

Medha Prakash

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EDUCATION

University of Texas at Austin (UT Austin), Austin, TX

Ph.D. in Geosciences

Expected Graduation: May 2028

University of Virginia (UVA), Charlottesville, VA

B.S., Double major in Environmental Sciences and Statistics, Astronomy Minor

May 2023

- *Summa Cum Laude*, Honors Thesis: *Morphometric comparison of terrestrial eskers and martian sinuous ridges*, Advised by Dr. Lauren Simkins and Dr. Ajay Limaye
- Mathematical Statistics Concentration
- **Selected Coursework:** Nonparametric and Rank-Based Statistics, Stochastic Processes, Glaciers and Ice Sheets, Fundamentals of Geology/Lab, Planetary Geology/Lab, Regression Analysis, Organic Chemistry/Lab, Differential Equations

RESEARCH EXPERIENCE

The University of Texas Institute for Geophysics (UTIG), Austin, TX

Graduate Research Assistant, Sept 2023 — Present

- Working with Dr. Sean Gulick and Dr. Cyril Grima on the IMAGES Project funded by NASA LDAP to analyze Lunar Radar Sounder data capturing the subsurface, specifically in Schrödinger crater. This a landing site for future deployments of NASA's Artemis missions, on the Moon.
- Combining this data type with surface reflectivity, separated incoherent and coherent data, and photogeologic mapping from Kramer et al. to characterize Schrödinger crater
- Organizing bi-weekly Planetary Geoscience meetings across the Department of Earth and Planetary Sciences and UTIG
- Mentoring Mercedes Jordan, an Honors undergraduate who is calibrating Lunar Radar Sounder data around the Chang'E 5 landing site to understand the contributions of metallicity and subsurface properties on reflectivity

Ice and Ocean Research Group, Charlottesville, VA

Undergraduate Researcher, Aug 2020 — May 2023

- Worked under the supervision of Dr. Lauren Simkins, Dr. Ajay Limaye, and Dr. Marion McKenzie
- Conducted my distinguished major's thesis on morphometrics and spatial properties of terrestrial eskers and martian ridges in order to quantitatively compare both feature types using tools in ArcGIS and JMARS.
- Designed code in R to statistically analyze aforementioned morphometrics by acquiring summary statistics, creating visuals, and hypothesis testing in order to improve understanding of martian glaciology and hydrology
- Analyzed clast characteristics with the Image Processing toolbox in MATLAB of outcrops in Washington State to better understand depositional environments of the Cordilleran Ice Sheet (CIS) by designing code to identify and outline clasts in a sediment matrix.
- Led group meetings and discussions about economic accessibility in field studies and relevance of glacial research to astrobiology

NASA Goddard Space Flight Center, Greensboro, MA (*Remote*)

Student Intern, Aug 2021 – Dec 2021

- Used File Transfer Protocol (FTP) and the CReSIS toolbox on MATLAB to analyze radar data and trace snow layers from flights over the Greenland Ice Sheet under the supervision of Dr. Thomas Overly from the Cryospheric Lab

NASA Jet Propulsion Laboratory, Pasadena, CA (*Remote*)

Student Intern, Feb 2021 — Aug 2021

- Worked with Dr. Jessica Weber, Dr. Laurie Barge of the Origins and Habitability Lab (OHL), and Dr. Yuk Yung (Caltech) to study carbon reduction reactions in the geologic context of early Earth and Mars
- Designed and compiled a database related to minerals catalyzing carbon reductions and serpentinization including 40 publications^[1]
- Presented two one-hour talks at OHL group meetings presenting research findings

- Facilitated discussions on research papers related to early Mars, carbon reduction, serpentinization, and hydrothermal vents in the Astrobiology Literature Club
 - (Liu, J, Michalski, JR, Tan, W, He, H, Ye, B and Xiao, L (2021) Anoxic chemical weathering on a reducing greenhouse on Mars. *Nature Astronomy* 5, 503–509)

Applied Metabolism and Physiology Lab, Charlottesville, VA

Research Assistant, Nov 2019 — July 2020

- Collected and recorded data from studies involving the “exercise prescription” delegated to participants at risk of, or having, metabolic syndrome

ABSTRACTS AND PEER-REVIEWED PUBLICATIONS

Prakash, M.; Weber, J. M.; Rodriguez, L. E.; Sheppard, R. Y.; Barge, L. M. “Database on Mineral Mediated Carbon Reduction: Implications for Future Research.” *International Journal of Astrobiology*, Volume 21, Issue 6, pp. 423-440, **2022**, 1-18, <https://www.doi.org/10.1017/S1473550422000052> ^[1]

