fall 2018  
 Intensive field research studying severe thunderstorms in central Argentina

## SERVICE

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**Peer reviewer** for *Journal of the Atmospheric Sciences*, *Climate Dynamics*, *Journal of Advances in Modeling Earth Systems*, *Geophysical Research Letters*, *Atmospheric Chemistry and Physics*

**Proposal reviewer** for the National Science Foundation

**GFDL Global Cloud-Resolving Model Reading Group** 2022-present  
 Biweekly GFDL journal club focused on research related to global cloud-resolving modeling  
 Created the group in September 2022 and currently serve as lead organizer

**PAOC Colloquium Committee** 2017-2022  
 Seminar organizing committee for the Program in Atmospheres, Ocean and Climate, MIT  
 Served as committee chair during Spring 2019 and Spring 2021

**MIT Unlearning Racism in Geoscience (URGE) pod** Spring 2021  
 National journal-reading and diversity, equity and inclusion policy design program for geoscientists

**Towards Inclusion and Diversity in EAPS (TIDE)** Spring 2021  
 Student-led organization dedicated to advancing diversity, equity and inclusion in EAPS

**EAPS Graduate Student Advisory Council** 2016-2021  
 Graduate student government and advocacy group in the Department of Earth, Atmospheric and Planetary Sciences, MIT

**EAPS Peer Mentoring Program** 2018-2021  
 Peer mentor to first- and second-year graduate students

**Graduate Climate Conference Executive Committee** 2017, 2019  
 Organizing committee for NSF-funded conference for graduate students in climate science

**EAPS Graduate Student Retreat Coordinator** 2016-2017  
Fundraiser for and organizer of weekend retreat for EAPS graduate students

**OUTREACH**

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**Massachusetts STEM Week classroom visit** 2021  
Interactive lecture and interview with middle school students during two class sessions

**MIT Museum Girls Day** 2019  
Rotating tank fluid demonstrations for temporary exhibits

**RELAMPAGO-CACTI Field Campaign community outreach** 2018  
Small group presentations to secondary school students in Cordoba, Argentina

**Beacon Hill Seminar Series** 2017  
Half-hour lecture on climate science open to general public in Boston, MA

**DayCon Seminar Series** 2017  
Half-hour lecture on climate science open to general public in Cambridge, MA