Liam Peterson

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Education

Bachelor of Science, Geological Sciences — August 2019
Minor, Mathematics
Specialization, Geophysics
Michigan State University, East Lansing, MI
Overall GPA: 3.822
Major GPA: 4.0
Relevant Course Work: Historical Geology, Mineralogy and Geochemistry, Igneous and Metamorphic Geochemistry and Petrology, Planetary Geology, Solid Earth Geophysics and Geodynamics, Structure and Tectonics, Advanced Igneous Petrology, Sedimentology and Stratigraphy, Applied Geophysics, Field Camp

Doctor of Philosophy, Geology — Anticipated April 2024
University of Maryland, College Park, MD
Dissertation Topic: The concentration of H in incompletely and wholly melted terrestrial building blocks
Overall GPA: 3.966
Relevant Course Work: Isotope Geochemistry, Geoscientific Modeling, Geology and Geophysics of the Terrestrial Planets, Advanced Data Analysis, Science and Technology Policy, Physical Chemistry I, Volcanology, Chemical Geodynamics

Awards and Honors

University of Maryland Geology Dept. Best Talk Award – Post-Candidate	2022
University of Maryland Dean's Fellowship	2019, 2022
Outstanding Teaching Assistant Award AY 2020-2021	Dec. 2020
Warren W. and Anneliese C. Wood Undergraduate Research Award	Spring 2017
Harold J. and Mildred T. Englehardt Scholarship	2016, 2017, 2018
Eagle Scout, Troop 102, Lowell, MI	2016

Grants

Total funding: $161,675

- "Volatile Sourcing and Retention in the Early Solar System: the Ureilite Parent Body" (NASA FINESST Program; Award Amount: $135000; Sept. 2021 – Sept. 2024)
- "Experimental Constraints on Water Partitioning in Olivine at Crustal Conditions" (Geological Society of America; Award Amount: $1375; July 2020 – July 2021)
- Geochemical Society Goldschmidt Travel Grant (Geochemical Society; Award Amount: $1000; July 2023)
- *Additional funding from Awards and Honors:* $24,300

Teaching Experience

Sedimentology and Stratigraphy Lab — Fall 2019
- Student Evaluation (out of 4): 3.4

Mineralogy Lab — Spring 2020
- Student Evaluation (out of 4): 3.6

- Received Outstanding Teaching Assistant Award

Other Qualifications and Skills

- **Analytical Experience:** SEM, LA-ICP-MS, Solution ICP-MS, XRF, EPMA, nanoSIMS, SIMS, FTIR, Petrography
- **Programming:** MATLAB, Python
    - Wrote "Sigfind" a MATLAB package that baseline corrects FTIR data for OH in minerals and requires minimal user input, thereby increasing reproducibility.
- **Other:** Sample/Data collection and archiving, Laboratory Safety, Vector Graphics Software (Adobe Illustrator)

Professional Experience

Graduate Assistant *August 2019 - Present*
University of Maryland, College Park, MD, 20740

- Performed analyses of highly volatile elements in silicates from meteoritic and terrestrial samples using SIMS, FTIR, and EPMA
- Performed H partitioning experiments in silicates using cold-seal pressure vessels
- Coordinated multi-institutional and international collaborations
- Trained 5 new users on sample prep, data acquisition, and data processing for SIMS and FTIR analyses of H, C, F, Cl, and S in silicates

Geologist Intern *May 2018 - October 2018*
Arcadis, Novi, MI, 48377

- Collected soil and water samples in conjunction with maintaining and archiving field notes
- Led field activities at 5 job sites, including management of external contractors
- Collated and performed quality assurance checks on data and reports to ensure adherence to internal and external regulations
- Collaborated with site leads to coordinate material/human resources and timelines

Lab Manager *June 2017 - May 2019*
Fuser *September 2016 - June 2017*
MSU XRF Lab, East Lansing, MI, 48824

- Managed material and human resources (3 facilities; team of 7 people)
- Trained 9 employees across 3 jobs
- Maintained lab safety, lab hygiene, and data quality by updating protocols for lab procedures, safety, and cleaning
- Worked with Principal Investigator to adhere to expected timelines and ensure reproducibility of method and data

Fieldwork Experience

- **Cinder Cone Field Expedition (2022)** Excavating, sampling, and classification of eruptive deposits from a sequence of three units from Cinder Cone, Lassen National Park, California.
- **IUGFS Judson Mead Field Camp (2019)** Sedimentological, structural, metamorphic, and igneous field identification and mapping throughout the southern Tobacco Root Mountains