Weber, J.; Marlin, T.; **Prakash, M.;** Teece, B.; Dzurilla, K. & Barge, L. (2023). A Review on Hypothesized Metabolic Pathways on Europa and Enceladus: Space-Flight Detection Considerations. *Life*, 13(8)

Abstracts:

Prakash, M., Simkins, L., McKenzie, M., Smith, J., and Limaye, A., Morphology and Process-Based Implications of Martian Ridges and Terrestrial Eskers: Geological Society of America Abstracts with Programs, **2022**, 54, 3, <https://doi.org/10.1130/abs/2022NE-374536>

Prakash, M., Simkins, L., McKenzie, M., Smith, J., and Limaye, A., Morphometrics of Terrestrial Eskers and Martian Sinuous Ridges Reveal Persistent Pathways of Subglacial Meltwater Drainage, EP35B-08, AGU Fall Meeting, **2022**

PRESENTATIONS

- Oral: “**Morphometric comparison of terrestrial eskers and martian sinuous ridges,**” *Distinguished Majors Thesis Defense*, Charlottesville, VA, May 2023
- Poster: “**Morphometric comparison of terrestrial eskers and martian sinuous ridges,**” *Virginia Space Grant Consortium Symposium*, Norfolk, VA, April 2023
- Oral: “**Using Terrestrial Esker Analogs to Understand Subglacial Water Drainage on Mars,**” *American Geophysical Union Fall Meeting, Session EP024*, Chicago, IL, December 2022
- Poster: “**Utilizing Image Analysis to Characterize Glacial Sediments in Washington State,**” *Undergraduate Research Symposium*. University of Virginia, Charlottesville, VA, April 2022
- Oral: “**Morphology of terrestrial eskers and martian ridges,**” *URN Talks*, University of Virginia, Charlottesville, VA, April 2022
- Oral: “**Morphology and Process-Based Implications of Martian Ridges and Terrestrial Eskers,**” *Geological Society of America Northeastern Section Meeting*. Lancaster, PA, March 2022
- Oral: “**Eskers and their Implications for Comparative Planetology,**” *EnviroDay Research Symposium*. University of Virginia, Charlottesville, VA, February 2022.
- Oral: “**Snow Volume Change from Radar Layer Tracking,**” *NASA Goddard Space Flight Center Intern Final Presentations*. Goddard Space Flight Center, Online, December 2021
- Oral: “**Database on Carbon Reduction Reactions,**” *NASA Jet Propulsion Laboratory Intern Final Presentations*. NASA Jet Propulsion Laboratory, Online, July 2021
- Oral: “**Mineral Reactivity with Oxidized Carbon Sources,**” *Origins and Habitability Lab Group Meeting*. NASA Jet Propulsion Laboratory, Online, April 2021

ACCOLADES AND HONORS

Bianchi John & John Boone Endowed Presidential Fellowship, awarded by: The Jackson School of Geosciences (2023)
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- Fellowship to fund my first year of graduate studies based on academic merit

Wilbur A. Nelson Award, awarded by: Department of Environmental Sciences (2023)

- For high academic achievement in the geosciences

Richard Scott Mitchell Award, awarded by: Department of Environmental Sciences (2022)

- For high academic achievement and advanced geosciences coursework

VSGC Undergraduate STEM Research Scholarship, awarded by: Virginia Space Grant Consortium (2022)

- For high academic achievement and promise in research

Undergraduate Research Scholar Fellowship, awarded by: Undergraduate Research and Mentorship Program (2022)

- For good academic standing and development of a research project

Double Hoos Research Award, awarded by: Office of Undergraduate Research (2021)

- For developing a research project with my mentor

Dean's List, awarded by: College of Arts and Sciences (Fall 2019, 2021)

Echols Scholar, awarded by: Echols Scholars Program (2020)

Paul Tudor Jones II Jefferson Scholarship, awarded by: The Jefferson Scholars Foundation (2019)

TEACHING EXPERIENCE

Mission to Mars (ASTR 3450), Charlottesville, VA

Teaching Assistant, Jan 2022 — May 2022

- Coordinated the peer review process and provided feedback for a course that is centered around future exploration of Mars as well as the history of space exploration

Principles of Chemical Structure (CHEM 1810), Charlottesville, VA

Head Teaching Assistant, Aug 2020 — Present

- Facilitated discussions and assisting first-year college students in understanding and applying advanced chemistry concepts
- Organized logistics between multiple teaching assistants to effectively help and answer questions for over 100 hundred students

