Dr. Alexander Sehlke

NASA Ames Research Center, Building N245, MS N245-3, Moffett Field, CA 94035 alexander.sehlke@nasa.gov
(650) 604-3651 planetsehlke.rocks Google Scholar 0000-0001-7929-1776 Alexander-Sehlke

Summary

Position and Focus: Planetary geologist at NASA Ames Research Center/BAER Institute, specializing in the scientific exploration of the solar system through returned sample analyses, fieldwork, space flight hardware development, and NASA-led science exploration missions. Serving as Principal Investigator (PI) and Co-Investigator (Co-I) on multiple research awards funded by NASA's Science Mission Directorate (SMD).

Publications and Presentations: Author of 30 peer-reviewed papers in international scientific journals and over 100 scientific abstracts presented at prestigious international conferences such as the American Geophysical Union (AGU), Lunar and Planetary Science Conference (LPSC), Meteoritical Society (MetSoc), among others.

Teaching and Mentoring: Extensive experience in teaching and mentoring students at high school, undergraduate, and graduate levels.

Current Position

- Research Scientist at NASA Ames Research Center, contracting through the Bay Area Environmental Research Institute, Moffett Field, CA 94035

Education

PhD **University of Missouri, Columbia MO**, Geological Sciences — Jan 2011 – Dec 2015
- Minor in College Science Teaching

Dipl **Leibniz Universitaet Hannover, Germany**, Geosciences — Oct 2005 – Dec 2010
- Minor in Material Sciences

Professional Appointments

NASA Ames Research Center/ BAER Institute, Research Scientist — Moffett Field, CA, USA, Jan 2019 – present
- *Apollo Lunar Sample Analysis*: Thermochronology of the lunar surface and subsurface via thermoluminescence measurements, with emphasis on cold trap prospecting in anticaption of NASA's Artemis program.
- *Planetary Analog Research*: Conducting fieldwork and laboratory studies on Earth's geological formations that serve as analogs for terrains on other terrestrial planets and the Moon.
- *Space-Flight Instrument Research*: Developing and testing novel scientific instruments for human and robotic exploration missions.
- *NASA VIPER Mission*: Serving as Instrument Scientist for the Volatiles Investigating Polar Exploration Rover (VIPER) mission.
- *NASA Ames Vertical Gun Range*: Science PI overseeing the scientific direction of one of NASA's experimental facilities.

NASA Ames Research Center/ USRA, Postdoctoral Researcher — Moffett Field, CA, USA, Feb 2016 – Jan 2019
- Planetary Analog Research: Volcanic Terrains on Earth as Analogs for the Moon and

Mars

- Instrument Development for Human Space Exploration Missions

Awards and Honors

NASA Ames Honor Award

- Contractor Employee in 2020
- Partnership RESOURCE Research Program in 2020
- Team/Group BASALT Research Program in 2020
- Team/Group FINESSE Research Program in 2018

Committees and Assignments

SSERVI NASA Exploration Science Forum, Session Co-Chair July 2024

- Sample Science
- In-Situ Resource Utilization

SSERVI NASA Exploration Science Forum, Session Co-Chair July 2022

- Apollo Next Generation Sample Analysis

SSERVI NASA Exploration Science Forum, Science Organization Committee Co-Chair Mar 2022 – July 2022

Lunar and Planetary Science Conference Mar 2022

- Moderator: Planetary Volcanism: Eruptions in Fire and Ice
- Moderator: Lunar Regolith Properties and Processes

Lunar Surface Science Workshop #17 - Defining a Coordinated Lunar Resource Evaluation Campaign July 2022

- Documentarian

Lunar Surface Science Workshop #13 - Inclusive Lunar Exploration Jan 2022

- Session Co-Chair
- Documentarian

Peer Review Assignments: NASA Research Proposals 2016 – present

- Several NASA Research Opportunities in Space and Earth Science (ROSES) program proposals, once or twice per year. Served as External Reviewer, Executive Secretary, Panelist, and Panel Chair.

