Spencer Alan Hill

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EDUCATION

2016	Ph.D.	Atmospheric and Oceanic Sciences	Princeton University
2011	B.S.	Atmospheric and Oceanic Sciences; Applied Mathematics	UCLA

PROFESSIONAL APPOINTMENTS

2023- Assistant Professor, Dept. of Earth and Atmospheric Sciences, City College of New York
2021- Adjunct Associate Research Scientist, Lamont-Doherty Earth Observatory, Columbia University
2021-23 Associate Research Scholar, Program in Atmospheric and Oceanic Sciences, Princeton University
2021 Associate Research Scientist, Lamont-Doherty Earth Observatory, Columbia University
2019-21 Postdoctoral Research Scientist, Lamont-Doherty Earth Observatory, Columbia University
2016-19 Postdoctoral Research Scientist, dual appointment, Division of Geological and Planetary Sciences, California Institute of Technology, and Dept. of Atmospheric and Oceanic Sciences, UCLA
2011-16 Graduate Research Assistant, Program in Atmospheric and Oceanic Sciences, Princeton University

GRANTS AND FELLOWSHIPS

2021 "How do energy fluxes link precipitation variability across the tropical weather-climate continuum?" Principal Investigator. 3 yr, $682,038. NSF Climate and Large-Scale Dynamics.
2019 Columbia University Earth Institute Postdoctoral Research Fellowship (2019-21)
2016 California Institute of Technology Foster and Coco Stanback Postdoctoral Research Fellowship (deferred to 2018-19)
NSF Atmospheric and Geospace Sciences Postdoctoral Research Fellowship (2016-18)
2013 Dept. of Defense National Defense Science and Engineering Graduate Research Fellowship (2013-16)

PUBLICATIONS

Articles submitted/under review/in revision

Clark, JP, P Lin, **SA Hill**. "ITCZ Response to Disabling Parameterized Convection in Global Fixed-SST Aquaplanet Simulations at 50 km and 6 km Resolutions." Submitted, *J. Adv. in Mod. Earth Sys.*.

Byrne MP, G Hegerl, J. Scheff, …, **SA Hill**, et al. "Theory and the future of land-climate science." Submitted, *Nature Geosciences*.

Zurita-Gotor P, IM Held, TM Merlis, CY Chang, **SA Hill**, CG MacDonald. "Non-uniqueness in ITCZ latitude due to radiation-circulation coupling in an idealized GCM." Revised, *J. Adv. in Mod. Earth Sys.*.

Refereed journal articles

2023 21. Biasutti M, M Ting, **SA Hill**. "The dynamics and changes of the world's monsoons." Accepted, *Physics Today*.

20. Moscoso JE, RE Tripoli, S Chen, H Gonzalez, **SA Hill**, N Khoo, TL Lonner, JM Aurnou. "Low-cost table-top experiments for teaching multi-scale geophysical fluid dynamics." Accepted, *Frontiers in Marine Science*. doi: 10.3389/fmars.2023.1192056.
19. Ahmed F, JD Neelin, **SA Hill**, K Schiro, and H Su. "A process model for ITCZ narrowing under warming highlights clear-sky water vapor feedbacks and gross moist stability changes in AMIP models." *J. Climate*, **36**, 4913-4931. doi: 10.1175/JCLI-D-22-0689.1.
18. Mahfouz N, **SA Hill**, H Guo, and Y Ming. "The radiative and cloud responses to sea salt aerosol geoengineering in GFDL models." *Geophys. Res. Lett.*, **50**, e2022GL102340. doi: 10.1029/2022GL102340.

2022
17. **Hill SA**, NJ Burls, A Fedorov, and TM Merlis. "Symmetric and antisymmetric components of polar-amplified warming." *J. Climate*, **35**, 3157-3172. doi: 10.1175/JCLI-D-20-0972.1.
16. **Hill SA**, S Bordoni, and JL Mitchell. "A theory for the Hadley cell descending and ascending edges throughout the annual cycle." *J. Atmos. Sci.*, **79**, 2515-2528. doi: 10.1175/JAS-D-21-0328.1.
15. Biasutti M, **SA Hill**, and A Voigt. "The Effect Of An Equatorial Continent On The Tropical Rain Belt. Part 2: Summer Monsoons." *J. Climate*, **35**, 3091–3107. doi: 10.1175/JCLI-D-21-0588.1
14. **Hill SA**, AH Sobel, M Biasutti, and MA Cane. "On the all-India rainfall index and sub-India rainfall heterogeneity." *Geophys. Res. Lett.*, **49**, e2021GL096541, 10 pp. doi: 10.1029/2021GL096541.

