Lin Yao

Ph.D. Candidate
Department of Geophysical Sciences, University of Chicago
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Education

University of Chicago, USA *2023 – Present*
Ph.D. in Geophysical Sciences
Advisor: Da Yang

University of California, Davis, USA *2020 – 2023*
Ph.D. in Atmospheric Sciences (Transferred)
Advisor: Da Yang

Nanjing University, China *2015 – 2019*
B.S. in Atmospheric Sciences
Advisor: Zhe-Min Tan

Research Interests

I am interested in tropical convection—a phenomenon that releases instabilities and exhibits bifurcations across climates. My work investigates the emergence and evolution of large-scale convective systems using equations, dynamical models, and machine learning.

Publications

[1] **Yao, L.**, D. Yang, J. Duncan, A. Chattopadhyay, P. Hassanzadeh, W. Bhimji, and B. Yu (To be submitted). Constructing a Deep-Learning Model to Test Hypotheses for the Madden-Julian Oscillation.

[2] Yang, D., **L. Yao**, and W. Hannah (2024). Vertically Resolved Analysis of the Madden-Julian Oscillation Highlights the Role of Convective Transport of Moist Static Energy. *Geophysical Research Letters*. doi:10.1029/2024GL109910

[3] **Yao, L.**, and D. Yang (2023). Convective Self-Aggregation Occurs Without Radiative Feedbacks in Warm Climates. *Geophysical Research Letters*. doi:10.1029/2023GL104624

[4] **Yao, L.**, D. Yang, and Z.-M. Tan (2022). A Vertically Resolved MSE Framework Highlights the Role of the Boundary Layer in Convective Self-Aggregation. *Journal of the Atmospheric Sciences*. doi:10.1175/JAS-D-20-0254.1

Selected Awards

Outstanding Student Oral Presentation *2024*
24th Conference on Atmospheric and Oceanic Fluid Dynamics

Chinese Government Award for Outstanding Students Abroad *2023*
China Scholarship Council

Outstanding Graduate *2019*
Nanjing University

Outstanding Student *2018*

Jiangsu Province (Top 1%)

International Exchange Scholarship *2018*

Nanjing University (Top 1%)

National Scholarship *2017*

Nanjing University (Top 1%)

Leadership

- Co-host of **the Climate Dynamics Group Weekend Webinar**, 2024–2025. This initiative supports a Chinese community of over 400 students and scientists in climate science worldwide.
- Organizer of **the 2024 Rossbypalooza Summer School** at the University of Chicago. This two-week, project-oriented summer school attracts graduate students and postdocs from atmospheric, oceanic, and planetary sciences, with approximately 40 participants in 2024.
- Organizer of **the 16th Graduate Climate Conference (GCC)** in 2022. This student-run conference brought together around 100 participants. Link to GCC 2022.

Presentations

- **Machine Learning Models Use Large-Scale Information to Predict the Madden-Julian Oscillation.**
  Talk at the 24th Conference on Atmospheric and Oceanic Fluid Dynamics, Burlington (2024)
  Talk at the 36th Conference on Hurricanes and Tropical Meteorology, Long Beach (2024)
  Talk at the EGU24 General Assembly, virtual (2024)
- **Using Interpretable Deep Learning to Forecast the MJO: Emphasizing Large-Scale Patterns.**
  Talk at the 2023 AGU Fall Meeting, San Francisco (2023)
- **Convection Can Self-Aggregate in Warm Climates Without Radiative Feedbacks.**
  Talk at the 2023 CalGFD, La Jolla (2023)
  Poster at the 2023 CFMIP (2023)
- **The Contribution of Radiative Feedback to Convective Self-Aggregation Decreases With Warming.**
  Poster at the 2022 AGU Fall Meeting, Chicago (2022)
- **A Vertically Resolved MSE Framework to Study Convective Self-Aggregation Over Diverse Climates.**
  Poster at the 16th Graduate Climate Conference, Seattle (2022)
- **Vertical Structures of MSE Variance in Convective Self-Aggregation Over a Range of SSTs.**
  Talk at the 35th Conference on Hurricanes and Tropical Meteorology, New Orleans (2022)
- **Boundary-Layer Depth Defined by MSE Variance for Convective Self-Aggregation Over a Range of Climates.**
  Talk at the 23rd Conference on Atmospheric and Oceanic Fluid Dynamics, Breckenridge (2022)

- **Vertically-Resolved Moist Static Energy Diagnosis on the Development of Tropical Cyclones.**
  Poster at the 2021 AGU Fall Meeting, New Orleans (2021)
  Talk at the 15th Graduate Climate Conference, virtual (2021)
- **A Vertically Resolved Moist Static Energy Framework Highlights the Role of the Boundary Layer in Convective Self-Aggregation.**
  Talk at the 34th Conference on Hurricanes and Tropical Meteorology, virtual (2021)
  Poster at the 2020 AGU Fall Meeting, virtual (2020)
  Poster at the 2nd ICTP Summer School, Italy (2019)

Work Experience

Teaching Assistant *2023 – Present*
University of Chicago, USA

Research Assistant *2023 – Present*
University of Chicago, USA

Research Assistant *2020 – 2023*
University of California, Davis, USA

Research Assistant *2020 – 2021*
Nanjing University, China