Peer Review Assignments: Manuscripts 2015 – present

- International scientific journals, such as *Journal of Geothermal Research, Frontiers in Earth Science, Journal of Volcanology and Geophysical Research, Earth and Planetary Science Letters, Icarus, American Ceramic Society*

Publications

Cold Trap Prospecting on the Moon: Theory and Insights from Low Temperature Thermoluminescence of Lunar Regolith. 2024

A Sehlke, D Sears, and the ANGSA Science Team

Icarus, in review

Asteroid 2024 BX1 Returns Sample of a Wet Magma Ocean 2024

C Hamann, P Jenniskens, R Luther, A van den Neucker, A Greshake, and with ' ***A Sehlke***' among 92 other international co-authors'

Science, in review

Geomorphological evidence of near-surface ice at candidate landing sites in northern Amazonis Planitia, Mars 2024

E Luzzi, JL Heldmann, K Williams, G Nodjoumi, A Deutsch, ***A Sehlke***

JGR Planets, in review

Thermoluminescence and Apollo 17 ANGSA lunar samples: NASA's fifty-year experiment and prospecting for cold traps 2024

DWG Sears, ***A. Sehlke***, HH Schmitt, and the ANGSA Science Team

Journal of Geophysical Research: Planets, Volume 129(4), in press

Apollo Next Generation Sample Analysis (ANGSA): An Apollo Participating Scientist Program to Prepare the Lunar Sample Community for Artemis 2024

CK Shearer, FM McCubbin, S Eckley, SB Simon, A Meshik, F McDonald, HH Schmitt, RA Zeigler, J Gross, J Mitchell, C Krysher, RV Morris, R Parai, BL Jolliff, JJ Gillis-Davis, K Joy, SK Bell, P Lucey, L Sun, Z Sharp, C Dukes, ***A Sehlke***, A Mosie, J Allton, C Amick, JI Simon, TM Erickson, JJ Barnes, MD Dyar, K Burgess, N Petro, D Moriarty, NM Curran, JE Elsila, RA Colina-Ruiz, T Kroll, D Sokaras, HA Ishii, JP Bradley, D Sears, B Cohen, O Pravdivseva, MS Thompson, CR Neal, R Hanna, R Ketcham, K Welten, and the ANGSA Science Team

https://doi.org/10.1007/s11214-024-01094-x (Space Science Review, Volume 220:62)

Synthetic analogs for lava flows on the surface of Mercury: A mid-infrared study 2024

A Morlok, ***A Sehlke***, AN Stojic, AG Whittington, I Weber, MP Reitze, Hiesinger H, Helbert J.

https://doi.org/10.1016/J.ICARUS.2024.116078 (Icarus, Volume 415)

The Apollo 17 Regolith: Induced Thermoluminescence Evidence for Formation by a Single Event ~100 Million Years Ago and Possibly the Presence of Tycho Material 2024

A Sehlke, DWG Sears, and the ANGSA Science Team

https://doi.org/10.1029/2023JE008083 (Journal of Geophysical Research: Planets, Volume 129(4))

Average VNIR reflectance: A rapid, sample-free method to estimate glass content and crystallinity of fresh basaltic lava 2022

E Rader, S Ackiss, ***A Sehlke***, J Bishop, B Orrill, K Odegaard, M Meier, A Doloughan

https://doi.org/10.1016/j.icarus.2022.115084 (Icarus, Volume 383)

Ejecta blocks around the Kings Bowl phreatomagmatic crater in Idaho: An indication of subsurface water amounts with implications for Mars 2022

DWG Sears, ***A Sehlke***, SS Hughes, S Kobs-Nawotniak

10.1016/j.pss.2022.105564 (Planetary and Space Science, Volume 222)

Spontaneous reheating of crystallizing lava 2021

AG Whittington, ***A Sehlke***

10.1130/g49148.1 (Geology, Volume 49 Issue 12)

The impact and recovery of asteroid 2018 LA 2021

P Jenniskens, M Gabadirwe, QZ Yin, A Proyer, O Moses, and with '***A Sehlke***' among 61 other international co-authors'

https://doi.org/10.1111/maps.13653 (Meteoritics & Planetary Science, Volume 56, Issue 4)

