

Sean I. Peters

Last Updated April 18th, 2024

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Postdoctoral Fellow
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EDUCATION

2020 **Ph.D. – Geological Sciences, School of Earth and Space Exploration (SESE), Arizona State University (ASU), USA.**

Dissertation: The emplacement of lava flows: implications for volcanic hazards and planetary evolution

Advisor: Philip R. Christensen

2015 **M.S. – Geological Sciences, SESE, ASU, USA.**

Thesis: Investigating Late Amazonian Volcanotectonic Activity on Olympus Mons, Mars using Flank Vents and Arcuate Graben

Advisor: Philip R. Christensen

2013 **B.S. – Psychology, Mississippi State University (MSU), USA**

Minors: Geosciences

Graduated magna cum laude

CURRENT AND FUTURE RESEARCH THEMES: My research interests are thus far defined by the evolution and modification of planetary surfaces through the lens of volcanism.

1 – *Experimental volcanology:* I seek to understand the morphology and dynamics of lava flow emplacement using analog experiments.

2 – *Planetary geology:* I seek to understand the origin, evolution, and process of geologic activity (in this case, volcanism) on other planets using data collected by space missions. To date this work has occurred exclusively on Mars and involves the analysis of high-resolution images, topographic, thermophysical, and spectral data.

As I expand my collaborations and continue in my career, I expect my research interests to evolve and/or expand to include other geologic processes, planetary bodies, and mission involvement.

PROFESSIONAL EXPERIENCE

- >2023 – present **Postdoctoral Fellow of Geology**, Middlebury College
Faculty Instructor
- >Aug. 2021 – 2022 **Postdoctoral Fellow of Geology**, University of Idaho
Supervisor: Dr. Erika L. Rader
- >Jan – Aug. 2021 **Assistant Language Teacher (ALT)**, Himeji Board of Education via
Phoenix Sister Cities Teach Abroad Program
Supervisors: Takayuki Kamata and Shigeo Furuta
- >8/2020 – 01/2021 **Senior Research Specialist**, Arizona State University
Supervisor: Dr. Philip R. Christensen

PUBLICATIONS

PUBLISHED – PEER REVIEWED ARTICLES

- Rader, E.L., **S. Peters**, L. Vanderkluysen, A.B. Clarke, and H. Sheth (2024), Morphological transitions between resurfacing and distal breakout lava flows in flood basalts: insights from analog experiments, *Bulletin of Volcanology*, Volume 86, Article 8, <https://doi.org/10.1007/s00445-023-01693-6>.
- Peters, S.I.**, A.B. Clarke, and E.L. Rader (2022), The effects of unsteady effusion rates on lava flow morphology and emplacement: results from laboratory analogue experiments, *Journal of Volcanology and Geothermal Research*, 432, <https://doi.org/10.1016/j.volgeores.2022.107674>.
- Peters, S.I.**, P.R. Christensen, and A.B. Clarke (2021), Lava flow eruption conditions in the Tharsis Volcanic Province on Mars, *Journal of Geophysical Research – Planets*, 126, Issue 7, <https://doi.org/10.1029/2020JE006791>.
- Peters, S.I.** and P.R. Christensen (2017), Flank Vents and Graben as Indicators of Late Amazonian Volcanotectonic Activity on Olympus Mons, *Journal of Geophysical Research – Planets*, 112, Issue 3, <https://doi.org/10.1002/2016JE005108>.

IN PROGRESS

- Peters, S.I.**, A.B. Clarke, and E.L. Rader (under review), The impacts of lulls and peaks in effusion rate on lava flow propagation. To *Journal of Volcanology and Geothermal Research*.
- Russo, F.P., I.T.W. Flynn, **S.I. Peters**, and M.S. Ramsey (antic. Summer 2024 submission), The Impact of Slope Variability on Martian Lava Flow Modeling. To *Icarus*.

Peters, S.I., A.B. Clarke, and E.L. Rader (antic. Fall 2024 submission), The role of slope on lava flows erupted under variable effusion rates. To *Journal of Volcanology and Geothermal Research*.

