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

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

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 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

AWARDS

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

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

- **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

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). 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.

SERVICE

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 provides 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

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
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Paul DeYoung, Kenneth G. Herrick Professor and Department Chair
Department of Physics
Hope College, Holland
deyoung@hope.edu