Riley McGlasson, PhD

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Education

Purdue University — **West Lafayette, IN**
PhD, Planetary Sciences — *Fall 2020 – Fall 2024*
Advisor: Dr. Ali Bramson
Dissertation: Exploring Radar Observations of Dusty Ice Layers on Mars through Observations, Modeling, and Lab Experiments

Macalester College — **Saint Paul, MN**
Bachelor of Arts, Physics (Astronomy emphasis) and Mathematics Minor — *2016–2020*
Advisor: Dr. John Cannon

Professional Experience

Postdoctoral Research Geologist — **Washington, DC**
Center for Earth and Planetary Studies — *December 2024 – present*
National Air and Space Museum, Smithsonian Institution
Active projects: Geologic map of Mars' south polar region, temporal lunar landslide characterization, and sediment transport on Venus via permittivity studies

Graduate Research Assistant — **West Lafayette, IN**
Purdue University — *August 2020 – December 2024*
Advisor: Dr. Ali Bramson

Astronomy Ranger Intern — **Bryce, UT**
Bryce Canyon National Park — *Summer 2019*
Developed and presented astronomy interpretive programs.

REU Student Researcher — **Arecibo, Puerto Rico**
Arecibo Observatory, Advisors: Dr. Sean Marshall and Dr. Flaviane Venditti — *Summer 2018*
Project title: Radar and Lightcurve Observations and a Physical Model of Potentially Hazardous Asteroid 1981 Midas

REU Student Researcher — **Huntsville, AL**
University of Alabama in Huntsville/NASA MSFC, Advisor: Dr. Navdeep Panesar — *Summer 2017*
Project title: Magnetic Flux Cancellation as the Trigger Mechanism of Solar Coronal Jets

Undergraduate Research Assistant — **Saint Paul, MN**
Macalester College, Advisor: Dr. John Cannon — *Spring 2017*
Project title: First Characterization of the Neutral ISM in Two Local Volume Dwarf Galaxies

Peer-Reviewed Journal Publications

[8] **McGlasson, R. A.**, Sori, M. M., Bramson, A. M., & Lalich, D. E. (2024). Radar sounding reveals common evolutionary history between the north polar layered deposits and an outlier ice deposit on Mars. Geophysical Research Letters, 51, e2024GL109057.

[7] **McGlasson, R. A.**, Bramson, A. M., Morgan, G. A., Sori, M. M., (2023). Varied Histories of Outlier Polar Ice Deposits on Mars. Journal of Geophysical Research: Planets, 128, e2022JE007592.

[6] Virkki, A. K., Marshall, S. E., Venditti, F., et al. **(incl. McGlasson, R. A.)**, (2022). Arecibo Planetary Radar Observations of Near-Earth Asteroids: 2017 December - 2019 December. Planetary Science Journal, 3, 222.

[5] Sori, M.M., Becerra, P., Bapst, J., Byrne, S., and **McGlasson, R. A.**, (2022). Orbital forcing of Martian climate revealed in an outlier ice deposit. Geophysical Research Letters, 49, e2021GL097450.

[4] **McGlasson, R. A.**, Marshall, S. E., Venditti, F., et al. (2022). Radar and Lightcurve Observations and a Physical Model of Potentially Hazardous Asteroid 1981 Midas. The Planetary Science Journal, 3, 35.

[3] **McGlasson, R. A.**, Panesar, N. K., Sterling, A. C., Moore, R. L., (2019). Magnetic Flux Cancellation as the Trigger Mechanism of Solar Coronal Jets. The Astrophysical Journal, 882, 16.

[2] Cannon, J.M., Shen, Z., et al. **(incl. McGlasson, R. A.)**, (2018). Delayed Stellar Mass Assembly in the Low Surface Brightness Dwarf Galaxy KDG 215. The Astrophysical Journal Letters, 864, L14.

[1] Bralts-Kelly, L., Bulatek, A. M., et al. **(incl. McGlasson, R. A.)**, (2017). First Characterization of the Neutral ISM in Two Local Volume Dwarf Galaxies. The Astrophysical Journal Letters, 848, L10.