Peters, S.I., A.B. Clarke, and E.L. Rader (antic. 2025 submission), The influence of lulls and peaks in eruption rate on flow morphology. To *Bulletin of Volcanology*.

PUBLISHED – OTHER ARTICLES AND THESES

Peters, S.I. (2020), Investigating lava flow emplacement: implications for volcanic hazards and planetary evolution, *Arizona State University*, PhD dissertation.

Peters, S.I. (2019) Volcanoes on Other Planets, *Ask an Earth and Space Scientist* (ASU) <https://dev-aaess-drup-7.ws.asu.edu/explore/alien-lava>

Peters, S.I. (2015), Investigating Late Amazonian Volcanotectonic Activity on Olympus Mons, Mars using Flank Vents and Arcuate Graben, *Arizona State University*, MS thesis.

PUBLISHED – NON-ACADEMIC

Peters, S., A Museum of Personal Mystery, *Authors of Tomorrow*, 2008.

Peters, S., WE, *Anthology of Poetry by Young Americans*, vol. LXXXVII, 2002 Edition.

GRANTS

PENDING

Evolving Volcanic Eruption Styles as Recorded in Valles Marineris
Co-Investigator
Submitted

AWARDED

Summer 2024 Summer Research Assistant Fund – Middlebury College
Characterizing Lava Channels on Martian Volcanoes
Regional Variations in Lava Flow Emplacement on Mars
\$10,564

Spring 2024 Undergraduate Collaborative Research Fund – Middlebury College
\$1000

2023-2024 Faculty Professional Development Fund – Middlebury College
\$3993

2022-2023 Faculty Professional Development Fund – Middlebury College
\$2997

PRESENTATIONS

TALKS AND PANELS

**Denotes an invited talk*

Apr. 2024 **Middlebury College** Carol Rifelj Faculty Series
The volcanic evolution of Mars: insights from comparative planetology

Nov. 2023 ***Vermont State University – Johnson Science Colloquium Series**
From the lab to Mars: applying physical volcanology to extraterrestrial surfaces

Nov. 2023 ***Bates College** Earth and Climate Sciences Seminar Series
From the lab to Mars: volcanic investigations using analog experiments and remote sensing

Nov. 2023 ***Lamont-Doherty Earth Observatory (Columbia University)** Marine Geology and Geophysics / Seismology, Geology, and Tectonophysics (SGT) Seminar Series
From the lab to Mars: volcanic investigations using analog experiments and remote sensing

Oct. 2023 **Geological Society of America (GSA) Connects 2023**, Pittsburgh, PA
Peters, S., Clarke, A.B., and E.L. Rader (2023) The impact of lulls and peaks in eruption rate on lava flow propagation, Abstract #392740.

***Peters, S.**, (2023) Balancing research and teaching at a liberal arts college, Abstract #392687.

Moore, S., Atkins, C. A., **Peters, S.**, Velazquez Santana, L., Ulrich, R., and E., Wilson (2023) What we learned from intentional mentoring of STEM majors from minority serving institutions, Abstract #396120.

Sept. 2023 **Middlebury College** – 2023 Fall Faculty Forum
Linking Lab Experiments to the Natural World

Feb. 2023 ***University of Maryland** Department of Geology Colloquium
The effects of unsteady eruption rates on lava flow morphology and propagation

- Dec. 2022 ***AGU Fall Meeting**, Virtual
Early Career-Led DEI Initiatives: Actionable Insights Toward a More Just, Equitable, and Inclusive Scientific Environment Panel
- Oct. 2022 ***Sweet Science Seminar, USGS**, Virtual
Lava flow eruption conditions in the Tharsis Volcanic Province on Mars
- Sept. 2022 ***Planetary and Astrobiology Seminar**, Georgia Tech, Virtual
Lava flow eruption conditions in the Tharsis Volcanic Province on Mars
- Aug. 2022 ***Goddard Space Flight Center**, Virtual
Lava flow eruption conditions in the Tharsis Volcanic Province on Mars
- May 2022 ***Carnegie Institute of Science Planetary Reading Group**, Virtual
Lava flow eruption conditions in the Tharsis Volcanic Province on Mars
- Mar. 2022 **Middlebury College**, Virtual
Lava flow emplacement: implications for volcanic hazards and planetary evolution
- Apr. 2020 ***University of Texas Institute of Geophysics Brown Bag Seminar**, Virtual
The emplacement of lava flows: implications for hazards and planetary evolution.