2021
13. **Hill SA**, S Bordoni, and JL Mitchell. "Solsticial Hadley Cell ascending edge theory from supercriticality." *J. Atmos. Sci*, **78**, 1999-2011. doi: 10.1175/JAS-D-20-0341.1.
12. Mitchell, JL and **SA Hill**. "Constraints from invariant subtropical vertical velocities on the scalings of Hadley cell strength and downdraft width with rotation rate." *J. Atmos. Sci*, **78**, 1445-1463. doi: 10.1175/JAS-D-20-0191.1

2020
11. **Hill SA**, S Bordoni, and JL Mitchell. "Axisymmetric Hadley Cell theory with a fixed tropopause temperature rather than height." *J. Atmos. Sci.*, **77**, 1279-1294. doi: 10.1175/JAS-D-19-0169.1.

2019
10. **Hill SA**. "Theories for past and future monsoon rainfall changes." *Curr. Clim. Change Rep.*, **5**, 160-171. doi: 10.1007%2Fs40641-019-00137-8.
9. **Hill SA**, S Bordoni, and JL Mitchell. "Axisymmetric constraints on cross-equatorial Hadley cell extent." *J. Atmos. Sci.*, **76**, 1547-1564. doi: 10.1175/JAS-D-18-0306.1.

2018
8. **Hill SA**, JM Lora, N Khoo, SP Faulk, and JM Aurnou. "Affordable rotating fluid demonstrations for geoscience education: The *DIYnamics* project." *Bull. Am. Met. Soc.*, **99**, 2529-2538. doi: 10.1175/BAMS-D-17-0215.1.
7. **Hill SA**, Y Ming, and M Zhao. "Robust responses of the Sahelian hydrological cycle to global warming." *J. Climate*, **31**, 9793-9814. doi: 10.1175/JCLI-D-18-0238.1.
6. Smyth J, **SA Hill**, and Y Ming. "Simulated responses of the West African monsoon and zonal-mean tropical precipitation to early Holocene orbital forcing." *Geophys. Res. Lett.*, **45**, 12,049-12,057. doi: 10.1029/2018GL080494.

2017
5. **Hill SA**, Y Ming, IM Held, and M Zhao. "A moist static energy budget-based analysis of the Sahel rainfall response to uniform oceanic warming." *J. Climate*, **30**, 5637-5660. doi: 10.1175/JCLI-D-16-0785.1.
4. Brown PT, Y Ming, W Li, and **SA Hill**. "Change in the magnitude and mechanisms of unforced low-frequency surface temperature variability in a warmer climate." *Nature Climate Change*, **7**, 743-748. 10.1038/nclimate3381.
3. Jeevanjee N, P Hassanzadeh, **SA Hill**, and A Sheshadri. "A perspective on climate model hierarchies." *J. Adv. in Mod. Earth Sys.*, **9**, 1760-1771. doi: 10.1002/2017MS001038.

2015
2. **Hill SA**, Y Ming, and IM Held. "Mechanisms of forced tropical meridional energy flux change." *J. Climate*, **28**, 1725-1742. doi: 10.1175/JCLI-D-14-00165.1.
   Corrigendum: https://dx.doi.org/10.1175/JCLI-D-16-0485.1.

2012
1. **Hill SA** and Y Ming. "Nonlinear climate response to regional brightening of tropical marine stratocumulus." *Geophys. Res. Lett.*, **39**, L15707, 5 pp. doi: 10.1029/2012GL052064.

Book reviews

2012 **Hill SA** "A head in the clouds elucidates climate" (book review of *Atmosphere, Clouds, and Climate* by David Randall). *Science*, **337**, 1 pp., doi: 10.1126/science.1225615.

Other publications

2022 Biasutti M, M Ting, and **SA Hill**. "How the south Asian monsoon is changing in a warming climate." Guest post, *Carbon Brief*. Sep. 15th. https://www.carbonbrief.org/guest-post-how-the-south-asian-monsoon-is-changing-in-a-warming-climate/.

2017- Fourteen blog posts for the DIYnamics blog. Available at https://diynamics.github.io/blog/author/spencer-hill.html.

