Alissa Madera

Department of Earth and Planetary Sciences (EPS)
Rutgers, The State University of New Jersey
Wright Reiman Laboratories, 610 Taylor Road
Piscataway, NJ 08854

Email: am1505@eps.rutgers.edu
Phone: (732)-575-5079

Education

Present-2019 **Rutgers University**
Ph.D. Candidate, Department of Earth and Planetary Sciences
Thesis: *Combining Sample and Data Science with Remote Sensing to Understand the Geologic Evolution of Small-Planetary Bodies*
Est. Graduation: 2025

2013-2017 **Rutgers University**
B.A. Chemistry, ACS Certified Degree
Senior Project: *Extraterrestrial Samples: Unravelling their Chemical Composition and Crystallization History via Cathodoluminescence*

Research Experience

Present-2019 **Graduate Student Researcher,** Rutgers University, NJ
Department of Earth and Planetary Science
Advisor: Dr. Juliane Gross

- Studied the mineralogy and petrology of lunar mare basaltic meteorites using EPMA, SEM, and LA-ICP-MS.
- Developed the Lunar-Sample-Provenance (LSP) program to constrain potential source regions of lunar meteorites from the lunar surface using compositional data from remote sensing observations and sample analyses.

Summer 2021 **LPI Summer Exploration Science Graduate Intern,** (Virtual) Houston, Texas
Lunar and Planetary Science (LPI) and USRA
Advisor: Dr. David Kring

- Assisted in development of the MoonPIES (Polar Ice Stratigraphy and Ejecta) program to model lunar south pole geologic evolution and better understand the potential of ancient subsurface ice reservoirs for the future of lunar exploration.
- Surveyed regions of interest (ROI) in NASA classified Artemis "exploration zones" at the Lunar south pole to record sampling potential, ISRU, geomorphology, and hazards.

2017 **Undergraduate Senior Research,** Rutgers University, NJ
Department of Earth and Planetary Sciences
Advisor: Dr. Juliane Gross

- Studied chondrules and their zonation patterns using Electron Microprobe Analysis (EPMA) and cathodoluminescence

Fellowships

2021-2022 **Rutgers Excellence Fellowship, (**$30,000/yr), Department of Earth and Planetary Sciences, Rutgers University

2020-2021 **Teaching Assistant Fellowship,** ($28,000/yr), Department of Earth and Planetary Sciences, Rutgers University

2019-2020 **Teaching Assistant Fellowship,** ($28,000/yr), Department of Earth and Planetary Sciences, Rutgers University

Honors and Awards

2023	**Wiley Award (Top Oral Presentation),** 86th Annual Meeting of The Meteoritical Society
2023	**Barringer Crater Company Travel Award,** Flagstaff, AZ
2022	**EPS Chair Award**, Department of Earth, and Planetary Sciences (EPS), Rutgers University, NJ
2022	**SGS Travel Award,** School of Graduate Studies (SGS), Rutgers University, NJ
2021	**Excellence in Teaching Award,** Department of Earth and Planetary Sciences (EPS), Rutgers University, NJ
2021	**The George Rowe Award for Research in Mineralogy (Year 2)**, Department of Earth and Planetary Sciences (EPS), Rutgers University, NJ
2021	**The William & Grace Graduate Student Research Award,** Department of Earth and Planetary Sciences (EPS), Rutgers University, NJ
2020	**The George Award for Research in Mineralogy (Year 1),** Department of Earth and Planetary Sciences (EPS), Rutgers University, NJ

Teaching Experience

2023-2019	**Co-Adjunct (Non-Teaching)**, Rutgers University, NJ Course: Building Blocks of the Solar System *Responsibilities:* Graded assignements for level-100 introductory planeatry science course
2023-2019	**Invited Guest Lecturer,** Rutgers University, NJ Course: Introduction to Geology Invited guest lecturer to teach the basics of the periodic table and relevance of elements in Geology over the course of 6 semesters.
2021-2020	**Graduate Teaching Assistant**, Rutgers University, NJ Course: Introduction to Geology *Responsibilities*: Lab instructor, conducted introductory labs for subjects in Geology for a 100-level course. 20 students.
2020-2019	**Graduate Teaching Assistant,** Rutgers University, NJ Course: Planet Earth *Responsibilities:* Graded assignments for Online introductory Earth sciences, 100-level course. 300 students

Professional Development

Workshops & Trainings

2022	**NASA Proposal Writing and Evaluation Experience (NPWEE),** NASA/ASU L'Space Academy
2021	**Science Communicator for EVA Exercise at Meteor Crater**, NASA-JSC/USRA 2021 Virtual Science Operations Center

Services

2023	***President*, EPS Graduate Student Organization (GSO)** *Rutgers University, New Jersey*
2023	***Executive Secretary*, NASA Proposal Panel** *NASA*
2023	***Committee Member*, School of Graduate Studies (SGS) Graduate Diversity, Equity, & Inclusion (DEI) Advisory Committee** *Rutgers University, New Jersey*

2023-2021	***Vice President, EPS Graduate Student Organization (GSO)*** ***Rutgers University, New Jersey***
2022	***Committee Member & Reviewer*, 2022 Outstanding Educator Award** *Association of Women Geoscientists (AWG)*
2021	***Committee Member & Reviewer,* 2021 AWG Outstanding Educator Award** *Association of Women Geoscientists (AWG)*
2021-2020	***Secretary*, EPS Graduate Student Organization (GSO)** *Rutgers University, New Jersey*
2021	***Student Member*, EPS Undergraduate Student Recruitment Committee** *Rutgers University, New Jersey*

