

# GRADY ROBBINS

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## OBJECTIVE AND INTERESTS

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First-year geological sciences PhD student at Arizona State University with astronomy and geology degree seeking planetary science project experience via laboratory experimentation, mission analysis, and analog studies. Previous relevant experience includes laboratory material preparation and analysis, near-infrared spectroscopy, and high-performance computational modeling.

## EDUCATION

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Arizona State University, Tempe, AZ.

Expected 2030

### Ph.D. Geological Sciences

- **Relevant Coursework:** Remote Sensing & Planetary Geology.
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University of Florida, Gainesville, FL. Overall GPA 3.98/4.00

May 2025

### B.A. Geology, Major GPA 4.00/4.00, **Summa Cum Laude**

- **Thesis:** "Enhanced Rock Weathering of Basalt Soil Amendments—Mineralogy, Geochemistry, and CDR Potential."
- **Relevant Coursework:** Early Planetary Crusts, Mineralogy, Geomorphology, Field Methods, Instrumental Methods, Structural Geology/Tectonics, Geology of Florida.

### B.S. Astrophysics, Major GPA 3.98/4.00, **Summa Cum Laude**

- **Thesis:** "Multiple Gaps Opened by a Single Planet: A Three-Dimensional View."
  - **Relevant Coursework:** Exoplanets, Astrobiology, Astrophysics 1 & 2, Computational Astrophysics, Observational Astronomy, Electromagnetism 1 & 2, Mechanics 1 & 2.
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Saint Johns River State College, Saint Augustine, FL. Overall GPA 3.93/4.00

May 2021

### Associate of Arts, Dual Enrollment, **Summa Cum Laude**

## EXPERIENCE AND RESEARCH

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### University of Florida

*Gainesville, FL*

-Undergraduate Research Assistant, Dept. of Geology (Supervisor: Prof. David Foster)

8/2024-8/2025

- Performing XRD mineralogy, XRF geochemistry, and compositional analyses of basaltic materials for agricultural soil amendments and dissolution potential.
- Preparing basaltic materials for mineralogical/geochemical analysis via rock crushing, powder milling, and glass bead fusion.
- Implementing laser particle size analysis for particles  $\leq 2\text{mm}$  and sieving methods for larger particles.

-Undergraduate Research Assistant, Dept. of Astronomy (Supervisor: Prof. Jaehan Bae)

8/2022-8/2025

- Conducted 2D and 3D simulations of protoplanetary disk gas structures to model the formation and evolution of planetary systems, employing Python and JupyterHub.
- Generated mass accretion, surface density, and velocity structure figures to evaluate simulation results.
- Utilized FARGO-3D code and UF supercomputing resources for efficient large-scale simulations, gaining valuable experience in high-performance computing environments including CUDA and GPU usage.

-Life on the Edge Lab Member (Directed by Prof. Amy Williams)

9/2024-8/2025

- Participated in lab discussions and meetings, digesting and presenting recent research in planetary geology and astrobiology from Life on the Edge researchers and other institutions.
- Trained in Bligh and Dyre lipid biosignature extraction methods for use in gas chromatography mass spectrometry analysis.

## NASA & University of Colorado Boulder

Boulder, CO

-NASA Europa ICONS Intern (Supervisors: SUDA Deputy PI Sean Hsu & SUDA PI Sascha Kempf) 6/2024-8/2024

- Worked with the Europa Clipper SURface Dust Analyzer (SUDA) team to create an orbital simulation code from scratch capable of modeling the evolution of particles in the Galilean system launched from any moon surface.
- Examined the geology of primary impacts, secondary impacts, and ejecta mechanics on the Galilean moons.
- Created a global escape speed and mass escape map for particles ejected from Europa's surface impacts.
- Applied the three-body gravitational dynamics of impact ejecta to select giant impact craters on Europa.
- Selected among ~3000 applicants for 40 NASA positions.

## NSF's National Optical-Infrared Astronomy Research Laboratory (NOIRLab)

Tucson, AZ

-Intern, Science (Supervisor: *Backyard Worlds: Cool Neighbors* PI Aaron Meisner) 5/2023-8/2023

- Conducted near-infrared spectral analysis of brown dwarfs, establishing classification techniques, and defining physical properties leading to two first-author publications in American Astronomical Society journals.
- Collaborated with the *Backyard Worlds* science team to develop the NASA-funded crowdsourcing project *Backyard Worlds: Cool Neighbors*, applying Python and the Zooniverse Project Builder tool for data analysis.
- Developed and authored three articles, 11 infographic tweets, and professional emails to promote Cool Neighbors.

