Rebecca Gjini

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Education

Scripps Institution of Oceanography, UC San Diego — La Jolla, CA
Institute of Geophysics and Planetary Physics — 2021 - June 2026
Ph.D. in Earth Science (in progress)
Advisor: Matthias Morzfeld

Scripps Institution of Oceanography, UC San Diego — La Jolla, CA
Institute of Geophysics and Planetary Physics — 2021 - 2023
M.Sc. in Earth Science

Lehigh University — Bethlehem, PA
B.S. in Mathematics, *with highest honors* — 2017–2020
Minors in Computer Science and Environmental Studies

Positions

Scripps Institution of Oceanography, UC San Diego — La Jolla, CA
Institute of Geophysics and Planetary Physics — Summer 2021 - present
Graduate Research Assistant

- Feature-based data assimilation for cloud microphysics

Argonne National Laboratory — Lemont, IL
Student Research Participant in the Mathematics and Computer Science Division — Spring 2021

- Exploiting Automatic Differentiation in a Pythonic Multiple Doppler Radar Wind Retrieval Package

Michigan State University — East Lansing, MI
SURIEM REU — Summer 2020

- The Scattering Transform on Graphs

Publications

Peer Reviewed Articles

[1] R. J. Clancy, M. Menickelly, J. Hückelheim, P. Hovland, P. Nalluri, and **R. Gjini**, "TROPHY: Trust Region Optimization Using a Precision Hierarchy", *International Conference on Computational Science: Springer International Publishing*, pp. 445–459, 2022.

[2] R. Jackson, **R. Gjini**, S. H. K. Narayanan, M. Menickelly, P. Hovland, J. Hückelheim, and S. Collis, "Improving pydda's atmospheric wind retrievals using automatic differentiation and augmented lagrangian methods", *2022 Proceedings of the 21st Python in Science Conference*, pp. 210–216, 2022.

Outreach Articles

[3] **R. Gjini**, "Stratocumulus clouds and predator-prey dynamics", SIAM News Blog, 2023.

Presentations

1. **R. Gjini**, "Connecting Large-Eddy Simulations of Stratocumulus Clouds to Predator Prey Dynamics Via Feature Based Inversions", *SIAM Conference on Uncertainty Quantification (UQ24), February 2024*
2. **R. Gjini**, "Mapping Meteorological Conditions to Predator Prey Dynamics", *American Geophysical Union Annual Meeting (poster), December 2023*
3. **R. Gjini**, "Mapping Meteorological Conditions to Predator Prey Dynamics", *Learning the Earth with Artificial Intelligence (LEAP) and NASA Goddard Institute for Space Studies at Columbia University in the City of New York (invited talk), June 2023*
4. **R. Gjini**, "Mapping Meteorological Conditions to Predator Prey Dynamics", *Scientific Machine Learning Symposium at UCSD (poster), March 2023*
5. **R. Gjini**, "Mapping Meteorological Conditions to Predator Prey Dynamics", *SIAM Conference on Computational Science and Engineering (CSE23), March 2023*
6. **R. Gjini**, "Automatic Differentiation and Optimization in a Pythonic Direct Data Assimilation Framework for Wind Retrievals", *Center for Western Weather and Water Extremes (invited talk) , October 2022*
7. **R. Gjini**, "Automatic Differentiation and Optimization in a Pythonic Direct Data Assimilation Framework for Wind Retrievals", *International Conference on Continuous Optimization (ICCOPT), July 2022*
8. **R. Gjini**, "Graph Scattering Transform", *Joint Mathematics Meetings in the MAA Undergraduate Student Poster Session, 2021*
9. **R. Gjini**, "Graph Scattering Transform", *Shenandoah Undergraduate Mathematics and Statistics Conference, 2020*
10. **R. Gjini**,"Graph Scattering Transform", *Gulf Coast Undergraduate Research Symposium, 2020*
11. **R. Gjini**, "Graph Scattering Transform", *Mid-Michigan Symposium for Undergraduate Research Experiences, 2020*

Professional Activities

Conference/ Session Chair

- SIAM Conference on Computational Science and Engineering (CSE23) March 2023
  Minisymposium: Understanding Cloud Physics Using Stochastic, Dynamical, and Data-Driven Modeling
- International Conference of Continuous Optimization (ICCOPT) July 2022
  Computational Science and Engineering Applications of Automatic Differentiation and Optimization

Committees

- Computing Committee September 2023 - present
  Scripps Institution of Oceanography
- Community Anti-Bullying and Anti-Harassment (CAB) Task Force September 2022 - present
  Scripps Institution of Oceanography

Mentoring

- Geosciences Education and Mentorship Support (GEMS) Mentor September 2022 - Presemt
  Ruby and Sapphire track mentor
- Scripps Student Mentor September 2022 - Present
  Scripps Institution of Oceanography

Teaching

- **Instructor** during Scripps Institution of Oceanography's Summer Math Workshop — August 2022, August 2023
  Introduction to linear algebra
  Introduction to probability and statistics
- **Grading Assistant** at Lehigh University — Fall 2020
  Design and Analysis of Algorithms (CSE 340)
- **Grading Assistant** at Lehigh University — Spring 2020
  Discrete Structures and Algorithms (CSE 140)
- **Grading Assistant** at Lehigh University — Fall 2018, Spring 2019, Fall 2019
  Linear Methods (MATH 205)

Skills and Expertise

- **Programming Languages:** python, MATLAB, R, Java, Scala
- **Technology:** High-Performance Computing, Vim, LaTex, Beamer, Arduino, Mac Terminal, Word, Excel, Powerpoint, Keynote

Scholarships and Awards

- Student Travel Award for the 2024 SIAM Conference on Uncertainty Quantification — 2024
- Outstanding Student Presentation Award from the 2023 American Geophysical Union Annual Meeting — 2023
- Scripps Institution of Oceanography (SIO) Department Student Award — 2023
- Student Travel Award for the 2023 SIAM Conference on Computational Science and Engineering — 2023
- Geosciences of the Earth, Oceans and Planets (GEO) Program Winter 2022 Scripps Fellowship — 2022
- Contribution to Student Life Award (from Lehigh University) — 2020