Sam Lewin

slewin@berkeley.edu www.samlewin.github.io

I am a postdoc in the Mechanical Engineering Department at UC Berkeley with a broad interest in understanding and modeling fundamental aspects of multi-scale geophysical fluid flows, particularly in the ocean. My research lies at intersection between theory, observations and simulations of small-scale ocean dynamics. My PhD work focused on the dynamics and mixing properties of stratified turbulence using a combination of theoretical models, idealised high resolution direct numerical simulations and data-driven tools such as machine learning. I also have experience in conducting laboratory experiments for fluid dynamics, and in high performance computing.

ACADEMIC RECORD

2023 - present	**University of California, Berkeley** Postdoc supervised by Prof. Alexis Kaminski
Summer 2022	**Woods Hole Geophysical Fluid Dynamics Fellowship** 10-week research project *'Experiments on the instability of buoyancy-driven coastal currents'*
2019 - 2023	**Downing College, University of Cambridge** PhD in Applied Mathematics and Theoretical Physics '*Dynamically induced uncertainty in stratified turbulent mixing models'*
2014 - 2018	**Trinity College, University of Oxford** MMathPhys in Mathematics and Theoretical Physics

SELECTED PUBLICATIONS

Lewin, S. F. & Kaminski, A. K & McSweeney, J. M. & Waterhouse, A. F. (2025). Multiscale mixing variability on the inner shelf. *Submitted to J. Phys. Oceanogr. (preprint)*

Lewin, S. F. & Caulfield, C. P. (2024). Evidence for layered anisotropic stratified turbulence in a freely evolving horizontal shear flow. *J. Fluid Mech., 983, A20.*

Lewin, S. F. & de Bruyn Kops, S. M. & Caulfield, C. P. & Portwood, G. D. & (2023). A data-driven method for modeling dissipation rates in stratified turbulence. *J. Fluid Mech., 977, A37.*

Lewin, S. F. & Caulfield, C. P. (2022). Stratified turbulent mixing in oscillating shear flows. *J. Fluid Mech., 943, R3.*

SELECTED CONFERENCES AND INVITED TALKS

Lewin, S. F. & Kaminski, A.K. "Pathways to turbulence from internal waves in stratified horizontal shear flows" *APS Division of Fluid Dynamics, November 2024*

Lewin, S. F. & Kaminski, A.K. "Multiscale mixing dynamics on the inner shelf" *Poster presentation at the Gordon Research Conference on Ocean Mixing, June 2024*

Lewin, S. F. "Transient growth in stratified turbulence and the dependence of mixing on energy pathways." *UC Santa Cruz Applied Math Seminar, May 2024*

Lewin, S. F. "How can we use numerical models to help us understand the influence of stratification on ocean mixing?." *Western Coastal Collaboratorium Seminar, Oct 2023*