

# Pedro Angulo-Umana

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## Education

- **Ph.D. in Atmospheric and Climate Science, University of Washington, 2025**
  - Dissertation: [The Multiscale Nature of Tropical Convection in Observations and Models](#)
  - Advisors: Peter Blossey and Daehyun Kim
- **M.S. in Atmospheric and Climate Science, University of Washington, 2022**
  - Thesis: [The Enhancement of Precipitation due to Mesoscale Convective Organization](#)
  - Advisor: Daehyun Kim
- **B.S. in Physics and Mathematics, University of Minnesota – Twin Cities, 2019**
  - Graduated *cum laude*
  - Thesis: Geometric Analysis and Reassembly of Bone Fragments in Anthropology
  - Advisors: Peter Olver and Jeff Calder

## Positions

- Postdoctoral Researcher, Seoul National University, 2025 – Current
- Graduate Researcher, University of Washington, 2019 – 2025

## Publications

### Manuscripts in Preparation & in Press

1. Do-Yeon Kim, Daehyun Kim, and **Pedro Angulo-Umana**. Tropical convective rain becomes more localized under global warming. *In preparation*.
2. **Pedro Angulo-Umana**, Daehyun Kim, Peter N. Blossey, and Do-Yeon Kim. Morphological characteristics of tropical precipitation features producing extreme instantaneous rain rates in GPM and DYAMOND global storm resolving models. *Submitted*.

### Published Articles

1. Shamekh, S., **P. Angulo-Umana**, and P. A. O’Gorman (2026). Data-driven modeling of stratiform and convective rain area. *Journal of the Atmospheric Sciences*, e250178. <https://doi.org/10.1175/JAS-D-25-0178.1> (*in press*)
2. **Pedro Angulo-Umana**, Daehyun Kim, Peter N. Blossey, and Marat Khairoutdinov (2025). Multiscale convective circulations and scale interactions in a global storm-resolving model. *Journal of Advances in Modeling Earth Systems*, 18, e2025MS005032. <https://doi.org/10.1029/2025MS005032>
3. **Pedro Angulo-Umana** and Daehyun Kim (2023). Mesoscale convective clustering enhances tropical precipitation. *Science Advances*, 9, eabo5317. <https://doi.org/10.1126/sciadv.abo5317>

## Conference Presentations

### Talks

- “Multiscale Convective Circulations and Scale Interactions in a Global Storm-Resolving Model,” Busan IAMAS-IACS-IAPSO Joint Assembly, Busan, South Korea, July 2025.

- “Multiscale Convective Circulations in a Global Storm-Resolving Model,” 4th Workshop on Convective Organization and Precipitation Extremes, ICTP, Trieste, Italy, June 2024.
- “[Multiscale Controls on Oceanic Tropical Precipitation in Observations and Models](#),” 36th Conference on Hurricanes and Tropical Meteorology, Long Beach, California, May 2024.
- “[Mesoscale Convective Clustering Enhances Tropical Precipitation](#),” 35th Conference on Hurricanes and Tropical Meteorology, New Orleans, Louisiana, May 2022.
- “[Quantifying the Enhancement of Tropical Precipitation due to Mesoscale Convective Organization](#),” 102nd American Meteorological Society Annual Meeting, Virtual, January 2022.

## Posters

- “[Investigating the Influence of Mesoscale Convective Organization on Tropical Precipitation in a Global Cloud-Resolving Model](#),” 103rd American Meteorological Society Annual Meeting, Denver, Colorado, January 2023.
- “Automatic Classification of Anthropological Bone Samples,” Joint Mathematics Meeting of the American Mathematical Society and Mathematical Association of America, Baltimore, Maryland, January 2019. *Awarded Outstanding Poster, MAA Student Poster Session.*

## Teaching

### Instructor

- **ATMS 211: Introduction to Climate and Climate Change**, University of Washington, Summer 2021.
  - Prepared and recorded five virtual lectures per week.
  - Wrote and graded weekly quizzes and assignments.
  - Organized special extra-credit guest lectures given by UW researchers.

