

# McKayla Meier

Planetary Geochemistry Doctoral Researcher

## Appointments

### Doctoral Researcher

University of Florida | Summer 2023 - Present

### Masters Researcher

University of Idaho | Fall 2020 - Fall 2022

### Graduate Exploration Science Intern

Lunar and Planetary Institute | Summer 2021

### Undergraduate Researcher

Oregon State University | Spring 2017 - Spring 2020

### Research Assistant

Oregon State University | Winter 2018 - Spring 2020

### Technical Assistant

Oregon State University | Spring 2019 - Spring 2020

## Professional Experience

### Graduate Research Assistant

University of Florida | Fall 2024 - Present

### Research Mentor

Fall 2021 - Present

Abigail Griffis (University of Florida), for lunar basalt geochemistry

Sabrina Leon (University of Florida), for thesis on remote sensing and analog studies for Europa

Anya Castro Mendez (University of Idaho), for basaltic petrology

### Isotope Geochemistry and Cosmochemistry Workshop

Lunar and Planetary Institute | Fall 2024

### Proposal Panel Review Executive Secretary

NASA | 2025 (1), 2024 (2), 2023 (1)

### Terrestrial Analog Rover Science Team Member

Planetary Science Institute | Summer 2022 - Fall 2023

### Robotics Clubs Mars Rover Science Lead

Oregon State University | Fall 2016 - Spring 2020

## Teaching Experience

### NSF GeoSPACE Field Program Course Designer

University of Florida | Summer 2022 - Fall 2024

### Doctoral Teaching Assistant

University of Florida | Summer 2023 - Summer 2024

### Culturally Inclusive Planetary Engagement Workshop

Lunar and Planetary Institute | Fall 2023

### Introductory Science and Ecology Teacher

Corbett School District | Winter 2022 - Fall 2023

## Contact

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## Education

### Ph.D. in Geological Science

University of Florida, Present

Advisor: Stephen Elardo

### M.Sc. in Planetary Geology

University of Idaho, Fall 2022

Advisor: Alistair Smith

### B.Sc. in Earth Science

Oregon State University, Spring 2020

Advisor: Adam Kent

## Honors and Awards

### Skirvin and Thompson Fund Scholarship

University of Florida | 2023

### Jennings Coe Family Scholarship

Oregon State University | 2020

### Outstanding Geology Student

Oregon State University | 2019

### Taylor-Oles Scholarship

Oregon State University | 2018

### Samuel M. Evans, Jr Scholarship

Oregon State University | 2017

## Grants and Fellowships

**Funded: \$72,500 | Pending: \$11,000**

### Departmental Travel Grant

University of Florida | 2023, 2024

### Fall Meeting Travel Grant

Geological Society of America | 2022

### Graduate Travel Grant

University of Florida | 2022

### Lawrence A. Taylor Research Fund

American Geophysical Union | 2021

### LSAMP Fellowship

National Science Foundation | 2020

### Oregon NASA Space Grant

Oregon State University | 2020

## Outreach and Community Service

### Positions

#### **STEM Graduate Support and Workshop Organizer**

Fall 2021 - Present

Students individually mentored throughout the application process: JJ Ruse, Kaitlyn Krinsky, Keelyn Fife, Gabriela Gaarder, Gradon Robbins, Hailee Belcher, Sam Williams, Sabrina Leon, Alex Muller

#### **Graduate Mentor**

Geosciences Education & Mentorship Support | Fall 2024 - Present

#### **Student Ambassador**

International Association for Geoscience Diversity | Fall 2023 - Present

#### **Outreach Coordinator**

Association for Women Geoscientists, Northern Florida Chapter | Summer 2024 - Present

