

# Benjamin Z. Klein

Institute of Earth Sciences  
University of Lausanne  
Geopolis Room 3640  
1015 Lausanne, Switzerland

email: [benjaminzachary.klein@unil.ch](mailto:benjaminzachary.klein@unil.ch)  
mobile (Swiss): +41 78 220 06 64  
mobile (USA): +1 973-634-0700  
website: [www.benklein.rocks](http://www.benklein.rocks)

## Education

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Massachusetts Institute of Technology, Cambridge, MA  
PhD, Geology, January 2019  
Thesis: *Processes and Rates of Arc Crust Growth and Differentiation in the Southern Sierra Nevada Crustal Section, California*  
Advisor: Professor Oliver Jagoutz

Amherst College, Amherst, MA  
B.A. in Geology, May 2010  
Thesis: *Metamorphism of sillimanite-garnet-biotite-K-feldspar gneiss in the Highland Mountains of southwest Montana*  
Advisors: Professors Tekla Harms and Jack Cheney

University of Canterbury, Christchurch, New Zealand  
Geology field camp and semester abroad, 2009

## Work and Teaching Experience

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**Postdoctoral Research Fellow** – University of Lausanne, 2021-  
**Postdoctoral Research Scientist** – Boston College, 2019-2021  
**Graduate Research Assistant** – MIT, 2012-2018  
**Post-Bachelors Research Assistant** – Los Alamos National Laboratory, 2011 – 2012  
**Summer REU** – College of Oceanic and Atmospheric Science, Oregon State University, 2008  
**Summer Research Assistant** – Amherst College, Summer 2007

### Teaching Experience

Field Camp, MIT and Mojave Desert, 2016, 2018  
Introduction to Geophysics and Planetary Science, MIT, 2015  
Introduction to Geology, MIT, 2014  
Mineralogy, Amherst College, 2009  
Introduction to Geology, Amherst College, 2007, 2008

Completed Kaufman Teaching Certificate Course at MIT, spring 2018

## Awards and Honors

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**Post-Doctoral Knowledge Dissemination Grant**, Boston College, September 2019  
**Geochronology For Student Research Award**, Earthscope, June 2015  
**EAPS Student Research Fund Grant**, MIT, October 2015  
**Graduate Student Research Grant**, Geological Society of America, March 2015  
**EAPS Student Research Fund Grant**, MIT, February 2015  
**Grayce B. Kerr Fellowship**, MIT, August 2013  
**Presidential Graduate Fellowship**, MIT, August 2012  
**Summa cum laude**, Amherst College, May 2010  
**Phi Beta Kappa**, Amherst College, May 2010  
**The Belt-Brophy Prize**, Amherst College, May 2009  
**The Harvey Blodgett & Phi Delta Theta Scholarships**, Amherst College, May 2009  
**Howard Hughes Medical Institute Fellowship**, Amherst College, Summer 2007

## Publications

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**Klein, B.Z.** & Behn, M.D. 2021, On the evolution and fate of sediment diapirs in subduction zones. *Geochemistry, Geophysics, Geosystems*, 22.

**Klein, B.Z.**, & Jagoutz, O. 2021, Construction of a trans-crustal magma system: Building the Bear Valley Intrusive Suite, Southern Sierra Nevada, California. *Earth and Planetary Science Letters*, 553.

Rezeau, H., **Klein, B.Z.** & Jagoutz, O. 2021, Mixing dry and wet magmas in the lower crust of a continental arc: New petrological insights from the Bear Valley Intrusive Suite, southern Sierra Nevada, California. *Contributions to Mineralogy and Petrology*, 176(73).

**Klein, B.Z.**, Jagoutz, O. & Ramezani, J. 2020, High precision geochronology requires that ultra-fast mantle-derived magmatic fluxes built the trans-crustal Bear Valley Intrusive Suite, Sierra Nevada, CA, *Geology*, 49(1), 106-110.

Jagoutz, O. & **Klein, B.Z.** 2018, On the importance of crystallization-differentiation for the generation of SiO<sub>2</sub>-rich melts and the compositional build-up of arc (and continental) crust. *American Journal of Science*, 318(1), 29-63

**Klein, B.Z.**, Jagoutz, O. & Behn, M.D. 2017, Archean crustal compositions promote full mantle convection. *Earth and Planetary Science Letters* 474, 516-526.

Olive, J.A., Behn, M.D., Mittelstaedt, E., Ito, G. & **Klein, B.Z.** 2016, The role of elasticity in simulating long-term tectonic extension. *Geophysical Journal International* 205(2), 728-743

*In Review:*  
**Klein, B.Z.**, Jagoutz, O., Schmidt, M.W. & Kueter, N. A Global Assessment of the Controls on the Fractionation of Arc Magmas. *Geochemistry, Geophysics, Geosystems*

*In preparation:*  
**Klein, B.Z.**, Jagoutz, O., VanTongeren, J.A. & Setera, J. Evidence for relamination of subducted sediment in the lower crust of the Sierra Nevada, California.