Conference Posters and Presentations

* Indicates R. A. McGlasson is presenting author

† Indicates oral presentation

[29] Shoemaker Thackston, E. S., **McGlasson, R. A**., and Jawin, E (2025). A Multi-Offset Ground-Penetrating Radar Concept for Lunar Subsurface Exploration. Annual Meeting of the Lunar Exploration Analysis Group.

[28] ***†McGlasson, R. A.,** Cartwright, S. F. A., Whitten, J. L., Landis, M. E. (2025), Longitudinal Variations of Ice Coverage in Prometheus Basin, Mars, GSA Connects 2025, Abstract #10757.

[27] ***McGlasson, R. A.,** Cartwright, S. F. A., Landis, M. E., Whitten, J. L. (2025), A Revised Geologic Map of the South Polar Layered Deposits, Mars: Year 3 Updates, GSA Connects 2025, Abstract #10730.

[26] Cartwright, S. F. A., **McGlasson, R. A.,** Landis, M. E., Whitten, J. L. (2025), Hybrid geologic map of the Mars south polar residual cap: A test case for integrating compositional data in planetary geologic mapping, GSA Connects 2025, Abstract #10255

[25] Shoemaker Thackston, E.S., Bramson, A. M., **McGlasson, R. A.**, Baker, D. M. H., Henderson, M. (2025), Ground-Penetrating Radar Observations of Shallow Subsurface Ice for Planetary Exploration and ISRU at Hekla Volcano, Southwest Iceland. Abstract ID# 1978886, AGU.

[24] Harris, S., Bramson, A. M., **McGlasson, R. A.** (2025), Effects of thin layers on radar observations of the Martian polar layered deposits: An integrated approach using experiments, simulations, and spacecraft observations. Vol. 18, Abstract #1086, 57th AAS DPS/EPSC.

[23] ***McGlasson, R. A.,** Bramson, A. M. (2025), Laboratory Experiments on the Effect of Ice Layer Thickness and Dust Content on Radar Reflectivity. p.1723, 56th LPSC.

[22] ***†McGlasson, R. A.**, Shoemaker, E. S., Bramson, A. M. (2025), Detectability of Pore-Filling Ice by Ground-Penetrating Radar for Planetary ISRU at Hekla Volcano, Iceland. p.2027, 56th LPSC.

[21] †Harris, S.B., **McGlasson, R. A.**, Bramson, A. M. (2025), Radar Reflections of Packets of Sub-Resolution Dust Layers Within Ice in Martian Analog Experiments. p.2061, 56th LPSC.

[20] Shoemaker, E. S.**, McGlasson, R. A.**, Bramson, A. M. (2024). Testing Detectability of Pore-Filling Ice with Ground-Penetrating Radar for Planetary ISRU at Hekla Volcano, Southern Iceland. American Geophysical Union Fall Meeting 2024.

[19] ***†McGlasson, R. A. ,** Bramson, A.M. (2024). Laboratory Experiments on the Effect of Ice Layer Thickness and Dust Content on Radar Reflectivity. p. 6057, 8th International Conference on Mars Polar Science and Exploration, Whitehorse, Canada.

[18] Sori, M.M., Bapst, J., Beccera, P., Bramson, A.M., Byrne, S., Checketts, B.M., Durham, A., Horgan, B.N., Lawrence, I.T., **McGlasson, R.A.,** Patel, N., Petrini, E.Z., Tikoo, S.M., Zorzi, A. (2024). Climate records of outlying polar ice deposits on Mars. p. 6002, 8th International Conference on Mars Polar Science and Exploration, Whitehorse, Canada.

[17] ***McGlasson, R.A.**, Vannier, H., Bramson, A.M. (2024). In Situ Hydration Assessment via Ground Penetrating Radar and Spectroscopy at the Mars Desert Research Station. p. 1528, 55th LPSC, The Woodlands, TX.

[16] ***McGlasson, R.A.**, Sori, M.M., Bramson, A.M., Lalich, D.E. (2023). Radar Sounding Observations Reveal Stratigraphic Similarity Between Ice Deposits at the Polar Cap and in Korolev Crater on Mars. AAS Division of Planetary Sciences (DPS), #222.

[15] ***McGlasson, R.A.**, Bramson, A.M., Sori, M.M., Lalich, D.E. (2023). Time Series Analysis and Geologic Modeling of Radar Reflectors within Polar Outlier Ice Deposits in Korolev and Burroughs Craters on Mars. 54th Lunar and Planetary Science Conference, #2118.