#### **Planetary Geology Presenter**

Scientist in Every Florida School | Fall 2023 - Present

#### **STEM Penpal**

Letters to a Pre-Scientist | Summer 2022 - Present

#### **K-12 Science Fair Judge**

Oregon School Districts | Summer 2023

#### **K-12 Geology Outreach Organizer**

University of Idaho | Spring 2021 – Fall 2022

#### **Educational Opportunities Program**

Oregon State University | Fall 2016 – Spring 2020

#### **Geoscience Club Trip Organizer**

Oregon State University | Fall 2016 – Spring 2020

### Events

#### **Exhibitor, “Girls Do Science” Science Day**

Florida Museum of Natural History | Winter 2025

#### **Exhibitor, K-12 TRIO Visits**

University of Florida | Winter 2025

#### **Creator, STEM Graduate School and Application Process Workshop Series**

Association for Women Geoscientists | Fall 2024

#### **Collaborator, GeoGradApp Workshops**

Kansas University | Summer 2024 - Fall 2024

#### **Exhibitor, “Can You Dig It” K-12 Science Day**

Florida Museum of Natural History | Spring 2024

### Invited Talks

“Increasing Inclusivity in the Geosciences Through Accessible Field Studies”

Invited talk | University of Florida Dean’s Leadership Council and Donors Meeting 2024

“Planetary Geology Research and Career Pathways”

Invited talk | University of Florida Women in Astrophysics and Astronomy Mentorship Panel 2024

**Publications** Total: 4 | Current Citations: 18 | H-index: 2

\*Alphabetical Authorship [Link to Google Scholar](#) [Link to ORCID](#)

## Papers in Preparation

- [8] **Meier, M.**, Frizzell, K., Kopp, M., Kodikara, G., Luchsinger, K., Madera, A., Paladino, T., Tai Udovicic, C., Patterson, R., Kring, D. (2025). Geological and Resource Analysis of Potential and Selected Artemis Lunar Landing Sites.
- [7] **Meier, M.**, Marshall, A., Elardo, S., Thatcher, S., Piatek, J., Williams, A., Arroyo, Y., Leon, S., Cabalceta, M., Gallant, E., Collins, T., Williams, D. (2025). Increasing Accessibility in the Geosciences Through Virtualizing Field Courses.
- [6] Banks, M., Bell, E., Ahrens, C., Knightly, P., **Meier, M.**, Patterson, R., Martin, A., Clark, R., Noe Dobrea, E. (2025). Exploring Integration of Astronaut Surface Operations and Science with Rover Autonomy.
- [5] Clark, R., Prettyman, T., Banks, M., Hendrix, A., Noe Dobrea, E., Lane, M., Vilas, F., Wright, S., Vaniman, D., Thieberger, C., Ahrens, C., Buxner, S., Pearson, N., Holsclaw, G., Borrelli, M., Kramer, G., Wettergreen, D., Vijayarangan, S., Candela, A., Breitfeld, A., Hansen, M., Kumari, N., Martin, A., Patterson, R., **Meier, M.**, Knightly, P., Steckel, A., Osterloo, M. (2025). Science Team Experience with an Autonomous Rover and Automated Science Analyses During the TREX 2021 and 2022 Field Campaigns.

## Peer-Reviewed Papers

- [4] \*Noe Dobrea, E., Ahrens, C., Banks, M., Bell, E., Breitfeld, A., Bristow, T., Candela, A., Clark, R., Hansen, M., Hendrix, A., Holsclaw, G., Knightly, P., Kramer, G., Kumari, N., Lane, M., Martin, A., **Meier, M.**, Patterson, R., Pearson, N., Prettyman, T., Steckel, A., Vijayarangan, S., Vilas, F., Wettergreen, D., Wright, S. (2025). Rover Science Autonomy in the Field.
- [3] Patterson, R., Lapen, T., Kring, D., Lemelin, M., **Meier, M.** (2024). Lithologies and Chronologic Opportunities of Materials Returned from the Artemis Exploration Zone. [Link to Paper](#)
- [2] \*Tai Udovicic C., Frizzell, K., Kopp, M., Kodikara, G., Luchsinger, K., Madera, A., **Meier, M.**, Paladino, T., Patterson, R., Wroblewski, F., Kring, D. (2023). Journal of Geophysical Research: Planets. Buried Ice Deposits in Lunar Polar Cold Traps Were Disrupted by Ballistic Sedimentation. [Link to Paper](#)
- [1] Rader, R., Ackiss, S., Sehlke, A., Bishop, J., Orrill, B., Odegaard, K., **Meier, M.**, Doloughan. (2022). Icarus. Average VNIR Reflectance: A Rapid, Sample-Free Method to Estimate Glass Content and Crystallinity of Fresh Basaltic Lava. [Link to Paper](#)

