Daniel A. Rothenberg

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RESEARCH INTERESTS

As a leader and innovator in the atmospheric sciences, I've employed novel analytical, modeling, "big data", and machine learning techniques to help pioneer the field of "atmospheric data science" and tackle cutting-edge research questions in the world of weather and climate. In my academic career I studied the multi-faceted role of aerosols in the climate system, especially their influences on clouds and their indirect effects on climate; I've also studied the role of climate variability in driving air quality as a means for better understanding the impacts of climate air pollution policy.

Throughout my research career I've been committed to helping develop open source software and tools in order to support novel applications of machine learning and data science to understanding and solving problems in meteorology. I've also strived to form a robust community of scientists, data scientists, and engineers who would also support these initiatives and themselves contribute to open science.

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA
Ph.D., Atmospheric Science, Dept. of Earth, Atmospheric and Planetary Sciences   Oct 2016
  Committee: Chien Wang, Dan Czizco, Paul O'Gorman, Steve Ghan
  Dissertation Title: Fundamental Aerosol Interactions and the Aerosol Indirect Effect on Climate

Cornell University, Ithaca, NY
B.S., Atmospheric Science, *magna cum laude*, Honors in Research   Dec 2010
  Thesis Advisor: Natalie Mahowald
  Thesis Title: Volcano Impacts on Climate and Biogeochemistry

HONORS AND AWARDS

Outstanding Student Presentation Award (†), AMS	2015
National Science Foundation Graduate Research Fellowship, NSF	2012
National Defense Science And Engineering Fellowship, ASEE (*declined*)	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
Richard and Helen Hagermeyer Scholarship, AMS	2010

RESEARCH EXPERIENCE

Center for Global Change Science, MIT, Cambridge, MA
Postdoctoral Associate   Dec 2016-Sep 2017
Studied 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
Developed and analyzed large ensemble of IGSM/GEOS-Chem coupled climate-chemistry 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 inte-
    grated assessment framework
Instigated and co-developed open-source, Python-based toolkits for accelerating the analysis of GEOS-
    Chem model output and working with legacy binary file formats in modern workflows

Program in Atmospheres, Oceans, and Climate, MIT, Cambridge, MA
Research Assistant   Aug 2011-Dec 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 FEB 2008-JUN 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

PROFESSIONAL ACTIVITIES

CMIP6 Hackathon, NCAR, Boulder, CO — October, 2019

Rossbypalooza, Climate/Statistics Summer School, University of Chicago, Chicago, IL — SUMMER 2016

NSPG, STEM on the Hill Congressional Visits Day, Washington, DC — SPRING 2015

AMS, Weather Water and Climate Day, Washington, DC — JUNE 2015

AMS, 7th Annual Geosciences Congressional Visits Day, Washington, DC — SEPTEMBER 2014

AMS, Summer Policy Colloquium, Washington, DC — SUMMER 2014

MIT/SPI, ASTE Science/Engineering Congressional Visits Day, Washington, DC — SPRING 2012/2014

CMMAP/NCAR/NCEP, Summer School on Atmospheric Modeling, Boulder, CO — SUMMER 2010

TEACHING EXPERIENCE

Graduate

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

Atmospheric Physics and Chemistry (12.806/12.306) SPRING 2014-2015
MIT, Department of Earth, Atmospheric, and Planetary Sciences
Teaching Assistant

"Climate Change Science" IAP Seminar WINTER 2011-2013
MIT, Joint Program on the Science and Policy of Global Change
Lecturer

Undergraduate

Object-Oriented Programming and Data Structures (CS 2110) 2009-2010
Cornell University, Department of Computer Science
Course Consultant, Teaching Assistant

American Meteorological Society

Committee on Environmental Stewardship
    Member   2019-PRESENT
Annual Meeting Oversight Committee
    Member   2017-2020
Student Conference Planning Committee
    Co-Chair   2015-2016
    Session Chair   2011-2014
AMS Committee on Environmental Information Processing Technologies
    Member, Python Symposium Committee   2018-PRESENT
    Session Chair, *Teaching, Training, Outreach, and Building Communities around Python*   2018
    Session Co-organizer, *Scalable Operational Artificial Intelligence Applications with Python*   2019

Reviewer
    Journal of Geophysical Research - Atmospheres
    Journal of Climate
    Atmospheric Chemistry and Physics
    The Journal of Open Source Education
    IBM World Community Grid