Induced thermoluminescence as a method for dating recent volcanism: The Blue Dragon flow, Idaho, USA and the factors affecting induced thermoluminescence 2021

DWG Sears, ***A Sehlke***, SS Hughes

https://doi.org/10.1016/j.pss.2020.105129 (Planetary and Space Science, Volume 195)

Basaltic fissure types on Earth: Suitable analogs to evaluate the origins of volcanic terrains on the Moon and Mars? 2020

SS Hughes, WB Garry, ***A Sehlke***, EH Christiansen, SE Kobs Nawotniak, DWG Sears, RC Elphic, DS Lim, JL Heldmann

10.1016/J.PSS.2020.105091 (Planetary and Space Science, Volume 193)

Thermal properties of glassy and molten planetary candidate lavas 2020

A Sehlke, AM Hofmeister, AG Whittington

https://doi.org/10.1016/J.PSS.2020.105089 (Planetary and Space Science, Volume 193)

Rheology of a KREEP Analog Magma: Experimental Results Applied to Dike Ascent through the Lunar Crust 2020

A Sehlke, AG Whittington

https://doi.org/10.1016/j.pss.2020.104941 (Planetary and Space Science, Volume 187)

Microbial community distribution in variously altered basalts: Insights into astrobiology sample site selection 2020

A Brady, E Gibbons, ***A Sehlke***, C Renner, S Kobs Nawotniak, D Lim, G Slater

10.1016/j.pss.2020.105107 (Planetary and Space Science, Volume 194)

The rheology of crystallizing basaltic lavas from Nyiragongo and Nyamuragira volcanoes, D.R.C. 2020

A Morrison, AG Whittington, B Smets, M Kervyn, ***A Sehlke***

https://doi.org/10.30909/vol.03.01.0128 (Volcanica, Volume 3 Issue 1)

A Low-Diversity Microbiota Inhabits Extreme Terrestrial Basaltic Terrains and Their Fumaroles: Implications for the Exploration of Mars 2019

C Cockell, J Harrison, A Stevens, S Payler, S Hughes, S Kobs Nawotniak, A Brady, R Elphic, C Haberle, ***A Sehlke***, K Beaton, A Abercromby, P Schwendner, J Wadsworth, H Landenmark, R Cane, A Dickinson, N Nicholson, L Perera, D Lim

10.1089/ast.2018.1870 (Astrobiology, Volume 19 Issue 3)

Opportunities and Challenges of Promoting Scientific Dialog throughout Execution of Future Science-Driven Extravehicular Activity 2019

SE Kobs Nawotniak, MJ Miller, AH Stevens, JJ Marquez, SJ Payler, AL Brady, SS Hughes, CW Haberle, ***A Sehlke***, KH Beaton, SP Chappell, RC Elphic, DSS Lim

10.1089/ast.2018.1901 (Astrobiology, Volume 19 Issue 3)

The BASALT Research Program: Designing and Developing Mission Elements in Support of Human Scientific Exploration of Mars 2019

D Lim, A Abercromby, S Kobs Nawotniak, D Lees, M Miller, A Brady, Z Mirmalek, ***A Sehlke***, S Payler, A Stevens, C Haberle, K Beaton, S Chappell, S Hughes, C Cockell, R Elphic, M Downs, JL Heldmann

10.1089/ast.2018.1869 (Astrobiology, Volume 19 Issue 3)

Basaltic Terrains in Idaho and Hawai'i as Planetary Analogs for Mars Geology and Astrobiology 2019

S Hughes, C Haberle, S Kobs Nawotniak, ***A Sehlke***, W Garry, R Elphic, S Payler, A Stevens, C Cockell, A Brady, JL Heldmann, D Lim

10.1089/ast.2018.1847 (Astrobiology, Volume 19 Issue 3)

Strategic Planning Insights for Future Science-Driven Extravehicular Activity on Mars 2019

