ABIGAIL BODNER

HOMEPAGE: abodner.github.io
Simons Society Postdoctoral Fellow working with Dr. Laure Zanna,
Center for Atmosphere Ocean Science, Courant Institute, NYU

EDUCATION

PhD *2021*
Earth, Environmental and Planetary Sciences
Brown University
Advisor: Dr. Baylor Fox-Kemper

ScM *2020*
Applied Mathematics
Brown University

MSc (magna cum laude) *2019*
Geophysics, Atmospheric and Planetary Sciences
Tel Aviv University
Advisor: Dr. Nili Harnik

BSc (Double Major) *2014*
- Geophysics, Atmospheric and Planetary Sciences
- Mathematics
Tel Aviv University

HONORS AND AWARDS

Community Earth System Model (CESM) Graduate Student Award *June 2022*

Junior Fellow in the Simons Society of Fellows *AY 2021-2024*

Student Oral Presentation Award at the Atmospheric and Oceanic Fluid Dynamics Meeting of the American Meteorological Society *June 2019*

Associate of Sigma Xi Scientific Research Honor Society *2019*

Gulf of Mexico Research Initiative Scholar *2018*

Departmental First Year Fellowship, Brown University *AY 2015-2016*

Rana Samuels Ofran MSc Student Excellence Award *AY 2014-2015*

PUBLICATIONS

Bodner, A. S., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P. (2019). A perturbation approach to understanding the effects of turbulence on frontogenesis. *Journal of Fluid Mechanics*, 883.

Bodner, A. S. & Fox-Kemper, B. (2020). A Breakdown in Potential Vorticity Estimation Delineates the Submesoscale-to-Turbulence Boundary in Large Eddy Simulations. *Journal of Advances in Modeling Earth Systems*, e2020MS002049.

Bodner, A., Fox-Kemper, B., Johnson, L., Van Roekel, L. P., McWilliams, J. C., Sullivan, P. P., Hall, P. S. & J.Dong (2022). Modifying the Mixed Layer Eddy Parameterization to Include Frontogenesis Arrest by Boundary Layer Turbulence. *Journal of Physical Oceanography (under review).*

INVITED TALKS

"Modifying the mixed layer eddy parameterization to include frontogenesis arrest by boundary layer turbulence", Physical Oceanography Seminar, Woods Hole Oceanographic Institution, May 2022.

"Modifying the Mixed Layer Eddy Parameterization: frontogenesis arrest by boundary layer turbulence"", Regional MOM6 Meeting, NOAA GFDL, December 2021.

"Relating coastal sea level to its drivers in the ocean interior", Machine Learning for Climate, Kavli Institute for Theoretical Physics (KITP), Santa Barbara, CA, November 2021.

"On the interaction between submesoscales and turbulence: from theory to implementation in global climate models", Physical Oceanography Dissertations Symposium (PODS) XI, Lihue, Kaua'i, October 2021.

"Stir and mix: studying upper ocean dynamics from theory to application", Department of Earth and Planetary Sciences, Weizmann Institute of Science, May 2021.

"Stir and mix: studying upper ocean dynamics from theory to application", Department of Solar Energy and Environmental Physics (YDSEEP), Ben Gurion University of the Negev, April 2021.

"Stir and mix: studying upper ocean dynamics from theory to application", School of Earth Sciences, Tel Aviv University, March 2021.

"On the interaction between submesoscales and turbulence: from theory to application", Department of Applied Mathematics and Theoretical Physics Seminar, University of Cambridge February 2021.

"Stir and mix: studying upper ocean dynamics from theory to application", Climate, Atmosphere and Oceanography Seminar, The Hebrew University of Jerusalem, January 2021.

"On the interaction between submesoscales and turbulence: from theory to implementation in global climate models", Physical Oceanography Seminar, Woods Hole Oceanographic Institution, June 2020.

"On the interaction between submesoscales and turbulence: from theory to implementation in global climate models", The Center for Atmosphere Ocean Science, Courant Institute of Mathematical Sciences, New York University, October 2019.

"Frontal evolution in the presence of submesoscale instabilities and turbulence", Atmosphere, Ocean, and Climate Dynamics Seminar, Yale University, April 2019.

SELECTED CONFERENCE PRESENTATIONS

Bodner, A., Zanna, L. & Ross, A. S.: "A Machine Learning Approach for Relating Sea Level to its Local Drivers", Ocean Sciences Meeting, TOS/ASLO/AGU, February 2022. *Oral.*

Bodner, A., Fox-Kemper, B., Johnson, L., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: "Modifying the Mixed Layer Eddy Parameterization to Include Frontal Width Determined by Boundary Layer Turbulence", Ocean Model Working Group Winter Meeting, February 2021. *Oral.*

Bodner, A., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: "Frontal Formation in the Presence of Submesoscale Instabilities and Turbulence", Atmospheric and Oceanic Fluid Dynamics Meeting, AMS, Portland, ME, June 2019. *Oral.*

Bodner, A. & Fox-Kemper, B.: "Hidden Dangers in Potential Vorticity", Sources and Sinks of Ocean Mesoscale Eddy Energy Workshop (US CLIVAR), Tallahassee, FL, March 2019. *Oral.*

