

Sarah P. Slotznick

Department of Earth Sciences
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Education

California Institute of Technology, Pasadena, CA	
Ph.D. in Geobiology	2016
M.S. in Geobiology	2012
Massachusetts Institute of Technology, Cambridge, MA	
S.B. in Earth, Atmospheric, and Planetary Sciences	2009

Academic Appointments

Dartmouth College, Hanover, NH	
Assistant Professor in the Department of Earth Sciences	Winter 2020
Visiting Scholar in the Department of Earth Sciences	Fall 2019
University of California, Berkeley, Berkeley, CA	
Department of Earth and Planetary Sciences	2019
Miller Institute Postdoctoral Fellow	2016-2019

Professional Experience

NPS Interpretive Park Ranger	Summer 2010
<i>North Cascades National Park, Stehekin District, Stehekin, WA</i>	
Intern, Exhibits Department	Spring 2010
<i>Montshire Museum of Science, Norwich, VT</i>	
Intern, Mauna Loa Geology, USGS Hawaii Volcano Observatory,	Fall 2009
<i>Hawaii National Park, HI</i>	
Interpreter, GSA GeoCorps America Intern,	Summer 2009
<i>Glacier National Park, West Lakes District, West Glacier, MT</i>	

Honors and Awards

Institute for Rock Magnetism U.S. Student Fellowship	Sept. 2015
GSA Student Research Grant, Outstanding Mention	May 2015
P.E.O. Scholar Award, Betty Cook Karrh Memorial Endowed Scholar	March 2015
Belt Association Student Research Grant	April 2014
Tobacco Root Geological Society Scholarship	April 2014
NASA Earth and Space Science Fellow	Sept. 2014-June 2016
NSF Graduate Research Fellow	Sept. 2010-Aug. 2014
California Institute of Technology Benjamin M. Rosen Fellow	Sept. 2010-Sept. 2011

Peer-Reviewed Publications

[15] Milanese, F. N., Olivero, E. B., Slotznick, S. P., Tobin, T. S., Raffi, M. E., Skinner, S. M., Kirschvink, J. L., Rapalini, A. E. (2020). Coniacian-Campanian magnetostratigraphy of the Marambio Group: The Santonian-Campanian boundary in the Antarctic Peninsula and

