Mohini Jodhpurkar

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RESEARCH INTERESTS

Geomorphology and surface processes on terrestrial planetary bodies – particularly Mars and the Moon – with emphasis on quantitative remote sensing, photogrammetry, and geologic mapping. Current work investigates martian deltaic and alluvial fan deposits as a science-team member on NASA's Mars 2020 Mastcam-Z investigation, and hydrogen anomalies at the lunar South Pole.

EDUCATION

Ph.D., Geological Sciences *August 2020 – Present*
Arizona State University — Expected Completion: December 2026

- Graduate Research Assistant; PhD Candidate
- Mars 2020 science-team member (Mastcam-Z and Perseverance operations)
- Dissertation research: Jezero crater's northern fan deposit and putative deltaic deposits on Mars; hydrogen anomalies near Nobile Crater in support of upcoming lunar missions
- Teaching Assistant, SES 107: A Solar System Journey (Spring 2026)

B.S., Geology *August 2015 – May 2019*
College of William & Mary

- Graduated Cum Laude
- Member, Sigma Gamma Epsilon
- Structural Geology and Introductory Geology Teaching Assistant
- Intern, Virginia Institute of Marine Science

RESEARCH EXPERIENCE

Contractor *June 2019 – July 2020*
USGS Astrogeology Science Center

- Mapped and identified stratigraphy in the Melas Basin, Mars
- Conducted a paleo-bedform survey and modeling study in Melas Chasma, Mars
- Updated and digitized Apollo mission landing-site maps with the latest available data
- Performed crater counting and density plotting on the Moon, focused on Moulton Crater and its surroundings

Research Intern *May – August 2018*
Smithsonian National Air and Space Museum, Center for Earth and Planetary Studies

- Mapped backslopes of three tesserae on Venus and devised a classification scheme for tesserae
- Calculated backscatter coefficients and generated potential ejecta parabolas for impact craters to compare against nearby geologic features (impact and volcanic)
- Constructed a relative stratigraphic sequence for one of the three sites; compared topography and emissivity across latitude
- Research culminated in senior thesis, "Relationship Between Radar-Bright Areas and Geologic Landforms in Venusian Tesserae" (submitted May 2019)

REU Intern *June – August 2017*
Northern Arizona University (hosted at USGS Astrogeology Science Center)

- Mapped complex bedding patterns in the Medusae Fossae Formation using HiRISE imagery
- Measured bedding orientations using a custom MATLAB program; compared results to known dune bedding patterns to interpret ancient wind regimes
- Compared findings to Gale Crater to help constrain the formation's origin

Undergraduate Research Intern *January – May 2017*
Virginia Institute of Marine Science

- Prepared and processed sediment and plant samples for loss-on-ignition (LOI) analyses
- Conducted fieldwork at coastal marsh study sites; collected water samples
- Maintained lab space and materials inventory

TEACHING EXPERIENCE

Teaching Assistant *January – May 2026*
Arizona State University, School of Earth and Space Exploration

- Compiled extensive interactive and visual resources to aid students in understanding coursework
- Held two office hour sessions every week to answer students' questions
- Monitored student grades and periodically checked in with those who were struggling
- Suggested modifications or replacements for questions in weekly assessments

Teaching Assistant *January – May 2019*
William & Mary, Department of Geology

- Taught several sessions of Structural Geology; prepared lecture and lab materials
- Held tutoring sessions outside class time; assisted with field trips; graded coursework

Teaching Assistant *August – December 2018*
William & Mary, Department of Geology

- Assisted in teaching the introductory geology lab; prepared and set up lab sessions
- Held tutoring sessions outside class time

Grader *August 2016 – May 2019*
William & Mary, Department of Geology

- Graded coursework for all introductory and some upper-level courses (Geomorphology, Mineralogy, and others)
- Communicated with faculty regarding student difficulties with course material and exam questions

SERVICE & LEADERSHIP

- Member, Graduate Colloquium Committee, Arizona State University (2023–2024)
- Elected DEI Graduate Student Advocate, ASU Graduate Council (2021–2022)
- Organized geology alumni symposium (with keynote speaker Ellen Stofan) and reception marking the hundredth anniversary of coeducation at William & Mary (October 2018)
- Founding member, William & Mary chapter of the Association for Women Geoscientists
- STEM panelist for prospective and incoming students, William & Mary

