

Michelle Muth

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PROFESSIONAL EXPERIENCE

2016- Present	<i>Graduate Researcher</i> , University of Oregon
2020	<i>GRIP Fellow</i> , Smithsonian National Museum of Natural History
2019	<i>Lead Instructor</i> , Sternberg Museum of Natural History Science Camps
2015- 2016	<i>Geoscientist</i> , AECOM, Philadelphia Area Remediation Services Group
2014	<i>Outdoor Education Instructor</i> , Texas Parks and Wildlife Department
2013- 2015	<i>Undergraduate Researcher</i> , Rice University Experimental Petrology Group
2012- 2015	<i>Student Consultant</i> , Rice University Center for Communication
2013	<i>NSF-REU Intern</i> , University of Minnesota Institute for Rock Magnetism

EDUCATION

2021 (<i>expected</i>)	<i>Ph.D. Earth Science</i> , University of Oregon, Eugene, OR Research advisor: Paul Wallace
2015	<i>B.S. Earth Science</i> , Rice University, Houston, TX Research advisor: Rajdeep Dasgupta Distinction in Research and Creative Work Thesis: The effect of variable Na/K on CO ₂ solubility in slab-derived rhyolitic melts
2013	Sea Education Association, Woods Hole, MA 6 weeks oceanography coursework, 6 weeks at sea in Eastern Pacific Research Project: Effect of Low pH on the Growth of Phytoplankton in the Eastern Pacific Ocean

PUBLICATIONS

- Submitted Lerner, A. H., **Muth, M. J.**, Wallace, P.J., Lanzirotti, A., Newville, M., Gaetani, G. A., Chowdhury, P., Dasgupta, R. Improving the reliability of Fe- and S-XANES measurements in silicate glasses: correcting beam damage and identifying Fe-oxide nanolites in hydrous and anhydrous melt inclusions. *Geochimica et Cosmochimica Acta*.
- In Review **Muth, M. J.**, Wallace, P.J. Slab-derived sulfate generates oxidized basaltic magmas in the Southern Cascades arc. *Geology*.
- 2020 **Muth, M.**, Duncan M. S., Dasgupta, R. (2020). The Effect of Variable Na/K on CO₂ Solubility in Slab-Derived Rhyolitic Melts. *Carbon in Earth's Interior AGU Monograph*, 195-208.
- 2014 Frahm, E., Feinberg, J. M., Schmidt-Magee, B. A., Wilkinson, K., Gasparyan, B., Yeritsyan, B., Karapetian, S., Meliksetian, K., **Muth, M.**, and Adler D. S. (2014). Sourcing geochemically identical obsidian: multiscalar magnetic variations in the Gutansar volcanic complex and implications for Palaeolithic research in Armenia, *Journal of Archaeological Science*, 47, 164-178.

HONORS AND AWARDS

- 2019 Argonne National Laboratory User Beamtime Award
- 2019 Warren DuPre Smith Research Award
- 2018 Geology Emeritus Research Award
- 2017 NSF Graduate Research Fellowship
- 2017 Geology Emeritus Tribute Award
- 2016 University of Oregon First Year Graduate Student Fellowship
- 2016 Eugene Cota-Robles Fellowship (*Declined*)
- 2015 Torkild Rieber Award in Earth Science
- 2013 Eugen Merten Memorial Prize in Geology and Geophysics
- 2013 Chevron Earth Science Minority Scholarship

INVITED SEMINAR PRESENTATIONS

- 2020 Carnegie Science Earth and Planets Laboratory
- 2020 Smithsonian National Museum of Natural History, Dept. of Mineral Sciences
- 2020 International Volcanology Seminar (*Collaborative Virtual Seminar Series*)

CONFERENCE PRESENTATIONS

- 2020 **Muth, M.**, Wallace, P.J. Insights into global sulfur cycling from the melt inclusion record. *AGU 2020 Fall Meeting, Virtual, 1-17 December. (invited).*
- 2020 **Muth, M.**, Wallace, P.J. The influence of slab-derived sulfur on the sulfur content and oxidation state of arc magmas in the Southern Cascades. *AGU 2020 Fall Meeting, Virtual, 1-17 December.*
- 2020 Lerner, A., **Muth, M.**, Wallace, P. J., Lanzirotti A., Newville, M., Gaetani, G., Chowdhury, P., Dasgupta, R. Correcting Fe- and S-XANES Beam Damage and Recognizing Rapid Redox Equilibration of Olivine-Hosted Melt Inclusions. *Goldschmidt Conference, Virtual, 21-26 June.*
- 2020 **Muth, M.**, Wallace, P. J. Tracking Slab-Derived Sulfur and its Effect on Magma Oxidation State in the Southern Cascades. *Goldschmidt Conference, Virtual, 21-26 June.*
- 2019 **Muth, M.**, Wallace, P. J., Gaetani, G. A. Drawing connections between slab-derived sulfur, mantle melting, and arc magma oxidation state: A case study in the southern Cascades. *AGU 2019 Fall Meeting, Washington D. C., 9-13 December.*
- 2019 **Muth, M.**, Wallace, P. J. How does slab-derived sulfur affect magma redox in the southern Cascades? Insights from the melt inclusion record. *Cordilleran Section-115th Annual Meeting, 15-17 May.*
- 2018 **Muth, M.**, Wallace, P. J. Insights into Arc Magma Volatile Cycling and Oxidation State from Global Sulfur Trends. *AGU 2018 Fall Meeting, Washington D. C., 10-14 December.*
- 2017 **Muth, M.**, Wallace, P. J., Walowski, K. J. The Role of Hydrous Slab Melts in the Sulfur Content, Metal Content, and Oxidation State of Primitive Arc Magmas in the Southern Cascades. *AGU 2017 Fall Meeting, New Orleans, LA.*