- the complete Upper Cretaceous–Lowermost Paleogene chronostratigraphical framework for the James Ross Basin. *Palaeogeography, Palaeoclimatology, Palaeoecology*, **555**, 109871.
- [14] Tobin, T.S., Roberts, E.M., Slotznick, S.P., Biasi, J.A., Clarke, J.A., O’Connor, P.M., Skinner, S.M., West, A.R., Snyderman, L.S., Kirschvink, J.L., Lamanna, M.C. (2020) New evidence of a Campanian age assignment for the Cretaceous fossil-bearing strata of Cape Marsh, Robertson Island, Antarctica. *Cretaceous Research*, **108**, 104313.
- [13] Slotznick, S.P., Sperling, E.A., Tosca, N.J., Miller, A.J., Clayton, K., van Helmond, N.A.G.M., Slomp, C.P., Swanson-Hysell, N.L. (2019) Unraveling the mineralogical complexity of sediment iron speciation using sequential extractions. *Geochemistry, Geophysics, Geosystems*, **20**, e2019GC008666.
- [12] Swanson-Hysell, N.L., Fairchild, L.M., Slotznick, S.P. (2019) Primary and secondary red bed magnetization constrained by fluvial intraclasts. *Journal of Geophysical Research—Solid Earth*, **124**, 4276–4289.
- [11] Slotznick, S.P., Webb, S.M., Kirschvink, J.L., Fischer, W.W. (2019) Mid-Proterozoic ferruginous conditions reflect post-depositional processes. *Geophysical Research Letters*, **46**, 3114–3123.
- [10] Milanese, F.N., Rapalini, A.E., Slotznick, S.P., Tobin, T.S., Kirschvink, J.L., Olivero, E.B. (2019) Late Cretaceous paleogeography of the Antarctic Peninsula: New paleomagnetic pole from the James Ross Basin. *Journal of South American Earth Sciences*, **91**, 131–143.
- [9] Slotznick, S.P., Swanson-Hysell, N.L., and Sperling, E.A. (2018) Oxygenated Mesoproterozoic lake revealed through magnetic mineralogy, *Proceedings of the National Academy of Sciences*. **15**(51), 12938–12943.
- [8] Slotznick, S.P., Eiler, J.M., Fischer, W.W. (2018) The effects of metamorphism on iron mineralogy and the iron speciation redox proxy. *Geochimica et Cosmochimica Acta*, **224**, 96–115.
- [7] Present, T.M., Bergmann, K.D., Myers, C., Slotznick, S.P., Creveling, J.C., Zieg, J., Fischer, W.W., Knoll, A.H., Grotzinger, J.P. (2017) Pyrite-walled tube structures in a Mesoproterozoic SEDEX massive sulfide deposit. *GSA Bulletin*, **130**(3–4), 598–616.
- [6] Trembath-Reichert, E., Ward, L.M., Slotznick, S.P., Bachtel, S.L., Kerans, C., Grotzinger, J.P., Fischer, W.W. (2016) Gene Sequencing-Based Analysis of Microbial-Mat Morphotypes, Caicos Platform, British West Indies. *Journal of Sedimentary Research*, **86**(6), 629–636.
- [5] Slotznick, S.P., Winston, D., Webb, S.M., Kirschvink, J.L., Fischer, W.W. (2016) Iron mineralogy and redox conditions during deposition of the Mid-Proterozoic Appekunny Formation, Belt Supergroup, Glacier National Park. *GSA Special Paper*, **522**, 221–242.
- [4] Slotznick, S.P., Fischer, W.W. (2016). Examining Archean Methanotrophy. *Earth and Planetary Science Letters*, **441**, 52–59.
- [3] Slotznick, S.P., Zieg, J., Webb, S.M., Kirschvink, J.L., Fischer, W.W. (2015) Iron mineralogy and redox chemistry of the Mesoproterozoic Newland Formation in the Helena Embayment, Belt Supergroup, MT. *Northwest Geology*, **44**, 55–72.
- [2] Hansma, J., Tohver, E., Yan, M., Trinajstić, K.M., Roelofs, B., Peek, S., Slotznick, S.P., Kirschvink, J.L., Playton, T., Haines, P.W., Hocking, R.M. (2015) Late Devonian carbonate magnetostratigraphy from the Oscar and Horse Spring Ranges, Lennard Shelf, Canning Basin, Western Australia. *Earth and Planetary Science Letters*, **409**, 232–242.

- [1] Slotznick, S. P., Shim, S.-H. (2008) In situ Raman spectroscopy measurements of MgAl₂O₄ spinel up to 1400 °C. *American Mineralogist*, **93**(2-3), 470-476.

Other Publications

- [3] Slotznick, S.P. (2016) Complex iron mineralogy of the 1.4 Ga lower Belt Supergroup: iron oxides, siderite and (nanophase) pyrrhotite. *Institute for Rock Magnetism Quarterly*, **26**(2), 3-4.
- [2] Slotznick, S.P. (2016) Coupling textural, magnetic, and modeling techniques to understand Precambrian paleoenvironments. PhD Dissertation, Advisors Joseph Kirschvink and Woodward Fischer, California Institute of Technology. doi:10.7907/Z9HT2M8X.
- [1] Slotznick, S. P. (2009) A paleomagnetic study of the angrite Sahara 99555. Undergraduate Thesis, Advisor Benjamin Weiss, Massachusetts Institute of Technology.

Invited Research Presentations

Lamont-Doherty Earth Observatory, Geodynamics Seminar	(rescheduled, COVID-19)
Princeton University, Geosciences Department Seminar	April 2019
University of Cambridge, Department of Earth Sciences, Seminar	March 2019
Harvard University, Earth and Planetary Sciences Department Colloquium	March 2019
Stony Brook University, Geosciences Department Seminar	February 2019
University of California, Davis, Department Seminar	February 2019
University of Victoria, School of Earth and Ocean Sciences Seminar	February 2019
University of California, Santa Cruz, Whole Earth Department Seminar	January 2019
Dartmouth College, Earth Sciences Friday Department Seminar	January 2019
UC Berkeley Photosynthesis, Carbon Fixation and the Environment Symposium	June 2018
University of California, Berkeley, EPS Department Seminar	March 2018
University of Maryland, College Park, Geology Department Colloquium	February 2018
Stanford University, Geological Sciences Department Seminar	February 2018
University of Chicago, Geophysical Sciences Department Seminar	February 2018
American Museum of Natural History, Department Seminar	March 2017
University of California, Berkeley, Isotope Geochemistry Seminar	March 2017

