# Ash L. Gilbert

(they/them/theirs)
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## EDUCATION

**University of Colorado, Boulder** — Boulder, CO
PhD, Atmospheric Sciences — Expected 2027
Candidacy Exam — November 2024

**University of Michigan** — Ann Arbor, MI
BSE with Honors, *summa cum laude* — April 2022
Major: Climate & Meteorology, concentration in Meteorology
Minors: Latin & Computer Science

## AWARDS & HONORS

National Science Foundation (NSF) Graduate Research Fellowship — 2022

## RESEARCH INTERESTS

- polar cloud processes
- Community Earth System Model (CESM)
- Arctic amplification
- meltwater dynamics in Greenland
- wind nudging
- climate model development
- internal climate variability
- climate change attribution
- sea ice-air interactions

## RESEARCH EXPERIENCE

**University of Colorado, Boulder** — Boulder, CO
Graduate Research Assistant, Advisor: Jennifer E. Kay — 2022 – Present
Project 1:

- Evaluated the impact of temperature dependent liquid water optical properties on the Arctic climate via a hierarchy of models
- Identified small but not statistically significant effect of temperature dependent optics in both a single-column CESM case study and a long-term pre-industrial global CESM simulation
- Isolated the signal of the optics change by using a novel technique called wind nudging and by using ensemble members in CESM
- Publication of this study is in review

Project 2:

- Assessed the contribution of observed winds to recent Arctic warming and sea ice loss using wind nudging in CESM
- Identified and removed wind nudging induced model climate drift via cycling of atmospheric forcings
- Evaluated the change in wind contribution for an increase and decrease in mean state sea ice thickness
- Publication of this study is in preparation for journal submission

**University of Michigan** — Ann Arbor, MI

Research Assistant, Advisor: Jeremy N. Bassis 2019 – 2023

- Determined the controls on supraglacial lake formation through observational analysis and modeling to further knowledge of ice sheet ablation
- Identified the observed spatio-temporal patterns in supraglacial lake formation and air temperature with ArcGIS
- Modeled how supraglacial lakes drain to replicate observed patterns using Python software and ArcGIS
- Presented poster on work in 2020 and 2021 at national conference for American Geophysical Union
- Participated in weekly lab meetings discussing relevant research papers and professional development topics
- Wrote and submitted a research paper for publication from this project (rejected)

**University of Michigan** Ann Arbor, MI

Research Assistant, Advisor: Christiane Jablonowski 2021 – 2022

- Analyzed a case study of lake effect snow forecasting for the UFS-SRW model coupled to the FV3COM, a lake dynamics model
- Ran various configurations of the coupled UFS-FV3COM model on the NCAR Cheyenne supercomputer
- Compared model results to reanalysis data and snow accumulation observations to evaluate model skill

**NSF Oceanic Sciences (Virtual) REU, NorthWest Research Associates**

Research Intern, Advisor: Penny Rowe 2020

- Worked under a mentor to find the influence of temperature dependence of cloud optical properties on simulated IR flux
- Received anti-discrimation, anti-harassment, DEI, and research ethics training through a series of professional development seminars provided by NSF
- Gave research talk as final part of the REU
- Presented poster on work in 2021 at national conference for American Meteorological Society

**University of Michigan** Kangerlussuaq, Greenland

Field Expedition Member, Lead: Perry Samson 2019

- Gained significant field research experience by working with team of students and professors to conduct multiple experiments involving stream flow, net solar radiation, PIBAL and rawinsonde launches, air quality, and 3D-scanning with drones
- Led and trained sub-team responsible for rawinsonde launches

**University of Michigan** Ann Arbor, MI

Research Assistant, Advisor: Perry Samson 2018 – 2019

- Study titled: *Ensemble Probability Program for Backward Trajectories from the University of Michigan Biological Station (UMBS) based on the Relative Abundance of* $^{18}O$
- Wrote Python program that accessed a data bank of HY-SPLIT trajectories and retrieved trajectories corresponding to high or low $^{18}O$ values, then ran trajectory coordinates through probability function to produce a map that described where air with a high or low $^{18}O$ likely originated in order to find moisture sources for the UMBS using Python
- Concluded project by writing a summary paper and giving a poster presentation

**University of Michigan** Ann Arbor, MI

Research Assistant, Advisor: Phoebe Aron 2018 – 2019

- Interpolated meteorological, hydrological, and isotopic data with ArcGIS tools

- Developed and evaluated multiple procedures for calculating statistics of watersheds with ArcGIS tools
- Maintained and updated database of meteorological and isotopic information with SQL for Southern Peru
- Performed linear regression analysis on reanalysis datasets and isotope data using MATLAB
- Assisted PhD student relating to their study of hydrology in the Peruvian Andes by completing a variety of small research projects

## TEACHING EXPERIENCE

**University of Michigan**
Instructional Aide, Earth and Space System Evolution — Fall 2021
Collaborator, Melting Ice Rising Seas Teach-Out — Fall 2019 – Spring 2020

## SERVICE

**University of Colorado, Boulder**
Technology Committee — 2022 – Present
- Made improvements to department website including removal of old links and addition of photos and personal website links to graduate student pages
- Advocated for committee to have department website access to make regular updates

Mentorship Committee — 2023 – Present
- Participated as a mentor in the Graduate Application Mentorship program in Fall 2022-24
    - Mentored several students each year applying to the department by giving advice and reviewing personal statements
- Co-led Graduate Application Mentorship program in Fall 2023-24
    - Matched mentor graduate students to mentee applying students

Prospective Student Committee — 2023 – Present
- Helped organized prospective student visits in the spring

ATOC REU — Summer 2024
- Mentored an undergraduate student for a summer research project
- Gave technical and career advice