## Conference Abstracts

- [34] **Meier, M.**, Elardo, S. M., Pesar, E. A., Griffis, A. (2025). Geochemical Examination of Northeast Africa 039 and Comparison to other Low-Ti Lunar Basaltic Meteorites. LPS LVI (Abstract#1298).
- [33] Elardo, S. M., **Meier, M.**, Pesar, E. A. (2025). New Unbrecciated Basaltic Lunar Meteorite NWA 16286: A High-K, Moderate-Ti Basalt Potentially From a New Mare Unit. LPS LVI (Abstract#2476).
- [32] Piatek, J. L., Marshall, A., Gallant, E., **Meier, M.**, Thatcher, S., Tramel, N., Collins, T., Elardo, S. M., Williams, A. J., Williams, D. A. (2024). Reflections on an Accessible Field Course: Three Years of GeoSPACE. LPI Contributions, 3062, 2020.
- [31] Williams, D. A., Marshall, A., **Meier, M.**, Redding, S. L., Gallant, E., Piatek, J., Thatcher, S., Bearden, A., Arroyo, Y., Collins, T., Williams, A. J., Elardo, S. M. (2024). GeoSPACE: Bringing Field Geology and Planetary Geoscience to the Accessibility Challenged. LPI Contributions, 3043, 8001.
- [30] **Meier, M.**, Frizzell, K., Kodikara, G., Kopp, M., Luchsinger, K., Madera, A., Paladino, T., Patterson, R., Tai Udovicic, C., Kring, D. (2024). Detailed Geomorphic Analysis of Lunar Regions of Interests. LPS LV (Abstract#2086).
- [29] **Meier, M.**, Thatcher, S., Piatek, J., Marshall, A., Arroyo, Y., Leon, S., Williams, A., Collins, T., Gallant, E., Elardo, S., Williams, D. (2024). Improving Inclusivity and Accessibility in Planetary Science in Remote Field Courses. LPS LV (Abstract#1793).