Select Conference Abstracts

- Slotznick, S.P., Evans, D.A.D., Sousa, F., Swanson-Hysell, N.L. (2020) Paleogeographic constraints from the Kaapvaal Craton (South Africa) in the immediate aftermath of the Great Oxidation Event, *GSA Abstracts with Program*.
- Carrero, S., Arora, B., Slotznick, S.P., Wan, J., Steefel, C., Banfield, J., Gilbert, B. (2020) Redox Controls on Trace Element Mobility during Shale Weathering from Microscale Analyses, *Goldschmidt2020*.
- Slotznick, S.P., Carrero, S., Sharrar, A., Sitar, M.C., Banfield, J., Swanson-Hysell, N., and Gilbert, B. (2019) Iron mineral transformations during weathering of sulfide-bearing shales and sandstones. American Geophysical Union, Fall Meeting.
- Slotznick, S. P., Sperling, E.A., Tosca, N.J., Miller, A.J., Clayton, K., van Helmond, N., Slomp, C.P., and Swanson-Hysell, N.L. (2018) Probing the Iron Speciation Extraction using Magnetic Techniques and X-ray Diffraction. *Geobiology* 2019.

- Slotznick, S. P., Swanson-Hysell, N.L., Wellman, C.H., Strother, P.K. (2018) Paleolake Nonesuch: A paleoenvironmental and biological record at the end of the Midcontinent Rift. *GSA Abstracts with Programs*. Vol. 50, No. 6, Paper No. 68-11.
- Slotznick, S. P., Evans, D.A.D., and Swanson-Hysell, N.L. (2017) Paleomagnetic directions from the Pretoria Group of South Africa: Hints at the position of the Kaapvaal Craton at 2.2 – 2.1 Ga. GAC-MAC Joint Annual Meeting, Vol. 40, 350.
- Slotznick, S. P., Kirschvink, J. L., and Fischer, W. W. (2017) Rotational remanent magnetization (RRM): Identifying pyrrhotite and siderite in natural samples. 2017 MagIC Science and Database Workshop.
- Mitchell, R., Thissen, C., Kirschvink, J. L., Shrag, D., Montanari, A., Coccioni, R., Slotznick, S. P., Tamazaki, T., Penserini, B., Abrahams, J., Cruz-heredia, M., Evans, D. (2015) Milankovitch wobble?. American Geophysical Union, Fall Meeting, Abstract GP23B-1313.
- Kim, W., Slotznick, S.P., Shin, J., Park, C.K., Moon, J.-W. (2015) Magnetostratigraphy of the ferromanganese crust in the northwest equatorial Pacific. 8th International Conference on Asian Marine Geology, Abstract S10-P05.
- Fischer, W.W., Slotznick, S.P., Johnson, J.E., Webb, S.M., Rasmussen, B., Raub T.D. & Kirschvink, J.L. (2014) Archean ‘Whiffs of Oxygen’ Tied to Post-Depositional Processes. Goldschmidt2014, Abstract 701.
- Slotznick, S. P., Raub, T. D., Barbeau, Jr., D.L., and Kirschvink, J. L. (2012) Unraveling the paleomagnetic record of King George Island, South Shetlands, Antarctica. International Geological Congress, 34th Annual Brisbane, Australia, Abstract #1654.

Teaching Experience

EARS 1 How the Earth Works	Fall 2020
<i>Co-instructor with Prof. Meredith Kelly</i>	
EARS 201 Fundamentals and Pedagogy in Earth Sciences	Fall 2020
<i>Co-instructor with Prof. Meredith Kelly</i>	
EARS 80.06 Astrobiology	Summer 2020
EARS 1 How the Earth Works	Spring 2020
<i>Co-instructor with Dr. Edward Meyer</i>	

Supervisory Experience

Mentor for Presidential Scholar Assistantship Student	Fall 2020-Winter 2021
<i>Advisor for Dylan Davis</i>	
Secondary Advisor for Senior Fellowship Student	Fall 2020-Spring 2021
<i>Advisor for Theodore Green</i>	
Mentor for Undergraduate Research Apprenticeship Program Student	Spring 2018-2019
<i>Supervised an undergraduate student in UC Berkeley's Paleomagnetism Laboratory</i>	
Mentor for College Prep's STEM Research Program	Summer 2017, 2018, 2019
<i>Research mentor for local high school students in summer internship at UC Berkeley</i>	
Lab Safety Officer and Lab Use Training	Aug. 2011-June 2016
<i>Trained 14 graduate students and visitors to use Caltech's Paleomagnetism Laboratory</i>	
Co-mentor for Summer Undergraduate Research Students	Summer 2011-2015
<i>Co-mentored 11 Caltech undergraduate students with Prof. Joseph Kirschvink</i>	

