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Luke Kachelein

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Education

2016–2023 | **Ph.D. in physical oceanography**, Scripps Institution of Oceanography.
Dissertation title: "Bayesian Harmonic Analysis of Tidal and Wind-Driven Currents in the California Current System"

2016–2017 | **M.S. in physical oceanography**, Scripps Institution of Oceanography (concurrent with Ph.D.).

2011–2015 | **B.A. in physics**, Vassar College. General honors, departmental honors, Phi Beta Kappa, Sigma Xi. Minor in mathematics.

Research Experience

2023–Present | **Postdoctoral Researcher - NASA Jet Propulsion Laboratory**
· Analyze sea surface height data from the SWOT mission
· Validate against *in situ* measures from the SWOT cal/val field campaign
· Participate in 8-day redeployment cruise for mooring platform (April 2024)
· Conduct independently-directed research on combining SWOT, HFR currents, and satellite sea surface temperature to investigate coastal processes
Supervisors: **Jinbo Wang and Benjamin Hamlington**.

2016–2023 | **Graduate Student Researcher - Scripps Institution of Oceanography**
· Investigated tidal and wind-driven signals in coastal radar observations of surface currents.
· Developed MATLAB software package for tidal analysis in the presence of correlated noise
Advisors: **Sarah Gille, Matthew Mazloff, and Bruce Cornuelle**.

Publications

Published

Luke Kachelein, Bruce D. Cornuelle, Sarah T. Gille, and Matthew R. Mazloff. Harmonic Analysis of Non-Phase-Locked Tides with Red Noise Using the red_tide Package. *Journal of Atmospheric and Oceanic Technology*, 2022. https://doi.org/10.1175/JTECH-D-21-0034.1

Luke Kachelein, Sarah T. Gille, Matthew R. Mazloff, and Bruce D. Cornuelle. Characterizing Non-Phase-Locked Tidal Currents in the California Current System Using High-Frequency Radar. *Journal of Geophysical Research: Oceans*, 129(7), 2024. URL https://doi.org/10.1029/2023JC020340

In Preparation or Review

Luke Kachelein, Jinbo Wang, Andrew Lucas, Audrey Delpech, Tom Farrar, Matthew Robert Archer, Matthias Lankhorst, Babette C. Tchonang, Uwe Send, Scott Stalin, Jeffrey Sevadjian, and Oscar Schofield. Sub-100 km Ocean Processes Revealed by Structure Functions of SWOT Sea Surface Height and In Situ Observing Network. *JGR: Oceans*, 2025 (expected). URL `https://doi.org/10.22541/essoar.174250725.56102978/v1`. In Review

Luke Kachelein Sarah T. Gille, Matthew R. Mazloff, and Bruce D. Cornuelle. The Diurnal Cycle in the California Current System: Currents from High-Frequency Radar and Winds from ERA5. In Preparation

Fellowships and Awards

2019–2022 **Future Investigators in NASA Earth and Space Science and Technology** – Awarded by NASA for graduate student-designed research projects that contribute to Science Mission Directorate's science, technology, and exploration goals.

2015–2016 **Fulbright Fellowship** – Awarded by the U.S. Department of State for a year of study in Jena, Germany, in the subject of photonic physics.

Teaching Experience

2018 **Introduction to Physical Oceanography - SIOC 210** - Teaching assistant for the foundational physical oceanography class, a required course for most SIO first year graduate students. Conducted review sessions and graded homework assignments for the 42 students in the class. Course instructor: Professor Lynne Talley.

Service

2024 **JPL Summer Intern Co-mentor** – Served as the co-mentor under primary mentor Jinbo Wang of multiple undergraduate and graduate summer interns at JPL.

2021 **Undergraduate Mentor** – Served as the graduate student mentor for a visiting undergraduate student during the summer as part of the Scripps Undergraduate Research Fellowship (SURF) program.

2018–2019 **Peer Mentor** – Served as a mentor for a first year Ph.D. student in my department as part of the peer mentor program at Scripps Institution of Oceanography, San Diego, CA. Received *Outstanding Mentor Award* for that year's cohort of mentors.

Conference Participation

Results from graduate school research presented at:
· Ocean Sciences Meeting 2018, 2020, and 2022
· American Geophysical Union Annual Meeting 2018
· SWOT Science Team Meeting 2018, 2019, 2022

Results from postdoctoral research presented at:
· Ocean Sciences Meeting 2024
· SWOT Science Team Meeting 2023, 2024

Computational skills

Programming Languages	MATLAB, Python, Mathematica.
Tools and Software	LaTeX, Bash shell, Git, Microsoft 365.
Operating Systems	Unix-like operating systems (macOS and GNU/Linux), Windows.

Languages and Citizenship

English:	Native language
German:	Limited working proficiency
Citizenship:	United States of America – Passport valid through October of 2034