## PUBLICATIONS

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### Published

- **Robbins, G.**, et al. 2023, "CWISE J105512.11+544328.3: A Nearby Y Dwarf Spectroscopically Confirmed with Keck/NIRES", *The Astrophysical Journal*, AAS 958 94.
- **Robbins, G.**, et al. 2023, "Scarlet Spectra: Two Red L Dwarfs Revealed by SOAR", *Res. Notes AAS* 7 140.
- *Undergraduate Journal* - **Robbins, G.** et al. 2024, "Backyard Worlds: Cool Neighbors – Post-launch Performance and a First Proper Motion Discovery", *Accepted to ASP Compendium of Undergraduate Research*.
- Meisner, A., Caselden, D., Humphreys, A., **Robbins, G.**, et al. 2024, "Cool Neighbors: Combining Artificial Intelligence and Citizen Science to Chart the Sun's Cosmic Neighborhood". *Citizen Science: Theory and Practice*, vol. 9, no. 1.
- *Approved JWST Cycle 3 Proposal* - Meisner, A., ..., **Robbins, G.**, et al. 2024, "Is CWISE 1055+5443 the first young Y-type brown dwarf?", *JWST Proposal. Cycle 3, ID. #6084*.
- *Conference Proceeding* - **Robbins, G.**, Hsu S., Kempf, S. 2024, "Three-Body effects on Impact Ejecta of Europa: A Dynamic Dance", *AAS Division for Planetary Sciences meeting #56, id. 104.03*.
- *Conference Proceeding* - **Robbins, G.**, Bae, J. 2024, "Three-Dimensional Simulations of Planet-Induced Gap Openings in Protoplanetary Disks", *Bulletin of the American Astronomical Society*.
- *Conference Proceeding* - Meisner, A., **Robbins, G.**, et al. 2024, "A Nearby and Potentially Young Y Dwarf", *Bulletin of the American Astronomical Society*.

### Submitted/In Preparation

- **Robbins, G.**, Bae, J. 2024, "Three-Dimensional Simulations of Planet-Induced Gap Openings in Protoplanetary Disks", *To Be Submitted* to the *Astrophysical Journal*, AAS.
- **Robbins, G.**, Hsu, H.-W. 2024, "Three-Body Dynamics of Impact Ejecta on Europa", *In Preparation*.

## TALKS, POSTERS, AND MEDIA

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### Talks (6) & Posters (8)

- *THREE-BODY DYNAMICS OF SURFACE IMPACT EJECTA FROM EUROPA*. (oral), LPSC 56th Meeting, March 2025.
- *Three-Body Effects on Impact Ejecta of Europa: A Dynamic Dance* (poster), DPS 56th Meeting, October 2024.
- *Mass Escape from Europa Impacts Due to 3-Body Effects* (oral), NASA Europa ICONS Final Presentations, virtual, August 2024.
- *Three-Dimensional Simulations of Planet-Induced Gap Openings in Protoplanetary Disks* (poster) and *A Nearby Potentially Young and Low Mass Brown Dwarf* (oral), American Physics Society April Meeting, April 2024.

- *Breaking free from 2D: Simulating Planetary Gaps in PPDs* (**poster**), PULSAR Research Symposium 2024, UF, March 2024.
- *Breaking free from 2D: Simulating Planetary Gaps in PPDs* (**poster**), Spring 2024 Undergraduate Research Symposium, UF, March 2024.
- *Three-Dimensional Simulations of Planet-Induced Gap Openings in Protoplanetary Disks* (**iPoster**), AAS 243rd Meeting, January 2024.
- *Sapphire Spectra - an Unusually Blue and Potentially Young Y dwarf* (**oral**), Gulf Coast Undergraduate Research Symposium, Rice University, October 2023.
- *A Three-Dimensional Study of Planet-Induced Gaps in PPDs* (**poster**), Florida Undergraduate Research Conference, University of North Florida, February 2024.
- *A Three-Dimensional Study of Planet-Induced Gaps in PPDs* (**poster**), Fall 2023 Undergraduate Research Symposium, UF, November 2023.
- *A Summer at NSF's NOIRLab* (**oral**), Department of Astronomy, UF, October 2023.
- *Scarlet Spectra: Two Red L Dwarfs Revealed by SOAR* (**oral**), Planets & Dwarfs Meeting, NOIRLab, July 2023.

### Prominent Media Features

- *USRA Announces the 2024 Distinguished Undergraduate Award Recipients Recognizing Academic Excellence*, by Dr. Suraiya Farukhi, USRA.
- *AAS Nova Research Highlight. Investigation of a Nearby, Cold, and Young Brown Dwarf*, by Kerra Hensley, the American Astronomical Society.
- *Student-College Highlight. Student Power Unleashed: UF Undergraduate's Impact on Project Launch*, by the University of Florida Astronomy Department.
- *Ytori Magazine Fall 2023 Highlight. New Tools Open Horizons in Astronomy*, by Brian Smith
- *NOIRLab Story. Newly Launched Backyard Worlds: Cool Neighbors Project Assembles Team of Citizen Scientists to Hunt for Brown Dwarfs in Our Cosmic Backyard*, by Josie Fenske.

### LEADERSHIP AND NOTEWORTHY INFORMATION

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#### Mentor, Women in Astronomy and Astrophysics Mentorship Program (WAAM) 8/2023 - 8/2025

- Mentoring two fellow students in the field of astrophysics, providing guidance and assistance.
- Contributing to the advancement and empowerment of women in astronomy and astrophysics through mentorship and support.
- Guiding and supporting two mentees in pursuing research opportunities, including REUs and internships, and offering insights on enhancing academic and networking experiences in astronomy.

