# Lily C. Hahn

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## EDUCATION

**University of Washington**, Seattle, WA 2018-2023
Ph.D., Atmospheric Sciences

**Yale University**, New Haven, CT 2013-2017
B.S., Geology & Geophysics: Atmosphere, Ocean and Climate with Distinction in the Major, *summa cum laude*, Phi Beta Kappa

## AWARDS AND HONORS

NOAA Climate & Global Change Postdoctoral Fellowship 2023-2025
Wagner Memorial Award for Women in Atmospheric Sciences 2022
Advanced Climate Dynamics Course Participant in Rondane, Norway 2022
Graduate Student Distinguished Service Certificate, UW Atmospheric Sciences 2022
National Science Foundation (NSF) Graduate Research Fellowship 2018-2021
Achievement Rewards for College Scientists (ARCS) Fellowship 2018-2021
Belknap Prize in Geology & Geophysics, Yale 2017
Summer Student Fellowship, Woods Hole Oceanographic Institution 2016
Von Damm Research Fellowship in Geology & Geophysics, Yale 2016
J. Edward Meeker Freshman English Prize, Yale 2014

## POSTDOCTORAL APPOINTMENT

**Scripps Institution of Oceanography** September 2023-present
NOAA Climate & Global Change Postdoctoral Fellow: Impacts of the Atlantic Meridional Overturning Circulation on Global and High-Latitude Warming
*Advised by* Nick Lutsko and Ian Eisenman

## RESEARCH EXPERIENCE

**University of Washington, Atmospheric Sciences Department** 2018-2023
Mechanisms of polar-amplified warming
*Advised by* David Battisti and Kyle Armour

**University of Oslo, Department of Geosciences** Spring 2018
Role of topography for Greenland cloud response to atmospheric circulation
*Advised by* Trude Storelvmo

**Woods Hole Oceanographic Institute** Summer 2016, Summer-Fall 2017
Linking extreme Greenland Ice Sheet melt and atmospheric circulation variability
*Advised by* Caroline Ummenhofer

**Yale Atmosphere, Oceans, and Climate Dynamics Group** 2015-2017
Orbital forcing with observationally-constrained clouds; Climate geoengineering effects
*Advised by* Trude Storelvmo

## PEER-REVIEWED PUBLICATIONS

Hofer, S., **Hahn, L.C.**, Shaw, J.K. *et al.* (2024). Realistic representation of mixed-phase clouds increases projected climate warming. *Communications Earth & Environment,* 5, 390. https://doi.org/10.1038/s43247-024-01524-2

Armour, K. C., Proistosescu, C., Dong, Y., **Hahn, L. C.**, Blanchard-Wrigglesworth, E., Pauling, A. G. et al. (2024). Sea-surface temperature pattern effects have slowed global warming and biased warming-based constraints on climate sensitivity. *Proceedings of the National Academy of Sciences*, 121, e2312093121. https://doi.org/10.1073/pnas.2312093121

**Hahn, L. C.**, Armour, K. C., Battisti, D. S., Donohoe, A., and Fajber, R. (2023). Seasonal changes in atmospheric heat transport to the Arctic under increased $CO_2$. *Geophysical Research Letters*, 50, e2023GL105156. https://doi.org/10.1029/2023GL105156

Bonan, D. B., Feldl, N., Zelinka, M.D., and **Hahn, L. C.** (2023). Contributions to regional precipitation change and its polar-amplified pattern under warming. *Environmental Research: Climate*, 2, 035010. https://doi.org/10.1088/2752-5295/ace27a

**Hahn, L. C.**, Armour, K. C., Battisti, D. S., Eisenman, I., and Bitz, C. M. (2022). Seasonality in Arctic Warming Driven by Sea Ice Effective Heat Capacity. *Journal of Climate*, 35, 1629-1642. https://doi.org/10.1175/JCLI-D-21-0626.1

**Hahn, L. C.**, Armour, K. C., Zelinka, M. D., Bitz, C. M., and Donohoe, A. (2021). Contributions to Polar Amplification in CMIP5 and CMIP6 Models. *Frontiers in Earth Science*, 9, 710036. https://doi.org/10.3389/feart.2021.710036

