Rajat Masiwal

Email: rajatm@uchicago.edu
rmasiwal.github.io

Education

Centre for Atmospheric and Oceanic Sciences, Indian Institute of Science — India
M.Tech (Res.) & Ph.D. in Tropical Climate Dynamics — 2018–2025

- Advisor: Dr. Ashwin K Seshadri
- CGPA: 9.4/10

University Institute of Engineering and Technology, Panjab University — India
B.E. in Mechanical Engineering — 2014–2018

- CGPA: 8.3/10 (with honours)

Experience

Department of Geophysical Sciences, The University of Chicago
Postdoctoral Scholar — Feb 2025 - Present

- Decision-oriented weather forecasting using AI Weather Prediction (AIWP) Models
- Examining monsoon regime transition capabilities of AI weather and climate emulators

Divecha Centre For Climate Change, Indian Institute of Science
Research Associate — Jul 2024 - Dec 2024

- Idealized modeling of boundary layer flow during seasonal transition
- Balancing seasonality of renewable for electricity grid de-carbonization

CSIR-Central Scientific Instruments Organisation
Research Trainee — Jan 2018 - Jun 2018

- Project Title: Design and development of optical pressure sensor for ocean application

Bharat Heavy Electricals Limited (BHEL)
Summer Intern — Jun 2016 - Jul 2016

- Project Title: Study of Thermal Power Plants

Publications

Published:

- **Masiwal, R.**, Dixit, V., & Seshadri, A. K. (2025) Intraseasonal convection-Circulation Coupling in the Tropics: A vorticity-budget analysis. *Quarterly Journal of the Royal Meteorological Society*,e4969
- **Masiwal, R.**, Dixit, V., & Seshadri, A. K. (2023). Contrasting controls on convection at latitude zones near and away from the equator for the Indian summer monsoon. *Environmental Research Letters*, 18(11), 114027.
- **Masiwal, R.**, Dixit, V., & Seshadri, A. K. (2023). Explaining Dynamics and Rapid Onset of the Somali Jet through Its Kinetic Energy Budget. *Journal of the Atmospheric Sciences*, 80(3), 833-847.

In Review:

- **Masiwal, R.**, Seshadri, A. K., & Dixit, V., Emergence of an Advective Boundary Layer in Monsoon Cross-Equatorial Flow: Scaling, Dynamics, and Idealized Models. (https://doi.org/10.48550/arXiv.2603.08550)
- **Masiwal, R.**, Aitken, C., Marchakitus, A., Gupta, M., Kowal, K., Pahlavan, H.A., Yang, T., Sun, Y.Q., Kremer, M., Jina, A. and Boos, W.R., & Hassanzadeh, P., Decision-oriented benchmarking of AI weather models for climate adaptation (https://doi.org/10.48550/arXiv.2602.03767)
- Aitken, C., **Masiwal, R.**, Marchakitus, A., Kowal, K., Gupta, M., Yang, T., Jina, A., Hassanzadeh, P., Boos, W.R., & Kremer, M., Designing probabilistic AI monsoon forecasts to inform agricultural decision-making. (https://doi.org/10.48550/arXiv.2603.07893)

CONFERENCES

- **Masiwal, R.**, Gupta, M., Marchakitus, A., Aitken, C., Yang, T., Sun, Y. Q., ... Hassanzadeh, P., Decision-oriented benchmarking of AI weather models for subseasonal monsoon onset forecasts in India, *EGU General Assembly 2026*. (Oral presentation)
- **Masiwal, R.**, Gupta, M., Marchakitus, A., Aitken, C., Yang, T., Sun, Y. Q., ... Hassanzadeh, P. (2025). Human-centered operational benchmarking of AI weather models for subseasonal monsoon onset forecasts in India. *AGU25*. (Poster presentation)
- Gangopadhyay, A.,**Masiwal, R.** and Seshadri, A. K., Balancing seasonality in decarbonising electricity systems worldwide, *EGU General Assembly 2024*, EGU24-11262. (Poster presentation)
- **Masiwal, R.**, Dixit, V., and Seshadri, A. K., Can Monsoon Intraseasonal Convection Strengthen Vorticity?, *Geophysical Flow Lab Meeting 2024*, IIT Madras, India (Poster presentation)
- **Masiwal, R.**, Dixit, V., and Seshadri, A. K., Role of thermodynamic processes in driving Monsoon Intraseasonal Oscillations (MISO) away from the Equator, *EGU General Assembly 2023*, EGU23-436. (Oral presentation)
- **Masiwal, R.**, Dixit, V., and Seshadri, A. K., Rapid intensification of Somali Jet kinetic energy prior to monsoon onset, *EGU General Assembly 2022*, EGU22-8832. (Virtual oral presentation)
- **Masiwal, R.** and Seshadri, A. K., Low-frequency modes of vorticity and divergence in monsoon intraseasonal oscillations, *AGU Fall Meeting 2021*, AGU, 2021 (Virtual poster presentation)

Teaching

Teaching Assistant at Center for Atmospheric and Oceanic Science (CAOS), IISc 2023
Nonlinear Models in Climate Sciences (AS 313)

Live Mentoring Sessions at National Programme on Technology Enhanced Learning (NPTEL) 2022-2023
Interacted with the students in the Live Mentoring Sessions for Graduate Aptitude Test in Engineering (GATE) preparation

Teaching at Kendriya Vidyalaya, IISc 2020-2021
Assisting school teacher as part of the Prime Minister Research Fellow (PMRF) duties

Teaching Assistant at Center for Atmospheric and Oceanic Science (CAOS), IISc 2020
Environmental Fluid Dynamics (AS 215)

Mentoring

Gaurav Talekar (M.Tech at Center for Atmospheric and Oceanic Science (CAOS), IISc) 2022-2024
Co-advised with Dr. Ashwin K. Seshadri

- Topic: Diurnal cycle of seasonal mean horizontal kinetic energy in the lower atmosphere.

Misari Bhanani (Summer intern at IISc Bangalore) 2021
Co-advised with Dr. Ashwin K. Seshadri

- Topic: Computing largest Lyapunov exponent of surface level winds during Indian summer monsoon.

Scholarships and Awards

Early Career Scientist's Travel Support 2023
from European Geosciences Union

Prime Minister Research Fellowship 2020-2023
from Ministry of Human Resource Development, Government of India

Jeremy Grantham Fellowship 2019-2021
from Divecha Centre For Climate Change, IISc

PhD Research scholarship 2018-2020
from Ministry of Human Resource Development, Government of India

Skills

- **Softwares:** MATLAB, Python, NCL, CDO, Shell
- **Climate Model:** Community Earth System Model (CESM 2.1), Isca GCM
- **Writing Tools:** LaTex, Microsoft Office

Languages

- **Language: English** *Fluent*
- **Language: Hindi** *Native*

Academic Service

- **Co-organizer** of "Moist convective dynamics of Monsoons - II (2026)" at International Centre for Theoretical Sciences.
- **Co-convener**, "Session ERE2.5 - Bridging the gap: climate science models and renewable energy research" in *EGU General Assembly 2024, 2025, 2026.*
- **Reviewer** for *Journal of Geophysical Research: Atmospheres; Geophysical Research Letters; Quarterly Journal of the Royal Meteorological Society; Science Advances.*
- **Co-organizer** of workshop on Climate Modeling at Divecha Centre for Climate Change, IISc.