

Michael J. Farner

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Education

8/12 - 5/17 Ph.D. – Earth Science (Petrology & Geochemistry), Rice University
Doctoral Advisor: Cin-Ty A. Lee
8/09 - 5/12 B.S. – Geology (cum laude), California State University-Fresno

Ph.D. Thesis: Examination of magmatic differentiation processes in the formation of intermediate and silicic composition magmas: constraints from regional and global geochemical systematics

Research Interests

Physical and chemical controls on geochemical differentiation in arc magmatic systems. Petrogenesis of silicic plutons and associated mafic enclaves. Structural and compositional evolution of volcanic arcs. Tectonic evolution of western North America. Application of data science methods to geochemical & petrologic problems.

Present Appointment

8/19 - Science Instructor, Incarnate Word Academy

Past Appointments

7/17- 7/19 Science Instructor, YES Prep Northbrook High School
5/17 - 12/17 Complimentary Visiting Scientist, Rice University
8/12 - 5/17 Graduate Student Researcher, Rice University
5/10 - 5/12 Research Assistant, California State University - Fresno

Teaching Experience (instructor of record unless noted)

Incarnate Word Academy

8/20 - Advanced Placement Chemistry
8/19 - Physics (Honors & regular courses)

YES Prep Northbrook HS

8/18 – 5/19 Advanced Placement Environmental Science
8/17 – 5/19 Physics

Rice University

1/17 – 5/17 ESCI 334 Geological Techniques/Field Geology (teaching assistant)
1/16 – 5/16 ESCI 301 Introduction to the Earth (lab instructor)
1/14 – 5/14 ESCI 334 Geological Techniques/Field Geology (teaching assistant)
8/13 – 12/13 ESCI 101 The Earth/Physical Geology (teaching assistant)

Analytical Experience

Laser ablation-inductively coupled plasma mass spectrometry; X-ray fluorescence spectrometry; X-ray diffractometry; petrographic thin section preparation; paleomagnetic core drilling; micro-XRF compositional mapping, electron microprobe

Computational Experience

Matlab programming; ArcGIS; ImageJ image analysis software; R statistics package, Tableau data visualization platform, JMP statistics software, some familiarity with SQL database management

Professional Affiliations

American Geophysical Union, Geological Society of America, Golden Key National Honor Society, Teach for America

Community Activities & Additional Experience

Standard Teaching Certification (Science 7-12), Texas Education Agency (5/2018-3/2023)

Teach for America Corps Member (2017-2019)

Reviewer for: *Geology*, *G-cubed*; *Geophysical Research Letters*; *International Geology Review*; *Journal of Asian Earth Sciences*

Co-chair (with M. Torres and N.R. McKenzie) *Magmatic and tectonic influences on elemental cycling and Earth's oxidation state* session AGU Fall Meeting 2016

Participant at CIDER 2015 summer workshop, University of California - Berkeley

Co-organizer of ESCI 555 Carbon cycle seminar, Rice University, Fall 2014

Co-chair (with C.-T. Lee) *AFC processes in the formation of intermediate magmas from mantle to crust* session GSA Cordilleran Section Meeting 2013

Pre-Ph.D. Scholarships, Awards, Etc.

Outstanding Graduate Teaching Award (2014)

Chevron Fellow (2013)

Geological Society of America Student Research Grant (2013)

Outstanding Undergraduate Student (2012)

Estwing Hammer Award (2012)

1st place, Physical and Mathematical Sciences – CSU Research Competition (2012)

American Chemical Society Honorable Mention (2012)

Neva W. Hollister Scholarship (2011)

Fresno Gem and Mineral Society Research Grant (2011)

College of Science and Mathematics Research Grant – California State University - Fresno (2011-2012)

American Geophysical Union Student Travel Grant (2010)

Downing Science Scholarship (2010)

Trauger Geology Scholarship (2010)

Publications (published/accepted)

He, D., Lee, C.-T.A., Yu, X., **Farner, M.J.** (2019) Ge/Si partitioning in igneous systems: constraints from high mass resolution laser ablation ICP-MS measurements on natural samples. *Geochem. Geophys. Geosys.*, 20, 4472-4486.

Farner, M.J., Lee, C.-T.A., Mikus, M.L. (2018) Constraining the extent of mafic-felsic magma mixing in generating intermediate magmas: insights from geochemical variability in enclave swarms. *Geol. Soc. of Am. Bull.*, 130, 649-660.

- Farner, M.J.,** Lee, C.-T.A. (2017) A global study on the effects of crustal thickness in magmatic differentiation in subduction zone volcanism: implications for the formation of continental crust. *Earth Planet. Sci. Lett.*, 470, 96-107.
- Lee, C.-T.A., Morton, D.M., **Farner, M.J.,** Moitra, P. (2015) Field and model constraints on silicic melt segregation by compaction/hindered settling: the role of water and its effect on latent heat release. *Am. Min.*, 100, 1762-1777.
- Farner, M.J.,** Lee, C.-T.A., Putirka, K.D. (2014) Mafic-felsic magma mixing limited by reactive processes: A case study of biotite-rich rinds on mafic enclaves. *Earth Planet. Sci. Lett.*, 393, p. 49-59.
- Carlson, C.W., Pluhar, C.J., Glen, J.M.G., **Farner, M.J.** (2013) Kinematics of the west-central Walker Lane: spatially and temporally variable rotations evident in the Late Miocene Stanislaus Group. *Geosphere*, 9, p. 1530-1551.