Sagoo, N., Storelvmo, T., **Hahn, L. C.**, Tan, I., Danco, J., Raney, B., and Broccoli, A. J. (2021), Observationally Constrained Cloud Phase Unmasks Orbitally Driven Climate Feedbacks. *Geophysical Research Letters*, 48, e2020GL091873. https://doi.org/10.1029/2020GL091873

**Hahn, L. C.**, Armour, K. C., Battisti, D. S., Donohoe, A., Pauling, A. G., and Bitz, C. M. (2020), Antarctic elevation drives hemispheric asymmetry in polar lapse-rate

climatology and feedback. *Geophysical Research Letters,* 47, e2020GL088965. https://doi.org/10.1029/2020GL088965

**Hahn, L. C.**, Storelvmo, T., Hofer, S., Parfitt, R., and Ummenhofer, C. C. (2020), Importance of orography for Greenland cloud and melt response to atmospheric blocking. *Journal of Climate,* 33, 4187–4206. https://doi.org/10.1175/JCLI-D-19-0527.1

Donohoe, A., Armour, K. C., Roe, G. H., Battisti, D. S., and **Hahn, L. C.** (2020), The partitioning of meridional heat transport from the Last Glacial Maximum to $CO_2$ quadrupling in coupled climate models. *Journal of Climate,* 33, *4141-4165.* https://doi.org/10.1175/JCLI-D-19-0797.1

**Hahn, L. C.**, Ummenhofer, C. C., and Kwon, Y.-O. (2018), North Atlantic natural variability modulates emergence of widespread Greenland melt in a warming climate. *Geophysical Research Letters*, 45, 9171-9178. https://doi.org/10.1029/2018GL079682

## PUBLICATIONS IN PREPARATION

**Hahn, L. C.**, Lutsko, N. J., and Eisenman, I., Impacts of the Atlantic Meridional Overturning Circulation on intermodel spread in transient warming. Anticipated submission, 2024.

**Hahn, L. C.**, Armour, K. C., Battisti, D. S., and Bitz, C. M., Interseasonal dependence of Arctic warming on radiative heating. Anticipated submission, 2024.

Pietschnig, M., Hofer, S., **Hahn, L. C.**, Olivié, D. J. L., Moseid, K. O., Madan, G., et al., Northern Hemisphere cooling leads to Southern Hemisphere warming in response to $SO_2$ doubling over Asia. Anticipated submission, 2024.

## OTHER WORKS

Forster, P., Storelvmo, T., Armour, K., Collins, W., Dufresne, J.-L., Frame, D., … , **Hahn, L. C.**, et al., 2021: The Earth's Energy Budget, Climate Feedbacks, and Climate Sensitivity. In Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 923–1054. https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter07.pdf

Zinetti, S., Meyer, M., **Hahn, L.**, Kulik, K. M., Matossian, M., and Scherer, N. (2020). Feasibility Study for a Potential Community Choice Aggregation in Arlington County. Prepared as a volunteer scientist with the American Geophysical Union's Thriving Earth Exchange. https://www.virginiacleanenergy.org/cca-feasibility-study.html

## TEACHING AND MENTORSHIP

**Guest Lecturer,** Scripps Institution of Oceanography, UC San Diego
Numerical Modeling of the Climate System — Spring 2024
*Model Workshop: Using Simple Models and Analyzing GCM Output*

Dynamics of the Atmosphere and Climate — Spring 2024
*Polar Amplification*

**Guest Lecturer,** University of Washington, Atmospheric Sciences
Exploring the Atmospheric Sciences
*Ice and Climate* — Spring 2023
*Climate feedbacks and polar warming* — Fall 2022

**Instructor**, University of Washington, Atmospheric Sciences
Exploring the Atmospheric Sciences — Summer 2021

**Teaching Assistant,** University of Washington, Atmospheric Sciences
Climate and Climate Change (Professor: Kat Huybers) — Fall 2019

**Research Advising**
Ben Mackay, Scripps Institution of Oceanography, PhD student — 2023-present
Zaria Cast, CU Boulder, MA Student, NSF SOARS Program — Summer 2024
Elinor Kay, Smith College, Undergraduate Intern — Summer 2023
Benjamin Buchovecky, Princeton University, HMEI Undergrad. Intern — Summer 2022
Madeleine Burns, Princeton University, HMEI Undergraduate Intern — Summer 2022

