

Medha Prakash

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EDUCATION

University of Virginia (UVA), Charlottesville, VA

B.S., College of Arts & Science

Expected Graduation: May 2023

- **Majors:** Environmental Science (Distinguished Majors Thesis Track) **and** Statistics (Mathematical Statistics Concentration)
- **Minor:** Astronomy
- **Selected Coursework:** Nonparametric and Rank-Based Statistics, Glaciers and Ice Sheets, Fundamentals of Geology/Lab, Planetary Geology/Lab, Regression Analysis, Organic Chemistry/Lab, Differential Equations

RESEARCH EXPERIENCE

Ice and Ocean Research Group, Charlottesville, VA

Undergraduate Researcher, Aug 2020 — Present

- Working under the supervision of Dr. Lauren Simkins and PhD Candidate Marion McKenzie
- Gathering morphometrics and spatial properties of terrestrial eskers and martian ridges via ArcGIS and JMARS in order to quantitatively compare both feature types
- Designing 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.
- Leading 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

In preparation:

Weber, J. M.; Marlin, T.; **Prakash, M.**; Barge, L. M. *et al.* “Hypothesized Metabolic Pathways on Europa and Enceladus: Space-Flight Instrument Considerations.” *Life* **2022**, *In prep for submission.*

In Press:

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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*, **2022**, 1-18, <https://www.doi.org/10.1017/S1473550422000052> ^[1]

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, **submitted to EP024, AGU**

PRESENTATIONS

- 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**," *URNTalks*, 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

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 — Present

- Coordinating the peer review process and providing 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

- Facilitating discussions and assisting first-year college students in understanding and applying advanced chemistry concepts

- Organizing logistics between multiple teaching assistants to effectively help and answer questions for over 100 hundred students

OTHER WORK EXPERIENCE

WOURLD™, Charlottesville, VA

Lesson Developer, Sept 2020 — Present

- Developing 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
- Developing 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: Microsoft Office (Word, Excel, PowerPoint), GIS (ArcGIS Pro), R, JMARS, 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

Ektaal A cappella, Charlottesville, VA

President (Formerly Music Director), 2020 — Present

- Leading remote and in person practices, writing medleys of South Asian and Western music using MuseScore, helping members learn arrangements, mix audio using Audacity, Garage Band, and Logic Pro, leading to our debut album, Safar.
- Presiding over a group of 18 singers to put on semester concerts, perform at local and cultural gigs, and competing in regional competitions (earned 2nd place at North Carolina State University's Sangeet Sagar, as well as having over 25,000 listeners on Spotify)
- Working for and advocating for the inclusion of smaller, lesser known groups, as well as cultural appreciation arts organizations on Grounds
- Sparking 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 working to release our second album.

Charlottesville Book and Literacy Organization (The Order), Charlottesville, VA

Vice President, 2020 — Present

- Managed the application process and welcome of new recruits to the Charlottesville Book and Literacy Organization, ensured we engage in philanthropy every semester, and planned major events for the club

AppsforBLM, Portland, OR

Cofounder, 2020 — Present

- Reading over college application essays in order to encourage donations supporting the BLM movement
- Improving college applicants' essays by proofreading and providing critical feedback
- Managing the social media account and communicating actively with those interested in our services

Science Olympiad at UVA (SOUVA), Charlottesville, VA

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Outreach Chair, 2022 — Present

- Enhancing 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,

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 and coordinated food 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 photobooks titled Contrast and Together in Italy

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

May 2022 — Present

- Compiling information for a geological field study guide of locations in Europe such as the Giants Causeway, Cinque Terre, Cararra, and Tintagel
- 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

- Interviewing South Asian athletes across multiple sports, such as Rajeev Ram, to ask about their experiences as an athlete, their connection with their South Asian identity, and how their sport has impacted their connection and vice versa.
- Researching and reflecting on South Asian presence in the sport industry

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 — Present

UVA Quizbowl, Charlottesville, VA

Member, 2020 — Present