# Michelle Muth

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## Professional Experience

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

## Education

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| 2016- Present | *Ph.D. Earth Science*, University of Oregon, Eugene, OR<br>Research advisor: Paul Wallace |
| 2015 | *B.S. Earth Science*, Rice University, Houston, TX<br>Research advisor: Rajdeep Dasgupta<br>Distinction in Research and Creative Work<br>Thesis: The effect of variable Na/K on $CO_2$ solubility in slab-derived rhyolitic melts |
| 2013 | Sea Education Association, Woods Hole, MA<br>6 weeks oceanography coursework, 6 weeks at sea in Eastern Pacific<br>Research Project: Effect of Low pH on the Growth of Phytoplankton in the Eastern Pacific Ocean |

## PUBLICATIONS

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| Submitted | **Muth, M.**, Wallace, P.J. Slab-derived sulfate generates oxidized basaltic magmas in the Southern Cascades arc. *Nature Geoscience.* |
| 2020 | **Muth, M.**, Duncan M., S. and Dasgupta, R. (2020). The Effect of Variable Na/K on $CO_2$ 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.,** & 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

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| 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 | UO First Year Graduate Student Fellowship |
| 2015 | Torkild Rieber Award in Earth Science |
| 2013 | The Eugen Merten Memorial Prize in Geology and Geophysics |
| 2013 | Chevron Earth Science Minority Scholarship |

## INVITED SEMINAR PRESENTATIONS

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| 2020 | Carnegie Science Earth and Planets Laboratory |
| 2020 | Smithsonian National Museum of Natural History, Dept. of Mineral Sciences |

2020 International Volcanology Seminar

## Conference Presentations

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., Krawczynksi, M. "The ins and outs of mélange 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 $CO_2$ solubility in slab-derived rhyolitic melts- An experimental study. *AGU 2014 Fall Meeting, San Francisco, CA, 15-19 December.*

## Field Experience

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| 2019 | *Lassen Volcanic Area, CA*<br>Field sampling of tephra deposits with high school students during a two-week volcanology field course. |
| 2018 | *Trinity Ophiolite, CA*<br>Field trip with the University of Delaware Mantle Processes group for 3 days in the Trinity Ophiolite. |
| 2018 | *Santorini, Greece*<br>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*<br>Sample collection of tephra deposits at selected cinder cones, targeting deposits likely to contain rapidly quenched primitive melt inclusions. |
| 2017 | *Long Valley Caldera, CA*<br>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
Modelling (MATLAB, Python)
Melt inclusion preparation and analysis

## Professional Activities

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| 2019 | GeoPrisms Synthesis and Integration Theoretical and Experimental Institute<br>*San Antonio, TX* |
| 2018 | Thermodynamic modeling with alphaMELTS and other MELTS software Workshop<br>*Caltech, CA* |
| 2018 | Annual Workshop in Secondary Ion Mass Spectrometry<br>*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.

## ORGANIZATIONS AND 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.

2019 *Session Convener, Cordilleran Section GSA Annual Meeting*
"Crystal Windows into Igneous Processes"