

# Joseph Knisely

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🌐 LinkedIn

## Education

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### PhD, University of Maryland, College Park

*Atmospheric and Oceanic Science*

*Expected Summer 2025*

### BS, Pennsylvania State University, University Park

*Physics, Minor in Mathematics*

*2016*

## Academic Research Experience

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### Doctoral Dissertation

*Atmospheric and Oceanic Sciences, University of Maryland*

*Aug 2019 – Present*

- **Tentative Title:** Exploring Satellite Radiance Assimilation and Ensemble Methodologies for Numerical Weather Prediction within Theoretical and Operational Frameworks
- **Committee:** Jonathan Poterjoy (advisor), Kayo Ide, Brian Hunt, Tim Canty, Daryl Kleist, Elizabeth Satterfield
- Incorporated new workflow and source code developments for the NOAA Hurricane Analysis and Forecast System (HAFS) numerical weather model
- Analyzed and verified model forecasts for physical and TC-specific error statistics, including comparisons against ERA5 reanalysis data
- Conducted research on different bias correction techniques for satellite radiance data assimilation in UFS applications
- Committed code developments for the official HAFS workflow and data assimilation system within community code repositories

### Graduate Intern

*Naval Research Laboratory, Monterey, CA*

*June – Sept 2022; June – Aug 2023*

- Performed idealized data assimilation research using the low-dimensional chaotic Lorenz (2005) model for the purpose of advancing bias correction methodologies
- Simulated atmospheric conditions and observation networks designed to resemble satellite radiance measurement systems
- Developed model and observation bias correction techniques that are scalable and therefore easily transferrable to high-dimensional operational NWP models

## Fellowships and Awards

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### WINGS Dissertation Fellowship

*University of Maryland, College Park*

*2023 – Present*

- Weather Program Office (WPO) Innovation for Next Generation Scientists (WINGS) Dissertation Fellowship
- Supported by NOAA WPO and administered by UCAR's Cooperative Programs for the Advancement of Earth System Science
- Mentored by Daryl Kleist, head of the Data Assimilation and Quality Control Group at the Environmental Modeling Center

### Outstanding Graduate Assistant

*University of Maryland, College Park*

*2021*

### Ferdinand Baer Fellowship for Graduate Accomplishments

*University of Maryland, College Park*

*2021*

### Outstanding Teaching Assistant Award

*University of Maryland, College Park*

*2020*

## Specialized Skills

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**Programming Languages:** Python (expert), Shell Scripting (proficient), High Performance Computing (proficient), Git (proficient), MATLAB (proficient), Fortran (working knowledge)  
**Numerical Models and Software:** HAFS, UFS, GSI  
**Datasets:** NWP data (GRIB, NetCDF, BUFR), Reanalysis (ERA5)

## Publications and Articles

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**Knisely, J.** : "WINGS Fellow Joseph Knisely's Research Hopes to Advance Tropical Cyclone Predictions" *NOAA Weather Program Office, Featured News, 2024 July 18*

**Knisely, J.** and J. Poterjoy: "Implications of Self-Contained Online Radiance Bias Correction within the Hurricane Analysis and Forecasting System (HAFS)" *Weather and Forecasting, 2023 Sep 1*

**Knisely, J.,** J. Poterjoy, E. Satterfield, W. Campbell: "Scalable Bias Correction Techniques Investigated with a Low-dimensional Dynamical Model" *Manuscript in Prep.*

**Knisely, J.** and J. Poterjoy: "Advancing Methodologies for Uninterrupted, Basin-Wide Data Assimilation in the Hurricane Analysis and Forecast System (HAFS)" (Tentative Title) *Manuscript in Prep.*

## Research Presentations

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**Talks:** "Advancing Methodologies for Uninterrupted, Basin-Wide Data Assimilation in the Hurricane Analysis and Forecast System (HAFS)", *AGU Annual Meeting, Washington DC, 2024; AMS Annual Meeting, New Orleans LA, 2025*

**Talks:** "Scalable Bias Correction Techniques Investigated with a Low-dimensional Dynamical Model", *Unifying Innovations in Forecasting Capabilities Workshop 2023, Boulder CO, 2023; AMS Annual Meeting, Baltimore MD, 2023*

**Talk:** "Implications of Self-Contained Online Radiance Bias Correction within the Hurricane Analysis and Forecasting System (HAFS)", *35th AMS Conference on Hurricanes and Tropical Meteorology, New Orleans LA, 2022*

**Poster:** "Advancing Methodologies for Uninterrupted, Basin-Wide Data Assimilation in the Hurricane Analysis and Forecast System (HAFS)", *Unifying Innovations in Forecasting Capabilities Workshop 2024, Jackson MS, 2024*

## Teaching and Service

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### Teaching Assistant

*University of Maryland, College Park*

*Aug 2019 – Dec 2020*

- Taught AOSC 200 and 201, an undergraduate course averaging 240 students per semester and its complementary laboratory component
- Topics included: atmospheric dynamics, weather forecasting, climate and paleo-climate, observation systems, atmospheric composition
- Developed and graded quizzes, exams, labs, homework, and projects

### Department Seminar Student Coordinator

*University of Maryland, College Park*

*Aug 2020 – April 2022*

- Organized and facilitated our department's weekly seminar series
- Developed the yearly line-up of seminar speaker based on faculty and student suggestions
- Managed seminar administration, announcements, and one-on-one meetings between seminar speakers and department members