Field Expeditions

Ashland, Iron, Gogebic, Ontonagon Counties, WI and MI	July-Aug. 2018
<i>Co-leader of stratigraphic measurement and paleomagnetic sampling trip</i>	
Mpumalanga, Gauteng, and North West Provinces, South Africa	Aug. 2016, Sept. 2017
<i>Leader of paleomagnetic sampling for Paleoproterozoic paleogeography</i>	
James Ross, Snow Hill, Vega, and Seymour Islands, Antarctica	Feb.-March 2016
<i>Second-in-Command for paleomagnetic and paleontological sampling</i>	
Glacier National Park, MT	Aug. 2014, July 2015
<i>Leader of sample collection trips to understand iron redox in Belt-Purcell Supergroup</i>	
Agouon Field Course, Belt-Purcell Supergroup, MT and ID	July 2013
<i>Assistant Organizer, collection/educational trip to explore Mesoproterozoic strata</i>	
Belle Fourche and Hot Springs, SD	June-July 2013
<i>Logistics coordinator, long-core and paleomagnetic sampling</i>	
Apiro and San Severino, Italy	July 2012
<i>Logistics coordinator, long-core and paleomagnetic sampling</i>	
Sand Creek, Rumsey Hills, CA	March 2012
<i>Logistics coordinator, long-core sampling to understand Cordilleran tectonics</i>	
Isla Angel de la Guarda, Baja California, Mexico	November 2011
<i>Field assistant, paleomagnetic sampling to understand opening of the Gulf of California</i>	
James Ross, Snow Hill, Vega, and Seymour Islands, Antarctica	Feb.-March 2011
<i>Field assistant, paleomagnetic sampling for late Cretaceous magnetostratigraphy</i>	

Funding

NSF EAR-2018253, Major Research Instrumentation Grant	2020-2023
<i>MRI: Acquisition of a Superconducting Rock Magnetometer System for Earth Sciences Research (\$509,952)</i>	
Institute for Rock Magnetism Visiting Fellowships	2017, 2018
<i>Probing Sequential Chemical Extractions for Iron Mineralogy using Magnetic Methods (2018; \$4,000); Investigating Ocean Redox and Plate Tectonics during the Lomagundi-Jatuli (2.2 Ga to 2.0 Ga) using magnetic techniques (2017; \$4,000)</i>	

Professional Service

Reviewer for Earth and Planetary Science Letters, Geology, G-Cubed, Precambrian Research	
Review Editor for Frontiers in Earth Science, Geomagnetism and Paleomagnetism Section	
Topic Editor for Frontiers in Earth Science Research Topic: <i>Advances in Magnetism of Soils and Sediments</i>	
Panelist for NASA Exobiology Program	
Session Convener, Chair, and OSPA Liaison for AGU Fall Meeting	Dec. 2020
Session Convener, Chair, and OSPA Liaison for AGU Fall Meeting	Dec. 2019
Judge for AGU's Outstanding Student Presentation Award	Dec. 2018
Judge for American Geophysical Union's Virtual Poster Showcase	Nov. 2017
American Geophysical Union, Student Representative	Sept. 2013-Dec. 2016
<i>Geomagnetism and Paleomagnetism Section</i>	
Mentor with UC Berkeley's Society of Women in the Physical Sciences	Sept. 2016-2019
Mentoring Coordinator for Society of Women in the Physical Sciences	Sept. 2018-2019

MIT Educational Counselor, alumni interviewer of undergrad applicants Oct. 2010-present
Seminar Speaker for “Popping the Science Bubble” at Berkeley Public Library Nov. 2018
Lab Tour Guide for SWPS’s Berkeley High School STEMInist Shadow Day Oct. 2018
Mentor in Caltech’s Women Mentoring Women Program Oct. 2013-June 2016
Caltech Graduate Honor Council Oct. 2010-June 2016
Judge at Caltech’s Perpall Undergraduate Research Speaking Competition Nov. 2014, 2015
Lab Tour Guide for Junior Watson Program for a local high school class Nov. 2014
Moderator and Judge at Caltech’s Summer Undergrad Research Seminar Day August 2013