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: $98,200
Amelia Earhart Fellowship
Zonta International | 2025
Dissertation Improvement Fellowship
NASA Florida Space Grant | 2025
CLAS Travel Grant
University of Florida | 2024, 2025
Departmental Travel Grant
University of Florida |2023, 2024, 2025
Fall Meeting Travel Grant
Geological Society of America | 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 Representative
Department of Geological Sciences, University of Florida | Winter 2025 - Present

Graduate Mentor
Geosciences Education & Mentorship Support | Fall 2024 - Present

Student Ambassador
International Association for Geoscience Diversity | Fall 2023 - Present

President
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: 29 | H-index: 3

*Alphabetical Authorship Link to Google Scholar Link to ORCID

Papers in Preparation

[9] **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.

[8] **Meier, M.**, Marshall, A., Thatcher, S., Piatek, J., Williams, A., Arroyo, Y., Leon, S., Gallant, E., Collins, T., Elardo, S., Williams, D. (2025, submitted). Increasing Accessibility in the Geosciences Through Virtualizing Field Courses.

[7] 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.

[6] 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, submitted). Science Team Experience with an Autonomous Rover and Automated Science Analyses During the TREX 2021 and 2022 Field Campaigns.

[5] Marshall, A., Thatcher, S., Baker, A., Bearden, A., Piatek, J., **Meier, M.**, Gallant, E., Arroyo, Y., Williams, D., Williams, A., Elardo, S. (2025, submitted). Crip Trips: Field-Tested Guidelines for Designing Accessible, Inclusive Field Learning Experiences

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 (Asbtract#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.