Savannah L. Ferretti

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PhD candidate in Earth System Science working at the intersection of atmospheric science and machine learning. Experienced in developing interpretable machine learning methods alongside physics-based models for large-scale atmospheric data analysis. Strong background in deep learning, statistical modeling, and open-source research workflows.

EDUCATION

University of California, Irvine, Ph.D. in Earth System Science — Expected Jun 2026
Advised by Dr. Mike Pritchard & Dr. Jane Baldwin — Irvine, CA

University of California, Irvine, M.S. in Earth System Science — Dec 2023
Irvine, CA

Cornell University, B.S. in Earth & Atmospheric Sciences — Dec 2020
Atmospheric Sciences Concentration — Ithaca, NY

EXPERIENCE

Graduate Student Researcher — Sep 2021 - Present
University of California, Irvine — Irvine, CA

- Evaluated a statistical model's ability to predict monsoon rainfall changes and identify key drivers
- Developed an interpretable, kernel-based dimensionality-reduction method for atmospheric data
- Designed a model hierarchy spanning physics-based, neural network, and symbolic regression models to study skill-interpretability trade-offs for monsoon rainfall prediction
- Designed main figure for an award-winning paper & co-developed a GitHub repository with 100+ stars

Consulting Analyst — Mar - Aug 2021
Huron Consulting Group — New York, NY (Remote)

- Created Excel tools to streamline financial management of a university-run research nonprofit
- Developed long-term finance & resource forecasts & presented strategy to executive stakeholders

National Science Foundation Intern — Jun - Aug 2020
Lamont-Doherty Earth Observatory — Palisades, NY (Remote)

- Assessed COVID-19 shutdown impacts on New York City atmospheric methane concentrations
- Used meteorological observations & transport modeling to identify undocumented methane sources

Undergraduate Research Assistant — Sep 2019 - May 2020
Cornell University — Ithaca, NY (Hybrid)

- Generated time series of volcano thermal anomalies using ENVI for satellite imagery analysis
- Investigated pre-eruptive thermal patterns of Latin American volcanoes for NASA's AVTOD database

Student Administrative Assistant — Jan - Dec 2020
Cornell University — Ithaca, NY (Hybrid)

- Increased prospective student yield through creation an interactive ArcGIS campus tour
- Improved student engagement through execution of an office-wide social media strategy

SKILLS

Python (Xarray, Dask, Zarr, PyTorch, PySR) • High-Performance Computing • Linux • Cloud Computing • Git • LaTeX • WordPress • Microsoft Excel (Certified Specialist, 2020) • PowerPoint

PUBLICATIONS

S. L. Ferretti, T. Beucler, J. Lin, M. S. Pritchard, S. Shamekh, & J. W. Baldwin. Data-driven integration kernels for interpretable nonlocal operator learning. *In preparation*.

S. L. Ferretti, M. S. Pritchard, F. Ahmed, L. Peng, & J. W. Baldwin. (2025). Explaining South Asian monsoon rainfall seasonality using a metric of plume buoyancy. *Geophysical Research Letters*, *52*(16), e2025GL115546.

L. Peng, P. N. Blossey, W. M. Hannah, …**S. L. Ferretti**, …& M. S. Pritchard. (2025). Resolving low cloud feedbacks globally with E3SM High-Res MMF: Agreement with LES but stronger shortwave effects. *Journal of Advances in Modeling Earth Systems*, *17*(6), e2025MS005003.

S. Yu, Z. Hu, A. Subramaniam, …**S. L. Ferretti**, …& M. S. Pritchard. (2025). ClimSim-Online: A large multi-scale dataset and framework for hybrid ML–physics climate emulation. *Journal of Machine Learning Research*. *26*(142), 1-85.

S. Yu, W. M. Hannah, L. Peng, …**S. L. Ferretti**, …& M. S. Pritchard. (2023). ClimSim: A large multi-scale dataset for hybrid physics–ML climate emulation. *Advances in Neural Information Processing Systems*. **Outstanding Datasets & Benchmarks Award**.

A. M. Jenney, **S. L. Ferretti**, & M. S. Pritchard. (2023). Vertical resolution impacts explicit simulation of deep convection. *Journal of Advances in Modeling Earth Systems*, *15*(10), e2022MS003444.

AWARDS & FELLOWSHIPS

Advancing Inclusive Excellence Award — Jan 2023 - Jun 2023
School of Physical Sciences, University of California, Irvine — $ 400

Diversity, Equity, & Inclusion Graduate Leaders Fellowship — Sep 2022 - Jun 2023
School of Physical Sciences, University of California, Irvine — $ 24,720

TEACHING

University of California, Irvine, Air Quality Management — Apr - Jun 2024
Teaching Assistant — Irvine, CA

University of California, Irvine, Earth System Chemistry — Sep - Dec 2023
Teaching Assistant — Irvine, CA

University of California, Irvine, Diversity in STEM Seminar — Sep - Dec 2022
Coordinator — Irvine, CA

PRESENTATIONS

S. L. Ferretti, T. Beucler, M. S. Pritchard, …& J. W. Baldwin (2025). Learning Nonlocal Controls on South Asian Monsoon Rainfall. *AGU Fall Meeting*. Oral.

S. L. Ferretti, M. S. Pritchard, & J. W. Baldwin (2025). Towards Data-Driven Discovery of Thermodynamic Controls on South Asian Monsoon Rainfall. *LEAP NSF-STC Annual Meeting*. Poster.

S. L. Ferretti, L. Peng, J. W. Baldwin, & M. S. Pritchard (2024). Spatiotemporal Stress-Testing of a Process-Oriented Diagnostic for Rainfall. *AGU Fall Meeting*. Poster.

S. L. Ferretti, J. W. Baldwin, N. Liu, …& M. S. Pritchard (2024). Unraveling CMIP6 Biases in Summer Monsoon Rainfall Over the Arabian Sea and Western India. *104th AMS Annual Meeting*. Poster.

S. L. Ferretti, N. Liu, J. W. Baldwin, & M. S. Pritchard (2022). Understanding the Monthly Variation in the Upstream Enhancement of Indian Summer Monsoon Precipitation Near the Western Ghats. *AGU Fall Meeting*. Poster.

S. L. Ferretti (2022). Using Models to Understand Climate Change. *University of California, Irvine*. Invited Oral.

S. L. Ferretti, B. Dalton, L. D. Schiferl, …& R. Commane (2020). Assessing the Meteorological Impact on Methane (CH_4) Emission Changes in New York City During the COVID-19 Shutdown. *AGU Fall Meeting*. Poster.

SERVICE & ENGAGEMENT

Journal of Geophysical Research Atmospheres, Reviewer — Nov 2025 - Present

UCI ESS First-Year Mentoring Program, Mentor — Sep 2022 - Aug 2024

UCI Climate Justice Initiative, Fellowship Application Reviewer — Jun 2023

UCI CLEWS Climate-Tech Seminar Series, Panelist — Jun 2023

UCI ESS Inclusive Excellence Committee, Organizer — Sep 2022 - Jun 2023

Community Earth System Model Tutorial, Boulder, CO — Aug 2022

AGU Bridge Program New Student Orientation, Panelist — Jul 2022

Seed Consultant Group, Volunteer Project Consultant — Mar - May 2022

GREEN Program, Microgrid Systems for Rural Development, Kathmandu, Nepal — Jan 2020

Cornell University Dance Team, Cofounder & Vice President — Oct 2017 - Dec 2020

Cornell University College Mentors for Kids, Mentor — Aug 2017 - May 2018