POSTERS

†Denotes a student

- Antic. 2024* **Goldschmidt**, Chicago, IL
†McDonald, W.T., K. Derenoncourt, and **S.I. Peters** (2024), Lengths and Distribution of Lava Channels on Martian Central Volcanoes, *Goldschmidt 2024*, Abstract, 22973.
- Antic. 2024* **Earth and Climate Sciences Dept. Seminar**, Middlebury College
†McDonald, W.T., K. Derenoncourt, and **S.I. Peters** (2024), Lengths and Distribution of Lava Channels on Martian Central Volcanoes
- 2024 **COV12**, Antigua, Guatemala
Peters, S.I., A.B. Clarke, and E.L. Rader (2024) The impacts of lulls and peaks in eruption rate on lava flow propagation: insights from analog experiments, *Cities on Volcanoes 12*, Abstract, 17.
- 2023 **LPSC**, The Woodlands, TX

- Peters, S.I.** (2023) A survey of volcanically emplaced rilles, *2023 Lunar and Planetary Science Conference*, Abstract, 1713.
- 2023 **IAVCEI**, Rotorua, Aotearoa (NZ)
Peters, S.I., A.B. Clarke, and E.L. Rader (2023) The effects of unsteady vent conditions on lava flow propagation, morphology, and surface texture, *The International Association of Volcanology and Chemistry of the Earth's Interior Scientific Assembly 2023*, Abstract, 589.
- 2022 **LPSC**, Virtual
Peters, S.I., and E. L. Rader (2022) Potential contributions of VNIR imaging and laboratory analogue experiments to inform modeling efforts, *2022 Lunar Planetary Science Conference*, Abstract, 1150.
- 2020 **LPSC**, The Woodlands, TX
Peters, S.I., and P.R. Christensen (2020) Constraining Martian lava flow eruption rates in the Tharsis Volcanic Province, *2020 Lunar Planetary Science Conference*, Abstract, accepted. Conference cancelled due to Covid-19.
- 2019 **AGU Fall Meeting**, San Francisco, CA
Peters, S.I., and A.B. Clarke (2019), The role of unsteady effusion rates on lava flow emplacement: results from laboratory analogue experiments, *2019 American Geophysical Union*, Abstract, V23F-0270.
- 2019 **GSA Fall Meeting**, Phoenix, AZ
Peters, S.I., and A.B. Clarke (2019), The effects of unsteady effusion rates on lava flow morphology and emplacement: results from laboratory analogue wax experiments, *2019 Geological Society of America fall meeting*, Abstract, 337812.
- 2018 **LPSC**, The Woodlands, TX
Peters, S.I., P.R. Christensen, and A.B. Clarke (2018) Constraining lava flow eruption rates on Mars using laboratory analogue wax experiments, *2018 Lunar Planetary Science Conference*, Abstract, 3002.
- 2017 **AGU Fall Meeting**, New Orleans, LA
Peters, S.I. and A.B. Clarke (2017), Controls on lava flow morphology and propagation: Using laboratory analogue experiments, *2017 American Geophysical Union*, Abstract, V43F-0586.
- 2017 **LPSC**, The Woodlands, TX
Schaefer, E.I., C.W. Hamilton, C.D. Neish, M.M. Sori, A.M. Bramson, S.P. Beard, **S.I. Peters**, T.A. Miller, and E.L. Rader (2017), Seeing Pahoehoe from Orbit (Without Squinting), *2017 Lunar Planetary Science Conference*, Abstract, 2343.