AWARDS AND HONORS

2021 Columbia University Nominee, Blavatnik Regional Award for Young Scientists
2012 Princeton University Elliotte Robinson Little '25 Fellowship
2011 American Meteorological Society Annual Meeting Climate Change Travel Scholarship
NSF Graduate Research Fellowship Honorable Mention
UCLA Magna Cum Laude and College Honors graduation distinctions
2009 National Oceanic and Atmospheric Administration Ernest F. Hollings Undergraduate Scholarship
2007 United States Presidential Scholar, conferred by the U.S. Dept. of Education Commission on Presidential Scholars

INVITED COLLOQUIA AND SEMINARS

2023 Dept. of Earth and Planetary Science, Yale University, Mar. 8th.
Atmosphere, Ocean, and Climate Dynamics seminar series, Yale University, Mar. 9th.
Dept. of Atmospheric and Oceanic Sciences, UCLA, Mar. 1st.
Dept. of Earth and Atmospheric Sciences, City College of New York, Feb. 14th.
2022 Equilibrium Climate Sensitivity & Cloud Feedback Virtual Symposium, Mar. 24th.
2021 Atmosphere, Ocean, and Climate Dynamics seminar series, Yale University, Feb. 25th.
Meteorology Seminar Series, Dept. of Earth, Atmospheric, and Oceanic Sciences, Florida State University, Feb. 18th.
2019 Monthly Climate Meeting, Earth Research Institute, University of California – Santa Barbara, Jan. 7th.
2018 Division of Ocean and Climate Physics, Lamont-Doherty Earth Observatory, Feb. 16th.
NOAA Geophysical Fluid Dynamics Laboratory, Feb. 14th.
2016 Center for Atmosphere Ocean Science, New York University, Nov. 9th.
Natural and Behavioral Sciences Lecture, Gaede Institute for the Liberal Arts, Westmont College, Oct. 13th.
2015 Student seminar series, Center for Atmospheric and Oceanic Sciences, New York University, Mar. 6th.
2014 Dept. of Geophysics, Yale University, Oct. 9th.

CONFERENCE ACTIVITIES

Chaired sessions

2023 "Large-Scale Atmospheric Dynamics and Climate: Jet Streams, Storm Tracks, Stationary Waves, and Monsoons IV" AMS Annual Meeting, Denver, CO, Jan. 10th.
2022 "Monsoon Dynamics: Variability, Change, and Impacts I and II" AMS Annual Meeting (virtual), Jan. 26th-27th.
2018 "Monsoons: Observations, Subseasonal, Seasonal, and Interannual to Decadal Variability, Forecast, Climate Change, and Extremes III." AGU Fall Meeting, Washington, D.C., Dec. 11th.
2017 "Idealized approaches to the atmospheric and oceanic circulation II." American Meteorological Society 21st Conference on Atmospheric and Oceanic Fluid Dynamics, Portland, OR, Jun. 26th.

2016 "Tropical circulations and their sensitivities to changes in climate I." AGU Fall Meeting, San Francisco, CA, Dec. 16th.
"Tropical convection and radiative convective equilibrium." World Climate Research Programme Model Hierarchies Workshop, Princeton, NJ, Nov. 3rd.

Invited Conference Talks

2023 "More extreme Indian monsoon daily rainfall in El Nino summers." AMS Annual Meeting, Denver, CO, Jan. 9th.
2022 "Indian summer monsoon rainfall interannual variability: seasonal-mean and daily extremes." Continental Climate Change Workshop, St. Andrews, Scotland, Jun. 8th.
2019 "Toward an analytical, predictive theory for the location of Hadley and monsoonal cell ascending branches." AGU Fall Meeting, San Francisco, CA, Dec. 10th.
2016 "`infinite-diff` and `animal-spharm`: `xarray`-based finite differencing and spherical harmonics." Columbia University Python and Atmospheric and Oceanic Sciences Workshop, New York, NY, Nov. 12th.
2015 "Towards constraining Sahel rainfall responses to global mean temperature changes." Linde Center for Global Environmental Science, California Institute of Technology, Monsoons: Past, Present and Future workshop, Pasadena, CA, May 21st.