Pangeo-data
    Founding Member and Developer   2016-PRESENT
    Lead, Data Management Technical Working Group   2018-PRESENT

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

Atmospheric Sciences Seminar Committee
MIT Department of Earth, Atmospheric, and Planetary Sciences
    Member   2012-2014
    Chair   2014-2015

Science Policy Initiative Executive Committee   2013-2016
Massachusetts Institute of Technology

Climate Voices
    Speaker   2016-2018

/r/science Moderator   2010-2011, 2016
Reddit (volunteer)

Waymo
Atmospheric Science, Technical Lead   JULY 2021-PRESENT

Tomorrow.io (formerly ClimaCell)
Advisor   JULY 2021-PRESENT
Chief Scientist   SEP 2018-JULY 2021
Director of Meteorology   AUG 2017-SEP 2018

Oversaw the research, development, and implementation of a real-time, global, high-resolution precipitation observation system using commercial cellular microwave links, radars, and satellite datasets

Managed and mentored a team of 2-6 physical scientists, data scientists, and engineers across multiple offices conducting research and product development to support company initiatives; group alumni have advanced their careers in atmospheric data science at CalTech, NOAA/CIRA, Indigo, Microsoft, and other high profile institutions/companies

Established an internal applied research division (ClimaCell Labs) with a focus on develop AI-powered applications for applied weather analysis and forecasting; developed proposals for SBIR and other competitive federal funding programs sponsored by NOAA, NSF, and DOE

Created and managed long-term research and development roadmaps aligned with emerging company business and strategic opportunities

Established professional forecasting services unit within the company to broaden product portfolio in support of improving client satisfaction and retention

Developed and implemented a high-performance, Python-based quantitative precipitation nowcasting system optimized or performance on the cloud and deployed the model operationally (with >99.9% SLA) to provide nowcasts based on radar and satellite-derived datasets for domains across the world

Developed and prototyped a cloud-optimized, tera-scale geoscientific data archival system based on Pangeo stack (dask, Zarr, Intake, kubernetes) and curated over 100 TB of data from reanalysis (ERA-5), NWP (multi-year HRRR archive) and proprietary datasets

Google / Ravenbrook Software   SUMMER 2011
Contract Developer, Google Summer of Code

Ported a high-performance algorithm used in surface temperature analysis at the National Climatic Data Center from Fortran to Python

Developed extensive documentation and test suite for algorithm

Identified and corrected numerous numerical and programming bugs and validated algorithm against synthetic datasets

Orion Network Services   JUL 2006-AUG 2007
Software Developer

Developed an online river flooding visualization tool for NOAA using ArcGIS and other scripting tools

PUBLICATIONS

In Prep / Review

1. **Rothenberg, D.**: Parameterization of sub-grid scale aerosol-cloud processes for climate models using auto-machine learning, (*in prep*)
2. **Rothenberg, D.**, Eastham, S., Monier, E., Garcia-Menendez, F., Solomon, S., and Selin, N.: Quantifying the "time of emergence" of air quality climate penalties (*in prep*)

Refereed / Peer-Reviewed

1. Silva, S., Ma, P.-L., Hardin, J., **Rothenberg, D.**: Physically Regularized Machine Learning Emulators of Aerosol Activation, Geosci. Model Dev., 14, 3067–3077, doi:10.5194/gmd-14-3067-2021, 2021.
2. Koecorius, S., **et al**: New particle formation and its effect on CCN abundance in the summer Arctic: a case study during PS106 cruise, Atmos. Chem. Phys., doi:10.5194/acp-19-14339-2019, 2019.
3. Dimanchev, E. G., Paltesev, S., Yuan, M., **Rothenberg, D.**, Tessum, C. W., Marshall, J. D., and Selin, N. E.: Health co-benefits of sub-national renewable energy policy in the US, Environ. Res. Lett. 14, 085012, doi:10.1088/1748-9326/ab31d9, 2019.

4. **Rothenberg, D.**, Wang, C., and Avramov, A.: On the representation of aerosol activation and its influence on model-derived estimates of the aerosol indirect effect, Atmos. Chem. Phys., doi:10.5194/acp-18-7961-2018, 2018.

5. Demott, P. J., **et al**: The Fifth International Workshop on Ice Nucleation phase 2 (FIN-02): Laboratory intercomparison of ice nucleation measurements, Atmos. Meas. Tech., 11, 6231-6257, doi:10.5194/amt-11-6231-2018, 2018.