Outreach Services

Events

May 2023	**2023 Annual Science Fair Vendor,** Amsterdam Elementary School - *Somerset, NJ*
April 2023	**Menlo Park Earth Day Event Vendor,** Menlo Park Mall **-** *Piscataway, NJ*

Publications

Tai Udovicic, C. J., Frizzell, K. R., Kodikara, G. R. L., Kopp, M., Luchsinger, K. M., **Madera, A.**, Meier, M. L., Paladino, T. G., Patterson, R. V., Wroblewski, F. B., Kring, D. A., (*In Review*), Buried Ice Deposits in Lunar Polar Cold Traps were Disrupted by Ballistic Sedimentation, *Journal of Geophysical Research-Planets*

Abstracts

Madera, A., Gross, J., Fagan, A.L. (2023), Sector-zoned pyroxenes in young lunar mare basalt, Northwest Africa (NWA) 8632: Insights into crystallization kinetics during late-stage volcanism on the Moon, *86th MetSoc, #6053*

Tai Udovicic, C. J., Frizzell, K. R., Kodikara, G. R. L., Kopp, M., Luchsinger, K. M., **Madera, A.**, Meier, M. L., Paladino, T. G., Patterson, R. V., Wroblewski, F. B., Kring, D. A. (2022), Buried ancient ice deposits were likely dispersed due to ballistic sedimentation, *2022 Lunar Polar Volatiles Conference,* #5022

Madera, A. and Gross, J. (2022), Lunar-Sample-Provenance (LSP) Program: Determining the Potential Source Regions of Lunar Basaltic Meteorites, *53rd LPSC,* #2823

Wroblewski, F. B., Frizzell, K. R., Kodikara, G. R. L., Kopp, M., Luchsinger, K. M., **Madera, A.**, Meier, M. L., Paladino, T. G., Patterson, R. V., Tai Udovicic, C. J., Kring, D. A., (2022), 1:2500 Geomorphological Map of the Intercrater Region Between Shackleton Crater and Shoemaker Crater of the Lunar South Pole, *53rd LPSC*, #1687

Meier, M. L., Frizzell, K. R., Kodikara, G. R. L., Kopp, M., Luchsinger, K. M., **Madera, A.**, Paladino, T. G., Patterson, R. V., Tai Udovicic, C. J., Wroblewski, F. B., Kring, D. A., (2022), Geomorphic and Resource Analysis of the VIPER Landing Site of the Artemis Program, *53rd LPSC*, #1621

Patterson, R. V., Frizzell, K. R., Kodikara, G. R. L., Kopp, M., Luchsinger, K. M., **Madera, A.**, Meier, M. L., Paladino, T. G., Tai Udovicic, C. J., Wroblewski, F. B., Kring, D. A., (2022), In Situ Resource Utilization Investigations of Potential Artemis Landing Site 105, Lunar South Pole, *53rd LPSC*, #1637

Tai Udovicic, C. J., Frizzell, K. R., Kodikara, G. R. L., Kopp, M., Luchsinger, K. M., **Madera, A.**, Meier, M. L., Paladino, T. G., Patterson, R. V., Wroblewski, F. B., Kring, D. A., (2022), Modeling the Effects of Basin Impacts and Ballistic Sedimentation on Ice Lunar Cold Traps, *53rd LPSC*, #1528

Madera, A., Gross, J. (2021): Provenance of lunar basaltic meteorite Northwest Africa 8632 and related meteorites. *52nd LPSC,* #2686

Presentations

Oral Presentations

August 2023 — **Conference Presenter, Title: "Sector-zoned Pyroxenes in Young Lunar Mare Basalt, Northwest Africa (NWA) 8632: Insights into Crystallization Kinetics During Late-Stage Volcanism on the Moon"**, 86th Annual Meteoritical Society Meeting – *Los Angeles, CA*

January 2023 — **Invited Speaker, Title: "Lunar Meteorites: Puzzle Pieces of the Moon",** Amateur Astronomers Inc. (AAI) – *Union Community College, Cranbury, NJ*

March 2022 — **Conference Presenter, Title: "Lunar-Sample-Provenance (LSP) Program: Determining the Potential Source Regions of Lunar Basaltic Meteorites",** 53rd Lunar and Planetary Science Conference (LSPC) – *Virtual Attendance, Houston, Texas*

August 2021 — **LPI Summer Exploration Science Graduate Internship Presentation, Title: "Modelling the Effects of Basin Impacts and Ballistic Sedimentation on Polar Ice Stratigraphy within Lunar Craters",** Lunar and Planetary Institute (LPI) **–** *Virtual, Houston, Texas*

March 2021 — **Conference Presenter, Title: "Provenance of Lunar Basaltic Meteorite NWA 8632 and Related Meteorites",** 52nd Lunar and Planetary Science Conference (LPSC) **–** *Virtual LPSC, Houston, Texas*

November 2020 — **Invited Speaker, Title: "The Moon",** Great American Teach In - *Hillsborough Elementary, Tampa, Florida*

May 2020 — **Speaker, Title: "Rock the Elements!", "Ask a Geologist",** Geology Museum Summer Series **-** *Rutgers Geology Museum, New Brunswick, NJ*

Poster Presentations

May 2017 — **Madera, A.,** Gross, J. "Extraterrestrial Samples: Unraveling their Chemical Composition and Crystallization History via Cathodoluminescence", Department of Earth and Planetary Sciences, Rutgers University, NJ

Membership

2019 — **American Geophysical Union**, AGU
2019 — **Geological Society of America**, GSA
2020 — **Society for Advancement of Chicanos/Hispanics and Native Americans in Science,** SACNAS
2020 — **Society of Latinx/Hispanics in Earth and Space Sciences,** SOLESS
2021 — **GeoLatinas**
2023 — **Mineralogical Society of America**, MSA