

Leif Karlstrom Curriculum Vitae

August, 2020

Publications

Google Scholar profile:

<https://scholar.google.com/citations?user=YEI2zl0AAAAJ&hl=en>

Popular press

Karlstrom, L. and J. S. Byrnes* (2018), "More bad news for dinosaurs: Chicxulub meteorite impact triggered global volcanic eruptions on the ocean floor" *The Conversation*.

Peer reviewed

In review/In revision:

Barth, A., L. Karlstrom, B. Holtzman, A. Pate, A Niyak (2020) "Sonification and animation of multivariate data to illuminate dynamics of geyser eruptions" *in revision at Computer Music Journal*.

Crozier, J. and L. Karlstrom (2020) "Very-long-period seismicity over the 2008-2018 eruption of Kilauea Volcano" *in review at JGR Solid Earth*.

Accepted/In print:

2020

O'Hara D., L. Karlstrom, and D. W. Ramsey (2020) "Time-evolving surface and subsurface signatures of Quaternary volcanism in the Cascades Arc", *Geology*, <https://doi.org/10.1130/G47706.1>.

Wada I., **L. Karlstrom** (2020) "Modeling fluid migration in subduction zones", *EOS*, 101, <https://doi.org/10.1029/2020EO145551>.

Bindeman, I.N., N.D. Greber, O.E. Melnik O.E., A.S. Artyomova, **L. Karlstrom**, D. Colon (2020) "Pervasive Hydrothermal Events Associated with Large Igneous Provinces Documented by the Columbia River Basaltic Dikes", *Nature Scientific Reports*, 10, 10206.

Lerner, A.H., D. O'Hara, **L. Karlstrom**, S.K. Ebmeier, K.R. Anderson, S. Hurwitz (2020), "The prevalence and significance of offset magma reservoirs at arc volcanoes", *Geophysical Research Letters*, 47, 14.

Wu, S.-M., F.-C. Lin, J. Farrell, B. Shiro, **L. Karlstrom**, P. Okubo (2020), "Spatiotemporal Seismic Structure Variations Associated with the 2018 Kilauea Eruption based on Temporary Dense Geophone Arrays", *Geophysical Research Letters*, 47, e2019GL086668.

Liang, C., J. Crozier, **L. Karlstrom**, and E. M. Dunham (2020) "Magma oscillations in a conduit-reservoir system, application to very long period (VLP) seismicity at basaltic volcanoes--Part II: Data inversion and interpretation at Kilauea Volcano", *Journal of Geophysical Research: Solid Earth*, 125, e2019JB01745.

Liang, C., **L. Karlstrom**, and E. M. Dunham (2020) "Magma oscillations in a conduit-reservoir system, application to very long period (VLP) seismicity at basaltic volcanoes--Part I: Theory", *Journal of Geophysical Research: Solid Earth*, 125, e2019JB01743.

Bodmer, M., D.R. Toomey, J.J. Roering, **L. Karlstrom**, (2020) "Asthenospheric buoyancy and the origin of high-relief topography along the Cascadia forearc" *Earth and Planetary Science Letters*, 531, 115965.

2019

Karlstrom, L., K. E. Murray, and P. W. Reiners (2019) "Bayesian Markov-Chain Monte Carlo inversion of low-temperature thermochronology around two 8-10 m wide Columbia River Flood Basalt dikes" *Frontiers of Earth Science*, 7, 90.

Richardson, P. R. and **L. Karlstrom** (2019) "The multi-scale influence of topography on lava flow morphology." *Bulletin of Volcanology*, 81, 21.

O'Hara, D., **L. Karlstrom**, and J. J. Roering (2019) "Distributed landscape response to localized uplift and the fragility of steady states." *Earth and Planetary Science Letters*, 506, 243-254.

2018

Yang, K, L. C., Smith, **L. Karlstrom**, M. C. Cooper, M. Tedesco, D. van As, X. Cheng, Z. Chen, M. Li (2018) "A new surface meltwater routing model for use on the Greenland Ice Sheet surface." *The Cryosphere*, 12, 3791-3811

Perry-Houts, J. and **L. Karlstrom** (2018) "Anisotropic viscosity and time-evolving lithospheric instabilities due to aligned igneous intrusions." *Geophysical Journal International*, <https://doi.org/10.1093/gji/ggy466>

Crozier, J., **L. Karlstrom**, and K. Yang (2018) "Basal control of supraglacial meltwater catchments on the Greenland Ice Sheet," *The Cryosphere*, 12, 3383-3407.

Karlstrom, L., P. Richardson, D. O'Hara, and S. Ebmeier, "Magmatic landscape construction", *JGR Earth Surface*, 123, <https://doi.org/10.1029/2017JF004369>.

