

Research Interests

Large-scale atmospheric circulation, climate dynamics, stratosphere-troposphere connections

Academic Appointments

2022 – present **Postdoctoral Fellow** | NASA Goddard Institute for Space Studies

New York, NY Advisor: Clara Orbe

2017 – 2022 **Graduate Research Assistant** | Johns Hopkins University

Baltimore, MD Advisor: Darryn Waugh

2015 – 2017 **Graduate Research Assistant** | McGill University

Montreal, Qc Advisor: Timothy Merlis

Education

2022 **Ph.D. Johns Hopkins University** | Earth and Planetary Sciences

Baltimore, MD Dissertation: "Atmospheric Interactions in a Changing Climate"

2017 **M.Sc. McGill University** | Atmospheric and Oceanic Sciences

Montreal, QC Thesis: "Investigating the Impact of Direct Effects of Radiative Forcing on Ocean Heat Uptake"

2014 **B.Sc. Virginia Tech** | Engineering Science and Mechanics

Blacksburg, VA Capstone Project: "Computational Analysis of Undulatory Batoid Motion for Underwater Robotic Propulsion"

Fellowship Grants

2022 – 2024 **NASA Postdoctoral Program Fellowship**

"Tropical Stratospheric-Tropospheric Interaction in a Changing Climate"

2021 **JHU Dean's Prize Fellowship**

"Communicating Climate Science: Freshman Seminar"

2020 **JHU Dean's Teaching Fellowship**

"Communicating Climate Science"

Refereed Journal Publications

Menzel, Molly E., Darryn W. Waugh, and Zheng Wu, 2023: Replicating the Hadley Cell and subtropical jet disconnect in idealized atmospheric models. *Weather and Climate Dynamics*, submitted.

Menzel, Molly E., Darryn W. Waugh, and Clara Orbe, 2023: Connections between upper tropospheric and lower stratospheric circulation responses to increased CO₂. *Journal of Climate*, **36 (12)**, 4101-4112.

<https://doi.org/10.1175/JCLI-D-22-0851.1>

Menzel, Molly E., Darryn W. Waugh, and Kevin M. Grise, 2019: Disconnect between Hadley Cell and Subtropical Jet variability and response to increased CO₂. *Geophysical Research Letters*, **46** (12), 7045-7053. <https://doi.org/10.1029/2019GL083345>

Menzel, Molly E. and Timothy M. Merlis, 2019: Connecting direct effects of CO₂ radiative forcing to ocean heat uptake and circulation. *Journal of Advances in Modeling Earth Systems*, 11 (7), 2163-2176. <https://doi.org/10.1029/2018MS001544>

Presentations

Invited Talks

2023 Lamont–Doherty Earth Observatory
2022 NASA Goddard Institute for Space Studies
United States Naval Academy
2021 University of Exeter (virtual)
McGill University (virtual)

Conference and Workshop Talks

2023 AMS 103rd Annual Meeting, 36th Conference on Climate Variability and Change
2022 ISSI Tropical Width Impacts on the Stratosphere Team
AMS 23rd Conference on Atmospheric and Oceanic Fluid Dynamics
2019 Joint DynVarMIP/CMIP6 and SPARC DynVar & SNAP Workshop
AMS 22nd Conference on Atmospheric and Oceanic Fluid Dynamics

Conference Posters

2022 SPARC 7th General Assembly
2020 AGU Fall Meeting
2018 AGU Fall Meeting
2017 AMS 21st Conference on Atmospheric and Oceanic Fluid Dynamics

Professional Affiliations

2023 – present AGU Outstanding Student Presentation Award Committee, Atmospheric Science
2022 – present AMS Atmospheric and Oceanic Fluid Dynamics Committee
2019 – present ISSI Tropical Width Impacts on the Stratosphere Team, Young Scientist
2020 – 2022 AMS Atmospheric and Oceanic Fluid Dynamics Committee, Student Member
2018 – 2022 JHU Earth and Planetary Science Student Colloquium Coordinator

Member of American Meteorological Society, American Geophysical Union, National Association of Geoscience Teachers

Reviewer for *Journal of Climate*, *Geophysical Research Letters*, *npj Climate and Atmospheric Science*

Certificates

2023 Science Policy and Advocacy Certificate Program
2019 Johns Hopkins University Teaching Academy

Teaching and Outreach

- 2021 **Instructor | Johns Hopkins University**
AS.270.130: Freshman Seminar, Communicating Climate Science
- 2020 **Instructor | Johns Hopkins University**
AS.270.348: Communicating Climate Science
- 2019 **Guest Lecturer and Teaching Assistant | Johns Hopkins University**
AS.270.378/641: Present and Future Climates
- 2017 **Climate Outreach | Faith Presbyterian Church**
- 2016 – 2017 **Teaching Assistant | McGill University**
ATOC 181: Introduction to Atmospheric Science
ATOC 215: Oceans, Weather and Climate
- 2014 **Physics Outreach | Virginia Tech Physics Department**
Elementary, middle, and high school classrooms

Awards

- 2019 **Outstanding Student Oral Presentation Award**
22nd Atmospheric and Oceanic Fluid Dynamics Conference
- 2014 **Dan H. Pletta Award, Outstanding Senior Research Project**
Virginia Tech Department of Engineering Science and Mechanics