Bodner, A., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: "A Novel Approach to Understanding the Effects of Turbulence and Instabilities on Frontogenesis", Symposium on Geophysical Fluid Dynamics, Sde Boker, Israel, January 2019. *Oral.*

Bodner, A., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: "A Novel Approach to Understanding the Effects of Turbulence and Instabilities on Frontogenesis", CARTHE All Hands Meeting ,Miami, FL, November 2018. *Oral.*

Bodner, A., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: "A Perturbation Method to Understanding the Effects of Turbulence and Instabilities on Frontogenesis", Ocean Sciences Meeting, TOS/ASLO/AGU, Portland, OR, February 2018. *Oral.*

Bodner, A., Fox-Kemper, B., Van Roekel, L. P., McWilliams, J. C. & Sullivan, P. P.: "Arrest of Frontogenesis by Submesoscales and Turbulence", Ocean Sciences Meeting, TOS/ASLO/AGU, New Orleans, LA, February 2016. *Poster.*

Bodner, A., Harnik, N. & Lachmy, O.: "Global Circulation Regimes in the Presence of Stationary Planetary Wave Forcing", Geophysical Fluid Dynamics Seminar, Weizmann Institute, Israel, July 2015. *Oral.*

Bodner, A., Harnik, N. & Lachmy, O.: "Global Circulation Regimes in the Presence of Stationary Planetary Wave Forcing", 20th conference on Atmospheric and Oceanic Fluid Dynamics, Minneapolis, MN, June 2015. *Poster.*

Bodner, A., Harnik, N. & Lachmy, O.: "Effects of Stationary Forcing on Global Circulation Regimes", Symposium on Geophysical Fluid Dynamics, Sde Boker, Israel, January 2015. *Poster.*

ADDITIONAL RESEARCH EXPERIENCE AND TRAINING

Trustworthy Artificial Intelligence for Environmental Science *June 2022*
Summer school by the National Center for Atmospheric Research (NCAR) in Boulder, CO.

Kavli Institute for Theoretical Physics Research Fellow *Fall 2021*
Program for Machine Learning and the Physics of Climate (University of California Santa Barbara).

Community Earth System Model (CESM) Tutorial *Summer 2019*
Run by the National Center for Atmospheric Research (NCAR) in Boulder, CO.

Kavli Institute for Theoretical Physics Graduate Fellow *Spring 2018*
Program for Planetary Boundary Layers in Atmospheres, Oceans, and Ice on Earth and Moons (University of California Santa Barbara).

Fundamental Aspects of Turbulent Flows in Climate Dynamics *Summer 2017*
Summer school program run by Ecole de Physique des Houches (Les Houches, France).

TEACHING EXPERIENCE

Studying the Ocean from the Classroom to the Bay *Summer 2018 & 2019*
Course designer and co-instructor in Summer@Brown pre-college program (Brown University).

Principles in Planetary Climate *Fall 2018*
Teaching assistant under Professor Jung-Eun Lee (Brown University).
Guest lecture: "Large Scale Dynamics in the Ocean and Atmosphere".

Teaching Consultant Program, Brown University Sheridan Center. *Fall 2017*

Climate Change: Fact or Fiction? *Summer 2017*
Course designer and instructor in Summer@Brown middle school program (Brown University).

Reflective Teaching Program, Brown University Sheridan Center. *Fall 2016*

Continuum Mechanics - Fluids *Spring 2015*
Teaching assistant under Professor Eyal Heifetz (Tel Aviv University).

Climate Theory *Spring 2015*
Teaching assistant under Professor Nili Harnik (Tel Aviv University).

Laboratory Experiments in Atmospheric Sciences *Fall 2014*
Teaching assistant under Professor Nili Harnik (Tel Aviv University).

Earth Sciences Teacher *2012-2013*
High school senior year research project (Shay Agnon High School, Israel).

Mathematics Teacher *2009-2014*
Middle school gifted children program (Bar-Ilan University).
High school and pre-college students (Raz Etgarim Educational Center, Israel).
At-risk youth (Haklai Boarding school, Israel).

SERVICE

Reviewer for Journal of Advances in Modeling Earth System (JAMES) *2022- Present*

Reviewer for Journal of Turbulence *2022- Present*

Ocean Sciences Session Convener *February 2022*
Inter-scale connections and transfers in mesoscale, submesoscale, and boundary layer turbulence

Ocean Sciences Meeting Student Reviewer *February 2022*

Expert Reviewer for the Intergovernmental Panel on Climate Change (IPCC) *2019*
Sixth Assessment Report

Expert Reviewer for the Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC) *2018*

Reviewer for Journal of Physical Oceanography *2017-Present*

Graduate School Community Fellow *2018-2019*

First Year Graduate Student Mentor *2018-2019*

International Student Representative and Event Organizer *2016-2018*

Leadership Alliance - Graduate Student Panel *2018*

Volunteer at the Division of Fluid Dynamics Meeting (APS DFD) *November 2015*

PROFESSIONAL AFFILIATIONS

Multiscale Machine Learning In Coupled Earth System Modeling (M^2LInES)	*2022-Present*
Institute at Brown for Environment & Society (IBES)	*2015-2021*
Consortium for Advanced Research on Transport of Hydrocarbon in the Environment (CARTHE)	*2015-2021*
Graduate Fellow of the Rhode Island Consortium for Coastal Ecology Assessment Innovation & Modeling (C-AIM)	*2015-2021*