

curriculum vitae of
ASIYA BADARUNNISA SAINUDEEN

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EDUCATION

- Aug 2021 - present PhD Candidate in Geosciences
Advisor: Dr. Marcus Lofverstrom, Co-advisor: Prof. Diane Thompson
Minor: Global Change
[Department of Geosciences, University of Arizona](#)
Expected graduation: Jan 2026, GPA: 4.0
- 2015 - 2020 BS-MS in Earth Sciences, CGPA: 9/10
[Indian Institute of Science Education and Research \(IISER\), Kolkata](#)

RESEARCH INTERESTS

Climate modeling, Precipitation variability, Extreme climate events and attribution studies, Climate mitigation

PEER-REVIEWED PUBLICATIONS

- *In preparation.* **Sainudeen, A. B.**, Lofverstrom, M., Thompson, D. (2025). Characterizing South American summer hydroclimate using a new water tag-enabled variable-resolution CESM global simulation.
- *In preparation.* **Sainudeen, A. B.**, Lofverstrom, M., Thompson, D. (2025). Evolution of ENSO in the 21st century and its impact on Amazon rainfall during the monsoon season from the perspective of a multi-model large ensemble.
- *In review.* **Sainudeen, A. B.**, Lofverstrom, M., Thompson, D., Bush, M., Rodbell, D., Cook, M., Hlohowskyj, S. (2025). CMIP6 models under the lens: Evaluating the representation of the South American Summer Monsoon. *Journal of Climate*.
- Mishra, S. K., Upadhyaya, P., Fasullo, J. T., Keshri, N. P., Salunke, P., Ghosh, A., **Sainudeen, A. B.**, Kang, I.-S. (2023). A need for actionable climate projections across the global South. *Nature Climate Change*, 13(9), 883–886.
- Dasgupta, B., **Sainudeen, A. B.**, Ajay, A., Sanyal, P. (2022). Hydrometeorological progression of the Himalayan cryosphere: The Karakoram predicament. *Journal of Hydrology*, 613, 128348.

PRESENTATIONS (FIRST AUTHOR AND PRESENTER)

- **CESM Workshop 2025 (Talk):** “Exploring the Moisture Sources and Pathways for South American Rainfall Using Variable-Resolution CESM2.2 Geotrace Simulations” presented at [CESM Workshop 2025](#), Boulder, CO, June 2025.

- **GeoDaze (Poster):** “Exploring the Moisture Sources and Pathways for South American Rainfall Using Variable-Resolution CESM Simulations” presented at GeoDaze, University of Arizona Geosciences Symposium, March 2025.
- **GeoDaze (Talk):** “South American Hydroclimate in High-Resolution Global Climate Model: Pushing Boundaries with Variable Resolution Simulations” presented at GeoDaze, University of Arizona Geosciences Symposium, March 2024.
- **AGU Fall Meeting 2023 (Poster):** Sainudeen, A. B., Lofverstrom, M., Thompson, D. M. (2023), “South American summer precipitation in CMIP6 models”, GC22F-0665, presented at AGU Fall Meeting, December 11-15, San Francisco, CA, USA.
- **AGU Fall Meeting 2022 (Poster):** Sainudeen, A. B., Lofverstrom, M., Thompson, D. M. (2022), “Impact of El Niño-Southern Oscillation on South American hydroclimate in CMIP6”, GC22F-0665, presented at AGU Fall Meeting, December 12-16, Chicago, IL, USA.
- **GeoDaze (Poster):** [Understanding the new norm of extreme events: Atmospheric rivers and climate change](#), presented at the 50th University of Arizona Geosciences Symposium (*GeoDaze*), Tucson, AZ, March 2022.
- **EGU General Assembly 2020 (Poster):** Badarunnisa Sainudeen, A. and Sanyal, P.: Impact of surface warming over the Equatorial Pacific Ocean on western disturbances precipitation, EGU General Assembly 2020, Online, May 4–8, 2020. [EGU2020-633](#).

TUTORIALS

ForceSMIP Hackathon, Aug 2023 - [Attended in-person workshop](#), called the Forced Component Estimation Statistical Method Intercomparison Project (ForceSMIP), where we utilize climate model ensembles to develop and assess statistical methods for isolating the forced response from individual realizations of the climate system.

CESM Tutorial, July 2023 - [Participated in in-person modeling tutorial](#) at the NCAR Mesa Laboratory, in Boulder, Colorado, USA.

