

David S. Connelly

Research and work experience

- Visiting Lecturer**, Cornell University January 2026 – May 2026
- Teach EAS 3420/5420 (Atmospheric Dynamics)
- Doctoral researcher**, New York University 2020 – January 2026
- Developed parameterizations of atmospheric gravity wave drag
 - Integrated physics-based approaches with machine learning
 - Advised by Edwin P. Gerber
- Undergraduate research assistant**, Cornell University 2017 – 2020
- Operated climate models on high-performance computing systems
 - Validated model output against observations of atmospheric aerosols
 - Advised by Natalie Mahowald
- Summer intern**, NASA Jet Propulsion Laboratory Summer 2019, Summer 2020
- Modeled uncertainty propagation in downstream use of remote sensing surface reflectance data from the EMIT mission
 - Advised by David R. Thompson

Education

- New York University**, Courant Institute of Mathematical Sciences 2020 – 2026
- PhD in Atmosphere Ocean Science and Mathematics
 - Dissertation: *Physically Consistent Data-Driven Models of Unresolved Gravity Wave Momentum Transport*
- Cornell University**, College of Arts and Sciences 2016 – 2020
- BA in Mathematics, *magna cum laude* with distinction in all subjects
 - Pauline and Irving Tanner Dean's Scholar
 - Minor in French Studies

Skills and technologies

- Atmospheric science and physical modeling (FMS, MiMA, ICON, CESM)
- Numerical and geospatial computing in Python (numpy, geopandas, xarray)
- Data science, statistics, and machine learning (scikit-learn, PyTorch, XGBoost)
- High performance numerical computing (Fortran, C, Slurm)
- Data visualization (matplotlib, cartopy)
- Source code management, validation, and testing (Git, mypy, pytest, CMake, shell scripting)
- Written and spoken French (B2–C1) and Spanish (B1–B2)
- Technical and plain-language writing (LaTeX)

Teaching assistantships and pedagogical training

- Teaching assistant, Earth's Atmosphere and Ocean** Spring 2023,
Spring 2024
- Taught under Professor Olivier Pauluis
 - Wrote exams and helped plan the course curriculum
 - Designed active learning lessons and reviews for recitations
 - Evaluated "very effective" (10/10 respondents)
- Preparing Future Faculty: The Art and Craft of Teaching** Fall 2023 –
Spring 2024
- Two-semester seminar taught by Dr. Marla Wolf
 - Received instruction in active learning methods, syllabus and curriculum planning, and classroom management
- Teaching assistant, Ordinary Differential Equations** Fall 2023
- Taught under Professor David Holland
 - Evaluated "very effective" (10/12 respondents) and "effective" (2/12)
- Teaching assistant, Introduction to Mathematical Modeling** Fall 2022
- Taught under Professor Shafer Smith
 - Evaluated "very effective" (8/13 respondents), "effective" (2/13), and "neutral" (3/13)

Publications

- **David S. Connelly**, [...]. Fast, accurate parameterization of atmospheric gravity waves, accounting for transient dynamics. *Submitted to Journal of Advances in Modeling Earth Systems*, 2026
- **David S. Connelly**, [...]. Regression Forest Approaches to Gravity Wave Parameterization for Climate Projection. *Journal of Advances in Modeling Earth Systems*, 16(7), 2024
- Ofer Shamir, **David S. Connelly**, [...]. The graft-versus-host problem for data-driven gravity-wave parameterizations in a one-dimensional quasibiennial oscillation model. *Quarterly Journal of the Royal Meteorological Society*, 150(761):2255–2272, 2024
- **David S. Connelly**, [...]. The EMIT mission information yield for mineral dust radiative forcing. *Remote Sensing of Environment*, 258, 2021
- Nathan Magee, [...], **David Connelly**, [...]. Captured Cirrus Ice Particles in High Definition. *Atmospheric Chemistry and Physics*, 21:7171–7185, 2021

Conference presentations

- **David S. Connelly**, [...]. Parameterizing Gravity Waves with Ray Tracing at Low Cost and High Accuracy. Oral presentation at the 106th Annual Meeting of the American Meteorological Society, Houston, TX, 2026
- **David S. Connelly**, [...]. Acceleration of a ray tracing parameterization of gravity wave momentum transport. Oral presentation at Mathematics of the Weather, Bad Orb, DE, 2024
- **David S. Connelly**, [...]. Acceleration of a Ray Tracing Parameterization of Gravity Wave Momentum Transport. Oral presentation at the 22nd Conference on Middle Atmosphere, Burling-

ton, VT, 2024

- **David S. Connelly**, [...]. Targeted Retraining Improves Online Performance of Regression Forest Gravity Wave Parameterizations. Poster presentation at the 24th Conference on Atmospheric and Oceanic Fluid Dynamics, Burlington, VT, 2024
- **David S. Connelly**, [...]. Online Performance of Data-Driven Gravity Wave Parameterizations: Regression Tree Approaches. Poster presentation at the 7th SPARC General Assembly, Boulder, CO, 2022