- 2016 **LPSC**, The Woodlands, TX
Peters, S.I. and P.R. Christensen (2016), Investigating the Volcanotectonic Evolution of Olympus Mons using Flank Vents and Arcuate Graben, *2016 Lunar Planetary Science Conference*, Abstract, 209-1634.
- 2015 **AGU Fall Meeting**, San Francisco, CA
Peters, S.I. and P.R. Christensen (2015), Investigating Late Amazonian Volcanotectonic Activity on Olympus Mons, Mars using Flank Vents and Arcuate Graben, *2015 American Geophysical Union*, Abstract, P33C-2139.
- 2015 **LPSC**, The Woodlands, TX
Peters, S.I. and P.R. Christensen (2015), The Characterization and Implications of Flank Vents on Olympus Mons, *2015 Lunar Planetary Science Conference*, Abstract, 141-2008.
- 2014 **AGU Fall Meeting**, San Francisco, CA
Peters, S.I. and P.R. Christensen (2014), The Implications of Flank Vents on Olympus Mons, *2014 American Geophysical Union*, Abstract, P41B-3898.

PLANETARY MISSION EXPERIENCE

- 2020 Lucy Thermal Emission Spectrometer (LTES) thermal vacuum chamber (TVAC) Test Operator
Instrument operator and analyst for the EMIRS instrument during TVAC testing
- 2019 Emirates Mars Infrared Spectrometer (EMIRS) thermal vacuum chamber (TVAC) Test Operator
Instrument operator and analyst for the EMIRS instrument during TVAC testing
- 2015 – 2016 OSIRIS-Rex Thermal Emission Spectrometer (OTES) thermal vacuum chamber (TVAC) Test Operator
Instrument operator and analyst for OTES instrument during TVAC testing

TEACHING EXPERIENCE

- 2023 – 2024 **Instructor**, Middlebury College
Natural Hazards (ECSC 111)
Physical Volcanology (ECSC 0375)
Readings & Research (ECSC 0500) – Will McDonald

- Fall 2022 **Guest Lecturer**, University of Idaho
Introduction to Volcanology, led by Dr. Erika L. Rader
Exploring the Solar System
- 2021 **Assistant Language Teacher (ALT)**, Himeji Board of Education, Himeji,
Hyogo, Japan
- Himeji Shiritsu Hanada Junior High
 - Himeji Shiritsu Masui Junior High
 - Himeji Shiritsu Masui Elementary School
 - Himeji Shiritsu Mizukami Elementary School
 - Himeji Shiritsu Tohori Elementary School
 - Himeji Shiritsu Hanada Elementary School
- 2019 **Prison Teaching Intern**, ASU
Teaching Assistant, led by Dr. Cornelia Wells
Introduction to Geology / Astronomy
- 2014 – 2017 **Guest Scientist**, ASU
Mars Student Imaging Project (MSIP), led by Sheri Klug-Boonstra
- 2013 – 2015 **Graduate Teaching Assistant**, ASU
Introduction to Physical Geology Lab, (J. Johnson), Spring 2014/2015
Fundamentals of Planetary Geology, (Dr. M. S. Robinson), Fall 2014
Physical Geology, (Dr. D. DeVacchio & T. Perkins), Fall 2013/2014
Historical Geology, (Dr. D. Burt), Fall 2013
- 2011 – 2012 **Undergraduate Teaching Assistant**, MSU
Introductory Psychology Statistics (lab section)
Dr. C. Williams, Fall 2011
Dr. M. Giesen, Spring 2012
Dr. J. Keeley, Fall 2012

RESEARCH EXPERIENCE

- 2023 – present **Planetary volcanology (via remote sensing) | Department of Earth and
Climate Sciences, Middlebury College**
- Investigating volcanically emplaced channels and lava flows on Mars
- 2021 – 2022 **Analog experimentation & Field analog studies | University of Idaho
Department of Earth and Spatial Sciences and Geological Sciences**
Supervisor: *Dr. Erika L. Rader*

