# JOSH CROZIER

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## EDUCATION

**PhD in Earth Science** at **University of Oregon**, GPA 3.6 summer 2016-spring 2021

**BS in Earth Science** with a geophysics concentration at **Rice University**, GPA 3.15 fall 2012-spring 2016
• Geology field camp at South Dakota School of Mines and Technology, semester abroad at the University of Otago in New Zealand

## RESEARCH and EXPERIENCE

**Mendenhall postdoctoral fellowship** at **U.S. Geological Survey California Volcano Observatory** summer 2021-present
• Modeling earthquake and fluid mechanics during caldera collapse
• Organizing volcano geodesy community model verification and validation exercises
• Field work cataloging tuffisites, coring sediments, cosmogenic and luminescence dating, seismic and magnetotelluric surveys
• Participating in California volcano monitoring and Mauna Loa eruption response

**Graduate research** at **University of Oregon** with Dr. Leif Karlstrom summer 2016-spring 2021
• Cataloged long-period seismicity at Kīlauea Volcano and inverted for seismic and GNSS data with coupled fluid-solid models
• Combined seismic source inversions and 3d eruptive plume models for the 2018 eruption of Kīlauea Volcano
• Modeled controls on ice sheet surface meltwater routing from supraglacial stream incision and bedrock topography
• Nodal seismic deployments at Mt. St. Helens, Mt. Hood, and Mt. Rainier

**Volcanology workshop** with **CIDER** (Cooperative Institute for Dynamic Earth Research) summer 2019
• Modeled two-phase conduit magma flow and fracture outgassing in the 2011 eruption of Cordón Caulle

**Teaching assistant** for undergraduate and graduate earth science courses at **University of Oregon** winter 2017-fall 2020

**Undergraduate research** at **Rice University** with Dr. Helge Gonnermann fall 2014-fall 2015
• Modeled bubble-network permeability in magma, prepared and analyzed pumice samples with a porometer and permeameter

**Undergraduate field experience** through **Rice University** summer 2014-2015
• Glacial grounding zone wedge stratigraphy in the Puget Sound and nodal seismic deployment with iMUSH at Mt. St. Helens

**Co-founder** at **ParkIT**, a startup founded by five Rice students that participated in the **OwlSpark** accelerator spring-fall 2013
• Co-developed vehicle recognition and tracking algorithms using image-analysis and machine learning

## TECHNICAL SKILLS

**Programming languages/software:** MATLAB, COMSOL, Python, Mathematica, QGIS
**Subjects:** signal processing, inverse methods, finite difference and finite element methods, code optimization, Fourier analysis, image analysis, machine learning, fluid dynamics, solid mechanics, seismology, geodesy

## Publications

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|---|---|
| 2023 Bull. Volcanology | **Crozier, J.**, Karlstrom, L., Montgomery-Brown, E., Angarita, M., Cayol, V., Bato, MG., Wang, T., Grapenthin, R., Shreve, T., Anderson, K., et al. *Understanding the drivers of volcano deformation through geodetic model verification and validation* |
| 2023 EOS | Karlstrom, L., Holtzman, B., Barth, A., **Crozier, J.**, Pate, A. *Earth is noisy. Why should its data be silent?* |
| 2022 JVGR | **Crozier, J.,** Tramontano, S., Forte, P., Oliva, S., Gonnermann, H., Lev, E., Manga, M., Myers, M., Rader, E., Ruprecht, P., Tuffen, H., Paisley, R., Houghton, B., Shea, T., Schipper, C., Castro, J. *Outgassing through magmatic fractures enables effusive eruption of silicic magma* |
| 2022 Science Advances | **Crozier, J.**, Karlstrom, L. *Evolving magma temperature and volatile contents over the 2008-2018 eruption of Kīlauea Volcano* |
| 2021 JGR Solid Earth | **Crozier, J.**, Karlstrom, L. *Wavelet-based characterization of very-long-period seismicity reveals temporal evolution of shallow magma system over the 2008–2018 eruption of Kīlauea Volcano* |
| 2019 JGR Solid Earth | Liang, C., **Crozier, J.**, Karlstrom, L., Dunham, E. *Magma oscillations in a conduit-reservoir system, application to very long period (VLP) seismicity at basaltic volcanoes–Part II: Data inversion and interpretation at Kīlauea Volcano* |
| 2018 The Cryosphere | **Crozier, J.**, Karlstrom, L., Yang, K. *Basal control of supraglacial meltwater catchments on the Greenland Ice Sheet* |
| 2017 JGR Solid Earth | Gonnermann, H., Giachetti, T., Fliedner, C., Nguyen, C., Houghton, B., **Crozier, J.**, Carey, R. *Permeability during magma expansion and compaction* |
| (*submitted*) | **Crozier, J.**, Dufek, J., Karlstrom, L., Cahalan, R., Anderson, K., Thelen, W., Liang, C., Benage, M. *Explosive volcanic eruptions driven by a "stomp rocket" mechanism.* |
| (*in prep*) | **Crozier, J.**, Anderson, K. *Earthquake and magma mechanics during caldera collapse.* |