Rachel Yuen Sum Tam

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EDUCATION

Doctorate of Philosophy in Climate, Meteorology, and Atmospheric Sciences **Aug 2021 - Present**
University of Illinois, Urbana-Champaign (UIUC), *Urbana, IL*
Concentration in Computational Science and Engineering

Bachelor of Science in Oceanic and Atmospheric Science, Cum Laude **Jun 2021**
University of California, San Diego (UCSD), *La Jolla, CA*
Minor in Climate Change Studies

SELECTED RESEARCH EXPERIENCES

Graduate Research Assistant **Aug 2025 - Present**
CliMAS, University of Illinois, Urbana-Champaign, and Illinois State Water Survey *Urbana, IL*
Supervisor(s): Drs. Trent Ford and Cristian Proistosescu

- Derive Illinois State historical climate data such as heat index, wind chill and standardized precipitation index at county and zip code level for a public-informing climate database in collaboration with Illinois Emergency Management Agency and Illinois Department of Public Health.

Graduate Research Assistant **Aug 2021 - Present**
CliMAS, University of Illinois, Urbana-Champaign, *Urbana, IL*
Supervisor: Dr. Cristian Proistosescu

- Investigate sources of uncertainty of low cloud feedback contributed by cloud controlling factors and model sensitivities to meteorological changes with global climate model output.
- Analyze impacts of the pattern effect to global cloud feedback and the sensitivities of output to model physics with a suite of perturbed parameters ensemble on the Exascale Energy Earth System Model (E3SM).

Graduate Student Intern **Summer 2025**
Summer Internships in Parallel Computational Science (SIParCS), CISL, NSF-NCAR *Boulder, CO*
Mentor: Philip Chmielowiec, Orhan Eroglu

- Developed and benchmarked Dask and Airspeed Velocity functionalities for the open-source UXarray package, enhancing climate model output analysis and visualization on unstructured grids.
- Populated UXarray example gallery and user guide, demonstrating package scalability with E3SM output.

PUBLICATIONS

Tam, R., Myers, T., Zelinka, M., Proistosescu, C., Lin, Y.-J., and Marvel, K.: Meteorological Drivers of the Low-Cloud Radiative Feedback Pattern Effect and its Uncertainty, EGUsphere, [preprint].

SELECTED PRESENTATIONS

Oral Presentations

Tam, R., Chmielowiec, P., Eroglu, O. (2024, August). *Scaling UXarray: Bridging the Gap for High-Performance Unstructured Grid Analysis and Documentation Enhancements.* Summer Internships in Parallel Computational Science (SIParCS), UCAR & NSF-NCAR, Boulder, CO.

Tam, R.. (2022, December). *Different Drivers of Low Cloud Radiative feedbacks and their uncertainty in historical and future simulations.* American Geophysical Union (AGU) Fall Meeting 2022, Chicago, IL.

Tam, R., Evan, A. (2021, May). *Seasonal Cycle of Arctic Cloud Cover based on AVHRR Satellite Data.* Undergraduate Research Conference (URC) at UC San Diego, La Jolla, CA.

Poster Presentations

Tam, R., Qin, Y., Proistosescu, C., Zelinka, M. (2025, December). *Lessons from a Perturbed Parameter Ensemble driven with an El Nino Southern Oscillation SST Pattern*. AGU Fall Meeting 2025, New Orleans, LA.

Tam, R., Chmielowiec, P., Eroglu, O. (2025, January). *Scaling UXarray: Bridging the Gap for High-Performance Unstructured Grid Analysis*. American Meteorology Society (AMS) 105th Annual Meeting, New Orleans, LA.

Swift, J., Saraf, D., **Tam, R**., et al. (2022, March). *The New Java OceanAtlas Suite - Application Updates, Expanded Data Library, and Education Support*. Ocean Sciences Meeting, Honolulu, HI.

TECHNICAL SKILLS

- Programming: Python, C, Fortran, MATLAB, Shell Scripting (Bash).
- Climate Modeling: Proficient in configuring, compiling, and executing E3SM, CESM, and MPAS on High-Performance Computing (HPC) clusters
- Machine Learning & Parallel Computing: PyTorch, CUDA; Dask and Xarray
- Environments & Tools: Linux/Unix (Advanced), Git, GitHub, LaTeX, Slurm/PBS job scheduling.

WORKSHOPS AND TRAINING

LEAP Winter 2026 Momentum Bootcamp **Jan 2026**
Model for Prediction Across Scales (MPAS) Tutorial 2025, NSF-NCAR **April 2025**
Model for Prediction Across Scales (MPAS) Workshop 2024, NSF-NCAR **June 2024**
Project Pythia Hackathon **June 2024**
Community Earth System Model (CESM) Workshop 2024, NSF-NCAR **June 2024**
Energy Exascale Earth System Model (E3SM) Tutorial 2024, DOE NERSC **May 2024**
Community Earth System Model (CESM) Tutorial 2023, NSF-NCAR **July 2023**
Pattern Effect: Coupling of SST Patterns, Radiative Feedbacks & Climate Sensitivity Workshop **June 2022**

HONORS AND AWARDS

Outstanding Student Presentation Award, 105th AMS Annual Meeting **Spring 2025**
Conference Presentation Award, UIUC **Fall 2022**
Department of Atmospheric Sciences Graduate Student Recruitment Fellowship, UIUC **Fall 2021**
Undergraduate Library Research Prize, UC San Diego **Spring 2021**
Triton Research & Experiential Learning Scholars, UC San Diego **Fall 2020 – Spring 2021**
Provost Honors, UC San Diego **Winter 2020 –Winter 2021**

PROFESSIONAL SERVICE AND OUTREACH

Steering Committee Member **Mar 2023 – Present**
Asian American and Pacific Islander in Geosciences (AAPIiG)

- Co-organized *Navigating the Bamboo Ceiling* public panel event for 2023 AANHPI Heritage Month event with over 70 attendees.
- Supported AAPIiG mentoring program through AGU Mentoring365 platform by organizing events and conducting technical tests for the platform.
- Conducted social media campaign and design for the 2024 AANHPI Heritage Month events.

Conference Co-chair **Jan 2022 – Oct 2022**
6th Midwest Student Conference on Atmospheric Research (MSCAR)

- Organized the first MSCAR with an in-person component since the 2019 pandemic and hosted 87 in-person attendees and 40 virtual participants
- Invited and communicated with 3 sponsors, 8 graduate schools, and 4 corporations for the first in-person Graduate School and Careers Fair
- Recruited and led over 20 graduate and undergraduate volunteers on promoting and planning the virtual and in-person components of the conference

Conference Subcommittee **July 2021 – Oct 2021**
5th Midwest Student Conference on Atmospheric Research (MSCAR)

- Assisted in planning virtual logistics of the conference and facilitated the poster session at the conference by creating and managing the poster judging rubric.

TEACHING ASSIGNMENTS

Co-Instructor **Jan 2025**
AMS 2025 Short Course: Data Visualization in Python: Leveraging Community Tools for Earth System Science Across Scales
Teaching Assistant **Fall 2022, 2024**
ATMS 140 Climate and Global Change

PROFESSIONAL MEMBERSHIPS

- **American Geophysical Union (AGU)**
- **American Meteorology Society (AMS)**
- **Special Interest Group on High Performance Computing (SIGHPC)**