Cole Persch

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EDUCATION

- **Ph.D. 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
- **M.S. in Atmospheric and Oceanic Sciences** **Spring 2023**
  University of Colorado, Boulder
  Advisor: Dr. Pedro DiNezio
  GPA: 3.88 / 4.0
- **B.S. in Mathematics and Physics** **May 2020**
  Hope College, Holland MI
  Advisor: Dr. Paul DeYoung
  GPA: 3.91 / 4.0
- **Budapest Semester in Mathematics** **Spring 2019**
  Budapest, Hungary
  GPA: 4.0 / 4.0

RESEARCH INTERESTS

I am interested in combining models and data to learn more about the history of Earth's climate.

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 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: Python (excellent), C++ (proficient), Java (proficient), NCO (proficient)
- Systems: MacOS, Windows, Linux, High-Performance Computing
- Software: Microsoft Excel, Microsoft Word, CESM2, Jupyter Lab/Notebook, LATEX
- Field Work: Cosmogenic Dating, Drone Landscape Surveys, Schmidt Hammers

TEACHING EXPERIENCE

Lead Instructor, Weather and the Atmosphere **Summer 2023**
Atmospheric and Oceanic Sciences Department, University of Colorado, Boulder
- Designed and delivered lectures, created homework assignments, and led in-class activities for approximately 15 undergraduate students throughout the course
- Created an environment that fostered student questions and discussions

Paired Instructor, Python Bootcamp **Summer 2023**
Atmospheric and Oceanic Sciences Department, University of Colorado, Boulder
- Delivered lectures and led workshops designed to teach an incoming summer REU group the basics of Python over two weeks

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

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 the 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

PUBLICATIONS

- **Persch, C.**, et. al., (2023). The Impact of Orbital Precession on Air-Sea CO_2 Exchange in the Southern Ocean. **Geophysical Research Letters***, 50, e2023GL103820***.**

- **Persch, C.**, et. al., (2021). ß-decay feeding intensity distributions of ^{71,73}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

POSTERS

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). β-Decay Feeding Intensity Distributions of ^{71,73}Ni. Virtual poster session presented at the Celebration of Undergraduate Research, Holland, MI.

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

AWARDS & FELLOWSHIPS

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

ATOC University Fellowship Funds (x2), CU Boulder **Summer 2022, Winter 2024**
Awarded to a graduate student to aid in travel expenses.

SERVICE

REU Mentor **Summer 2021, Summer 2022**
University of Colorado, Boulder

- Served as a mentor for two students in an Atmospheric and Oceanic Sciences program designed to provide research experience for those historically excluded from STEM
- Had meetings to discuss their research goals and provide feedback on presentations.

ATOC Hiring Committee **Spring 2021**
University of Colorado, Boulder

- Served as the student representative on a committee to hire a new faculty member
- Wrote and asked questions for several interviews designed to ensure the candidates were conscious of student needs

Scientific Reviewer

- *Journal of Climate, Geophysical Research Letters*

REFERENCES

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