- [28] Leon, S., **Meier, M.**, Elardo, S., Thatcher, S. Marshall, A. (2024). Morphological Mapping of Europa Chaos Terrains and the Potential of Terrestrial Sea-Ice Analogs. LPS LV (Abstract#2770).
- [27] Steckel, A., Clark, R., Prettyman, T., Kumari, N., **Meier, M.**, Pearson, N., Ahrens, C., Martin, A., Patterson, R., Lane, M., Vilas, F., Knightly, P., Wettergreen, D., Banks, M., Bell, E., Wright, S., Noe Dobrea, E., Hendrix, A. (2024). Mineral Identification Using Tetracorder During the TREX Field Campaign. LPS LV (Abstract#2793).
- [26] Gallant, E., Marshall, A., Piatek, J., Thatcher, S., Arroyo, Y., Collins, T., Williams, A., Elardo, S., **Meier, M.**, Williams, D. (2023). The GeoSPACE Project: Insights From the Pilot Years of a Hybrid Accessible Field Course. AGU.
- [25] **Meier, M.**, Thatcher, S., Piatek, J., Marshall, A., Arroyo, S., Elardo, S., Williams, A., Gallant, L., Williams, D., Collins, T. (2023). GeoSPACE: Mission Control and Astronaut Exploration Field Course Teachings. GSA.
- [24] Thatcher, S., **Meier, M.**, Piatek, J., Williams, A., Gallant, E., Marshall, A., Arroyo, Y., Elardo, S., Collins, T., Williams, D. (2023). Enhancing Spatial Reasoning Utilizing a Hybridized Field Course Model. GSA.
- [23] Arroyo, Y., Collins, T., Marshall, A., **Meier, M.**, Thatcher, S., Gallant, E. (2023). Going Live – Enabling Real Time Access to Field Sites Using Video Streaming and Discord. GSA.
- [22] Patterson, R., Lapen, T., Kring, D., Lemelin, M., **Meier, M.** (2023). Determining Ages of Rocks Accessible within the Artemis Exploration Regions. Artemis III Candidate Landing Regions Workshop (Abstract#2027).
- [21] Steckel, A., Clark, R., Pearson, N., Buxner, S., Prettyman, T., Kumari, N., **Meier, M.**, Ahrens, C., Martin, A., Patterson, R., Lane, M., Vilas, F., Knightly, P., Wettergreen, D., Banks, M., Bell, E., Wright, S., Noe Dobrea, E., Hendrix, A. (2023). Hyperspectral Imaging Spectrometer in A Geologic Unit Mapping in Planetary Analog Setting. DPS (Abstract#576).
- [20] **Meier, M.**, Patterson, R., Pearson, N., Clark, R., Martin, A., Kumari, N., Ahrens, C., Banks, M., Bell, E., Vilas, F., Osterloo, M., Knightly, P., Prettyman, T., Noe Dobrea, E., Hendrix, A. (2023). Terrestrial Analog Analysis: Mineralogical Evaluation Within The Visible and Near-Infrared. LPS LIV (Abstract#2742).
- [19] **Meier, M.**, Patterson, R., Castro Mendez, A., Rangel, J., Odegaard, K., Reeder, A., Rader, E. (2023). Geochemical and Spectral Assessment of Terrestrial Lava Flow Analogs. LPS LIV (Abstract#1687).
- [18] Kumari, N., Prettyman, T., Lane, M., Martin, A., Patterson, R., **Meier, M.**, Ahrens, C., Pearson, N., Clark, R., Vilas, F., Steckel, A., Knightly, P., Wettergreen, D., Banks, M., Bell, E., Wright, S., Noe Dobrea, E., Hendrix, A. (2023). Procedure Standardization For Toolbox For Research And Exploration (Trex) Field Data Analysis. LPS LIV (Abstract#1814).
- [17] Patterson, R., Lapen, T., Kring, D., Lemelin, M., **Meier, M.** (2023). Determining Ages of Rocks Accessible within the Artemis Exploration Zone. LPS LIV (Abstract#2121).
- [16] Cabalceta, M., **Meier, M.**, Thompson, A., Baker, A., Marshall, A., Williams, A., Piatek, J., Arroyo, Y., Collins, T., Thatcher, S., Gallant, L., Elardo, S., Williams, D. (2023). GeoSPACE: An Approach to Accessible and Inclusive Planetary Science Education. LPS LIV (Abstract#2871).
- [15] Prettyman, T., Buxner, S., Steckel, A., Knightly, P., Pearson, N., Hendrix, A., Noe Dobrea, E., Clark, R., Wettergreen, D., Ahrens, C., Kumari, N., Martin, A., **Meier, M.**, Patterson, R., Vilas, F. (2023). Radioelement Geochemistry: Rover Analog Study at Yellow Cat. LPS LIV (Abstract#1389).
- [14] \*Noe Dobrea, E., Ahrens, C., Banks, M., Bell, E., Breitfeld, A., Bristow, T., Candela, A., Clark, R., Hansen, M., Hendrix, A., Holsclaw, G., Knightly, P., Kramer, G., Kumari, N., Lane, M., Martin, A., **Meier, M.**, Patterson, R., Pearson, N., Prettyman, T., Steckel, A., Vijayarangan, S., Vilas, F., Wettergreen, D., Wright, S. (2023). Autonomous Rover Science in the Field: Yellow Cat. LPS LIV.
- [13] Steckel, A., Clark, R., Pearson, N., Prettyman, T., Kumari, N., **Meier, M.**, Ahrens, C., Martin, A., Patterson, R., Lane, M., Vilas, F., Knightly, P., Wettergreen, D., Banks, M., Bell, E., Wright, S., Noe Dobrea, E., Hendrix, A. (2023). Utilizing a Hyperspectral Camera for Field Surveys during the TREX Field Mission. LPS LIV.
- [12] **Meier, M.**, Neal, M., Abel-Zurstadt, M., Calbalceta, M., Olvera, A., Piatek, J., Williams, A., Marshall, A. (2022). GeoSPACE Remote Analysis Team: Virtually Exploring Volcanic Analogs for the Moon and Mars. Geological Society of America.