Byrnes, J. and **L. Karlstrom**, "Anomalous K-Pg aged seafloor attributed to impact-induced mid-ocean ridge magmatism" *Science Advances*, 4, 2, eaao2994
DOI: 10.1126/sciadv.aao2994.

2017

Karlstrom, L., S. R. Paterson and A. M. Jellinek (2017), "A reverse energy cascade for crustal magma transport", *Nature Geoscience*, 20, DOI: 10.1038/NGEO2982

2016

Bletery, Q., Thomas, A. M., Rempel, A. W., **Karlstrom, L.**, Sladen, A., De Barros, L., (2016) "Mega-Earthquakes rupture flat megathrusts", *Science*, 354, 6315, 1027-1031.

Gill, Y., C. David, I. Demir, B. T. Essawy, R. W. Fulweiler, J. L. Goodall, **L. Karlstrom**, H. Lee, H. J. Mills, J-H. Oh, S. Pierce, A. Popoe, M. W. Tzeng, S. R. Villamizar, X. Yu., (2016), "Towards the Geoscience paper of the future: Best practices for documenting and sharing research from data to software to provenance" *Earth and Space Sciences*, 3.

Yang, K., **Karlstrom, L.**, Smith, L. C., and Li, M., (2016) "Automatic High Resolution Satellite Image Registration Using Supraglacial Rivers on the Greenland Ice Sheet." accepted by *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*.

Karlstrom, L. and E.M. Dunham (2016), "Excitation and resonance of acoustic-gravity waves in a column of stratified, bubbly magma" *Journal of Fluid Mechanics*, 797, 431-470.

Karlstrom, L. and K. Yang (2016), "Fluvial supraglacial landscape evolution on the Greenland Ice Sheet" *Geophysical Research Letters*, 43, [doi:10.1002/2016GL067697](https://doi.org/10.1002/2016GL067697).

2015

Richards, M.A., W. Alvarez, S. Self, **L. Karlstrom**, P.R. Renne, M. Manga, C.J. Sprain J. Smit, L. Vanderkluyzen, S. Gibson (2015), "Triggering of the largest Deccan eruptions by the Chicxulub impact" *GSA Bulletin*, [doi:10.1130/B31167.1](https://doi.org/10.1130/B31167.1)

L. Karlstrom, H. M. Wright and C. R. Bacon (2015), The effect of pressurized magma chamber growth on melt migration and pre-caldera vent locations through time at Mount Mazama, Crater Lake, Oregon, *Earth and Planetary Science Letters*, 412, 209-219.

2014

Vandemeulebrouck, J., R. A. Sohn, M. L. Rudolph, S. Hurwitz, M. Manga, M. J. S.

Johnston, S. A. Soule, D. McPhee, J. M. G. Glen, **L. Karlstrom**, F. Murphy (2014), Eruptions at Lone Star Geyser, Yellowstone National Park, USA, Part 2: Constraints on Subsurface Dynamics, *Journal of Geophysical Research Solid Earth*. DOI: 10.1002/2014JB011526

Karlstrom, L., C. Lee and M. Manga (2014), The role of magmatic crustal thickening on arc front migration, *Geochemistry, Geophysics, Geosystems*, 15, 2655-2675, DOI:10.1002/2014GC005355.

Jutzeler, M., R. Marsh, R.J. Carey, J.D.L. White, P.J. Talling and **L. Karlstrom** (2014), On the fate of pumice rafts formed during the 2012 Le Havre submarine eruption, *Nature Communications*, 5:3660.

Karlstrom, L., A. Zok, and M. Manga (2014), Near-surface permeability in a supraglacial drainage basin on the Llewellyn glacier, Juneau Ice Field, British Columbia, *The Cryosphere*, 8, no. 2, 537-546.

2013

Karlstrom, L., P. Gajjar, and M. Manga (2013), Meander formation in supraglacial streams, *Journal of Geophysical Research*, 118, F20135.

Karlstrom, L., S. Hurwitz, R. A. Sohn, J. Vandemeulebrouck, F. Murphy, M. L. Rudolph, M. J. S. Johnston, M. Manga, and B. Mcleskey (2013), Eruptions at Lone Star Geyser, Yellowstone National Park, USA, Part 1: Energetics and Eruption Dynamics, *Journal of Geophysical Research*, 118, B50251.

2012

Rudolph, M. L., M. Manga, S. Hurwitz, M. Johnston, **L. Karlstrom** et al. (2012), Mechanics of Old Faithful Geyser, Calistoga CA, *Geophysical Research Letters*, 39 L24308.