OTHER WORK EXPERIENCE

WOURLD™, Charlottesville, VA

Lesson Developer, Sep 2020 — May 2022

- Developed lessons to explain environmental science principles that are concise, educational, and engaging with a startup company devoted to education of a variety of populations on climate change issues and providing solutions to help rebuild forests in endangered areas such as the Amazon basin
- Facilitated and led discussions and assimilated feedback for the Sustainable Living Panel during the first, international WOURLD Climate Education Conference
- Developed content for a blog on sustainable living, climate science careers, and current research

Springbok Analytics, Charlottesville, VA

Analytics Intern, Apr 2020 — Aug 2020

- Compiled and organized data pertaining to the functional group and anatomical properties of lower extremity muscles
- Conducted literature searches on isolation exercises and muscle activation
- Designed graphically appealing information sheets on lower extremity muscles for users of the service
- Managed communication with colleagues in the start-up despite being remote and across time zones

SKILLS

Software: Python, GIS (ArcGIS Pro), R, JMARS, Microsoft Office (Word, Excel, PowerPoint), MATLAB, iWork, QuickBooks, Responsive Web Design, Adobe Photoshop

Laboratory: Titration, recrystallization, distillation, chemical identification, IR spectroscopy, NMR

Language: English (native or bilingual proficiency), Hindi (native or bilingual proficiency), Spanish (limited working proficiency)

LEADERSHIP AND PERSONAL GROWTH

Graduate Student Executive Council (GSEC), Austin, TX

First Year Liaison, Sep 2023 — Present

- Improving the experiences of graduate student orientation and prospective student weekend by gathering data and feedback from students and working with Jackson School administration

Ektaal A cappella, Charlottesville, VA

President (Formerly Music Director), Sep 2019 — May 2023

- Led remote and in person practices, wrote medleys of South Asian and Western music using MuseScore, helped members learn arrangements, mixed audio using Audacity, Garage Band, and Logic Pro, leading to our debut album, Safar.
- Presided over a group of 18 singers to put on semester concerts, perform at local and cultural gigs, and compete in national competitions (earned 2nd place at North Carolina State University's Sangeet Sagar, as well as having over 25,000 listeners on Spotify)
- Worked for and advocated for the inclusion of smaller, lesser known groups, as well as cultural appreciation arts organizations on Grounds
- Sparked a major period of holistic growth of our group in popularizing our music, increasing the amount of members, incorporating choreography into our arrangements, acquiring funding through unique fundraisers, connecting with other Desi a cappella groups across the nation, as well as worked to release a single and EP.

The Order, Charlottesville, VA

Vice President, Sep 2020 — May 2023

- Managed the application process and welcome of new recruits to the Order, ensured we engage in philanthropy every semester, and planned major events for the club
- My personal pride: left a gigantic chalk mural depicting Harry Potter references on Grounds

Science Olympiad at UVA (SOUVA), Charlottesville, VA

Outreach Chair, Feb 2022 — May 2023

- Enhanced university student participation in the Virginia State Science Olympiad competition through social media outreach and solidifying a consistent volunteer base through this organization
- Volunteering at virtual and in-person state and invitational Science Olympiad Competitions
- Helping facilitate the first UVA-Virginia Tech virtual invitational tournament in the fall through assisting in planning, test writing, encouraging volunteers

Geosciences in the Field, various geologic sites in the Northeast United States,

Meal Logistics Coordinator/Student, Feb 2022 — Mar 2022

- Spent spring break on the road in harsh weather conditions, contributed to a field guide about various geologic sites in the Northeast
- Coordinated meal logistics for 22 people

UVA in Italy: Photography and Art History, Rome/Castiglion Fiorentino/Florence/Venice, Italy

Student, May 2022- Jun 2022

- Spent 4 weeks examining churches, cathedrals, and galleries of Rome, Florence, Venice and various Tuscan towns through the lens of Art History and Photography. Attended the Biennale and critiqued the Chilean exhibit on peat bogs.
- Produced a photobook titled Contrast

Independent Study Abroad Project, Italy, Turkey, Greece, The United Kingdom, Ireland

May 2022 — Present

- Using photography and creative writing to examine how ancient mythology such as Greek, Roman, Celtic, and Arthurian manifest in contemporary locations and culture.

South Asian Athletes Project, Remote

Sep 2022 – Present

- Interviewed Rajeev Ram to ask about his experiences as an athlete, his connection with their South Asian identity, and how the sport has impacted his connection and vice versa.

Triangle, Circle, and I, Remote

Sep 2023- Present

- Writing a fan blog intellectually and satirically examining theories, themes, and moments in the Harry Potter series

Raven Society, Charlottesville, VA

Member, 2022 — Present

- The most prestigious honorary society at the University of Virginia

UVA Environmental Science Organization, Charlottesville, VA

Member, 2020 — 2023

UVA Quizbowl, Charlottesville, VA

Member, 2020 — 2023