### Teaching Assistant

- **ATMS 442: Atmospheric Motions II**, University of Washington, Winter 2024.
  - Led weekly coding-based lab sessions for students.
  - Helped to prepare in-person demonstrations in the [UW Oceanography’s Geophysical Fluid Dynamics Laboratory](#).
  - Held weekly office hours.
- **ATMS 103: Hurricanes and Thunderstorms**, University of Washington, Spring 2021.
  - Prepared and recorded exam-review sessions for students.
  - Held weekly office hours.

### Peer-Assisted Learning Facilitator

Facilitator in the Peer-Assisted Learning (PAL) program<sup>1</sup> at the University of Minnesota. Led twice-weekly review sessions, designed practice problems, and developed active-learning activities under the supervision of the SMART Learning Commons and the University of Minnesota Libraries.

- **PHYS 1302: Physics 2**, Fall 2018.
- **PHYS 1301: Physics 1**, Spring 2018.

<sup>1</sup>For background on the program model, see Arendale, D. R., & Hane, A. R. (2014). [Holistic growth of college peer study group participants: Prompting academic and personal development](#). *Research & Teaching in Developmental Education*, 31(1), 7–29; and Arendale, David R.; Hane, Amanda, R.. (2016). [Peer Study Groups as Catalyst for Vocational Exploration](#). *Journal of Developmental Education*, 39(2), 2-4, 6, 8, 10-11, 26-27.

- **MATH 1051: Precalculus 1**, Fall 2017.
- **MATH 1272: Calculus 2**, Spring 2017.
- **MATH 1031: College Algebra**, Fall 2016, Spring 2018.

## Mentoring

### Graduate Students

- **Do-Yeon Kim**, PhD student at Seoul National University, 2025 - present
  - Primary Advisor: Professor Daehyun Kim
  - Research area: Tropical convective precipitation
- **Jin Yoo**, M.S. student at Seoul National University, 2025 - present
  - Primary Advisor: Professor Daehyun Kim
  - Research area: Convectively coupled equatorial waves

### Undergraduate Researchers

- **Jon Liu**, University of Washington, 2021
  - Project: Moisture-precipitation coupling in global storm-resolving models
- **Arjun Subramanian**, University of Washington. 2022
  - Project: Heatwaves and global warming in CMIP6 models

## Service

### Chaired Sessions

- Co-Chair, “Convection III,” 35th Conference on Hurricanes and Tropical Meteorology, New Orleans, Louisiana, May 9–13, 2022.
- Co-Chair, “Precipitation,” University of Washington Program on Climate Change Virtual Summer Institute on Climate Extremes and Climate and Environmental Equity, September 14–18, 2020.

### Departmental Service

- Outreach Coordinator, Department of Atmospheric Sciences, University of Washington, 2020-2024.
  - Organized and scheduled [outreach events](#), leading demonstrations for audiences ranging from kindergartners to senior living center residents.
- Graduate Student Representative, Faculty Search Committee, Department of Atmospheric and Climate Science, University of Washington, 2022.
- Mentor, Graduate/Undergraduate Mentorship Program, Department of Atmospheric Sciences, University of Washington, 2021.

### Outreach

- Pen-Pal, [Letters to a Pre-Scientist](#)
- Curriculum Co-Author, [Science and Social Studies Adventures \(SASSA\)](#), Department of Anthropology, University of Minnesota, 2018.
- Communications Team Sub-Lead, [Engineers Without Borders, University of Minnesota Chapter](#), 2016-2018.
- Stage Assistant, [Physics Force](#), School of Physics and Astronomy, University of Minnesota, 2016-2017.

## Reviewing

- *Journal of Geophysical Research - Atmospheres*

## Awards and Honors

- Distinguished Service Award, UW Department of Atmospheric Sciences, 2022.
- Honorable Mention, NSF Graduate Research Fellowship Program, 2021.
- University of Minnesota Maroon and Gold Leadership Award, 2018.
- Participant, Minnesota Multicultural Summer Research Opportunities Program, Summer 2018.
- Erwin Marquit and Doris Grieser Marquit Undergraduate Scholarship in Physics, 2017.
- Undergraduate Mathematics Department Scholarship, 2017.
- Undergraduate Research Opportunities Award, Spring 2017.
- [Eagle Scout](#), 2013.