A Brady, S Kobs Nawotniak, S Hughes, S Payler, A Stevens, C Cockell, R Elphic, ***A Sehlke***, C Haberle, G Slater, D Lim

10.1089/ast.2018.1850 (Astrobiology, Volume 19 Issue 3)

Requirements for Portable Instrument Suites during Human Scientific Exploration of Mars 2019

A Sehlke, Z Mirmalek, D Burtt, CW Haberle, D Santiago-Materese, SE Kobs Nawotniak, SS Hughes, WB Garry, N Bramall, AJ Brown, JL Heldmann, DSS Lim

10.1089/ast.2018.1841 (Astrobiology, Volume 19 Issue 3)

Induced thermoluminescence as a method for dating recent volcanism: Hawaii County, Hawaii, USA 2018

DWG Sears, H Sears, ***A Sehlke***, SS Hughes

10.1016/j.jvolgeores.2017.09.022 (Journal of Volcanology and Geothermal Research, Volume 349)

X-ray computed tomography of extraterrestrial rocks eradicates their natural radiation record and the information it contains 2018

DWG Sears, ***A Sehlke***, JM Friedrich, ML Rivers, DS Ebel

10.1111/maps.13183 (N/A, Volume 53 Issue 12)

Induced thermoluminescence as a method for dating recent volcanism: Eastern Snake River Plain, Idaho, USA 2017

DWG Sears, H Sears, ***A Sehlke***, S Hughes

10.1002/2016JB013596 (Journal of Geophysical Research: Solid Earth, Volume 122 Issue 2)

Transport properties of glassy and molten lavas as a function of temperature and composition 2016

A Hofmeister, ***A Sehlke***, G Avard, A Bollasina, G Robert, AG Whittington

10.1016/j.jvolgeores.2016.08.015 (Journal of Volcanology and Geothermal Research, Volume 327)

The viscosity of planetary tholeiitic melts: A configurational entropy model 2016

A Sehlke, AG Whittington

10.1016/j.gca.2016.07.027 (Geochimica et Cosmochimica Acta, Volume 191)

Field and experimental constraints on the rheology of arc basaltic lavas: the January 2014 Eruption of Pacaya (Guatemala) 2016

A Soldati, ***A Sehlke***, G Chigna, AG Whittington

10.1007/s00445-016-1031-6 (Bulletin of Volcanology, Volume 78 Issue 6)

Rheology of lava flows on Mercury: An analog experimental study 2015

A Sehlke, AG Whittington

10.1002/2015JE004792 (Journal of Geophysical Research E: Planets, Volume 120 Issue 11)

Thermal diffusivity of Fe-rich pyroxene glasses and their melts 2014

A Hofmeister, ***A Sehlke***, AG Whittington

10.1016/j.chemgeo.2014.06.018 (Chemical Geology, Volume)

Textural and rheological evolution of basalt flowing down a lava channel 2014

B Robert, AJ Harris, L Gurioli, E Médard, ***A Sehlke***, AG Whittington

10.1007/s00445-014-0824-8 (Bulletin of Volcanology, Volume 76 Issue 6)

Pahoehoe to a'a' transition of Hawaiian lavas: An experimental study 2014

A Sehlke, AG Whittington, B Robert, AJ Harris, L Gurioli, E Médard

10.1007/s00445-014-0876-9 (Bulletin of Volcanology, Volume 76 Issue 11)

Abstracts and Presentations

Glimmerings in the Cold and Dark: Thermoluminescence of Lunar Regolith at Cryogenic Temperatures for Cold Trap Prospecting 2024

A Sehlke, DWG Sears

NASA Exploration Science Forum held at Washington University in St. Louis, MO, USA

Science, Operations, and Technology from NASA's RESOURCE Project 2024

JL Heldmann, ***A Sehlke***, MC Deans, and the RESOURCE Team

NASA Exploration Science Forum held at Washington University in St. Louis, MO, USA

Update on the Near Infrared Volatiles Spectrometer System (NIRVSS) Instrument on the Volatiles Investigating Polar Exploration Rover (VIPER) Mission: Calibration and Surface Operations 2024

