

Riley McGlasson, PhD

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Education

Purdue University

PhD, Planetary Sciences

Advisor: Dr. Ali Bramson

Dissertation: *Exploring Radar Observations of Dusty Ice Layers on Mars through Observations, Modeling, and Lab Experiments*

West Lafayette, IN

Fall 2020 – Fall 2024

Macalester College

B.A., Physics (Astronomy emphasis) and Mathematics Minor

Advisor: Dr. John Cannon

Saint Paul, MN

2016–2020

Acquincum Institute of Technology, Budapesti Műszaki Egyetem

Semester in Computer Science Abroad

Budapest, Hungary

Fall 2018

Professional Experience

Postdoctoral Research Geologist

Center for Earth and Planetary Studies

National Air and Space Museum, Smithsonian Institution

- Geological mapping of Mars' south polar region

Washington, DC

December 2024 – present

Graduate Research Assistant

Purdue University

Advisor: Dr. Ali Bramson

- PhD research focusing on radar observations of Mars' polar regions

West Lafayette, IN

August 2020 – December 2024

Astronomy Ranger Intern

Bryce Canyon National Park

- Developed and presented astronomy interpretive programs.

Bryce, UT

Summer 2019

REU Student Researcher

Arecibo Observatory

Advisors: Dr. Sean Marshall and Dr. Flaviane Venditti

- Developed a shape model for the potentially hazardous asteroid Midas.
- Performed approximately 50 radar observations of near-Earth asteroids using the Arecibo 305-meter radio telescope.

Arecibo, Puerto Rico

Summer 2018

REU Student Researcher

University of Alabama in Huntsville/NASA MSFC

Advisor: Dr. Navdeep Panesar

- Studied the magnetic origins of solar coronal jets.

Huntsville, AL

Summer 2017

Undergraduate Research Assistant

Macalester College

Advisor: Dr. John Cannon

- Performed the first characterization of the neutral ISM in two local volume dwarf galaxies using the HI 21cm spectral line.

Saint Paul, MN

Spring 2017

Peer-Reviewed Journal Publications

1. **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.
2. **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.

3. 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.
4. 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.
5. **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.
6. **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.
7. 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.
8. 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

1. E. S. Shoemaker, **R. A. McGlasson**, A. M. Bramson (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.
2. *†**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.
3. Sori, M.M., Bapst, J., Becerra, 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.
4. ***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.
5. ***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.
6. ***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.
7. †Sori, M.M., Laferriere, K.L., Burkman, K.S., Herring, J., Klidas, 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.
8. †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.
9. 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.
10. 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.
11. ***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.

12. *†**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.
13. 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.
14. *†**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.
15. 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.
16. 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.
17. ***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.
18. 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.
19. 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.
20. ***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.

Awards and Grants

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
<i>In support of development of the Astronomy on Tap program</i>	
NSF Graduate Research Fellowship Program, Honorable Mention	2021
Lunar and Planetary Institute Career Development Award	2021
<i>52nd Lunar and Planetary Science Conference</i>	
Macalester Physics Department's Dr. Sherman W. Schultz Memorial Award	2020
Chambliss Astronomy Achievement Award Student Prize	2019
<i>American Astronomical Society 233rd meeting</i>	

Field Experience

- Ground Penetrating Radar collection at 100, 200, 450, and 750 MHz for buried ice detection at Askja and Hekla volcanic regions, Iceland.
- Ground Penetrating Radar survey at 100 MHz of alluvial fan at Thingvellir National Park, Iceland.
- 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.
- Ground Penetrating Radar collection at 80 and 160 MHz at the Kentland Crater impact structure.

Teaching Experience

EAPS 111: Physical Geology <i>Lab TA for Purdue introductory geology class</i>	Fall 2020, Fall 2021, Fall 2022
EAPS 100: Planet Earth <i>TA for asynchronous online Purdue introductory Earth Science class</i>	Spring 2022
PHYS 440: Observational Astronomy <i>Undergraduate TA for Macalester upper-level observational astronomy course</i>	Spring 2020
PHYS 113: Modern Astronomy I <i>Undergraduate TA for Macalester introductory astronomy course</i>	Spring 2019

Volunteer Service and Outreach

Peer Reviewer <i>Geophysical Research Letters and Journal of Geophysical Research: Planets</i>	2022 – Present
"Leading Women to Space Careers" Mentor <i>Graduate student mentor for pilot mentorship program in the Purdue Honors College</i>	2022–2023
Prospective Student Expo Coordinator <i>Organized the 2022 (virtual) and 2023 (in person) prospective student interview weekends for Purdue EAPS.</i>	2022–2023
EAPS Graduate Student Mentorship Program Coordinator <i>Organized mentorship pairs and development programs to support incoming graduate students in Purdue EAPS.</i>	2022
Astronomy on Tap Organizer: <i>Established and served as primary organizer for the Lafayette, IN satellite series of "Astronomy on Tap".</i>	Fall 2021–Fall 2023
Radio Host <i>Hosted Radio Astronomy: Macalester College's astronomy talk show on WMCN 91.7 FM</i>	Fall 2017–Spring 2020
Host and Telescope Operator <i>Macalester College Public Observing Nights</i>	Fall 2017, Fall 2019
"Ask a Scientist Booth" Scientist <i>Arecibo Observatory Noche de Observación</i>	Summer 2018
NASA in the Park Presenter <i>Presented vacuum chamber experiments at the annual NASA in the Park event, Huntsville, AL</i>	Summer 2017
Destination Imagination Appraiser <i>Judged teams (elementary–high school levels) at the regional and state-level for Destination Imagination, a global creative problem-solving competition.</i>	2017–2020