- **Mid-continent Rift Flood Basalt Sampling (2018)** Three days of sampling serpentinized flood basalts in the Mid-continent Rift, near Marquette, MI
- **Undergraduate Fieldwork (2017-2019)** Mapping and field identification of sedimentological, igneous, and structural units in the greater Lansing, Petoskey, and Marquette regions of Michigan, and the greater Tudor region of Canada

Volunteer Work

- UMD Dept. of Geology Peer Mentoring Program (Mentor) 2022-Present
- Maryland Day 2022-Present
- KEMS Maryland 2019-2020

Professional Memberships

IAVCEI, Student Member April 2021-Present
Geochemical Society, Student Member February 2021-Present
Geological Society of America, Student Member January 2018- Present
American Geophysical Union, Student Member January 2018-Present
American Institute of Professional Geologists, Student Member January 2018-Present

Publications

Peterson L. D., Newcombe M. E., Piccoli P., Gion A., Gaetani G. A., Nielsen S. G., and Sarafian A. R. Olivine-melt H partitioning at pressures relevant to the upper crust and planetesimals. *In prep.*

Peterson L. D., Newcombe M. E., Alexander C. M. O'D., Wang J., and Nielsen S. G. The H-poor nature of incompletely melted planetesimals: the view from acapulcoites and lodranites. *In review.*

Peterson L. D., Newcombe M. E., Alexander C. M. O'D., Wang J., Klein F., Bekaert D. V. and Nielsen S. G. (2023) The H content of aubrites: An evaluation of bulk versus in situ methods for quantifying water in meteorites. *Earth Planet. Sci. Lett.* **620**, 118341.

Newcombe M. E., Nielsen S. G., **Peterson L. D.,** Wang J., C. M. O'D. Alexander, Sarafian A. R., Shimizu K., Nittler L. R., Irving A. J. (2023) Degassing of early-formed planetesimals restricted water delivery to Earth. *Nature* **615**, 854-857.

Peterson L. D., Newcombe M. E., Alexander C. M. O'D., Wang J., Sarafian A. R., Bischoff A. and Nielsen S. G. (2023) The H_2O content of the ureilite parent body. *Geochimica et Cosmochimica Acta* **340**, 141–157.

Steiner R. A., Rooney T. O., Girard G., Rogers N., Ebinger C. J., **Peterson L. D.** and Phillips R. K. (2022) Initial Cenozoic magmatic activity in East Africa: new geochemical constraints on magma distribution within the Eocene continental flood basalt province. *Geological Society, London, Special Publications* **518**, 435–465.

Conference Proceedings

"Relieving the Pressure: Low Pressure (30-100 MPa) Olivine/Melt Partitioning of H_2O"
- American Geophysical Union 2023

"Re-evaluating bulk H measurements of aubrites using secondary ion mass spectrometry"
- Goldschmidt 2023

"The H_2O content of aubrites"
- Lunar and Planetary Science Conference 2023

"The H_2O content of the ALM-A ureilitic trachyandesite"
- Lunar and Planetary Science Conference 2022

"The Water Content of the Ureilite Parent Body"
- Goldschmidt 2021

"The Middle: Examining Pulsed Magmatism in East Africa Using the Makonnen Basalts"
- Michigan State University Undergraduate Research and Arts Forum 2019

"Crossing the Gap: Linking the Eocene and Oligocene East African Rift Volcanics"
- GeoPRISMS TEI 2019
- Geological Society of America Fall Conference 2018

"One Plume or Two: An Investigation of East African Magmatism"
- Michigan State University Undergraduate Research and Arts Forum 2018

"A Comparison of Grain Surface Features on Two Mars Analogs from Mauna Kea, Hawai'i"
- Michigan State University Undergraduate Research and Arts Forum 2018
- Michigan Space Grant Consortium 2017

"Grain-Surface Textures on Mars Regolith Analog Volcanic Tephra HWMK600 and their Environmental Significance"
- Michigan State University Undergraduate Research and Arts Forum 2017

Invited Talks

"The H_2O Content of Early-Formed Planetesimals"
- Lunar and Planetary Institute, May 25th, 2023

"The H content of terrestrial building blocks: constraints from meteorites and experiments"
- Woods Hole Oceanographic Institute, September 20th, 2023