

Leif Karlstrom Curriculum Vitae

January, 2018

Academics

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

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

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

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

Assistant Professor, University of Oregon, Winter 2015-

Invited Talks (geoscience colloquia unless stated otherwise)

2010: Caltech Geoclub, San Jose State, AGU

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

2012: UCSC Whole Earth Seminar, USGS CVO, Open Earth Systems, Southern Methodist University, National Snow and Ice Data Center, Oxford University, Brown University

2013: U Oregon, Rice University, IAVCEI, AGU

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

2015: UC Davis, Harvard University, Oregon State University, Portland State University (applied math seminar), Cambridge University, Bristol University, AGU

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

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

Grants and awards

NSF EAR-1624557 “Collaborative Research: Waves in volcanic conduit-crack systems and Very Long Period seismicity at Kilauea Volcano, Hawaii”, 2016

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

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

University of Oregon CAS grant for interdepartmental fluids seminar, 2015

NSF EAR-Postdoctoral Fellowship # 1143623, 2012

UC Berkeley Louderback research award, 2011

NSF grant #1049983 (listed collaborator) “Little Devils Postpile revisited: Intercalibration of thermochronometer kinetics in a contact aureole,” 2011

Behrman UC Berkeley fieldwork grant, 2011

CTEMPS graduate student seed grant, 2011

GSA Graduate Student fieldwork grant, 2010

Professional Activities

Undergraduate student advising:

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

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

Graduate student advising:

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

Daniel O’Hara (PhD) 2014-

Matthew Morriss (PhD – second project) 2015-

Allan Lerner (PhD – second project) 2015-

Jon Perry-Houts (PhD – second project) 2015-

Josh Crozier (PhD) 2016-

Rachel Hampton (PhD) 2017-

Postdoc advising:

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

Graduate student evaluation committee member:

Jonathon Perry-Houts (PhD)
Matthew Morriss (PhD)
Ben Heath (PhD)
Dan O'Hara (PhD)
Allan Lerner (PhD)
Kathy Trafton (PhD)
Josh Crozier (PhD)
Rebecca Tumblin (PhD, UO physics department, external member)

Constance Ozimek (MSc)
Sam Shaw (MSc)
Dan Sulak (MSc)
Jiaming Yang (MSc, Portland State U, external member)

Peer Reviewer:

JGR Solid Earth, JGR Earth Surface, Geophysical Research Letters, Bulletin of Volcanology, Journal of Volcanology and Geothermal Research, Geology, 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, Journal of Fluid Mechanics, Water Resources Research, Geosphere, Nature Communications, Nature Geoscience, Science Advances, The Journal of Geology

Teaching Experience

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 quarter 2014

GEOL 315 "Earth Physics" – undergraduate course at University of Oregon, Winter quarter 2016

Finite difference methods, University of Oregon, Fall 2016

GEOL 410/510 "Fluid Dynamics" – undergraduate/graduate course at University of Oregon, Spring quarter 2015, Winter quarter 2017

GEOL 450 Summer field camp, University of Oregon, 2016, 2017

GEOL 315 "Earth Physics" – undergraduate course at University of Oregon, Winter quarter 2016

GEOL 306 “Volcanoes and Earthquakes”, undergraduate course, Winter 2018

Publications (* indicates undergraduate author)

Google Scholar profile:

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

In preparation:

Erickson, B. A. and L. Karlstrom, “Wave motion and conduit flow instabilities during explosive volcanic eruptions” *for J Fluid Mechanics*

Lerner, A., L. Karlstrom, D. O’Hara, S Hurwitz, S. Ebmeier, and K. Anderson, “The prevalence of magma chambers spatially offset from their surface vents” *for Nature Geoscience*

Karlstrom, L. and K. E. Murray, “Joint Bayesian inversion of petrologic and thermochronologic data around two Columbia River Flood Basalt dikes” *for Bull Volc*

Crozier, J. and L. Karlstrom, “Does Greenland Ice Sheet surface topography inform surface melting and basal processes?” *for J. Glaciology*

Karlstrom, L., and E. M. Dunham, “Oscillations in magmatic exchange flows with realistic volatile solubility laws” *for JVGR*

Richardson, P. and L. Karlstrom, “The influence of topography on lava flow morphology ” *for Bull. Volc.*

Perry-Houts, J. and L. Karlstrom, “Consequences of Lithospheric Structural Anisotropic Viscosity Produced by Aligned Igneous Intrusions” *for GJI*

Ozimek, C. and L. Karlstrom, “Eruption cycles in a coupled thermal-mechanical-compositional model of a magma chamber” *for JVGR*

Yang, K, L. C., Smith, L Karlstrom, and M. C. Cooper “Surface meltwater routing in internally drained catchments on the Greenland Ice Sheet”, *for JGR-Earth Surface*

In review/In revision:

O’Hara, D., L. Karlstrom, and J. J. Roering, “Distributed landscape response to localized uplift and the fragility of steady states” *in review Earth and Planetary Science Letters*

Karlstrom, L., P. Richardson, D. O’Hara, and S. Ebmeier, “Magmatic landscape construction”, *in revision at JGR Earth Surface*

Accepted/In print:

2018

Byrnes, J. and L. Karlstrom, “Anomalous K-Pg aged seafloor attributed to impact-induced mid-ocean ridge magmatism” *Science Advances*, *in press*

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.