[14] †Sori, M.M., Laferriere, K.L., Burkman, K.S., Herring, J., Klidaras, A., Manelski, H.T., **McGlasson, R.A.**, Menten, S.M., Pamerleau, I.F., Pérez-Cortés S.L. (2023). Hollows as a Source for Mercury's Polar Organics. 54th Lunar and Planetary Science Conference, #1103.

[13] †Broad, K.E., Sadler, B.O., Hoover, S.L., James, P.B., Robitaille, B.A., Büttner, C., Schmitt, D.R., **McGlasson, R.**, Bramson, A.M., Sori, M. M., Hutton, L. M., Delph, J. R. (2023). A Gravity Survey of the Kentland Crater Formation. 54th Lunar and Planetary Science Conference, #2715.

[12] Hoover, S.L., Broad, K.E., Sadler, B.O., James, P.B., Robitaille, B.A., Büttner, C., Schmitt, D.R., Bramson, A.M., Sori, M.M., Hutton, L.M., **McGlasson, R.** (2023). A Gravity Gradient Method for Calculating Bulk Density in Topographically Complex Areas. 54th Lunar and Planetary Science Conference, #2857.

[11] Bramson, A.M., Laferriere, K., Izquierdo, K., **McGlasson, R.** (2022). Constraining Mars' Polar Environment through Multi-faceted Analyses of Orbital GPR Data. 19th International Conference on Ground Penetrating Radar.

[10] ***McGlasson, R. A.**, Sori, M. M., Bramson, A. M., (2022). A Significant Periodicity of NPLD Layers as Revealed by SHARAD Observations. 53rd Lunar and Planetary Science Conference, #2063.

[9] *†**McGlasson, R. A.**, Bramson, A. M., Morgan, G. A., Sori, M. M., (2021). Subsurface Radar Observations of Outlier Polar Ice Deposits on Mars. American Geophysical Union Fall Meeting 2021, #P32D-05.

[8] Sori, M.M., Beccera, P., McGlasson, R.A., Bapst, J., Byrne, S. (2021), Morphology of crater ice deposits on Mars reveals Earth-like Milankovitch climate forcing, American Geophysical Union Fall Meeting 2021, 812204.

[7] ***†McGlasson, R. A.**, Bramson, A. M., Morgan, G. A., Sori, M. M., (2021). Subsurface Radar Observations of Outlier Polar Ice Deposits on Mars. 52nd Lunar and Planetary Science Conference, #1649.

[6] Repp, D. W., Marshall, S. E., et al. **(incl. McGlasson, R. A.)**, (2020). Shape modeling of potentially hazardous asteroid 2015 DP155 from radar and lightcurve observations. 51st Lunar and Planetary Science Conference, #2897.

[5] Taylor, P. A., Rivera-Valentín, E. G., **(incl. McGlasson, R. A.)**, (2019). Radar and Optical Observations of Equal-Mass Binary Near-Earth Asteroids (190166) 2005 UP156 and 2017 YE5. 50th Lunar and Planetary Science Conference, #2945.

[4] ***McGlasson, R. A.**, Marshall, S. E., et al., (2019). Shape Model of Potentially Hazardous Asteroid (1981) Midas from Radar and Lightcurve Observations. American Astronomical Society Meeting #233, 255.03.

[3] Taylor, P. A., Brozovic, M., et al. **(incl. McGlasson, R. A.)**, (2018). Radar and Optical Observations of Equal-Mass Binary Near-Earth Asteroid 2017 YE5. American Astronomical Society Division of Planetary Sciences meeting #50, 508.07.

[2] Marshall, S. E., Cobb, A., et al. **(incl. McGlasson, R. A.)**, (2018). Using Bayesian Optimization to Find Asteroids' Pole Directions. American Astronomical Society Division of Planetary Sciences meeting #50, 505.01D.

[1] ***McGlasson, R. A.**, Panesar, N. K., Sterling, A. C., Moore, R. L., (2017). Magnetic Flux Cancellation as the Trigger Mechanism of Solar Coronal Jets. American Geophysical Union Fall Meeting 2017, #SH43A-2796.

