

BENJAMIN S. DOUGLASS

PLANETARY SCIENCE PH.D. CANDIDATE

ARIZONA STATE UNIVERSITY
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EDUCATION

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| 2022-2027 | Arizona State University
Ph.D., Geological Sciences

Thesis Topic: <i>Investigating Surface and Subsurface Ices on Planetary Bodies Using Crater Morphology</i>

Advisor: Dr. Jim F. Bell III |
| 2017-2022 | University of Colorado Boulder
<i>B.A. in Astrophysics</i>
<i>Minor in Creative Technology & Design</i> |

RESEARCH EXPERIENCE

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| 2022-Present | Investigating Subsurface Ice on Mars Using Crater Morphology
<i>Arizona State University</i>

Measuring and analyzing crater depth/diameter ratios and morphologic characteristics of martian impact craters using high-resolution digital terrain models to investigate the distribution of subsurface ice throughout Mars' geologic history. |
| 2025-Present | LBT Image and Spectral Analysis of Interstellar Comet 3I/ATLAS
<i>Arizona State University</i>

Awarded 4 hours of observing time on the Large Binocular Telescope (Director's Discretionary Time) to observe interstellar comet 3I/ATLAS using LMIRCam imaging and PEPsi spectroscopic observations. Data currently under analysis. |
| 2022-2024 | Analysis of Direct Images of Exoplanets and Brown Dwarfs Orbiting Type M Stars
<i>Arizona State University</i>

Identified young stars with candidate companions in the Taurus star-forming region and analyzed LBT/LMIRCam data to classify companions and determine their physical properties. |
| 2018-2021 | Constraining the Thickness of the Lunar Regolith Layer Using Cold-Spot Craters
<i>NASA Jet Propulsion Laboratory</i>

Collected data from young lunar impact craters using Lunar Reconnaissance Orbiter Camera (LROC) images. Analyzed differences in boulder populations surrounding craters to estimate thickness of the regolith layer throughout the lunar maria. |

MISSION EXPERIENCE

- 2022-Present **Curiosity Rover/Mars Science Laboratory (MSL)**
NASA Jet Propulsion Laboratory
- Calibrated Mastcam multispectral data and trained undergraduate researchers. Attended MSL Operations meetings and science talks, and presented research at MSL Science Team Meeting in Toulouse, France.
- 2024 **Perseverance Rover/Mars 2020: Science Payload Downlink Analyst**
NASA Jet Propulsion Laboratory
- Analyzed newly received rover science data to assess instrument performance, process and interpret observations, and report results to the science team to inform planning of subsequent rover activities.

PROFESSIONAL TRAINING

- 2026 **NASA Planetary Science Summer School**
NASA Jet Propulsion Laboratory
- Proposal Manager for a multidisciplinary team developing a New Frontiers-class mission concept to Enceladus, including science traceability, mission architecture, payload selection, systems engineering, and cost/risk analysis.
- 2024 **Meteor Crater Field Camp**
Lunar and Planetary Institute
- Field-based training in terrestrial impact crater geology, crater morphology, impact processes, and geologic mapping at Meteor Crater, Arizona.

AWARDED TELESCOPE TIME

- 2025 **Large Binocular Telescope (LBT)**
PI: Ben Douglass
4.0 hours
- Director's Discretionary Time awarded for LBT imaging with LMIRCam and spectroscopy with PEPSI of interstellar comet 3I/ATLAS.
- 2023 **Large Binocular Telescope (LBT)**
PI: Jenny Patience
2.0 hours
- An LBT search and characterization for companions to the lowest mass stars in the Taurus star-forming region.

PUBLICATIONS

- 2019 C.M. Elder, **B. Douglass**, R.R. Ghent, P.O. Hayne, J.-P. Williams, J.L. Bandfield, E. Costello, (2019) *The Subsurface Coherent Rock Content of the Moon as Revealed by Cold-Spot Craters*. JGR— Planets, 124.

2025	A.R. Trussell, J.F. Bell III, <i>et al.</i> , ... Douglass, B.S. (2025). <i>Dark-toned halite-enriched veins above the marker band record a drying environment in Gale Crater</i> . <i>Journal of Geophysical Research: Planets</i> , 130(10).
In preparation	Marah Brinikji, Jenny Patience et al., ... Benjamin Douglass (In Prep), <i>LIRAS: The LMIRCam Imaging Reduction and Analysis Suite and its Application to a Direct Imaging Survey</i>
In preparation	<i>The Impact of Crater Age on Estimates of Regolith Thickness Derived from Ejecta Blanket Block Abundance (In Prep); B.S. Douglass, C.M. Elder</i>
In preparation	<i>Testing the Influence of the Martian Hemispheric Dichotomy on Simple Crater Morphology Using High-Resolution Digital Terrain Models (In Prep); B.S. Douglass, J.F. Bell III</i>

PRESENTATIONS & INVITED TALKS

2026	Depth/Diameter Ratios of Simple Impact Craters Across the Martian Hemispheric Dichotomy: Implications for the Global Distribution of Ground Ice <i>Lunar and Planetary Science Conference (LPSC)</i> Oral Presentation
2025	Using Crater Depth/Diameter Ratios to Infer Subsurface Ice Presence <i>Lunar and Planetary Science Conference (LPSC)</i> Poster Presentation
2024	Using Crater Depth/Diameter Ratios to Infer Subsurface Ice Presence <i>10th International Conference on Mars</i> Poster Presentation
2023	Using Crater Depth/Diameter Ratios to Infer Subsurface Ice Presence <i>American Geophysical Union (AGU)</i> Poster Presentation
2021	Constraining the Thickness of the Lunar Regolith Layer Using Cold-Spot Craters <i>Lunar and Planetary Science Conference (LPSC)</i> Oral Presentation
2018-2021	JPL Internship Research: Cold-Spot Craters and Regolith Thickness <i>Lunar Reconnaissance Orbiter Diviner Team Meetings</i> Oral Presentations – 2018, 2019, 2020, 2021

SKILLS

Programming	MATLAB, Python, IDL
Software	JMARS, ArcGIS, QGIS, ISIS3, Ames Stereo Pipeline