6. Jin, Q., Grandey, B. S., **Rothenberg, D.**, Avramov, A., Wang, C.: Impacts of Ship Emission Regulations, DMS Emissions, and Aerosol Mixing States on Cloud Radiative Effects of International Shipping Emissions, Atmos. Chem. Phys., Discuss., doi:10.5194/acp-2018-416, 2018

7. Tong, C. H. M., Yim, S., **Rothenberg, D.**, Wang, C., Lin, C-Y, Chen, Y., Lau, N-C: Projecting the impacts of atmospheric conditions under climate change on air quality over the Pearl River Delta region, Atmos. Envirom., doi:10.1016/j.atmosenv.2018.08.053, 2018

8. Tong, C. H. M., Yim, S., Chen, Y., Lau, N-C, **Rothenberg, D.**: Assessing the Impacts of Seasonal Atmospheric Conditions on Air Quality over the Pearl River Delta Region, Atmos. Environ., doi:10.1016/j.atmosenv.201 2018

9. Grandey, B. S., **Rothenberg, D.**, Avramov, A., Jin, Q., Lee, H., Wang, C.: Effective radiative forcing in the aerosol—climate model CAM5.3-MARC-ARG compared to default CAM5.3, Atmos. Chem. Phys., 18, 15783-15810, doi:10.5194/acp-18-15783-2018, 2018

10. Garimella, S., **Rothenberg, D.**, Wang, C., Cziczo, D. J.: How uncertainty in field measurements of ice nucleating particles influences modeled cloud forcing, J. Atmos. Sci., doi:10.1175/JAS-D-17-0089.1, 2017

11. Garimella, S., **Rothenberg, D.** A., Wolf, M. J., David, R. O., Kanji, Z. A., Wang, C., Roesch, M., and Cziczo, D. J.: Uncertainty in counting ice nucleating particles with continuous diffusion flow chambers, Atmos. Chem. Phys., 17, 10855-10864, doi:110.5194/acp-17-10855-20170, 2017.

12. **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., 10, 1817-1833, doi:10.5194/gmd-10-1817-2017, 2017.

13. Garimella, S., Kristensen, T. B., Ignatius, K., Welti, A., Voigtländer, J., Kulkarni, G. R., Sagan, F., Kok, G. L., Dorsey, J., Nichman, L., **Rothenberg, D.**, Rösch, M., Kirchgäßner, A., Ladkin, R., Wex, H., Wilson, T. W., Ladino, L. A., Abbatt, J. P. D., Stetzer, O., Lohmann, U., Stratmann, F., and Cziczo, D. J.: The SPectrometer for Ice Nuclei (SPIN): An instrument to investigate ice nucleation, Atmos. Meas. Tech, doi:10.5194/amt-9-2781-2016, 2016.

14. **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

15. **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.

16. Mahowald, N., Lindsay, K., **Rothenberg, D.**, Doney, S. C., Moore, J. K., Thornton, P., Randerson, J. T., and Jones, C. D.: Desert dust and anthropogenic aerosol interactions in the Community Climate System Model coupled-carbon-climate model, Biogeosciences, 8, 387-414, doi:10.5194/bg-8-387-2011, 2011.

17. Mahowald, N. M., Kloster, S., Engelstaedter, S., Moore, J. K., Mukhopadhyay, S., McConnell, J. R., Albani, S., Doney, S. C., Bhattacharya, A., Curran, M. A. J., Flanner, M. G., Hoffman, F. M., Lawrence, D. M., Lindsay, K., Mayewski, P. A., Neff, J., **Rothenberg, D.**, Thomas, E., Thornton, P. E., and Zender, C. S.: Observed 20th century desert dust variability: impact on climate and biogeochemistry, Atmos. Chem. Phys., 10, 10875-10893, doi:10.5194/acp-10-10875-2010, 2010.

Other

1. **Rothenberg, Daniel**: Seeing through the haze to learn how clouds shape climate. Physics Today, doi:10.1063/PT.5.4027. February 2, 2017.

Software

1. MARC: Model for Research of Aerosols and Climate. doi:10.5281/zenodo.1117370. Last Updated: v1.0.4, December, 2017
2. xbpch: xarray interface for bpch files. doi:10.5281/zenodo.584153. Last Updated: v0.3.0, May, 2017.
3. pyrcel: cloud parcel model. doi: 10.5281/zenodo.163265. Last Updated: v1.3.0, October, 2016.
4. py-mie: Python wrapper for Mie subroutines. doi: Last Updated: v0.4.0, December, 2016
5. experiment: high-performance, distributed processing of large-scale geophysical modeling experiment output (*in prep*)
6. Contributor/collaborator: GCPy, xarray, pangeo-data

PRESENTATIONS AND TALKS

Invited Talks and Seminars

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

Status of AI in the Atmospheric Sciences. *Panelist*, 18th Conference on Artificial and Computational Intelligence and its Applications to the Environmental Sciences, AMS Annual Meeting, Phoenix, AZ, 2019.