Honors

Employee Recognition Award for Departmental Achievements (Purdue EAPS) *2024*

Future Investigators in NASA Earth and Space Science and Technology (FINESST) Fellow *2023-2026*

Zonta International Amelia Earhart Fellow *2023*

Purdue University Graduate Teaching Award *2023*

Purdue TA Honor Roll *Fall 2021, Fall 2022*

Purdue Student Service-Learning Grant *2021*
In support of development of the Astronomy on Tap program

NSF Graduate Research Fellowship Program, Honorable Mention *2021*

Lunar and Planetary Institute Career Development Award *2021*
52nd Lunar and Planetary Science Conference

Macalester Physics Department's Dr. Sherman W. Schultz Memorial Award *2020*

Chambliss Astronomy Achievement Award Student Prize *2019*
American Astronomical Society 233rd meeting

Field Experience

Selected external collaborator for the Southwest Iceland Field Team (SWIFT), a 2025 planetary analog field expedition led by the NASA Goddard Instrument Field Team (GIFT).

Ground Penetrating Radar surveys (common offset and common midpoint) of permafrost, buried snowpack, and pore-filling ice at 100, 200, 450, and 750 MHz at Hekla volcanic regions, Iceland (2024, 2025). Also piloted drone flights for context imagery and operated SIPRE auger for ice coring.

Ground Penetrating Radar survey at 100 MHz of alluvial fan at Thingvellir National Park, Iceland (2024).

Ground Penetrating Radar collection at 450 MHz near the Mars Desert Research Station (MDRS; Hanksville, UT) as Executive Officer of Crew 288, a two-week-long analog astronaut mission at the MDRS (2023).

Ground Penetrating Radar collection at 80 and 160 MHz at the Kentland Crater impact structure (2022).

Mission/Spacecraft Experience

VERITAS mission, NASA Discovery Mission: Science Team Collaborator — *2025 – present*

SHARAD instrument, Mars Reconnaissance Orbiter, Science Team Collaborator — *2021 – present*

Invited Talks

UChicago "myCHOICE" career panel: — *2025*
"Museum Careers for STEM PhDs: Research, Curation, Education"

Macalester Astronomy Guest Lecturer — *2025*

Teaching Experience

EAPS 111: Physical Geology — Fall 2020, Fall 2021, Fall 2022
Lab TA for Purdue introductory geology class

EAPS 100: Planet Earth — Spring 2022
TA for asynchronous online Purdue introductory Earth Science class

PHYS 440: Observational Astronomy — Spring 2020
Undergraduate TA for Macalester upper-level observational astronomy course

PHYS 113: Modern Astronomy I — Spring 2019
Undergraduate TA for Macalester introductory astronomy course

Professional Service and Mentorship

NASA Proposal Review Panelist — 2025 – Present

Peer Reviewer — 2022 – Present
Geophysical Research Letters and *Journal of Geophysical Research: Planets*

"Leading Women to Space Careers" Mentor — 2022–2023
Graduate student mentor for pilot mentorship program in the Purdue Honors College

Prospective Student Expo Coordinator — 2022–2023
Organized the 2022 (virtual) and 2023 (in person) prospective student interview weekends for Purdue EAPS.

EAPS Graduate Student Mentorship Program Coordinator — 2022
Organized mentorship pairs and development programs to support incoming graduate students in Purdue EAPS.

Destination Imagination Appraiser — 2017–2020
Judged teams (elementary–high school levels) at the regional and state-level for Destination Imagination, a global creative problem-solving competition.

Outreach

Blogger, National Air and Space Museum Stories — 2025 – Present
Why Is a Planet Not a Star?

Astronomy on Tap Organizer: — Fall 2021–Fall 2023
Established and served as primary organizer for the Lafayette, IN satellite series of "Astronomy on Tap".

Radio Host — Fall 2017–Spring 2020
Radio Astronomy: Macalester College's astronomy talk show on WMCN 91.7 FM

Host and Telescope Operator — Fall 2017, Fall 2019
Macalester College Public Observing Nights

"Ask a Scientist Booth" Scientist — Summer 2018
Arecibo Observatory Noche de Observación

NASA in the Park Presenter — Summer 2017
Presented vacuum chamber experiments at annual NASA in the Park event, Huntsville, AL