#### Founder/President, UF PULSAR 4/2023 - 5/2024

- Founded PULSAR - Promoting Undergraduate Learning and Studies in Astrophysical Research, an organization dedicated to promoting undergraduate research in astronomy at the University of Florida.
- Organized and hosted a "Meet the Professors" event, fostering interactions between ~25 students and ~10 professors to introduce students to potential research mentors.
- Planned and hosted a research poster symposium, oral presentation conference, CV workshop, and poster workshop with the UF Astronomy Department Chair Dr. Elizabeth Lada, providing undergraduate students with opportunities to present their research, enhance presentation skills, and encourage networking.

#### UF Astronomy and Astrophysics Society Secretary/Treasurer 8/2022 - 8/2024

- Organized and hosted fundraisers to support educational visits to the local planetarium and Kennedy Space Center. Over \$1000 was successfully raised through hosted fundraisers in the past year.
- Coordinated observing nights at both UF's Campus Teaching Observatory and Rosemary Hill Observatory.
- Maintained and organized Astronomy and Astrophysics Society's files by category, file type, and date for easy access.

#### Eagle Scout 2020

- Initiated and completed a large-scale project involving the complete renovation of a dog run at a pet shelter from the ground up during the COVID-19 Pandemic.

- Raised \$2000 for the non-profit pet shelter "Saving Animals From Euthanasia" Project and donated additional funds to the non-profit.
- Collaborated with local businesses to secure resources and funding for the project.

## AWARDS AND HONORS

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- Exemplary Senior Thesis Award, Department of Astronomy, University of Florida, 2025
- Best Senior Thesis Award, Department of Geology, University of Florida, 2025
- **USRA Distinguished Undergraduate Award**, *Thomas R. McGetchin Memorial Scholarship*. \$5,000  
Universities Space Research Association, 2024
- Florida Academic Scholars Award, Bright Futures Scholarship Program, 2021-2024 Full Tuition
- Dean's List, University of Florida, 2021-2024
- President's Honor Roll, University of Florida, 2022-2023
- PULSAR Best Poster Award, PULSAR Student Organization, 2024
- Cone Heads Ice Cream Scholarship Recipient, Cone Heads Ice Cream, 2022 \$10,000
- AAS FAMOUS Travel Grant, American Astronomical Society, 2023 \$1,000
- APS Braslau, DAP, and FPD Travel Grants, American Physical Society, 2024 \$1,500
- DPS Hartmann Travel Award, AAS Division of Planetary Science, 2024 \$1,000
- Associate of Arts Summa Cum Laude, Saint Johns River State College, 2021
- National Rural and Small Town Recognition Program Recipient, College Board, 2020
- Fall President's Honor Roll, Saint John's River State College, 2020
- Spring Dean's List, Saint John's River State College, 2021

## SKILLS AND INSTRUMENTATION

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*Skills:* **Visual Analysis** – Advanced, **Research Writing** – Advanced, **Data Visualization** – Excellent, **Mineralogy** – Advanced, **Geologic Mapping** – Advanced, **Modeling and Simulation** – Advanced.

*Instruments:* XRD, XRF, SEM, carbon coating, isotope ratio mass spectrometry, ICP elemental mass spectrometry.

*Software:* **ArcGIS** - Advanced, **JMars** - Advanced, **ISIS 3** - Advanced, **Python** - Excellent.

## OUTREACH AND ASTRONOMICAL OBSERVING

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### **NASA Infrared Telescope Facility (IRTF), Hawaii, July 2023**

- Performed remote observations of faint/cold brown dwarfs using the SpeX spectrograph.
- Successfully performed guiding calibrations, telluric corrections, and recorded spectrograph data into observation logs.

### **AAS Division of Planetary Science Volunteer, 10/7/2024 - 10/10/2024**

- Volunteered during the DPS 56th Meeting, supporting staff and running exhibitor stands where needed.

### **American Physical Society Volunteer, 4/3/2024 - 4/6/2024**

- Volunteered at the APS April Meeting 2024, preparing and hosting undergraduate oral presentation sessions.

### **American Astronomical Society Volunteer, 1/7/2024 - 1/11/2024**

- Volunteered at the AAS 243rd Meeting, supporting presentation sessions and assisting staff in event preparation.

### **UF's Campus Teaching Observatory Volunteer, March 2023 - November 2024**

- Provided educational sessions of various planets and nebulae for families and amateur astronomers.
- Assembled, calibrated, and dismantled 8- and 12.5-inch Schmidt-Cassegrain telescopes for public viewing.

### ***Solar Eclipse and Stargazing Event, Cuscowilla Nature and Retreat Center, October 2023***

- Delivered engaging educational presentations for families during the 2023 annular solar eclipse, offering solar eclipse and sunspot observations using an 8-inch Schmidt-Cassegrain telescope.

### ***Stellar spectroscopy and the origin of the elements STEM program for Florida, 3/30/2023***

- Facilitated educational sessions for middle school students with other volunteers, providing hands-on experience and guidance in observing celestial bodies using an 8-inch Schmidt-Cassegrain telescope.