Augmented Weather Applications with Artifical Intelligence. *Chair/Convener*, AMS Washington Forum, Washington, D.C., 2019

Conference Talks

Eastham, S., Monier, E., **Rothenberg, D.**, Paltsev, S., Selin, N. Incorporating High-fidelity Air Quality Simulation into Integrated Assessment Models. AGU Fall Meeting. San Francisco, CA, 2020.

Givati, A. **et al**. Using Multiple Precipitation Inputs for Flash-Flood Forecasting in Semiarid Environments. 34th Conference on Hydrology, AMS Annual Meeting. Boston, MA, 2020.

Eastham, S., Monier, E., **Rothenberg, D.**, Selin, N. Time of Emergence for the Influence of Climate Change on Surface Ozone. 22nd Conference on Atmospheric Chemistry, AMS Annual Meeting. Boston, MA, 2020.

Rothenberg, Daniel. Rapidly Prototyping High-performance Meteorological Data Systems Using Xarray and Numba. Ninth Symposium on Advances in Modeling and Analysis Using Python, AMS Annual Meeting. Phoenix, AZ, 2019.

Gilford, D., Solomon, S., Emanuel, K., and **Rothenberg, D.** Seasonal Cycles in North Atlantic and Western Pacific Tropical Cyclone Maximum Intensity. AMS Annual Meeting. Phoenix, AZ, 2019.

Rothenberg, D., Garcia-Menendez, F., Solomon, S., and Selin, N. Regional Variation in the Time of Emergence of Air Quality Climate Penalties Under Climate Change Mitigation Scenarios. AMS Annual Meeting. Austin, 2018.

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, D., Wang, C., and Avramov, A. On the Sensitivity of Model-derived Estimates of Aerosol Indirect Effects and Forcings to Activation Schemes. 96th Annual Meeting of the American Meteorological Society, Eighth Symposium on Aerosol-Cloud-Climate Interactions. New Orleans, LA. 2016.

† **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

Rothenberg, Daniel and Chien Wang. Evaluating the Role of Aerosol Mixing State in Cloud Droplet Nucleation using a New Activation Parameterization. American Geophysical Union Fall Meeting, (A34D-03). 2013.

Rothenberg, Daniel and Chien Wang. Cloud and Climate Impacts in a Hazy World Simulation. 93rd Annual Meeting of the American Meteorological Society, 5th Symposium on Aerosol-Cloud-Climate Interactions. Austin, TX. 2014.

Rothenberg, Daniel and Nick Barnes. Lessons From Deploying the USHCN Pairwise Homogenization Algorithm in Python. 92nd Annual Meeting of the American Meteorological Society, Second Symposium on Advances in Modeling and Analysis Using Python. New Orleans, LA. 2012

Conference Posters

Gilford, D., Solomon, S., Emanuel, K. and **Rothenberg, D.**. Seasonal Cycles in North Atlantic and Western Pacific Tropical Cyclone Maximum Intensity. 99th Annual Meeting of the American Meteorological Society. Phoenix, AZ. 2019. | PDF

Rothenberg, Daniel and Chien Wang. Assessing Regional Differences in Aerosol-Cloud Interactions and their Contribution to the Global Indirect Effect. 97th Annual Meeting of the American Meteorological Society, Ninth Symposium on Aerosol-Cloud-Climate Interactions. Seattle, WA. 2017. | PDF

Garimella, S., **Rothenberg, D.**, Wolf, M., Zawadowicz, M., Christopoulos, C., Froyd, K. D., Huang, Y.-w., Murphy, D., Wang, C., and Cziczo, C. Climate implications of coal fly ash particles due to ice cloud formation. 35th Annual Conference, American Association for Aerosol Research. Portland, OR. 2016.

