

Ellen W. Alexander

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Education

University of California, Los Angeles: Ph.D, March 2020

C.Phil, Geology, 2019; M.S., Geology, 2017

Department of Earth, Planetary, and Space Sciences

Wesleyan University: B.A., 2014

Earth & Environmental Sciences, with Departmental Honors

Research

Postdoctoral Associate: University of Colorado, Boulder

2020 – present

NSF-funded investigation of crustal structure and hydration effects on uplift of Colorado Plateau using metamorphic petrology, thermobarometry, and isotope geochemistry. Supervisor: Kevin Mahan.

Science Mentor: Research Experience in Solid Earth Science for Students, UNAVCO

Summer 2020

Project lead and mentor for two undergraduate interns conducting original research in geochemical modeling of trace elements in arc magma production. Created project plan with deadlines for research deliverables; supervised interns' research activities, manuscript completion, and creation of oral and poster presentations.

Graduate Student Researcher: UCLA Dept. of Earth, Planetary, and Space Sciences

2015 – 2020

Dissertation topic: Geochemical and thermobarometric tracers of crustal thickness in Southern Tibet throughout the India-Asia Collision. Advisor: T. Mark Harrison

Undergraduate Student Researcher, Wesleyan University Dept. of Earth & Environmental Sci.

2012 – 2014

Thesis: Aqueous geochemistry of an active magmato-hydrothermal system: Copahue Volcano, Río Ágrío, and Lake Caviahue, Neuquén, Argentina. Advisor: Johan C. Varekamp

Teaching

Teaching Assistant/Associate/Fellow, UCLA EPSS

2015 – 2020

Laboratory Instructor, EPSS 103A: Igneous Petrology: Winter 2016, 2017, 2018, 2019, 2020

Thermodynamics and rheological properties of melts; eruption and emplacement of lavas and plutons; classification, petrography, geochemistry, and geochronology of igneous rocks; research design and methods; analytical techniques; geochemical modeling; scientific writing; oral presentation skills; peer instruction; field geology of volcanic and plutonic rocks.

Laboratory Instructor, EPSS 51: Mineralogy - Earth & Planetary Materials: Fall 2015, 2016, 2018, 2019

Mineral symmetry and crystallography; physical and chemical properties of minerals; mineral identification and classification; solid solutions; crystal form and habits; critical thinking methods for mineralogy, oral presentations.

Service

Graduate Student – Faculty Liaison, UCLA EPSS

2017 – 2019

Attended faculty meetings to advocate and report information relevant to graduate students.

Administered survey of teaching assistants to assess course material needs.

Administered comprehensive, anonymous survey of graduate students in EPSS. Presented results at faculty meeting and to the Assistant to the Executive Vice Chancellor.

Collaborated with the EPSS Graduate Student Advisor to compose a graduate student “Survive and Thrive” handbook, including holding workshops for student feedback.

Earth, Planetary, and Space Sciences Student Organization, UCLA

2015 – 2019

Treasurer (2015-2016), Vice President of Fundraising (2016-2017), President and Chair (2017-2019)

Planned and hosted: 3+ department-wide social events per year, annual incoming graduate student camping trip, annual student research symposia, admitted student visit day dinners, and various informational panels for undergraduates and graduates.

Maintained the budget of EPSSSO with apparel sales fundraising, institutional grants, and other revenue sources.

Referee for Earth and Planetary Science Letters

2016 – 2018

Awards and Grants

Excellence in Teaching Award, UCLA EPSS; 2016, 2017, 2019

Mineralogy, Geochemistry, Petrology and Volcanology Division travel grant to attend GSA 2019, \$500

2nd Place Talk, L.A. Basin Student Research Symposium, 2018

Fall Departmental Quarterly Fellowship, \$7,500, UCLA EPSS, 2017

Honors in Earth & Environmental Sciences, Wesleyan University, 2014

Hughes Summer Fellowship, \$2,500, Wesleyan University, 2013

Professional Development

Reclaiming STEM: one-day workshop on centering the voices of underrepresented and marginalized groups in STEM in the context of science communication and science policy, U.C. Irvine, September 2019.

Communicating Science Effectively in Today's World: one-day workshop on science communication and promotion, UCLA, June 2019.

UCLA SIMS Workshop (participant and presenter), February 2016; 2019, 2020 (scheduled).

Professional Society Memberships

Geological Society of America

Association of Women Geoscientists

American Geophysical Union

National Association of Geoscience Teachers

Invited Seminars

Geoclub, Caltech Division of Geological and Planetary Sciences, March 2019

Geocheminar, UCLA EPSS: May 2016, March 2017, November 2018

Publications

Alexander, E.W., 2014. Aqueous geochemistry of an active magmato-hydrothermal system: Copahue Volcano, Río Ágrio, and Lake Caviahue, Neuquén, Argentina. Undergraduate Honors Thesis, Wesleyan University.

Tang, F., Taylor, R., Einsle, J., Borlina, C., Fu, R., Weiss, B., Williams, H., Williams, W., Nagy, L., Midgley, P., Lima, E., Bell, E., Harrison, M., **Alexander, E.W.**, and Harrison, R., 2019. Secondary magnetite in ancient zircon precludes analysis of a Hadean geodynamo. *Proceedings of the National Academy of Sciences*, 116(2), pp.407-412.