Other Conference Presentations

2022 "Hadley cell extent across seasons and the solar system." Talk. AMS Atmospheric and Oceanic Fluid Dynamics Meeting. Breckenridge, CO. Jun. 17th.
"Symmetric and antisymmetric components of polar-amplified warming." Poster. U.S. CLIVAR Pattern Effect Workshop, Boulder, CO. May 11th.
"On the All-India Rainfall Index, Sub-India Rainfall Heterogeneity, ENSO, and Teleconnections from the Indian Ocean" Talk. AMS Annual Meeting (virtual). Jan. 26th.
"Symmetric and Antisymmetric Components of Polar-Amplified Warming." Talk. AMS Annual Meeting (virtual). Jan. 26th.
2021 "New scalings for the ascending and descending branch positions of the solsticial Hadley cells in planetary atmospheres including Titan" Poster. AGU Fall Meeting. New Orleans, LA. Dec. 16th.
"On the all-India rainfall index, sub-India rainfall heterogeneity, ENSO, and teleconnections from the Indian Ocean" Talk. AGU Fall Meeting. New Orleans, LA. Dec. 15th.
"Connecting sub-India, sub-seasonal monsoon rainfall variability with all-India, all-summer monsoon rainfall." AMS Annual Meeting (virtual). Talk. Jan. 14th.
2020 "Sub-India summer monsoon rainfall variability and its implications for all-India summer monsoon rainfall prediction." AGU Fall Meeting (virtual). Poster. Dec. 1st-17th.
2019 "Simulated polar amplification and its causes on decadal to millennial timescales." Poster. AGU Fall Meeting. San Francisco, CA. Dec. 10th.
"Modernizing Axisymmetric Hadley Cell and Monsoon Theory." Talk. AMS 22nd Conference on Atmospheric and Oceanic Fluid Dynamics. Portland, ME. Jun. 25th.
2018 "What sets the locations of the solsticial cross-equatorial Hadley cell edges?" Talk. AGU Fall Meeting. Washington, DC. Dec. 13th.
"Towards transient simulation of the Green Sahara onset and demise through idealized modeling of vegetation-land-atmosphere interactions." Poster. 17th Swiss Climate Summer School: Earth system variability through time. Grindelwald, Switzerland. Aug. 28th.
"What Determines the ITCZ Position During Solsticial Seasons on Earth and Other Planets?" Talk. AMS 33rd Conference on Hurricanes and Tropical Meteorology. Ponte Vedra, FL. Apr. 16th.
2017 "Dry Rainbelts: Understanding Boundary Layer Controls on the ITCZ Using a Dry Dynamical Core." Talk. AGU Fall Meeting. New Orleans, LA. Dec. 14th.
"Towards transient simulation of the Green Sahara onset and demise through idealized modeling of vegetation-land-atmosphere interactions." Poster. Gordon Research Conference on Radiation and Climate. Bates College, Lewiston, ME. Jul. 19th.

"Control of convergence zone migrations by planetary parameters." Poster. AMS 21st Conference on Atmospheric and Oceanic Fluid Dynamics. Portland, OR. Jun. 27th.

"Automate your climate and weather data analysis with aospy." Talk. AMS Annual Meeting, Seattle, WA. Jan. 24th.

"Energetic and precipitation responses in the Sahel to sea surface temperature perturbations." Talk. AMS Annual Meeting, Seattle, WA. Jan. 24th.

2016 "Robust drying influence of mean ocean surface warming on The Sahel and implications for constraining future rainfall change." Poster. AGU Fall Meeting, San Francisco, CA. Dec. 16th.

"A hierarchy of perturbation complexites: Case study of Sahel rainfall response to global warming" Poster. WCRP Model Hierarchies Workshop, Princeton University, Princeton, NJ. Nov. 2nd.

2015 "Towards constraining future rainfall in the Sahel using the moist static energy budget." Talk. AGU Fall Meeting, San Francisco, CA. Dec. 14th.

"Convection scheme, cloud, and stability effects on Sahel rainfall response to uniform warming." Poster. AMS Annual Meeting, Phoenix, AZ. Jan. 6th.

2014 "Convection scheme, cloud, and stability effects on Sahel rainfall response to uniform warming." Poster. AGU Fall Meeting, San Francisco, CA. Dec. 15th.

"Mechanisms of forced tropical meridional energy flux change." Poster. Latsis Symposium, ETH Zurich, Zurich, Switzerland. Jun. 19th.