- Determining contribution of glass and surface roughness to VNIR spectra of lava flows
- Using morphology of lava flow analogs to ascertain lava flow emplacement conditions

2016 – 2020 **Analog experimentation | ASU Experimental Volcanology Laboratory**
Project supervisor: Dr. Amanda B. Clarke
Graduate Research Assistant

- Using analogue experiments to simulate lava flow emplacement under unsteady eruption rates

2014 – 2020 **Planetary volcanology (via remote sensing) | Mars Space Flight Facility**
Advisor: Dr. Philip R. Christensen
Graduate Assistant

- Quantifying lava flow emplacement conditions in Tharsis volcanic province on Mars

2012 **Undergraduate Research Fellow, Human-Environment Regional Observatory (HERO), Clark University**
Advisors: Drs. Deborah Martin, John Rogan, and Verna DeLauer

Investigating the consequences of the Asian long-horned beetle infestation of central Massachusetts, specifically the socio-economic and ecological impacts on the urban forest of Worcester, MA and surrounding towns.

Policy Making Assessment group – Investigated socio-ecological variability, place making, policy and decision-making (e.g., archival research, transcription, interviews)

2010 – 2011 **Undergraduate Research Assistant, Advanced Social Psychology Lab, Mississippi State University**
Principal Investigator: Dr. H. Colleen Sinclair

Interpersonal Relationship Study – Investigating the effect of familial and peer influences on relationship decision making.

Political Psychology Project – Investigating the role of conformity and attitude change in a political discussion

Online Lecture Course – Presented a chapter on discrimination for online social psychology course

STUDENTS ADVISED

2023-2024 Kijani Derenancourt – Middlebury College (Fall 2023)
Will McDonald – Middlebury College

Student theses committee member – Middlebury College

2023-2024 Eliza Todd, ECSC
Erin Hansbrough, ECSC
Lizzy Vanderkloot, ECSC

Spring 2023 Abby Santis, ECSC
Max Hanscom, ECSC

MENTORSHIP

Summer 2023 **Research Mentor (Hybrid)**, University of Texas Austin
Strengthening Traineeships and Research Opportunities for Next Generation (STRONG) Geoscientists at Minority Serving Institutions

2022 – 2023 **Mentor (Virtual)**
Geosciences Education & Mentorship Support (GEMS) Mentor Match Program

2019 – 2020 **Graduate Mentor**, ASU
SESE Graduate Mentoring Program

2015 – 2016 **Mentor (General and research)**, ASU
Sundial Mentoring Program, led by Dr. Anna Zaniewski

AWARDS AND HONORS

2022 Meet A Scientist – American Geophysical Union (AGU) Volcanology, Geochemistry, and Petrology (VGP) Committee

2018 – 2019 ASU College of Liberal Arts and Sciences (CLAS) Student Leader

2015 – 2016 Graduate Education Doctoral Enrichment Fellowship, ASU
\$17,000

2012 MSU Dean's Scholar

2012 Nominated for membership in Golden Key International Honour Society

- 2009 – 2012 Mississippi State University President’s Scholar
- 2008 – 2013 Shackhous Honor College, MSU

PROFESSIONAL DEVELOPMENT & FIELD EXPERIENCE

- Antic. Summer 2024* Middlebury Language Schools
Japanese Immersion Program (8-weeks)
- 2023 Planetary Data Training Workshop, Arizona State University
Led by David Williams and David Nelson
- 2023 National Association of Geoscience Teachers (NAGT) Virtual Mentoring
Workshop
Led by Anne Eggers and Stefany Sit
- 2022 Krafla lava flow, Myvatn, Iceland
Led by Dr. Erika L. Rader
- 2016 El Pinacate y Gran Desierto de Altar Biosphere Reserve, Mexico
Led by Dr. Amanda B. Clarke
- 2016 SP Crater Lava Flow, San Francisco Volcanic Field, Flagstaff, AZ
Independent field excursion
- 2016 NASA Field Investigations to Enable Solar System Science and Exploration
(FINESSE) team, NASA Solar System Exploration Research Virtual
Institute (SSERVI)
Organized by Dr. Scott Hughes; on behalf of Ethan Schaefer
- 2016 NASA Volcanology Workshop, NASA/Univ. of Hawai’i
Led by Drs. S. K. Rowland, S. Fagents, & P. Mouginiis-Mark