Dufek, J., C. Huber, and **L. Karlstrom** (2012), Magma chamber dynamics and thermodynamics, *Chapter 2 of "Modeling Volcanic Processes: The Physics and Mathematics of Volcanism"* Cambridge University Press.

Karlstrom, L., M. L. Rudolph and M. Manga (2012), Caldera size modulated by the yield stress within a crystal-rich magma reservoir, *Nature Geoscience*, v. 5 no. 6, pp. 402-405.

2011

Karlstrom, L. and M. Richards (2011), On the evolution of large ultramafic magma chambers and timescales for Flood Basalt eruptions, *Journal of Geophysical Research*, 116, B08216.

Rudolph, M. L., **L. Karlstrom** and M. Manga (2011), A prediction for the longevity of

the Lusi Mud Volcano, Indonesia, *Earth and Planetary Science Letters*, 308, 124-130.

2010

Karlstrom, L., J. Dufek, and M. Manga (2010), Magma chamber stability in arc and continental crust, *Journal of Volcanology and Geothermal Research*, 190, 249-270.

2009

Karlstrom, L., J. Dufek, and M. Manga (2009), Organization of volcanic plumbing through magmatic lensing by magma chambers and volcanic loads, *Journal of Geophysical Research*, 114, B10204.

2006

Karlstrom*, L., and M. Manga (2006), Origins and implications of zigzag rift patterns on lava lakes, *Journal of Volcanology and Geothermal Research*, 154, 317-324.

Professional appointments and education

Assistant Professor, University of Oregon, Winter 2015-

NSF EAR-Postdoctoral Fellowship, conducted at Stanford University 2012-2014 with Eric Dunham

PhD Earth and Planetary Science, Fall 2011 with advisor Michael Manga, department of Earth and Planetary Science, UC Berkeley

Santa Fe Institute Complex Systems Summer School 2010, Santa Fe New Mexico, June 2010

B.S. Physics (Honors) University of Oregon, Spring 2006

B.S. Mathematics University of Oregon, Spring 2006

B.M. Violin Performance University of Oregon, Spring 2006

Grants

Awarded:

NSF CAREER award “Long-term Controls on Short-term Patterns of Magmatism: Towards a Unified Framework for Crustal Magma Transport” (start date June 1, **2019**, \$599,951)

NSF EAR-1624557 “*Collaborative Research: Waves in volcanic conduit-crack systems and Very Long Period seismicity at Kilauea Volcano, Hawaii*”, (2016, \$221,040) with Eric Dunham

NASA-NNX16AQ56G “Fluvial supraglacial erosion on the Greenland Ice Sheet as a Tracer of Spatially and Temporally evolving Melt and Ice Sheet Dynamics”, (2016, \$63,248)

NSF EAR supplement “The legacy dataset of William H. Taubeneck: Structure and geochemistry of the Columbia River Flood Basalt Group feeder dikes”, (2016, \$11,896)

University of Oregon CAS travel grant for Galapagos field work (2018, \$1,000)

University of Oregon CAS grant for interdepartmental fluids seminar, (2016, \$3000), (2019, \$1500)

NSF EAR-Postdoctoral Fellowship # 1143623, (2012, \$170,000)

Honors and awards

American Geophysical Union VGP section Hiyashi Kuno Early Career Award, 2018

National Academies of Sciences, Kavli Frontiers of Science Symposium Fellow, 2018

Professional Activities

Invited Talks

2020: U. British Columbia physics department seminar, AGU Chapman conference on distributed volcanism (keynote speaker, postponed to 2021)

2019: U Oregon physics department seminar, European Geosciences Union, GSA Cordilleran section

2018: USGS Hawaii Volcano Observatory, Georgia Institute of Technology, USGS Alaska Volcano Observatory

2017: UT Austin, Columbia/Lamont Doherty, Stanford, UC Santa Cruz, Portland State University, IAVCEI, GSA Annual Meeting, AGU (coauthor presented)

2016: U Oregon Institute for Theoretical Science (physics dept), University of Iceland, Oregon State University, AGU

2015: UC Davis, Harvard, Oregon State University, Portland State University (applied

math seminar), Cambridge University, Bristol University, AGU

2014: U British Columbia, MIT, Caltech, SSA, Open Earth Systems, USGS Volcano Hazards

2013: U Oregon, Rice University, IAVCEI, AGU

2012: UC Santa Cruz, USGS CVO, Open Earth Systems, Southern Methodist University, National Snow and Ice Data Center, Oxford University, Brown University

2011: USGS Volcano Hazards, Stanford Geophysics Seminar, U Oregon, AGU

2010: Caltech Geoclub, San Jose State, AGU

Undergraduate student advising

Martin Harris (committee member on senior thesis, 2017)

