

Curriculum Vitae

Edward L. Vinis

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Education

M.S. Environmental Studies, Tohoku University, Japan; Sept. 2024

B.S. Geology, University of Oregon, USA; Sept. 2021
Earth Science GPA 3.94

B.S. Chemistry, University of Puget Sound, USA; May 2014
Overall GPA 3.09

Publications

Flow boiling-driven intensive growth of critical minerals during short-lived events, by Shen Gao, Atsushi Okamoto, Satoshi Matsuno, **Edward L. Vinis**, Otgonbayar Dandar, Xinyu Zou, Ross N. Mitchell, Jiajun Liu, Kezhang Qin & Hong Xu. *Scientific Reports*, 2025.
<https://doi.org/10.1038/s41598-025-32193-6>

Oscillations in fluid pressure caused by silica precipitation in a fracture, by Atsushi Okamoto and **Edward Vinis**. *Nature Communications*, 2025.
<https://doi.org/10.1038/s41467-025-57199-6>

Fluid overprints and mineralization of the Zhuguangshan granite-related U district in China: Recorded by cathodoluminescence textures and chemistry of quartz by Shen Gao, Yongjian Wang; Xinyu Zou; **Edward L. Vinis**; Liangliang Huang; Yi Tao; JingXu; Kezhang Qin; Zhengjie Qiu. *Ore Geology Reviews*, 2024. <https://doi.org/10.1016/j.oregeorev.2024.106256>

Skill Overview

Chemical/geochemical laboratory techniques and instrumentation • Construction and handling of laboratory equipment • Geologic field work and mapping • Teamwork/project collaboration • Leadership and training • Quantitative analysis and writing • Basic carpentry/handy-work construction • Business development including employee operations, hiring, and marketing • Project management/administration • Communication • Problem solving • Multitasking

Research

Graduate Student Researcher, Oct. 2022-Sept. 2024

Thesis: *Experimental study on the silica-sealing zone above supercritical geothermal reservoirs and implications for fluid pressure oscillations related to earthquakes*

Adviser: Prof. Atsushi Okamoto

- Received government funding to perform geochemical experiments on silica precipitation and granite

- Physically conducted high-temperature and pressure (>380 °C, 25 MPa) flow-through experiments to understand silica behavior in crustal environments
- Quantitative analyses of findings using chemical instrumentation and software
- Trained and aided fellow researchers in flow-through experiments and techniques
- Gained a detailed knowledge of silica's role in geothermal energy potential and seismic activity with regards to aftershocks and hypocenter migration
- Presented findings at six international conferences with research pending publication

Undergraduate Research Assistant, Oct. 2021-June 2022

Advisers: Dr. Leif Karlstrom, Rachel Hampton PhD candidate

- Aided in field collection of Wallowa Mtns basalt dike and granite samples
- Analyzed and input data into GIS software to create maps for presenting

Undergraduate Research Assistant, Nov. 2020-Aug. 2021

Advisers: Dr. James M. Watkins, Ellen K. Olsen PhD candidate

- Performed experiments to research CaCO₃ precipitation from direct air capture of CO₂

Undergraduate Research Assistant, May 2013-May 2014

Thesis: *Investigating the effects of terminal alkyl chain alterations on the ODBP liquid crystal molecule*

Adviser: Dr. Eric Scharrer

- Performed organic synthesis experiments to investigate more efficient liquid crystal molecules to be used in potential LCD applications

Field Experience

Field Assistant; July 2021-Sept. 2021

Addison Richter, Master's Student

Examined structural geology and deformation of thrust terranes near Mt. Baker, Washington

Field Assistant; Aug. 2021

Ellen K. Olsen, PhD candidate

Investigating isotopic fractionations of seasonal saline lakes in Oregon and California

Field Assistant; July 2021

Rachel Hampton, PhD candidate

Collected samples from basaltic feeder dikes to the Columbia River Flood Basalts, Wallowa Mountains, Oregon

Assistant Field Camp Organizer; June 2021-July 2021

Aided UO Field Camp with logistics required for remote mapping including set up, take down, and transferring equipment between field sites

UO Field Camp 2020; July-Aug. 2020

Geologic mapping of stratigraphic units and paleo stream channels in central Oregon

Laboratory Techniques

Flow-through experiments with granite under supercritical conditions, Okamoto lab 2022-2024

- Intricate knowledge of stainless-steel *Swagelok* high-pressure gas and fluid equipment used to create a flow-through apparatus with a titanium autoclave and furnace
- Careful understanding of supercritical temperature and pressure conditions (380 °C, 22 MPa) needed to precipitate silica in a safe environment
- Precise and delicate cutting and polishing of granite cores and samples used in flow-through experiments
- Analyses include X-Ray Computed Tomography (X-Ray CT), Micro X-Ray Fluorescence (μ -XRF), Scanning Electron Microscope Energy Dispersive Spectroscopy (SEM-EDS), optical microscopy, Scanning Electron Microscope Cathodoluminescence (SEM-CL), Electron Probe Microanalyzer (EPMA), Raman Spectroscopy, and Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES).