PUBLICATIONS

Jodhpurkar, M. J., & Bell, J. F., III. (2026). Morphology, composition, and depositional history of fan deposits on Mars based on mapping of representative examples. [Manuscript submitted for publication]

Jodhpurkar, M. J., Bell, J. F., III, Gupta, S., Horgan, B., Gwizd, S., Caravaca, G., & Randazzo, N. (2024). Mapping and characterizing the northern fan deposits in Jezero crater, Mars. *Journal of Geophysical Research: Planets*, 129, e2024JE008308. https://doi.org/10.1029/2024JE008308

Bell, J. F., III, Maki, J. N., … **Jodhpurkar, M. J.**, … et al. (2022). Geological, multispectral, and meteorological imaging results from the Mars 2020 Perseverance rover in Jezero crater. *Science Advances*, 8(47), eabo4856. https://doi.org/10.1126/sciadv.abo4856 (93 authors)

Chojnacki, M., Fenton, L. K., Weintraub, A. R., Edgar, L. A., **Jodhpurkar, M. J.**, & Edwards, C. S. (2020). Ancient Martian aeolian sand dune deposits recorded in the stratigraphy of Valles Marineris and implications for past climates. *Journal of Geophysical Research: Planets*, 125, e2020JE006510. https://doi.org/10.1029/2020JE006510

PRESENTATIONS

- First and presenting author, AGU 2025 talk, "Investigating Lunar Hydrogen Anomalies in Mons Mouton and Its Surroundings" (December 2025)
- Invited speaker, Indian National Conference on Critical Minerals by Geological Society of India: presented on Jezero's northern fan (August 2025)
- Presented at Mars 2020 Team Meetings and Mastcam-Z Team Meetings (2022–2025); attended in 2026
- First and presenting author, LPSC 2023 talk, "Characterizing the Northern Fan Deposits in Jezero Crater, Mars" (March 2023)
- First and presenting author, LPSC 2022 poster, "Mapping and Interpreting Putative Deltaic Deposits Across the Martian Surface" (March 2022)
- First and presenting author, AGU 2021 poster, "Characterizing Putative Deltaic Deposits Across the Martian Surface" (December 2021)
- First and presenting author, GSA 2021 talk, "Mapping and Interpreting the Northern Fan Deposits in Jezero Crater, Mars" (October 2021)
- First and presenting author, Planetary Crater Consortium (PCC) Meeting 2021 talk, "Characterizing Moulton Crater and Its Surroundings" (August 2021)
- First and presenting author, LPSC 2021 posters, "Mapping and Interpreting the Northern Fan Deposit in Jezero Crater, Mars" and "Mapping and Interpreting Moulton Crater and Its Surroundings" (March 2021)
- First and presenting author, LPSC 2020 poster, "Creating Crater Catalogs of the Apollo 15-16-17 Landing Sites" (March 2020)
- First and presenting author, AGU 2019 poster, "Geologic Mapping and Stratigraphic Analysis in Southwestern Melas Chasma, Mars" (December 2019)
- First and presenting author, LPSC 2019 poster, "Relationship Between Radar-Bright Areas and Geologic Landforms in Venusian Tesserae" (March 2019)
- First and presenting author, LPSC 2018 talk, "Bedding Geometry in the Medusae Fossae Formation" (March 2018)

AWARDS & HONORS

- Focusing on Finishing Your Degree (FFYD) and University Graduate Fellowship (UGF), Fall 2026
- Townsend Memorial Fund (December 2025)
- Selected as a participant for Lunar and Planetary Laboratory (LPL) Planetary Photogrammetry Workshop (October 2025)
- NASA SCoPE LPSC SciAct Affiliate (March 2025)
- NASA Group Achievement Awards (2021, 2022, 2023, 2024, 2025) – Mastcam-Z development, science, and operations; exploration of Jezero crater's western fan and margin units
- Ellen Stofan Scholarship, William & Mary Department of Geology, for summer research (May 2018)
- Howard Hughes Medical Institute Scholarship (May 2015)

TECHNICAL SKILLS

GIS & Remote Sensing: ArcGIS Desktop, ArcGIS Pro, QGIS, JMARS

Photogrammetry & Point-Cloud Processing: Agisoft Metashape, AMES Stereo Pipeline, SOCET SET, CloudCompare

Programming & Analysis: MATLAB, Stereonet, IDL, Python

Productivity & Other: Microsoft Office Suite, Adobe Illustrator, Obsidian