"Mean and extreme tropical precipitation changes caused by the uniform and spatially varying components of anthropogenic forcing." Talk. AMS Annual Meeting, Atlanta, GA. Feb. 5th.

2013 "Mechanisms of forced tropical meridional energy flux change." Talk. AGU Fall Meeting, San Francisco, CA. Dec. 13th.

"Mechanisms of forced tropical meridional energy flux change." Talk. Graduate Climate Conference, Woods Hole Oceanographic Institution, Woods Hole, MA. Nov. 2nd.

"Mechanisms of forced tropical meridional energy flux change." Poster presentation. Gordon Research Conference, Colby-Sawyer College, New London, NH. Jul. 9th.

2012 "Climate response to a geoengineered brightening of subtropical marine boundary clouds." Poster. 11th Annual Student Conference at the AMS Annual Meeting, New Orleans, LA. Jan. 22nd.

2010 "Climate response to a geoengineered brightening of subtropical marine boundary clouds." Poster. San Francisco, CA. Dec. 14th.

"Climate response to a geoengineered brightening of subtropical marine boundary clouds." Talk. Special Symposium on Aerosols in Geoengineering at the American Association for Aerosol Research 29th Annual Conference. Portland, OR. Oct. 26th.

"Investigating climate response to geoengineering using a global climate model." Talk. National Oceanic and Atmospheric Administration Office of Education Science Symposium, Silver Spring, MD. Aug. 3rd.

CAMPUS AND DEPARTMENTAL TALKS

2022 Princeton AOS Dynamics Group Meeting. Aug. 11th.
Princeton AOS Discussion group on Isaac Held's Blog. Aug. 1st.
Princeton AOS Tutorial Series for summer interns. Jun. 21st.

2019 Lamont-Doherty Earth Observatory Postdoc Symposium (poster). Sep. 11th.

2018 Dept. of Atmospheric and Oceanic Sciences, UCLA. Nov. 7th.

2016 Division of Geological and Planetary Sciences, California Institute of Technology. Oct. 26th.
Dept. of Atmospheric and Oceanic Sciences, UCLA. Oct. 5th.

2015 Dynamics Seminar Series, Program in Atmospheric and Oceanic Sciences, Princeton University. Mar. 13th.

2012 Student/Postdoc Seminar Series, Princeton AOS. Feb. 28th.

2011 Graduate Research Symposium, Dept. of Geosciences, Princeton University. Nov. 11th.

ADVISING

PhD. students, as co-advisor

2022- Alexander Parsells, Dept. of Earth and Environmental Sciences, Columbia University

Masters students, as co-advisor

2023- Gregory Randazzo, Dept. of Earth and Atmospheric Sciences, City College of New York

Undergraduate students, as primary advisor

2021 Destiny Zamir Meyers, Columbia University
Matthew Donahue, Columbia University
2020 Valentina Rojas-Posada, Barnard University (partial funding awarded by competition from Columbia University Earth Institute)
2017 Norris Khoo, UCLA
Micah Kim, UCLA
2016 Juliet Olsen, UCLA

Undergraduate summer interns at NOAA GFDL, as co-advisor

2023 Kittson Hamill
2022 Rea Restugi
2015 Jane Smyth
2014 Marjahn Finlayson
2013 Colin Raymond

TEACHING ACTIVITIES

Courses

2023 Fall CCNY EAS 42000 (planned) "Statistical Methods in Earth and Atmospheric Sciences."

Teacher training workshops organized

2022 "Teaching atmosphere, ocean, and planetary fluid dynamic fundamentals vividly with rotating tanks." Earth Educators Rendezvous, Twin Cities, MN, Jul. 14-15th.

Teaching Assistant

2014 "Physics of Earth: The Habitable Planet." Upper-division undergraduate course. Dept. of Geosciences, Princeton University.

Certifications

2016 Teaching Transcript Certification, McGraw Center for Teaching and Learning, Princeton University.

Guest Lectures/Labs

2023 Lecture for "Climate Thermodynamics and Energy Transfer" (EESC 4040) graduate course, Dept. of Earth & Environmental Science, Columbia University. Apr. 25th.

2022 Lab for EAS 30900/B3090 "Fundamentals of Atmospheric Science" graduate course, Dept. of Earth and Atmospheric Sciences, City College of New York. Dec. 5th.
Lab for "Earth's Environmental Systems: The Climate System" undergraduate course, Dept. of Earth and Environmental Sciences, Columbia University. Feb. 24th.