- 2017 Harvey, K. M., Perry-Houts J., Domino J., **Muth M.**, Carruthers S., Kotowski A. J., DeGrandpre K., Faul, U., Kent, A. J., Abers, G. A., Krawczynski, M. The ins and outs of mélangé diapirs: a multidisciplinary approach to formation, ascent, and observation. *AGU 2017 Fall Meeting, New Orleans, LA, 11-15 December.*
- 2014 **Muth, M.**, Duncan, M. S., Dasgupta, R. Effect of variable Na/K ratio on CO₂ solubility in slab-derived rhyolitic melts- An experimental study. *AGU 2014 Fall Meeting, San Francisco, CA, 15-19 December.*

FIELD EXPERIENCE

- 2019 *Lassen Volcanic Area, CA*
Field sampling of tephra deposits with high school students during a two-week volcanology field course.
- 2018 *Trinity Ophiolite, CA*
Field trip with the University of Delaware Mantle Processes group for 3 days in the Trinity Ophiolite.
- 2018 *Santorini, Greece*
Field trip focusing on the volcanic deposits on the island of Santorini and deformation structures associated with the neotectonics of the surrounding region.
- 2017 *Lassen Volcanic Area, CA*
Sample collection of tephra deposits at selected cinder cones, targeting deposits likely to contain rapidly quenched primitive melt inclusions.
- 2017 *Long Valley Caldera, CA*
Sample collection of inter-layered ignimbrite and fall deposits.

RESEARCH TECHNIQUES

Fourier Transform Infrared Spectroscopy (FTIR)
Electron Microprobe (EPMA)
X-Ray Absorption Near Edge Structure (XANES)
Laser Ablation ICP-MS
Secondary Ion Mass Spectrometry (SIMS)
End-loaded Piston Cylinder Apparatus
MATLAB, Python
Melt inclusion preparation and analysis

PROFESSIONAL ACTIVITIES

- 2019 GeoPrisms Synthesis and Integration Theoretical and Experimental Institute
San Antonio, TX
- 2018 Thermodynamic modeling with alphaMELTS and other MELTS software
Workshop
Caltech, CA
- 2018 Annual Workshop in Secondary Ion Mass Spectrometry
University of Arizona, AZ
- 2018 Mineral-Hosted Melt Inclusions Workshop
Woods Hole Oceanographic Institution, MA
- 2017 CIDER (Cooperative Institute for Dynamic Earth Research) Summer
Program
University of California Berkeley, CA
Participated in collaborative research effort: “The ins and outs of mélange
diapirs: a multidisciplinary approach to formation, ascent, and observation”.
Presented results at 2017 AGU Fall meeting.

OUTREACH ACTIVITIES

- 2020 “Expert Is In”, Smithsonian National Museum of Natural History
Led a 2-hour interactive public discussion on museum floor around the
theme “The Many Faces of Sulfur”.
- 2016-2019 “Mad Duck” Science Outreach Program, University of Oregon
Organized and lead several 4-hour long science outreach modules for local
middle school students through NSF-funded ‘Mad Duck’ program.
Facilitated module design collaborations between Mad Duck and other
graduate student organizations. Module design for Oregon paleontology is
still in use.

PROFESSIONAL SERVICE

- 2017-current Board Member, CMiS (Community for Minorities in STEM)
University of Oregon
UO CMiS is a graduate student organization dedicated to helping minority
graduate students in STEM succeed through professional workshops, social
and networking events, and community building activities. Elected Social

and Outreach Chair 2017-2018, Seminar Chair 2018-2019 and Vice President 2019-current.

- 2018-current *Organizing Team, IgDEAS (Inclusivity and Gender Diversity in Earth and Atmospheric Science)*
University of Oregon
The mission of IgDEAS is to provide geoscience-specific professional and social support to women at the University of Oregon. Co-founded in 2018. Currently active on organizing team.
- 2020 *Manuscript Reviewer, Geology*
- 2019 *Session Convener, Cordilleran Section GSA Annual Meeting*
"Crystal Windows into Igneous Processes"