A Sehlke, A Colaprete, K Ennico-Smith, S Gyalay, E Noe Dobrea, TL Roush, JE Benton, R Bielawski, M Chin, J Connally, A Cook, L Ellingson, JB Forgione, DT Hoang, V Jha, A Rademacher, F Renema, EJ Talle, B White, C Youngquist, and the VIPER Science Team

NASA Exploration Science Forum held at Washington University in St. Louis, MO, USA

The Apollo 17 Regolith: Induced Thermoluminescence Evidence for Formation by a Single Event 100 Million Years Ago and Possibly the Presence of Tycho Material 2024

A Sehlke, DWG Sears, ANGSA Science Team

55th Lunar and Planetary Science Conference, Abstract Nr. 2536

Lunar Regolith Thermoluminescence Glow Curve Fitting to Extract Its Most Important Kinetic Parameters. 2023

A Sehlke, DWG Sears, ANGSA Science Team

54th Lunar and Planetary Science Conference, Abstract Nr. 1870

New Model to Calculate Lava Viscosity During Disequilibrium Crystallization for a Wide Range in Cooling and Strain Rates 2023

A Sehlke, AWG Whittington

54th Lunar and Planetary Science Conference, Abstract Nr. 2677

Thermal Histories of Lunar Cold Traps: Prospecting for Volatiles by Thermoluminescence. 2022

A Sehlke, DWG Sears

Lunar Polar Volatiles Conference, LPI Contrib. Nr. 5024

A Fifty-Year Experiment, the Natural TL Kinetics of Apollo 17 Regolith, and Prospecting for Water and Other Volatiles on the Moon 2022

A Sehlke, DWG Sears, ANGSA Science Team
53rd Lunar and Planetary Science Conference, LPI Contrib. Nr. 2030

THEIA — A Thermal History Exploration Instrument for Artemis 2022
A Sehlke, DWG Sears, JL Heldmann
Annual Meeting of the Lunar Exploration Analysis Group, Abstract Nr. 5005

In-Situ Thermoluminescence Measurements on the Moon Using THEIA - Thermal History Exploration Instrument for Artemis 2022
A Sehlke, DWG Sears, JL Heldmann
NASA Exploration Science Forum held at the University of Colorado, Boulder CO, USA

Five Decades of Thermoluminescence Studies on Lunar Samples: First Results of NASA's Unique 46-Year Experiment and Implications for Resource Prospecting on the Moon 2022
A Sehlke, DWG Sears, ANGSA Science Team
53rd Lunar and Planetary Science Conference, Abstract Nr. 1267

High-Temperature Rheology Measurements on Planetary Analog Magmas and Lavas 2022
A Sehlke, DWG Sears, ANGSA Science Team
53rd Lunar and Planetary Science Conference, Abstract Nr. 1171

Lava Surface Roughness and Morphologies: A New Remote-Sensing Method To Estimate Physical Properties of Lava Flows on Earth, the Moon and Mars 2021
A Sehlke, J Leija, SE Kobs Nawotniak
Workshop on Terrestrial Analogs for Planetary Exploration

Natural Thermoluminescence of Lunar Samples: Review and Update 2021
A Sehlke, DWG Sears, ANGSA Science Team
52nd Lunar and Planetary Science Conference, Abstract Nr. 2548

A luminescence-based Instrument to Explore the History and Nature of the Lunar Surface 2020
A Sehlke, DWG Sears
American Geophysical Union 2020 Fall Meeting. Abstract Nr. V013-0006

Looking Backwards to Look Forward: A Fifty-Year Experiment in the Kinetics of Thermoluminescence of Lunar Samples and the Apollo Next Generation Sample Analysis Program (ANGSA) 2020
A Sehlke, DWG Sears, ANGSA Science Team
51st Lunar and Planetary Science Conference, Abstract Nr. 1148

Thermal Properties of Glassy and Molten Planetary Candidate Lavas. 2019
A Sehlke, AM Hofmeister, AG Whittington
American Geophysical Union Annual Fall Meeting