Calcite precipitation experiments, Watkins lab 2021

- Involved use of auto-titrator, pH probe, Environmental Scanning Electron Microscope (ESEM), and general laboratory techniques for performing multi-day reactions

TestAmerica environmental testing labs, Organic Prep Analyst I, March 2016-June 2017

- Preparation of organic sample extractions using predetermined extraction methods:
 - Organic extract concentration using Kuderna-Danish (KD) concentrator apparatus to prepare organic samples for analysis
 - TCLP leachate extraction method performed using acidified waters to simulate long term environmental leaching of contaminants
- Data collection and organization using LIMS software

Organic Synthesis research, Scharrer lab, 2013-2014

- Organic synthesis techniques needed to produce alkyl chain alterations of liquid crystal molecules
- Required use of laboratory instrumentation including nuclear magnetic resonance (H-NMR), infrared spectroscopy (IR), mass spectrometry (MS), gas/liquid chromatography, differential scanning calorimetry (DSC), and polarizing microscopy

Presentations

Invited presentation ‘Tech Share’, Ormat Technologies Inc.: *Fluid pressure oscillation created by temporary fracture sealing with silica using flow-through experiments* by **Edward L. Vinis** (presenter), Atsushi Okamoto. Reno, USA; Mar. 2025

Oral conference presentation: *Fluid pressure oscillation created by temporary fracture sealing with silica using flow-through experiments* **Edward L. Vinis** (presenter), Atsushi Okamoto. International Joint Workshop on Slow-to-Fast Earthquakes 2024, Beppu, Japan; Sept. 2024

Conference poster: *Temporary fracture sealing by silica precipitation in granite: Insights from flow-through experiments under superhot conditions* **Edward L. Vinis** (presenter), Atsushi Okamoto. Japan Geoscience Union Meeting 2024, Chiba, Japan; May 2024

Conference poster: *Investigating the Formation of the Silica-Sealing Layer Above*

Supercritical Geothermal Reservoirs Using Flow-Through Experiments **Edward L. Vinis** (presenter), Atsushi Okamoto. Geothermal Research Society of Japan 2023, Annual Meeting, Gifu, Japan; Nov. 2023

Conference poster: *Experiments on the Formation of the Silica-Sealing Layer Above Supercritical Geothermal Reservoirs* **Edward L. Vinis** (presenter), Atsushi Okamoto. 5th Academic Forum on Environmental Studies, Sendai, Japan; Oct. 2023

Conference poster: *Systematic Changes in Quartz Precipitation on Granite Surfaces Revealed by Hydrothermal Experiments* **Edward L. Vinis** (presenter), Jumpei Sugioka, Atsushi Okamoto. International Joint Workshop on Slow-to-Fast Earthquakes 2023, Tokyo, Japan; Sept. 2023

Oral conference presentation: *Exploration of the Silica-Sealing Layer Above Supercritical Geothermal Reservoirs Using Flow-Through Experiments* **Edward L. Vinis** (presenter), Jumpei Sugioka, Atsushi Okamoto. International Symposium on Water-Rock Interaction 17/International Symposium on Applied Isotope Geochemistry 14, Sendai, Japan; Aug. 2023

Conference poster: *Flow-Through Experiments on the Formation of the Silica Sealing Layer Above Supercritical Geothermal Reservoirs* **Edward L. Vinis** (presenter), Jumpei Sugioka, Atsushi Okamoto. Earth, Sea, and Sky VIII International Workshop, Sendai, Japan; May 2023

Conference poster: *Flow-Through Experiments on the Formation of the Silica Sealing Layer Above Supercritical Geothermal Reservoirs* **Edward L. Vinis** (presenter), Jumpei Sugioka, Atsushi Okamoto. Japan Geoscience Union Meeting 2023, Chiba, Japan; May 2023

Co-author: *Emplacement Mechanics of Mafic Super-Eruptions in the Columbia River Basalt Province from Structural, Geochemical, Thermochronologic, and Magnetic Investigation of the Maxwell Lake Dike Complex* by Rachel Hampton (presenter), Joe Biasi, Becca Goughnour, Leif Karlstrom, Kendra Murray, and **Ed Vinis**. American Geophysical Union Fall Meeting, 2021.

Conference poster: *Isotopic fractionations produced during direct air capture of carbon dioxide* **Edward L. Vinis** (presenter), Ellen K Olsen, Dr. James M Watkins. University of Oregon Undergraduate Research Symposium, Eugene, USA; May 2021

Conference poster: *Investigating the effects of terminal alkyl chain alterations on the ODBP liquid crystal molecule* **Ed Vinis** (presenter), Dr. Eric Scharrer. University of Puget Sound Fall Research Symposium, Tacoma, USA; Sept. 2013

Scholarships and Awards

- Professional Master for Sustainable Environment award, Tohoku Univ., Sept. 2024
- Japanese Government (Monbukagakusho: MEXT) Scholarship, Sept. 2022
- University of Oregon Earth Science Department commencement speaker, June 2021
- Emeritus Faculty Tribute Fund, UO Field Camp Scholarship (\$400), June 2021
- Emeritus Faculty Tribute Fund, UO Field Camp Scholarship (\$750), July 2020
- Field Scholarship for UO IgDEAS (Inclusivity and gender Diversity in the Earth and Atmospheric Sciences) (\$150), July 2020

- Youngquist Fellowship Award (\$5000), June 2020

Grants

Puget Sound Summer Research Grant, May 2013

Software

Python (Matplotlib, Numpy, Cartopy), Adobe Illustrator, Microsoft Office, *Dragonfly* CT modeling software, ArcGIS, QGIS, CRM software, LIMS software, WordPress web design

Memberships

American Geophysical Union, 2023-present

Geological Society of America, 2021-present

Geochemical Society, 2020-present

American Association of Petroleum Geologists student member, 2021-2022

References

Atsushi Okamoto

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Mark H. Reed

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James M. Watkins

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*Additional references available upon request