**UW Graduate Student Peer Mentoring Program** — 2022-2023
*Mentor*

**UW Graduate-Undergraduate Mentor Program**
*Program Co-Lead* — 2019-2023
*Mentor* (5 undergraduate students) — 2018-2023

**UW Odegaard Writing and Research Center** — 2019-2020
*Writing Tutor*

**Yale Science and Quantitative Reasoning Tutoring Program** — 2014-2016
*Chemistry and Calculus Tutor*

## COMMUNITY ENGAGEMENT

**AGU Thriving Earth Exchange**
*Community Science Fellow* — 2023-present

Facilitate collaborative projects co-developed by communities and scientists

*Volunteer Scientist,* Environmental Benefits Chapter 2019-2020
Feasibility Study for Community Choice Aggregation of Renewable Energy Options

**UW Program on Climate Change (PCC) ACORN Program**
*Co-Founder and Co-Lead* 2020-2023
Actionable Community-Oriented Research eNgagement connects graduate students with community leaders to address community climate and energy priorities

*Volunteer Scientist* 2020-2022
Emissions Impacts of Demand Response Implementation in Washington State

**Project Bright** 2013-2017
*West Campus Installation and Outreach Co-Lead, Treasurer*
Received New England Grassroots Environmental Fund Grow Grant and Yale Landscape Lab Seedling Award for solar installation design and environmental outreach programs at Yale's West Campus Farm

## UNIVERSITY AND PROFESSIONAL SERVICE

**Department Service**
NCAR Postdoctoral Fellows Networking Committee 2023-present
First Annual Great Atmos Bake-Off Organizer 2022
UW Atmospheric Sciences Part-Time Lecturer Search Committee 2021

**UW PCC Graduate Steering Committee** 2019-2021
Launched the Program on Climate Change (PCC) Undergraduate Research Cohort
Facilitated the Spring Symposium and Climate Science on Tap: The Schooner Series

**Conference Activities**
*Scientific Organizing Committee,* US CLIVAR Polar Amplification Workshop 2023-2024
*Co-Convener,* Innovative Initiatives in Conducting Community-Based Science and Training the Next Generation of Practitioners, AGU Fall Meeting 2021
*Executive Committee Co-Chair,* Graduate Climate Conference 2021
*Executive Committee Member,* Graduate Climate Conference 2020, 2022

**Grant Reviewer**
National Science Foundation: Climate and Large-Scale Dynamics

**Journal Reviewer**
Climate Dynamics, Communications Earth & Environment, Environmental Research: Climate, Geophysical Research Letters, Journal of Climate, Journal of Geophysical

Research – Atmospheres, Nature Communications, npj Climate and Atmospheric Science

## PRESENTATIONS

*Invited Talks*

**UC Irvine, Department of Earth System Science** May 2024
Role of atmosphere-ocean-ice interactions for warming in the Arctic and beyond

**US CLIVAR Workshop on Polar Amplification of Climate Change** January 2024
Understanding Seasonal Asymmetry in Arctic Climate Change

**Scripps Institution of Oceanography, Climate, Atmospheric Sciences, and Physical Oceanography** October 2023
Understanding Seasonal Asymmetry in Arctic Climate Change

**UW Program on Climate Change Summer Institute** September 2023
Atmospheric Drivers of Polar Warming Asymmetries

**University of Washington, Odegaard Writing and Research Center** June 2023
Dissertation Writing Intensive Panel: Sustainable Writing Practices

**Desert Research Institute, Wagner Award Seminar** November 2022
Seasonality in Arctic Warming Driven by Sea Ice Effective Heat Capacity

**Paleoclimate Advances Webinar Series** July 2022
Contributions to Polar-Amplified Warming and Its Seasonality

**Polar Amplification Model Intercomparison Project Webinar Series** June 2022
Contributions to Polar-Amplified Warming and Its Seasonality

**Columbia University, Department of Earth and Environmental Sciences, Seminar in Race, Climate Change, and Environmental Justice** February 2021
ACORN: Actionable Community-Oriented Research eNgagement

**European Polar Science Week** October 2020
What Drives Hemispheric Asymmetry in Polar Warming?

*Contributed Talks*

**Hahn, L. C.**, N. J. Lutsko, I. Eisenman (2024), Role of Atlantic Meridional Overturning Circulation for Arctic and global warming, NOAA Climate and Global Change Summer Institute.