Requirements for portable instrument suites during human scientific exploration of Mars 2018
A Sehlke, Z Mirmalek, D Burtt, CW Haberle, D Santiago-Materese, SE Kobs Nawotniak, SS Hughes, WB Garry, N Bramall, AJ Brown, JL Heldmann, DSS Lim
NASA Exploration Science Forum held at NASA Ames Research Center, Moffett Field CA, USA

Invited Talks, Lectures and Presentations

Requirements for Handheld VNIR and XRF Instruments during Human Exploration Missions. 2022
Lunar Petrology and Landed Instrument Interchange Workshop
NASA Jet Propulsion Laboratory, Pasadena CA, USA

Exploration of our Solar System: Earth-based Science Investigations in Preparation for NASAs Moon to Mars Campaign. Graduate Student Seminar. 2021
Graduate Student Seminar (virtual)
Department of Geological Science, University of Texas at San Antonio, USA

Rheological and Thermal Evolution of Magmatic Systems: Insights into the Volcanic Past of our Solar System. 2020
Speaker Seminar Series
Departement of Earth and Planetary Sciences, University of California - Santa Cruz CA, USA

Rheological and Thermal Evolution of Magmatic Systems: Insights into the Volcanic Past in our Solar System 2019
Keynote at GeoMünster Conference
Münster, Germany

Anatomy of the Blue Dragon: Changes in Lava Flow Morphology and Physical Properties Observed in an Open Channel Lava Flow as a Planetary Analogue. 2017
Geological Society of America Annual Meeting
Seattle WA, USA

Designing Future Human Spaceflight 2017
Keynote at Sensors Expo 2017
San Jose CA, USA

Straight outta morphologies: Understanding the magmatic history of lava terrains on Earth and other rocky worlds in our Solar System 2017
Speaker Seminar Series
Department of Geological Sciences, San Jose State University, San Jose CA, USA

The morphological transition from pāhoehoe to aā of basaltic lavas: Combining field studies and experimental work to interpret the volcanic past on Earth and other planets and moons. 2017
Speaker Series Seminar
United States Geological Survey (USGS), Menlo Park CA, USA

Interviews and Mentions in Media

The Secrets of Moondust July 2019
written by Marina Koren (The Atlantic Staff Writer)
The Atlantic

NASA's lassoing of moon's potential for future use starts with a trove of rocks Mar 2019
written by Peter Fimrite (Science and Environment Reporter)
San Francisco Chronicle (Front Page, continued on pg. A8)

Research Awards and Funding

The Ames Vertical Gun Range — Oct 2024 – Sept 2028

- NASA ROSES Planetary Science Enabling Facilities Program $1,567,144
- PI: Chuck Cornelison, Science PI: Alexander Sehlke

1-Year Funded Extension, Thermoluminescence Studies on Frozen Apollo 17 Samples: Temperature Estimates of Shaded and Illuminated Lunar Surfaces. — Apr 2023 – Mar 2024

- NASA ROSES Science Mission Directorate Single-Source - By invitation only (2022), $113,000
- PI: Alexander Sehlke, Co-I: Derek WG Sears

1-Year Funded Extension, Thermoluminescence Studies on Frozen Apollo 17 Samples: Temperature Estimates of Shaded and Illuminated Lunar Surfaces. — Apr 2022 – Mar 2023

- NASA ROSES Apollo Next Generation Sample Analysis (ANGSA) Program, $103,359
- PI: Alexander Sehlke, Co-I: Derek WG Sears

THEIA: Thermal History Exploration Instrument for Artemis — Oct 2020 – Sept 2021

- NASA Ames Research Center Innovation Funds, $41,000
- PI: Jennifer Heldmann, Co-Is: Alexander Sehlke, Derek WG Sears

Resources for Exploration & Science of OUR Cosmic Environment (RESOURCE) — Feb 2020 – Jan 2025