## Conference Presentations

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Klein, B.Z., and Muntëner, O. Mn/Mg ratios in magmatic rocks track garnet fractionation and crustal thickness; 2021 AGU Fall Meeting

Klein, B.Z., and Behn, M.D. On the evolution and fate of sediment diapirs in subduction zones; 2021 AGU Fall Meeting

Klein, B.Z., and Behn, M.D. Modeling the evolution of sediment diapirs in subduction zones; 2020 AGU Fall Meeting

Klein, B.Z., and Jagoutz, O., Construction of the Bear Valley Intrusive Suite, a Trans-Crustal Magma System in the Sierra Nevada, California; *invited abstract*, 2020 GSA Annual Meeting

Klein, B.Z., and Behn, M.D. The Multiple Fates of Subducted Sediments; Golschmidt 2020

Klein, B.Z., Jagoutz, O., Schmidt, M. and Kueter, N. Wet and Deep vs. Dry and Shallow: Global Fractionation Conditions in Volcanic Arcs; 2019 AGU Fall Meeting

Klein, B.Z., Jagoutz, O. & Ramezani, J. Flare-up without a cause: The Bear Valley Intrusive Suite, Sierra Nevada, CA; 2019 GSA Annual Meeting

Klein, B.Z., Jagoutz, O. & Ramezani, J. How fast can an arc build new crust?; 2018 AGU Fall Meeting

Klein, B.Z. and Jagoutz, O. What controls the stratification and thickness of arc crust?; Goldschmidt 2018

Klein, B.Z., and Jagoutz, O. How is arc crust built? Insights from field observations and modeling; 2017 AGU Fall Meeting

Klein, B.Z., Jagoutz, O., VanTongeren, J.A. & Setera, J. Evidence for three distinct metasediment emplacement mechanisms in an arc crust section, southern Sierra Nevada, California; 2017 GSA Annual Meeting

Klein, B.Z., Jagoutz, O. & VanTongeren, J.A. Are arc lower crustal metasediments derived from above or below? A detrital zircon study in the lower crust of the Sierra Nevada, California; 2016 AGU Fall Meeting

Klein, B.Z., Jagoutz, O., Olive, J.A., & Behn, M.D. Compositional controls on subducted slab dynamics in the early Earth; 2015 AGU Fall Meeting

Klein B.Z., and Weiss, B. More evidence for a partially differentiated CV chondrite parent body from paleomagnetic studies of ALH 84028 and ALH 85006; 2014 AGU Fall Meeting

Klein, B.Z., Flowers, B.A., Gorkowski, K., Dubey, M.K., Knighton, W.B., Floerchinger, C., Herndon, S.C., Fast, J.D., & Zaveri, R.A. Understanding Biogenic and Anthropogenic Trace Gas Variations Measured Near Cool, CA in June 2010; 2011 AGU Fall Meeting

Klein, B.Z., Cheney, J.T., & Harms, T.A., Metamorphism of Mylonitic Sillimanite-Garnet-Biotite-K-Spar Gneiss in the Highland Mountains of Southwest Montana; GSA 2010 NE Section Meeting

Klein, B.Z., Goni, M., Macdonald, R., & Gobiell, C. Analysis of organic carbon in arctic shelf sediments; 2008 AGU Fall Meeting

## Invited Lectures

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University of Washington – Department Colloquia (February, 2021)  
Boston College – Department Seminar (October, 2020)  
Princeton University – Solid Earth Seminar (April, 2020)  
Lamont Doherty Earth Observatory – Geophysics Seminar (February 2017)  
Brown University – Geophysics Seminar (April, 2016)  
Woods Hole Oceanographic Institute – Geophysics/Geochemistry Seminar (April, 2016)

## Professional Activities

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### Reviewer:

Nature Communications  
Geochemistry/Geophysics/Geosystems  
Earth and Planetary Science Letters  
NSF Petrology and Geochemistry Program

### Member:

American Geophysical Union  
Geological Society of America

### Session Convener:

American Geophysical Union Fall Meeting 2019

## Field Experience

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Adamello and Bergell Intrusions, Italy (2021)  
Southernmost Sierra Nevadas, California (2015, 2016, 2017)  
Mojave Desert, California (2013, 2015, 2017)  
Eastern Sierra Nevada, California (2014)  
Indian Himalayas (2013)  
Highland and Little Belt Mountains, Montana (2009)  
New Zealand (2009)  
Death Valley and Inyo Mountains, California (2007)