Keane Daly (baccalaureate independent research, presented at AGU) 2016-2017

Morgan Nasholds (completed senior thesis, presented at AGU) 2016-2017

Haydn Thomas (honors thesis joint with U. Bristol) 2018

Felicia Cummings (UO undergraduate) 2019-

Graduate student advising

Masters students

Constance Ozimek (MSc) 2015-2017 (**defended 2017**)

Maria McQuillan (MSc) 2018-2020 (**defended 2020**)

PhD students

Daniel O'Hara (PhD) 2014-2020 (**defending 2020**)

Matthew Morriss (PhD–second project) 2015-2020 (**defended 2020**)

Allan Lerner (PhD–second project) 2015-2020 (**defended 2020**)

Jonathan Perry-Houts (PhD–second project) 2015-2018 (**defended 2018**)

Josh Crozier (PhD) 2016-

Rachel Hampton (PhD) 2017-

Allison Kubo (PhD) 2018-

Chris Harper (PhD – second project) 2019-

Nate Klema (PhD) 2018-

Genessee Lucia (PhD) 2020-

Postdoc advising

Paul Richardson (PhD MIT 2015) 2016-2017 – Now employed at US Forest Service

Peer Reviewer

JGR Solid Earth, JGR Earth Surface, Geophysical Research Letters, Bulletin of Volcanology, Journal of Volcanology and Geothermal Research, Geology, AGU Chapman conferences, NSF Polar Programs, NSF Geophysics, NSF Petrology and Geochemistry, NSF Geomorphology and Land-use Dynamics, Materials, G-Cubed, Physics of the Earth and Planetary Interiors, Earth and Planetary Science Letters, NASA-ESI, Journal of Fluid Mechanics, Water Resources Research, Geosphere, Nature Communications, Nature Geoscience, Science Advances, The Journal of Geology, Minerals, Journal of Petrology

Professional community involvement / organizing

Presenter at the American Geophysical Union conference, 2014-2020

Presenter at the Geological Society of America Conferences, 2017, 2019, 2020

Presenter at the European Geosciences Union conference, 2019

Invited participant at the 2019 CIDER workshop at UC Berkeley on “Volcanoes”

Modeling Collaboratory for Subduction, NSF Research Coordination Network “Fluid Transport Modeling” 2019 workshop co-organizer, with Ikuko Wada. *Subsequently invited to the steering committee of the MCS RCN.*

Participant in the 2018 Workshop on Advancing Integrative Volcanology with Community Experiments in Albuquerque, NM.

IAVCEI 2017 Session Co-Organizer “New approaches using statistical methods in volcanology” with Gabor Kereszturi, Benjamin Black, and Jacob Richardson

IAVCEI 2017 Session Co-Organizer “Arc evolution: space, time, morphology, and longevity of volcanic arcs” with Severine Moune, Paul Wallace, Mattia Pistone, Mark Jellinek, Diana C. Roman

Participant in the November, 2017 “Mount Rainier meeting” at the Cascades Volcano Observatory, reviewing science questions and state of knowledge at Mount Rainier volcano, Oregon.

Organizer of the Interdisciplinary Fluids Seminar at University of Oregon in **2016** and **2019**, a speaker series attracting international fluids experts across biology, physics, and earth science with UO College of Arts and Sciences funding.

Invited participant at the 2016 “Workshop on Improving Understanding of Volcanic Eruptions” National Academies of Sciences meeting in Washington DC that preceded the 2017 ERUPT report on grand challenges in volcanology.

Participant in the November, 2016 “Mount Hood meeting” at the Cascades Volcano Observatory, reviewing science questions and state of knowledge at Mount Hood

volcano, Oregon.

Teaching

Calculus I, volunteer with Patten University's Prison University Project, San Quentin Prison, January-September 2009

Stanford Course GEOPHYS 171: mafic volcanism in the Southwestern United States, spring 2014

GEOL 315 "Earth Physics" – undergraduate majors course at University of Oregon, Winter 2016, Spring 2018, Winter 2020

GEOL 454/554 "Fluid Dynamics" – developed and now listed permanently in UO course catalog, an undergraduate/graduate fluids course at University of Oregon, Spring 2015, Winter 2017, Winter 2019, Spring 2020

GEOL 450 Summer field camp, University of Oregon, 2016, 2017, 2018 – developed new Wallowas module looking at Columbia River Flood Basalt dikes and flows.

GEOL 399 "Current Research in Earth and Planetary Science", Spring 2019 – new experimental course introducing undergraduates to research in the department and how to read scientific literature.

GEOL 306 "Volcanoes and Earthquakes", Winter 2018, Spring 2019

Reading groups: Finite difference methods, Fall 2016, Rheology of complex fluids, Spring 2018