LEADERSHIP

- 2020 SESE Justice, Equity, Diversity, and Inclusion Task Force
Member
- 2018 – 2019 SESE Graduate Council
President
- 2016 – 2019 Volcano Listserv, collaborative venture among Arizona State University
(ASU), Portland State University (PSU), the Global Volcanism Program
(GVP) of the Smithsonian Institution's National Museum of Natural

History, and the International Association for Volcanology and Chemistry of the Earth's Interior (IAVCEI).
Editor & Moderator

2011 – 2012 The International Honor Society in Psychology, MSU
Treasurer

2009 – 2010 MSU Astronomy Club
Secretary

SERVICE & OUTREACH

- 2022 Panelist at Phoenix Fan Fusion
“Everything I Learned I Learned from Anime”
“Vulcan’s Wrath”
- 2019 Graduate Professional Student Association (GPSA), ASU
Awards Reviewer
- 2019 Intel International Science and Engineering Fair (ISEF)
Grand Awards Judge
- 2018 49th Lunar Planetary Science Conference
Session chair
- 2018 Intel STEM Fair, South Mountain Community College
“Walk on Mars” exhibit
- 2018 Earth and Space Exploration Day, ASU
“Walk on Mars” exhibit
- 2018 Panelist at Phoenix Comic Fest
“Black Panther and the Culture of the Unconquered”
“This Just in from Deep Space”
“Political Science for Teens”
- 2018 ASU Open Door
“Walk on Mars” exhibit
- 2017 Mountain Pointe High School
Guest speaker for Marilyn Raming’s Earth Science course
- 2017 Phoenix Comicon
Panelist for “How Misinformation Spreads”
Judge for the AZ Science Fair

- 2013 – 2014 SESE Open House, ASU
Mars Exhibit
- 2010 – 2012 Mississippi State University Peer Tutoring and Academic Mentoring
Program, MSU
Tutor
- 2010 – 2011 Health & Wellness Service Program, MSU
Volunteer

Professional Memberships

- 2014 – *present* American Geophysical Union
2023 – *present* Geological Society of America
2022 – *present* International Association of Volcanology and Chemistry of the Earth's
Interior
2012 The National Honor Society of Phi Kappa Phi
2011 – 2012 The International Honor Society of Psychology

Peer Reviewer

*Reviewer assignments listed in alphabetical order not chronologically and may constitute multiple assignments.

American Academy of Science Planetary Science Journal
Communications Earth & Environment
Icarus
Journal of Geophysical Research: Planets
Journal of Volcanology and Geothermal Research
Oxford University Press
NASA

Relevant / Technical Skills

Programming: *HTML, MATLAB, Davinci*

Software: *ESRI ArcGIS, Image J, ISIS3, JMARS, MS Office Suite, Overleaf, Tracker*

Languages: *Japanese, Spoken – Conversational level*
Japanese, Written – Hiragana & Katakana, some Kanji
Japanese, Reading – Hiragana & Katakana, some Kanji

References

Dr. Philip R. Christensen Arizona State University | phil.christensen@asu.edu
Dr. Amanda B. Clarke Arizona State University | amanda.clarke@asu.edu
Julia Johnson Arizona State University | Julia.Johnson@asu.edu
Dr. Erika L. Rader University of Idaho | erader@uidaho.edu
Dr. Peter Ryan Middlebury College | pryan@middlebury.edu
Dr. Samuel Moore University of Texas Austin | slmoore@austin.utexas.edu
Dr. Heather Meyer Johns Hopkins Applied Physics Laboratory | Heather.Meyer@jhuapl.edu