NCAR Python Tutorial, June 2022 - [Attended the extensive Python tutorial](#), hosted by Julia Kent, a Software Engineer at NCAR.

TEACHING EXPERIENCE

Guest Lecturer - GEOS 437/537: **Introduction to Earth-system modeling** (2023 Fall semester, 1 class)

Teaching Assistant - Geological Disasters and Society with Dr. Paul Goodman (Spring and Fall 2025, Department of Geosciences, University of Arizona). Class size: 120 students (1 TA). Led study groups, assisted students with assignments, and graded assignments and exams.

Teaching Assistant - Programming and Data Analysis in Earth Sciences with Dr. Chris Harig (Fall 2024, Department of Geosciences, University of Arizona). Class size: 50 students (1 TA). Assisted students during class exercises, helped fixing coding errors,

supported project work and idea/dataset development for the final assignment, and graded homework and final assignments.

Teaching Assistant - Introduction to Oceanography with Prof. Joellen Russell and Dr. Paul Goodman (**Fall 2023 and Spring 2024**, Department of Geosciences, University of Arizona). Class size: >400 students (3 TAs). Collaborated with other TAs to assist students during class activities, led small study groups, held office hours, managed course email and addressed student concerns, and graded assignments and exams.

Teaching Assistant - Introduction to Computer Programming for first-year BS-MS students, IISER Kolkata (**Autumn 2019**). Class size: 200 students (4 TAs). Assisted students with coding during class and graded assignments.

Teaching Assistant - Introduction to Environmental Science for second-year BS-MS students, IISER Kolkata (**Spring 2020**). Class size: 100 students (2 TAs). Led field trip, guided TA sessions for homework, and graded assignments.

GRANTS, SCHOLARSHIPS, AND FELLOWSHIPS

Galileo Circle Scholar (2024–2025) - Awarded by the College of Science, University of Arizona, to outstanding graduate students in recognition of academic excellence and research potential across the physical, mathematical, environmental, cognitive, and life sciences.

Marie S. Pearthree Summer Research Scholarship (Summer 2025) - Awarded by the department of Geosciences, University of Arizona for summer research to students demonstrating commitment to advancing underrepresented groups in Geosciences.

Sulzer Earth Science Scholarship (Fall 2024) - Awarded by the Department of Geosciences for outstanding women graduate students, University of Arizona.

Sulzer Summer Scholarship (2024) - Awarded by the Department of Geosciences for outstanding women graduate students, University of Arizona.

Melange Summer Scholarship (2023) - Awarded by the Department of Geosciences for outstanding graduate students, University of Arizona.

William and Clara Sulzer Scholarship (May 2022) - Awarded by the Department of Geosciences for outstanding women graduate students, University of Arizona.

University of Arizona GPSC Travel Award 2022

University of Arizona GPSC Travel Award 2023

Roland Schlich Early Career Scientist's Travel Support (2020) - Awarded for my [abstract](#) on the impact of surface warming over the Equatorial Pacific Ocean on western disturbances precipitation, presented at the [European Geosciences Union \(EGU\) 2020](#).

RESEARCH WORK AND EXPERIENCE

AUG 2021 - PRESENT	<p><i>PhD Candidate, Department of Geosciences, University of Arizona</i></p> <p>The three main aspects of my PhD project are: a) Evaluating state-of-the-art climate models to assess how well they represent South American rainfall; b) Using large ensemble simulations to isolate the role of climate change in driving Amazon rainfall; and c) Most importantly, running a unique CESM simulation with moisture-tracking abilities and grid refinement (variable-resolution configuration) to assess sources and pathways of moisture for South American precipitation under distinct climate modes across the mid-Holocene to the future.</p>
JULY 2020 - JUNE 2021	<p><i>Research Assistant, Indian Institute of Technology Delhi</i></p> <p>Analyzed the improvements in CMIP projections for the South Asian region over time in collaboration with Dr. Saroj Kanta Mishra.</p>
MS THESIS	<p><i>Indian Institute of Science Education and Research (IISER) Kolkata</i></p> <p>Topic: Role of global oceans in driving Western Disturbances precipitation (WDP). This research focused on rainfall variability, air-sea interactions, changes across different climate system components, and the resulting regional impacts. Deliberations were made to find possible causal relationships between WDP and other well-studied global climate modes. This project was supervised by Dr. Prasanta Sanyal.</p>
MAY - JULY 2019	<p><i>Summer Internship, Indian Institute of Tropical Meteorology (IITM), Pune</i></p> <p>Topic: Atlantic Meridional Overturning Circulation (AMOC) as a climate driver. Supervisor: Dr. C Gnanaseelan.</p>
MAY - JULY 2018	<p><i>Summer Internship, Centre for Earth Sciences, Indian Institute of Science (IISc), Bangalore</i></p> <p>Topic: Change in lake isotopic composition with various hydrological processes. Supervisor: Dr. Sambudha Misra.</p>
MAY - JULY 2017	<p><i>Summer Internship, Indian Institute of Tropical Meteorology (IITM), Pune</i></p> <p>Topic: Rainfall variability over the northeast region of the Indian sub-continent. Supervisor: Dr. Hamza Varikoden.</p>
MAY - JULY 2016	<p><i>Summer Internship, Department of Earth and Space Sciences, Indian Institute of Space Science and Technology, Trivandrum</i></p> <p>Topic: Simulation of HUD HUD cyclone using WRF-ARW. Supervisor: Dr. Govindan Kutty M.</p>