RECCS Program — Summer 2023
- Co-mentored an undergraduate student for summer research project with another graduate student
- Gave technical help

## COMPUTER SKILLS

- Python
- Jupyter
- C++
- SQL
- MATLAB
- Fortran90
- ArcGIS
- Unified Forecast System (UFS)
- Autodesk Inventor
- Adobe Illustrator
- Community Earth System Model (CESM)
- Microsoft Powerpoint
- LaTeX
- GitHub

## LANGUAGES

Latin (reading knowledge)

## PROFESSIONAL ASSOCIATIONS

American Geophysical Union
American Meteorological Society
Out in STEM
International Society of Nonbinary Scientists

## PUBLICATIONS

### In preparation

**Gilbert, A.**, Kay, J.E., Blanchard-Wrigglesworth, E., Holland, M.M., Jahn, A., Bailey, D.A., and Schneider, D. Isolating the Contribution of Observed Winds to Recent Arctic Warming and Sea Ice Loss. *Journal of Climate*. Expected submission in March 2025.

### In review

**Gilbert, A.**, Kay, J.E., and Rowe, P. A Novel Model Hierarchy Isolates the Effect of Temperature-dependent Cloud Optics on Infrared Radiation. *Geoscientific Model Development*. https://doi.org/10.5194/egusphere-2024-2043.

Wright, D.M., Jablonowski, C., Fujisaki-Manome, A., Mroczka, B., **Gilbert, A.**, Titze, D., Mann, G.E., Anderson, E.J. The Sensitivity of Lake-Effect Snowfall to Changes in Lake Surface Conditions Across the Forecast Horizon in the Unified Forecast System's Short-Range Weather Application (UFS-SRW). *Monthly Weather Review*.

### Published

Jonko, A., Oliveto, J., Beaty, T., Atchley, A., Battaglia, M.A., Dickinson, M.R., **Gilbert, A.**, Godwin, D., Kupfer, J.A., Hiers, J.K., Hoffman, C., North, M., Restaino, J., Sieg, C., and Skowronski, N. (2024). How will future climate change impact prescribed fire across the contiguous United States? *npj Climate and Atmospheric Science*. https://doi.org/10.1038/s41612-024-00649-7

Snide, C.E., **Gilbert, L.**, Meyer, A., Samson, P., Flanner, M., and Bassis, J. (2020). Seeing the Greenland Ice Sheet through students' eyes. *Eos*. https://doi.org/10.1029/2020EO139739.

## CONFERENCE PRESENTATIONS

**Gilbert, A.**, Kay, J., Blanchard-Wrigglesworth, E., Schneider, D. Isolating the Contribution of Observed Winds to Recent Arctic Warming and Sea Ice Loss. Graduate Climate Conference (GCC). Poster presentation delivered at the GCC, Pack Forest, Eatonville, WA, November, 2024.

**Gilbert, A.**, Kay, J., and Rowe, P. Isolating the Influence of Temperature-dependent Cloud Optics on Infrared Radiation within a Model Hierarchy. Polar Radiant Energy in the Far InfraRed Experiment (PREFIRE) Science Team Meeting. Submitted talk delivered at the PREFIRE Science Team Meeting, Boulder, CO, August, 2024.

**Gilbert, A.**, Kay, J., and Rowe, P. Isolating the Influence of Temperature-dependent Cloud Optics on Infrared Radiation within a Model Hierarchy. Community Earth System Model (CESM) Workshop. Submitted talk delivered at the CESM Workshop, UCAR, Boulder, CO, June, 2024.

**Gilbert, A.**, Kay, J., and Rowe, P. Isolating the Influence of Temperature-dependent Cloud Optics on Infrared Radiation within a Model Hierarchy. Cloud Feedback Modeling Intercomparison Project (CFMIP) Meeting. Poster presentation delivered at the CFMIP Meeting, Boston College, Boston, MA, June, 2024.

**Gilbert, A.** and Kay, J., A Breakdown of Arctic Warming. Land Ice and Polar Climate Working Group Meeting 2024. Submitted talk delivered at the Polar Climate Working Group meeting, NCAR Mesa Lab, Boulder, CO, February, 2024.

**Gilbert, A.**, Kay, J., and Rowe, P. Isolating the Influence of Temperature-dependent Cloud Optics on Infrared Radiation within a Model Hierarchy. Polar Amplification of Climate Change Across Hemispheres and Seasons: Causes and Constraints Workshop. Poster presentation delivered at the Polar Amplification workshop, UCAR, Boulder, CO, January, 2024.

**Gilbert, A.** and Kay, J. Impact of Temperature Dependent Cloud Optical Properties on Modeled Infrared Radiation. Gordon Research Conferences (GRC) 2023 Radiation and Climate. Poster presentation delivered at the GRC Radiation and Climate meeting, Bates College, Lewiston, ME, July, 2023.

**Gilbert, L.** and Bassis, J. Observing and Modeling Drainage Networks from Supraglacial Lakes on Russell Glacier, West Greenland. American Geophysical Union Abstracts. C151C-0809. Poster presentation delivered virtually at the American Geophysical Union meeting, New Orleans, LA, December, 2021.

**Gilbert, L.** and Bassis, J. Observing and Modeling Drainage Networks from Supraglacial Lakes on Russell Glacier, West Greenland. American Geophysical Union Abstracts. C061-0011. Poster presentation delivered virtually at the American Geophysical Union meeting, December, 2020.

**Gilbert, L.**, Rowe, P., Fergoda, M., Neshyba, S. Influence of Temperature Dependence of Cloud Optical Properties on Simulated IR Flux at South Pole, Antarctica. American Meteorological Society Abstracts. 136. Poster presentation delivered virtually at the American Meteorological Society meeting, January, 2021.

**REFERENCES**

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