- NASA Solar System Exploration Virtual Research Institute (SSERVI), $7,452,467
- PI: Jennifer Heldmann, Deputy PIs: Alexander Sehlke, Matthew Deans, Co-Is: 16 across academia, federal agencies and private sector

Thermoluminescence Studies on Frozen Apollo 17 Samples: Temperature Estimates of Shaded and Illuminated Lunar Surfaces. — Apr 2019 – Mar 2022

- NASA ROSES Apollo Next Generation Sample Analysis (ANGSA) Program, $348,050
- PI: Alexander Sehlke, Co-I: Derek WG Sears

Fast and/or Furious? Nature and Emplacement History of Lavas Erupted on Mars — May 2019 – Apr 2022

- NASA ROSES Solar System Workings (SSW) Program, $490,705
- PI: Alexander Sehlke, Co-I: Alan G Whittington

IceCrystal: Portable instrument protocol to delineate ancient ice and water on Mars using microcrystallinity of volcanic products — Oct 2018 – Sept 2021

- NASA ROSES Planetary Science and Technology from Analog Research (PSTAR) Program, $874,012
- PI: Erika Rader, Co-Is: Alexander Sehlke, Janice Bishop

NASA Postdoctoral Fellowship 3rd-Year Extension — Feb 2018 – Jan 2019

- NASA ROSES Postodoctoral Program (NPP), $86,866
- PI: Alexander Sehlke, Co-Is: Jennifer Heldmann, Darlene SS Lim

NASA Postdoctoral Fellowship — Feb 2016 – Jan 2018

- NASA ROSES Postodoctoral Program (NPP), $149,248
- PI: Alexander Sehlke, Co-Is: Jennifer Heldmann, Darlene SS Lim

Teaching Experience

University of Missouri - Columbia MO, USA 2011 – 2015

- 2015 Course Instructor - The Moon. Undergraduate
- 2015 Teaching Assistant - Regional Geology Field Course. Undergraduate
- 2014 Teaching Assistant/Lab Experiments - Igneous Petrology. Graduate
- 2013 Teaching Assistant - Mineralogy. Undergraduate
- 2012 Teaching Assistant - Mineralogy. Undergraduate
- 2011 Teaching Assistant - Mineralogy. Undergraduate

Mentoring Experience

NASA Internship mentoring at NASA Ames Research Center

- Summer 2024 (virtual), Arjun Prem, Summit Tahoma Highschool, San Jose CA, USA
- Summer 2024, Jordan Baden, Undergraduate at University of California, Santa Cruz CA, USA
- Summer 2023, Adriana Ariza Pardo, Graduate at UT San Antonio TX, USA
- Spring 2021, Iyare Oseghae. Undergraduate at UT San Antonio TX, USA
- Fall 2020 (virtual), Brianna Orrill, Undergraduate at Arizona State University AZ, USA
- Fall 2020 (virtual), Javier Leija, Undergraduate at Sam Houston University TX, USA
- Summer 2018, Caleb Renner, Undergraduate at Idaho State University ID, USA
- Spring 2017, David Burtt, Undergraduate at Whitman College WA, USA

Technology and Inventions

THEIA - Thermal History Exploration Instrument for Artemis: Instrument protoype to enable thrmoluminescence measurements on the lunar surface via robotic or human exploration missions. Technology Readiness Level (TRL) is 4. Invention is submitted to NASA's *New Technology Reporting (NTR) System*, with e-NTR Number 1684365045.

Public Outreach and Engagement

ExMASS (Exploration of the Moon and Asteroids by Secondary Students) Science Advisor Oct 2023 – July 2024

- Logos Charter School, Medford OR, USA - virtual

ExMASS (Exploration of the Moon and Asteroids by Secondary Students) Science Advisor Oct 2022 – July 2023

- Logos Charter School, Medford OR, USA - virtual

Silicon Valley Comic Con, San Jose CA, USA July 2019

- Panel Discussion on *The Artemis Generation: NASA's Journey Forward to the Moon.*

Fremont Peak Observatory, San Juan Bautista CA, USA Aug 2017

- Volcanism on terrestrial planets and moons across our solar system