POSITIONS OF RESPONSIBILITY, OUTREACH, DIVERSITY, EQUITY, AND INCLUSION (DEI) EFFORTS

Student Stories of Climate Change - Participated in [Student Stories of Climate Change](#), a climate change [educational program](#) that informs school students in over 80 middle and high school classrooms in Tucson, Arizona, USA.

Graduate and Professional Student Council (Spring 2024) - Grants Judge. Evaluated travel and research grant applications, made recommendations for awards.

Association for Women Geoscientists (AWG), Southern Arizona Chapter

- 2023 - 2025 | Vice President of AWG.
- 2022 - 2023 | Mentorship Chair of AWG.
- 2021 - 2022 | Mentor in AWG.

GeoDaze Organizing Committee - Member of the organizing committee for [GeoDaze](#), the annual symposium organized by students in the Department of Geosciences, University of Arizona (2022, 2023, 2024, 2025).

Ek Pehal (2015 - 2020) - Volunteered for [Ek Pehal](#), an initiative of IISER Kolkata students that provides free education to underprivileged students.

DST-INSPIRE Fellowship (2015 - 2020) - Department of Science and Technology - Innovation in Science Pursuit for Inspired Research (Government of India).

AWARDS AND ACHIEVEMENTS

College of Science Outstanding Graduate Student Departmental Award for Excellence in Service - Awarded by the [College of Science](#), University of Arizona, in recognition of contributions to broader impacts through service and engagement beyond academic responsibilities that benefit the department, university, and wider community.

Best Graduate Poster Award - [GeoDaze 2025](#), the annual Geosciences conference at the University of Arizona.

Best Poster Award - Convergence 2019, the annual Earth Sciences conference at IISER Kolkata.

Lectureship Eligibility in Earth Sciences - Cleared CSIR-NET (The Council of Scientific and Industrial Research - National Lectureship Eligibility Test) in December 2018, organized by the Human Resource Development Group, Govt. of India. **All India Rank: 76.**

COMPUTATIONAL SKILLS

Scripting Languages: Python, MATLAB, NCL, R

Operating Systems: : Mac, Windows, Linux, Unix

Climate Data Analysis and Visualization: Ferret, CDO, NCO, ImageMagick

Models: Community Earth System Model (CESM)

Markup Language: \LaTeX

Experience working with supercomputing clusters for climate modeling and large-scale climate data analysis. Currently running the CESM2 Earth System Model with variable resolution and moisture tagging capabilities as part of my PhD research.

PROFESSIONAL ASSOCIATIONS

2021 - Present: Member, American Geophysical Union (AGU)

2021 - Present: Member, Association for Women Geoscientists (AWG)

2019 - 2020: Member, European Geophysical Union (EGU)

FIELDWORK

Sep-Oct 2024: Fieldwork at Genovesa and Bainbridge in the Galápagos Archipelago to collect lake sediments for studying regional hydroclimate signals.

Dec 2018: Sedimentology fieldwork at Chandipur tidal front and Dagara Beach to study natural settings and identify sedimentary facies and sedimentary structures.

Dec 2017: Structural geology fieldwork at Ghatshila and Galudi to identify and interpret the structural geometry of deformed rocks in a natural setting.