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

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.

Select abstracts:

Yang, K, L Karlstrom, LC Smith, Investigating the inception of supraglacial channels on the southwest Greenland ice sheet using high-resolution satellite images and digital elevation models, *EGU2016-3161 EGU 2016*

Liang, C, E Dunham, O O'Reilly and L Karlstrom, A Linearized Model for Wave Propagation through coupled volcanic conduit-crack systems filled with multiphase magma, *S51D-2728 AGU 2015*

Dunham, E, L Karlstrom, W Thelen, M Patrick, C Liang and B Prochnow, Characterization of fluid oscillations at Kilauea volcano through time-dependent modeling of seismic displacements from rockfall events, *S43F-08 AGU 2015*

Karlstrom L and K Yang, Supraglacial landscape evolution on the Greenland Ice Sheet, *C43E-02 AGU 2015*

Ozimek, C and L Karlstrom, Time evolution of thermo-mechanically and chemically coupled magma chambers, *V43B-3155 AGU 2015*

Richards, MA, W Alvarez, S Self, L Karlstrom, P Renne, M Manga, C Sprain, J Smit, L Vanderkluyzen and S Gibson, Triggering of the largest Deccan eruptions by the Chicxulub impact, *V41C-3086 AGU 2015*

O'Hara, D, L Karlstrom, B Black and K R Murray, Landscape evolution in response to laccolith inflation on the Colorado Plateau, *EP51C-3534 AGU 2014*

Karlstrom, L., C.-T. Lee and M. Manga, Crustal thickening drives arc front migration, *for AGU fall meeting 2012*

Wright, H.M.N., L. Karlstrom and C. R. Bacon, Building a large silicic magma chamber at Mount Mazama, Crater Lake, Oregon, *for AGU fall meeting 2012*.

Loh, L.K., L. Karlstrom, D.W. Ramsey and C.L. Driedger, A new multi-parameter database of Holocene and Pleistocene Cascades magmatism, *for AGU fall meeting 2012*.

Shuster, D.L., P.W. Reiners, J.L. Schmidt, P.K. Zeitler, R.A. Ketcham, and L. Karlstrom,

Intercalibration of multiple thermochronometric systems at the Little Devil's Postpile contact aureole, *for AGU fall meeting 2012*.

Karlstrom, L., H.M.N. Wright and C.R. Bacon, Focusing of melt by magma chambers in time and space: theory and application to Mount Mazama, OR, *for Volcanism in the American Southwest workshop, Arizona 2012*.

Karlstrom, L. and T. Perron, Coupling between fluvial incision and volcanism in ocean island landscape evolution, *for Chapman conference Hawaiian Volcanoes: From source to surface, Hawaii 2012*.

Karlstrom, L. and M. Manga, Firn permeability and the spacing of supraglacial channels on the Juneau Icefield, *for International Glaciological Society symposium, Fairbanks, AK 2012*.

Lipovsky, B., E. Dunham and L. Karlstrom, Elastic wave propagation near glacial conduits, *for International Glaciological Society symposium, Fairbanks, AK 2012*.

Karlstrom, L., M. L. Rudolph, J. Vandemeulebrouck, F. Murphy, S. Hurwitz, M. Manga, R. A. Sohn and M. J. S. Johnston, Jet dynamics at Lone Star Geyser, Yellowstone National Park, *American Geophysical Union Fall Conference 2011*.

Karlstrom, L., M. Manga and M. L. Rudolph, Controls on the growth and eruption of large magma chambers, *Invited talk, American Geophysical Union Fall Conference 2011*.

Richards, M. A. and L. Karlstrom, The evolution of crustal magma storage during Large Igneous Province emplacement, *American Geophysical Union Fall Conference 2011*.

Karlstrom, L., M. Manga, M. A. Richards, and M. L. Rudolph, Mechanical controls on the longevity and magnitude of large volcanic eruptions, *AGU Chapman conference, July 25-31, Galapagos, Ecuador*.

Karlstrom, L., P. Gajjar and M. Manga, Supraglacial stream morphodynamics, *Invited talk, American Geophysical Union Fall Conference 2010*.

Zok, A., L. Karlstrom, E. W. Hood, M. Manga, R. Wenzel and E. S. Kite, Field observations of supraglacial streams on the Juneau Icefield, *Poster, American Geophysical Union Fall Conference 2010*.

Karlstrom, L., M. Manga and M. L. Rudolph, Coupled magma chamber evolution and flow in conduits during large volcanic eruptions. *Talk, American Geophysical Union Fall Conference 2010*.

Karlstrom, L., M. Manga and I. Matsuyama, Martian magmatic plumbing and the spacing between Tharsis Montes shield volcanoes, *Talk, Lunar and Planetary Science Conference 2010*.

Karlstrom, L., J. Dufek and M. Manga, Magma chamber growth and stability in the

shallow crust, *Poster at 2009 Penrose conference “Low $\delta^{18}O$ rhyolites and crustal melting: Growth and redistribution of the continental crust.”*

Karlstrom, L. and M. Manga, Magma siphoning and the mechanics of Large Igneous Province eruptions, *Poster, American Geophysical Union Fall Conference 2009.*