Publications (submitted/in prep)

- Zhang, J., Lee, C.-T.A., **Farner, M.J.** Using computer-aided image processing to estimate chemical composition of igneous rocks: A potential tool for large-scale compositional mapping. (submitted)
- Farner, M.J.,** Lee, C.-T.A. On the timing of K-feldspar crystallization and implications for the origins of megacrysts (in prep)
- Pluhar, C.J., **Farner, M.J.,** Asami, R.T., Putirka, K.D., Busby, C.J., Renne, P.R. Paleomagnetism, geochemistry and geochronology of the Stanislaus Group type section: A new reference for correlation and reconstruction along the Eastern Sierra Nevada and central Walker Lane (in prep)

Abstracts

- Farner, M.J.,** Lee, C.-T.A. (2016) A late-stage origin for Alkali Feldspar in granitic magma. AGU Fall Meeting.
- Branecky, C., **Farner, M.,** Keller, T., Lanza, F., Siravo, G., Gonnermann, H., Huybers, P., Manga, M., van der Wal, W. (2015) Feedback between deglaciation and volcanism in arc settings: the example of the Mount Mazama volcanic system, Crater Lake, Oregon. AGU Fall Meeting.
- Farner, M.J.,** Lee, C.-T.A. (2015) Compositional control on volcanic arc elevation and implications for magmatic differentiation. AGU Fall Meeting.
- Farner, M.J.,** Lee, C.-T.A. (2014) Assessing the role of mafic-felsic magma mixing in the formation of granitic plutons. V.M. Goldschmidt Conference
- Farner, M.J.,** Lee, C.-T.A. (2013) A late-stage origin for schlieren in felsic plutons. GSA Abstracts with Programs, v. 45 (7)
- Farner, M.J.,** Mikus, M.L., Lee, C.-T.A. (2013) High-resolution mapping illustrates late-stage magma mixing processes. GSA Abstracts with Programs, v. 45 (7)
- Jones, S.A., Pluhar, C.J., **Farner, M.J.,** Deino, A.L. (2013) Correlation and analysis of Miocene paleochannels in the central Sierra Nevada, California, as displayed by the Stanislaus Group. (GP41A-1109)
- Lee, C.-T., Bachmann, O., **Farner, M.** (2013) The origin of andesites and continental crust driven by crystal fractionation: insights from global Zr and P systematics and mafic enclaves. (V12A-08)

- Lindeman, J.R., Pluhar, C.J., **Farner, M.J.** (2013) Post-middle Miocene tuffs: vertical axis rotation from paleomagnetic analysis within Bodie Hills and Mono Basin, eastern California and western Nevada. (GP41A-1113)
- Farner, M.J.**, Lee, C.-T.A., Putirka, K.D. (2013) Magma mixing limited by reactive processes. GSA Abstracts with Programs, v. 45 (6).
- Jones, S.A., Puhar, C.J., **Farner, M.J.** (2013) Correlation and analysis of paleochannels in the Sierra Nevada, California, as displayed by the Stanislaus Group; towards updating late Cenozoic uplift estimates. GSA Abstracts with Programs, v. 45 (6).
- Carlson, C.W., Pluhar, C.J., Glen, J.M.G., **Farner, M.J.** (2013) Changes in Walker Lane strain accommodation near Bridgeport, CA. GSA Abstracts with Programs, v. 45 (6).
- Farner, M.J.**, Pluhar, C.J., Asami, R.T., Putirka, K.D., Busby, C.J., Renne, P.R. (2012) Paleomagnetism, Geochronology, and Geochemistry of the Type Section of the Stanislaus Group: Reference Parameters from the Stable Sierra Nevada Microplate, CA. AGU Fall Meeting. GP21A-1141
- Asami, R.T., Putirka, K.D., Pluhar, C.J., **Farner, M.J.**, Torrez, G., Shrum, B.L., Jones, S.A. (2012) Evidence of varying chambers and magmatic evolutionary histories for the Stanislaus Group in the Iceberg-Carson Wilderness region, Sonora Pass, California. AGU Fall Meeting. V11D-2799
- Carlson, C.W., Pluhar, C.J., Glen, J.M.G., **Farner, M.J.** (2012) Changes in central Walker Lane strain accommodation near Bridgeport, California; as told by the Stanislaus Group. AGU Fall Meeting. GP21A-1128
- Farner, M.J.**, Pluhar, C.J., Carlson, C.W. (2011) Comparison of geologically-averaged paleomagnetic and “instantaneous” GPS rotation data in the West-Central Walker Lane. AGU Fall Meeting. T23D-2422.
- Jackson, B.A., Putirka, K.D., Clynne, M.A., Wood, A.C., Jackson, J.L., **Farner, M.J.** (2011) Pre-eruption magmatic events recorded by vesicles in mafic enclaves: Evidence from the 1915 eruption of Lassen Peak, California. AGU Fall Meeting. V08-8414.
- Farner, M.J.**, Jackson, J.L., Putirka, K.D., Wood, A.C. (2010) Magma mixing and Crystallization at Chaos Crags in the Lassen Volcanic Center. AGU Fall Meeting. V43C-2384.