**Hahn, L. C.,** K. C. Armour, D. S. Battisti, and C. M. Bitz (2023), Interseasonal dependence of Arctic warming on radiative heating, AGU Fall Meeting.

**Hahn, L. C.,** K. C. Armour, D. S. Battisti, I. Eisenman, and C. M. Bitz (2021), Seasonality in Arctic Warming Driven by Sea Ice Effective Heat Capacity, AGU Fall Meeting.

**Hahn, L. C.,** T. Storelvmo, S. Hofer, R. Parfitt, and C. C. Ummenhofer (2020), Importance of Orography for Greenland Cloud and Melt Response to Atmospheric Blocking, AGU Fall Meeting.

**Hahn, L. C.,** K. C. Armour, D. S. Battisti, A. Donohoe, A. G. Pauling, C. M. Bitz, I. Eisenman (2020), What Drives Hemispheric and Seasonal Asymmetry in Polar Warming?, Polar Friday, Applied Physics Laboratory, University of Washington.

**Hahn, L. C.,** K. C. Armour, D. S. Battisti, A. G. Pauling, A. Donohoe, C. M. Bitz (2020), Antarctic Elevation Drives Hemispheric Asymmetry in Polar Lapse Rate Climatology and Feedback, Master's Defense, Department of Atmospheric Sciences, University of Washington.

**Hahn, L. C.,** K. C. Armour, D. S. Battisti, A. G. Pauling, A. Donohoe, C. M. Bitz (2019), Understanding Asymmetries in Arctic and Antarctic Lapse Rate Feedbacks and Polar Amplification, AGU Fall Meeting.

**Hahn, L. C.,** T. Storelvmo, S. Hofer, R. Parfitt, C. C. Ummenhofer (2019), Importance of Orography for Greenland Cloud and Melt Response to Atmospheric Blocking, Graduate Climate Conference.

**Hahn, L. C.,** C. C. Ummenhofer, and Y.-O. Kwon (2018), North Atlantic Natural Variability Modulates Emergence of Widespread Greenland Melt in a Warming Climate, AGU Fall Meeting.

**Hahn, L. C.,** C. C. Ummenhofer, and Y.-O. Kwon (2018), Impact of Natural Variability in the North Atlantic Ocean-Atmosphere System on the Emergence of Widespread Greenland Melt in the 21st Century, EGU General Assembly.

*Contributed Posters*

**Hahn, L. C.,** I. Eisenman, N. J. Lutsko (2024). Impacts of the Atlantic Meridional Overturning Circulation on intermodel spread in transient warming, CFMIP Workshop.

**Hahn, L. C.,** K.C. Armour, D.S. Battisti (2022). Seasonality in poleward atmospheric heat transport under increased $CO_2$, AGU Fall Meeting.

**Hahn, L. C.,** K.C. Armour, D.S. Battisti (2022). Seasonality in poleward atmospheric heat transport under increased $CO_2$, Graduate Climate Conference.

**Hahn, L. C.**, K. C. Armour, D. S. Battisti (2022). The relative roles of feedbacks, forcing, and effective heat capacity for higher transient warming in CMIP6 compared to CMIP5, US Climate Variability and Predictability Program: Pattern Effect Workshop.

**Hahn, L. C.**, K. C. Armour, M. D. Zelinka, C. M. Bitz, and A. Donohoe (2021). Contributions to Polar Amplification in CMIP5 and CMIP6 Models, Graduate Climate Conference.

**Hahn, L. C.,** K. C. Armour, D. S. Battisti, C. M. Bitz, I. Eisenman (2020), What Drives Seasonal Asymmetry in Arctic Warming?, Graduate Climate Conference.

**Hahn, L. C.**, C. C. Ummenhofer, R. Parfitt, and T. Storelvmo (2018), Evaluating Cloud Cover as a Link Between High Pressure Systems and Greenland Melt, EGU.

**Hahn, L. C.**, C. C. Ummenhofer, and F. Straneo (2017), Increasing Greenland Melt and Blocking in Recent Decades Modulated by Large-Scale and Regional Circulation Changes, AMS Annual Meeting.

**Hahn, L. C.** and T. Storelvmo (2016), Climate Engineering Review: Modelled Impacts of Stratospheric Sulfate, Marine Cloud Brightening, and Cirrus Cloud Seeding, Geoengineering Model Intercomparison Project (GeoMIP) Meeting.