

# Kara Hartig

Geological Museum, Harvard University, Cambridge, MA 02138, USA

kara\_hartig@g.harvard.edu

kahartig.github.io

## EDUCATION

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**Harvard University** | Cambridge, MA

PhD Candidate, Department of Physics, 2018 – Present

Advisor: Professor Eli Tziperman (Earth & Planetary Sciences)

**Brown University** | Providence, RI

Sc.B (Honors) in Physics, *magna cum laude*, Phi Beta Kappa, 2014 – 2018

Thesis: "Langmuir Turbulence in the Ocean Surface Boundary Layer: Towards a Sub-grid Statistical Climate Process Model"

Advisor: Professor Brad Marston

## RESEARCH EXPERIENCE

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**Cold Air Outbreaks in Modern & Warmer Climates**

**Cambridge, MA**

*Harvard PhD Thesis (primary project; ongoing)*

05/2019 – present

- Analyzing back trajectories for air parcels advected from the Arctic into the midlatitudes to determine the primary physical processes leading to cold air outbreaks and how those will change in a warmer climate

**Connections Between Surface Weather and Stratospheric Variability**

**Cambridge, MA**

*Harvard PhD Thesis (secondary project; ongoing)*

08/2021 – present

- Exploring possible teleconnections between stratospheric variability and wintertime surface temperatures in the Northern Hemisphere in reanalysis and models

**Direct Measurement of the Surface Capillary Force**

**Cambridge, MA**

*Research Rotation at Harvard*

09/2018 – 12/2018

- Imaged deflection of an optical fiber to directly measure the strength of capillary repulsion along the air-water interface between a hydrophobic floater and an elliptical boundary

**Simulating Langmuir Turbulence in the Upper Ocean**

**Providence, RI**

*Brown Senior Honors Thesis*

05/2017 – 05/2018

- Simulated Langmuir turbulence in the ocean surface boundary layer to compare the quasi-linear and generalized quasi-linear approximations to direct numerical simulation, focusing on trade-offs between accuracy and computational resource use

## PUBLICATIONS

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**K. Hartig**, C. P. Loughner, and E. Tziperman (2023). Processes Contributing to North American Cold Air Outbreaks Based on Air Parcel Trajectory Analysis. *Journal of Climate*, 36(3).

Zeng, C., Faaborg, M.W., Sherif, A. **et al.** (2022). 3D-printed machines that manipulate microscopic objects using capillary forces. *Nature* **611**.

Covington, C., **K. Hartig**, A. Russakoff, R. Kulpins and K. Varga (2017). Time-dependent density-functional-theory investigation of the collisions of protons and  $\alpha$  particles with uracil and adenine. *Physical Review A*, 95(5).

## PRESENTATIONS

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- Jun 2023 Summer Idea Smash Symposium at Harvard University
- Jun 2023 CESM Workshop
- Apr 2023 Kavli Seminar at Harvard University
- Mar 2023 (invited) Applied Math Graduate Student Seminar at Harvard University
- Dec 2022 American Geophysical Union Fall Meeting
- Oct 2022 Earth & Planetary Sciences Graduate Student / Post-Doc Seminar at Harvard University
- Jul 2022 National Defense Science & Engineering Graduate (NDSEG) Fellows Conference
- Jun 2022 Atmospheric & Oceanic Fluid Dynamics Conference
- Feb 2022 (invited) Lunch Bunch Seminar at Brown University Department of Earth, Environmental and Planetary Sciences
- Feb 2022 Kavli Seminar at Harvard University
- Dec 2021 American Geophysical Union Fall Meeting
- Oct 2021 Graduate Climate Conference
- Apr 2021 Kavli Seminar at Harvard University
- Dec 2020 American Geophysical Union Fall Meeting
- Oct 2020 Graduate Climate Conference
- Oct 2020 Kavli Seminar at Harvard University
- Dec 2019 American Geophysical Union Fall Meeting

## PROFESSIONAL SERVICE & OUTREACH

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Member: Diversity, Inclusion, & Belonging Sub-group on Workshops, Resources, & Colloquia, Harvard University, 2020-present

Steward for Cambridge Sciences and Department Representative for Earth & Planetary Sciences: Harvard Graduate Student Union (HGSU-UAW), 2020-present

## TEACHING

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Teaching Fellow, Spring 2021, EPS 101: Global Warming Science

- Certificate of Distinction in Teaching

Teaching Fellow, Spring 2020, EPS 101: Global Warming Science

## FELLOWSHIPS & AWARDS

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National Defense Science & Engineering Graduate (NDSEG) Fellowship, 2020-2023

R. Bruce Lindsay Prize for Excellence in Physics, Brown University, 2018