Rothenberg, D., Wang, C. and Avramov, A. Impacts of Droplet Activation on Fast and Slow Responses in a Coupled Aerosol-Climate Model. Gordon Research Seminar/Conference. Bates College, ME. 2015 | PDF

Rothenberg, Daniel and Chien Wang. Assessing the sensitivity of global aerosol indirect effects to activation treatment. Graduate Climate Conference, University of Washington. Seattle, WA. 2014

Rothenberg, Daniel and Chien Wang. A Novel Parameterization of Droplet Activation Suitable for Global Climate Models. 14th Conference on Cloud Physics, American Meteorological Society. Boston, MA. 2014 | PDF

Rothenberg, Daniel and Chien Wang. A Novel Parameterization of Droplet Activation Suitable for Global Climate Models. CENSAM Workshop. Singapore. 2014

Rothenberg, Daniel and Chien Wang. Evaluating the Role of Aerosol Mixing State in Cloud Droplet Nucleation using a New Activation Parameterization. 94th Annual Meeting of the American Meteorological Society, Sixth Symposium on Aerosol-Cloud-Climate Interactions. Atlanta, GA. 2013. | PDF

Rothenberg, Daniel and Chien Wang. Global Climate Response to Enhanced Anthropogenic Aerosol Emissions in a "hazy world" Experiment with the CESM. 6th Graduate Climate Conference. 2013.

Rothenberg, Daniel and Ross Heikes. A baroclinic instability test case on an anelastic dynamical core. 91st Annual Meeting of the American Meteorological Society, 24th Conference on Weather and Forecasting/20th Conference on Numerical Weather Prediction. Seattle, WA. 2012.

Technical and Programming Talks

Rothenberg, Daniel. Tutorial: Moving from Single Jobs to Many Nodes: Dask, X-Array, and Pangeo. 99th Annual Meeting of the American Meteorological Society, Ninth Symposium on Advances in Modeling and Analysis Using Python. Phoenix, AZ. 2019

Rothenberg, Daniel. Climate Data Science: A Framework for Improving Computational Climate Analysis. 98th Annual Meeting of the American Meteorological Society, Eighth Symposium on Advances in Modeling and Analysis Using Python. Austin, TX. 2018

Rothenberg, Daniel. Basic Pandas. 97th Annual Meeting of the American Meteorological Society, Seventh Symposium on Advances in Modeling and Analysis Using Python. Seattle, WA. 2017

Patents

Rothenberg, Daniel. Improved Forecasting Method with Machine Learning. US Patent US20200132884A1. Pending, April 30, 2020

Elkabetz, S. **et al**. Real-time weather forecasting for transportation systems. US Patent US10962680B2. March 3, 2021.

Elkabetz, S. **et al**. Improved real-time weather forecasting system. World Patent WO2019126707A1. June 27, 2019.

Public Talks and Engagement

Climate Chords. WUOL, WFPL, and SONICBernheim. Louisville, KY, August 2018

What's the Deal with Climate Change? Esplanade Association Lecture Series. Boston, MA. 2017

Additional talks to churches, community organizations, and classrooms through Climate Voices.

Note: annotations (†, etc) correspond to "Honors and Awards" section.

PROFESSIONAL AFFILIATIONS	American Meteorological Society 2010-PRESENT

American Meteorological Society   2010-PRESENT
American Physical Society   2011-PRESENT
American Geophysical Union   2013-PRESENT
Association for Computing Machinery   2011-2012

TECHNICAL SKILLS

Note: Please visit my Github page for examples of projects implementing these skills

Data Science - Python (*expert*), Spark/dask/MPI, Prefect/Airflow/Argo, Matlab, Java, d3.js, git/hg/svn, R (*familiar*)

Numerical Modeling - Python/NumPy/Cython/Numba, Julia, legacy/modern Fortran, C/C++/CUDA (*familiar*); emphasis on scientific software design and application of software engineering to numerical codes/tools, as well as the development of high-performance, distributed analysis systems for tera/peta-scale data.

DevOps - Kubernetes, Argo, Helm

Atmospheric/Climate Models - pyrcel, GEOS-Chem/GCHP, CESM, MIT-CRM, WRF (*familiar*)

High-Performance Computing - Google Cloud Platform/Amazon Web Services; NCAR supercomputers (bluefire/yellowstone/cheyenne); previously worked on NERSC and Oak Ridge systems

Web Design - Django, ghost, Pelican, HTML/CSS

PERSONAL INTERESTS

Violin performance - classical (22 years), Winter sports, Backpacking/hiking, Software development/ engineering, Meteorology education/forecasting, Debate and rhetoric, Science/Innovation policy

Last Updated: July 20, 2021