- [11] Gallant, E., Marshall, A., Piatek, J., Arroyo, Y., Collins, T., Elardo, S., **Meier, M.**, Thatcher, S., Williams, D. (2022). Using volcanic fields to improve accessibility in the geosciences: Examples from the GeoSpace pilot program. Earth and Space Science Open Archive.
- [10] Baker, A., Khan, S., **Meier, M.**, Olvera, A., Thompson, A., Gallant, E., Marshall, A. (2022). Preliminary field study of a small phreatomagmatic vent in the San Francisco Volcanic Field, AZ. Geological Society of America.
- [9] Pimentel, E., Baker, A., **Meier, M.**, Neal, M., Abel-Zurstadt, M., Cabalceta, M., Marshall, A. (2022). Virtual & In-Person Student Experiences in Field Geology: A Hybrid Approach to the Study of Vent 185 in the San Francisco Volcanic Field, Arizona. Geological Society of America.
- [8] **Meier, M.**, Rader, E., Sehkle, A., Zinzer, B., Orrill, B. (2021). Variations in Crystal Texture Observed in Basaltic Quench Margins: Interpreting Lava Cooling Rates on Earth and Mars. American Geophysical Union (Abstract#2139).
- [7] **Meier, M.**, Frizzell, K., Kopp, M., Kodikara, G., Luchsinger, K., Madera, A., Paladino, T., Tai Udovicic, C., Patterson, R., Wroblewski, F., Kring, D. (2022). Geomorphic and Resource Analysis of the VIPER Landing Site of the Artemis Program. LPS LIII (Abstract#1621).
- [6] \*Patterson, R., Frizzell, K., Kopp, M., Kodikara, G., Luchsinger, K., Madera, A., **Meier, M.**, Paladino, T., Tai Udovicic, C., Wroblewski, F., Kring, D. (2022). In Situ Resource Utilization Investigations Potential Artemis Landing Site 105, Lunar South Pole. LPS LIII (Abstract#1637).
- [5] Patterson, R., Rampe, E., Thorpe, M., Bedford, C., Gadera, O., **Meier, M.** (2022). Remote Sensing of Lake Sandvatn, Iceland: Analog for Gale Crater, Mars. LPS LIII (Abstract#2575).
- [4] \*Tai Udovicic C., Frizzell, K., Kopp, M., Kodikara, G., Luchsinger, K., Madera, A., **Meier, M.**, Paladino, T., Patterson, R., Wroblewski, F., Kring, D. (2022). Modeling the Effects of Basin Impacts and Ballistic Sedimentation on Ice in Lunar Cold Traps. LPS LIII (Abstract#1528).
- [3] Rader, E., Ackiss, S., Sehlke, A., Bishop, J., Orrill, B., Odegaard, K., **Meier, M.** (2021). VNIR brightness as an indicator of glass content in lava: Calibration of VNIR reflectance for crystallinity of basaltic lava flow surfaces. Workshop on Terrestrial Analogs for Planetary Exploration.
- [2] **Meier, M.**, and Kent, A. (2019). Petrology and Geochemistry of Volcanic Rocks From The Basement Beneath Mount Hood, Cascade Range, OR. Geological Society of America.
- [1] **Meier, M.** (2020). OSURC Mars Rover Exhibitor. American Association of the Advancement of Science Conference.