Alexander, E.W., Wielicki, M.M., Harrison, T.M., DePaolo, D.J., Zhu, D.C., and Zhao, Z., 2019. Hf and Nd Isotopic Constraints on Pre- and Syn-collisional Crustal Thickening of Southern Tibet. *JGR-Solid Earth*, 124, pp.11,038-11,054, doi: 10.1029/2019JB017696.

Borlina, C., Weiss, B., Lima, E., Tang, F., Taylor, R., Einsle, J., Harrison, R., Fu, R., Bell, E., **Alexander, E.W.**, Kirkpatrick, H., Wielicki, M., Harrison, M., Ramezani, J., and Maloof, A., 2019. Re-evaluating the Evidence for a Hadean-Eoarchean Dynamo. *Science Advances*, 6(15), doi: 10.1126/sciadv.aav9634.

Keisling, B., Bryant, R., Golden, N., Stevens, L., and **Alexander, E.W.**, 2020. Does our Vision of Diversity Reduce Harm and Promote Justice? *GSA Today: Groundwork*, 30(10), doi: 10.1130/GSATG429GW.1

Alexander, E.W., Yamamoto-Hillman, C.A., and Harrison, T.M., 2020: Rapid crustal thickening in Southern Tibet began at 60 Ma. *Submitted September 2020*.

Alexander, E.W., 2020: Trace element “pseudobarometers” do not accurately depict crustal thickness in Southern Tibet. *In preparation*.

Conference Papers

Alexander, E.W., Kading, T., Rodriguez, A., Oonk, P.B. and Varekamp, J.C., 2013, October. Volcanic impacts on Lake Caviahue, Argentina. Geological Society of America Abstracts with Programs, v. 45, n. 7.

Weiss, B., Lima, E., **Alexander, E.W.**, Bell, E., Boehnke, P., Wielicki, M., Harrison, M., Fu, R., Kehayias, P., Glenn, D. and Walsworth, R., 2016, December. Paleomagnetism of Hadean and Archean Detrital Zircons from the Jack Hills, Western Australia. In AGU Fall Meeting Abstracts.

Alexander, E.W.*, Wielicki, M., Harrison, M., Lovera, O. and DePaolo, D., 2016, February. Accessing the Fourth Dimension In Orogenic Reconstruction Using Granitoid Thermobarometry. In AGU Fall Meeting Abstracts.

Borlina, C., Weiss, B., Lima, E., Fu, R., Bell, E., **Alexander, E.W.**, Kirkpatrick, H., Wielicki, M., Harrison, M., Ramezani, J. and Harrison, R., 2017, December. Paleomagnetism of Hadean to Neoproterozoic Detrital Zircons from the Jack Hills, Western Australia. In AGU Fall Meeting Abstracts.

Alexander, E.W., Harrison, M., Wielicki, M., Lovera, O., DePaolo, D. and Yamamoto-Hillman, C., 2017, December. Crustal Thickening History of Southern Tibet Revealed with Titanium-in-Quartz Barometry, Zircon Ti-thermometry, and Zircon U-Pb geochronology. In AGU Fall Meeting Abstracts.

Alexander, E.W., Varekamp, J., and Rodriguez, A., 2017, The chemical heartbeat of a magmato-hydrothermal system at Copahue Volcano, Argentina. IAVCEI Abstracts with Programs, submission # 1135

Alexander, E.W.*, Yamamoto-Hillman, C., and Harrison, M., 2019, August. TitanQ Inclusions: Thermobarometry of Tibetan Lhasa Block Granitoid Zircons. Goldschmidt2019, Barcelona, Spain.

Alexander, E.W., Yamamoto-Hillman, C., Wielicki, M., and Harrison, M., 2019, September. Understanding oxygen isotopes of zircon inclusions: A case study of quartz inclusions in Tibetan granitoid zircons. Geological Society of America Abstracts with Programs, v. 51, n. 5

DePaolo, D., Harrison, M., Wielicki, M., Zhao, Z., Zhu, D.-C., and **Alexander, E.W.**, 2019, December. Granites, Rhyolites, Magma Generation, and Crustal Thickness in southern Tibet. In AGU Fall Meeting Abstracts

Alexander, E.W.* and Harrison, M., 2019, December. Do La/Yb and Sr/Y always reflect crustal thickness in magmatic rocks? In AGU Fall Meeting Abstracts.

(*oral presentation)

Technical Skills

Secondary Ion Mass Spectrometry: 5 years' experience in both positive and negative ion mode on CAMECA ims1270 and ims1290 ion microscopes; ion imaging, mono-, and multi-collection analysis definition and acquisition.

Scanning Electron Microscopy: 5 years' experience with Tescan VEGA-TC SEM at UCLA equipped with BSE, SE, color CL, and grayscale CL detectors, as well as an EDAX Team EDS detector. Imaging, elemental mapping, and point analysis quantitation at both high and low vacuum.

Electron Probe Micro-analysis: user of Jeol JXA-8200 Superprobe at UCLA.

Programming: MATLAB; Python with Jupyter notebooks

Petrography and geochemistry of igneous rocks

Geologic field mapping