

# Cole Persch

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## EDUCATION

### Doctor of Philosophy in Atmospheric and Oceanic Sciences

Expected Spring 2025

*University of Colorado, Boulder*

Dissertation title: "Orbital Precession and the Global Carbon Cycle"

Advisor: Dr. Sara Sanchez

GPA: 3.87 / 4.0

### Bachelor of Science in Mathematics and Physics

May 2020

*Hope College, Holland MI*

GPA: 3.91 / 4.0

### Budapest Semester in Mathematics

Spring 2019

*Budapest, Hungary*

GPA: 4.0 / 4.0

## RESEARCH INTERESTS

Combining models and data to learn more about the history of Earth's climate and oceans.

## RESEARCH EXPERIENCE

### Graduate Research Assistant

Fall 2020 - Present

*Atmospheric and Oceanic Sciences Department, University of Colorado Boulder*

- Executed a suite of CESM2 Global Climate Models under an array of orbital configurations designed to monitor air-sea carbon flux in the Southern Ocean
- Performed an air-sea carbon flux decomposition by breaking down the flux equation used by CESM2 into its individual components and analyzing their contributions
- Collaborated and coordinated with scientists within the Atmospheric and Oceanic Sciences Department, as well as the National Center for Atmospheric Research

### Undergraduate Research Assistant

Summer 2016 - Fall 2020

*Physics Department, Hope College*

- Created a new calibration method for an array of neutron detectors at the Facility for Rare Isotope Beams (FRIB)
- Performed a novel analysis of the beta-decay of two neutron-rich nuclei at FRIB
- Designed a new correlation algorithm used for half-life analysis in multi-isotope beams

## TECHNICAL SKILLS

- Programming Languages: Python (excellent), C++ (proficient), Java (proficient)
- Systems: MacOS, Windows, Linux, High-Performance Computing
- Software: Microsoft Excel, Microsoft Word, CESM, Jupyter Lab/Notebook, LATEX
- Field Work: Cosmogenic Dating, Drone Landscape Surveys, Schmidt Hammers

## TEACHING EXPERIENCE

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### Teaching Faculty, Juneau Icefield Research Program

Summer 2022

*Geology Department, University of Maine*

- Prepared lectures for 25 undergraduate students while participating in research on the Juneau Icefield
- Designed several hands-on workshops aimed at teaching the fundamentals of climate science to undergraduate students
- Led a book club centered around feminism and glaciology

### Instructor, Weather and the Atmosphere Laboratory

Fall 2020, Spring 2021

*Atmospheric and Oceanic Sciences Department, University of Colorado, Boulder*

- Designed and taught remote lectures and lab activities to illustrate principles of weather and climate

### Teaching Assistant, General Physics Laboratory I & II

Fall 2017 - Spring 2020

*Physics Department, Hope College*

- Served as a laboratory assistant for hands-on physics classes both providing student support and grading lab reports

## AWARDS

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### Freshman Physics Book Award, Hope College

Spring 2017

*Presented to a first-year physics student who has demonstrated outstanding performance*

### John H. Kleinheksel Mathematics Award, Hope College

Spring 2017

*Presented to students who have excelled at introductory math courses*

### Outstanding Physics Teaching Award, Hope College

Spring 2018

*Presented to an excellent student physics teaching assistant*

### Student Excellence, Budapest Semester in Mathematics

Spring 2019

*Presented to exceptional students who have excelled in math courses*

### Yntema Physics Prize, Hope College

Spring 2020

*An award to the senior student who has been chosen as the outstanding physics student*

### Albert E. Lampen Math Award, Hope College

Spring 2020

*Presented to an outstanding senior student in mathematics.*

### George & Joan Zuidema Award for Excellence in Research, Hope College

Spring 2020

*Presented to an outstanding senior who has excelled in undergraduate research*

### ATOC Outstanding Teaching Award, CU Boulder

Spring 2021

*Presented to a graduate student who has demonstrated excellence in teaching*

## PUBLICATIONS

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- Persch, C., et. al., (2023). The Impact of Orbital Precession on Air-Sea CO<sub>2</sub> Exchange in the Southern Ocean. *Geophysical Research Letters*, (Submitted).

- Persch, C., et. al., (2021).  $\beta$ -decay feeding intensity distributions of <sup>71,73</sup>Ni. *Phys. Rev. C*, 103, 055808.

- T. Redpath, C. Persch, et. al., New segmented target for studies of neutron unbound systems, *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, Volume 977, (2020), 164284.

- Votaw, D., Persch, C., et. al., Wantz, A., & Thoennessen, M. (2020). Low-lying level structure of the neutron-unbound N=7 isotones. *Phys. Rev. C*, 102, 014325.

## CONFERENCE PRESENTATIONS

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### POSTER PRESENTATIONS

Persch, C., et. al. (2022, December). Orbital Precession Impacts Carbon Outgassing in the Southern Ocean. Poster session presented at American Geophysical Union Conference, Chicago, IL.

Persch, C., et. al. (2020, May).  $\beta$ -Decay Feeding Intensity Distributions of  $^{71,73}\text{Ni}$ . Virtual poster session presented at the Celebration of Undergraduate Research, Holland, MI.

Persch, C., et. al. (2017, October). Neutron Radioactivity in  $^{26}\text{O}$  and Lifetime Analysis of Neutron-Rich Isotopes. Poster session presented at the Fall Meeting of the APS Division of Nuclear Physics, Pittsburgh, PA.

Persch, C., et. al. (2017, May). Neutron Radioactivity in  $^{26}\text{O}$ . Poster session presented at the Celebration of Undergraduate Research, Holland, MI.

## SERVICE

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### REU Mentor

Summer 2021, Summer 2022

*University of Colorado, Boulder*

- Served as a mentor for two undergraduate students in an Atmospheric and Oceanic Sciences summer program designed to provide research and educational opportunities for undergraduate students historically excluded from STEM
- Had weekly meeting where we discussed their research goals and gave feedback on writing and presentations

### ATOC Hiring Committee

Spring 2021

*University of Colorado, Boulder*

- Served as the student representative on a committee with the purpose of hiring a new faculty member
- Wrote and asked questions for several interviews designed to ensure the candidates were conscious of student needs
- Organized multiple lunches with graduate students and potential new faculty members.

### Scientific Reviewer

- *Journal of Climate*

## REFERENCES

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### Sara Sanchez, Assistant Professor

Department of Atmospheric and Oceanic Sciences  
University of Colorado, Boulder  
sara.sanchez@colorado.edu

### Nicole Lovenduski, Assistant Professor

Department of Atmospheric and Oceanic Sciences  
University of Colorado, Boulder  
nicole.lovenduski@colorado.edu

### Paul DeYoung, Kenneth G. Herrick Professor and Department Chair

Department of Physics  
Hope College, Holland  
deyoung@hope.edu