2018 Three lectures for "Introduction to Atmospheric and Oceanic Fluids," graduate-level course, Dept. of Atmospheric and Oceanic Sciences, UCLA.
"The general circulation of the atmosphere: Energetics." Nov. 13th.
"The general circulation of the atmosphere: Momentum." Nov. 15th.
"The general circulation of the atmosphere: Lab." Nov. 29th.

2014 Two lectures for "Physics of Earth: The Habitable Planet," upper-division undergraduate course, Dept. of Geosciences, Princeton University.
"Weather: From orbital order, atmospheric chaos." Oct. 14th.
"Climate modeling and climate change projections." Dec. 10th.

SCIENCE OUTREACH AND MEDIA

2023 Live on-air radio interview, KCBS San Francisco. Jul. 15th.

2022 City College of New York Physics Club event with Harlem middle school students. Nov. 18th.

2021 "Ask Me Anything" virtual Q+A session, "AMA Session on Climate Action," Presidential Scholars Alumni Association. Oct. 28th.
Interview in *The Medallion* (Newsletter of the Presidential Scholars Alumni Association). "Scholars in Climate Science: Observations from the Field." Sep. 27th.
U.S. Presidential Scholars Foundation roundtable on human and planetary health, Jul. 21st.
"You Spin Me Right Round." Zoom-based presentation on planetary fluid flows for K-12 students, part of the EI Live K12 series, Earth Institute, Columbia University. Feb. 11th.
`https://www.earth.columbia.edu/videos/view/you-spin-me-right-round`

2023- Member, *DIY*namics (organization advancing rotating tank-based geoscience teaching; https://diynamics.github.io).

2017-23 Co-founder and Co-Director, *DIY*namics

2015- Volunteer at many science outreach events at schools or open to the public

SERVICE ACTIVITIES

Professional

Associate Editor, *Journal of the Atmospheric Sciences*, 2023-.

Proposal referee: NSF Climate and Large-Scale Dynamics; NSF Cyberinfrastructure for Sustained Scientific Innovation; NSF EarthCube; NASA Juno Participating Scientist Program

Article referee, *Nature Climate Change*, *Science Advances*, *Nature Communications*, *npj Climate and Atmospheric Science*, *Journal of Advances in Modeling Earth Systems*, *Journal of Climate*, *Current Climate Change Reports*, *Quarterly Journal of the Royal Meteorological Society*, *Geophysical Research Letters*, *Journal of the Atmospheric Sciences*, *Surveys in Geophysics*, *Paleoceanography and Paleoclimatology*, *Geoscientific Model Development*, *Climatic Change*, *Climate Dynamics*, *Journal of Geophysical Research - Atmospheres*, *International Journal of Climatology*

Advisory Board Member, "Building Capacity for Investigating the Use of Spatial Reasoning in Fluid-Earth Science Disciplines," NSF Building Capacity in STEM Education Research (BCSER) program. PI Peggy McNeal. 2023-2024.

Developer and maintainer, `aospy` open-source Python software package for automating analyses of climate datasets (https://aospy.readthedocs.io)

Code contributor, `xarray` package for labeled multidimensional arrays in Python

Departmental/University

2015 Organizer, Convection Journal Club, Program in Atmospheric and Oceanic Sciences, Princeton University
2013-15 Organizer, Climate Sensitivity Journal Club, NOAA Geophysical Fluid Dynamics Laboratory
2012-13 Organizer, Student/Postdoc Seminar Series, Program in Atmospheric and Oceanic Sciences, Princeton University
2012-13 Representative to the faculty, Program in Atmospheric and Oceanic Sciences, Princeton University

ADDITIONAL TRAINING

2021 Workshop on Inclusive and Culturally Competent Teaching Strategies in the Earth Sciences, Columbia University, Jan. 8th
2020 Racial Sensitivity Workshop, Columbia University Earth Institute, Jun. 30th
2018 17th Swiss Climate Summer School, "Earth System Variability Through Time," Grindelwald, Switzerland
2012-13 Member, Princeton University Energy and Climate Scholars
2012 NOAA Geophysical Fluid Dynamics Laboratory Summer School on Atmospheric Modeling

PROFESSIONAL MEMBERSHIPS

2010- American Geophysical Union
2011- American Meteorological Society
2021- National Association of Geoscience Teachers