

Sarah P. Slotznick

Department of Earth Sciences
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Hanover, NH 03755
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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

2020 Editors' Citation for Excellence in Refereeing	May 2021
<i>Geochemistry, Geophysics, Geosystems</i>	
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

* Graduate student/Postdoc mentee ** Undergraduate student mentee

- [23] Slotznick, S. P., Swanson-Hysell, N.L., Zhang, Y., Clayton, K.E., Wellman, C.H., Tosca, N.J., Strother, P.K. (in press) Reconstructing the paleoenvironment of an oxygenated Mesoproterozoic shoreline and its record of life. *Geological Society of America Bulletin*.
- [22] Slotznick, S. P., Johnson, J. E., Rasmussen, B. Raub, T. D., Webb, S. M., Zi, J.-W., Kirschvink, J. L., Fischer, W. W. (2023) Response to comment on “Reexamination of 2.5-1 Ga ‘whiff’ of oxygen interval points to anoxic ocean before GOE”. *Science Advances*. **8**, adg1530.
- [21] Carrero, S., Slotznick, S. P., Fakra, S. C., Sitar, M. C., Bone, S E., Mauk, J. L., Manning, A.H., Swanson-Hysell, N. L. Williams, K. H., Banfield, J. F., Gilbert, B. (2023) Mineralogical, Magnetic and Microscale Geochemical Data Constrain the Pathways and Extent of Weathering of Mineralized Sedimentary Rocks. *Geochimica et Cosmochimica Acta*. 343, 180-195.
- [20] Roberts, E. M, O’Connor, P. M., Clarke, J. A., Slotznick, S. P., Placzek, C. J., Tobin, T. S., Hannaford, C., Orr, T., Jinnah, Z. A., Claeson, K. M., Salisbury, S., Kirschvink, J. L., Pirrie, D. and Lamanna, M. C. (2023) New age constraints support a K/Pg boundary interval on Vega Island, Antarctica: implications for latest Cretaceous vertebrates and paleoenvironments. *Geological Society of America Bulletin*. **135** (3-4), 867–885.
- [19] Slotznick, S. P., Johnson, J. E., Rasmussen, B. Raub, T. D., Webb, S. M., Zi, J.-W., Kirschvink, J. L., Fischer, W. W. (2022) Re-examination of 2.5 Ga “Whiff” of Oxygen Interval Points to Anoxic Ocean Before GOE. *Science Advances*. **8**, eabj7190.
- [18] Green, T. **, Slotznick, S. P., Jaqueto, P., Raub, T. D., Tohver, E., Playton, T. E., Haines, P. W., Kirschvink, J. L., Hocking, R. M., Montgomery, P. (2021) High-resolution late Devonian magnetostratigraphy from the Canning Basin, Western Australia: A re-evaluation. *Frontiers in Earth Sciences*. **9**, 757749.
- [17] Farrell, U. C., ... Slotznick, S. P., ... Planavsky, N. J., Lau, K. V., Johnston, D. J., Sperling, E.A. (2021) The Sedimentary Geochemistry and Paleoenvironments Project. *Geobiology*. **19**(6), 545-556.
- [16] Mitchell, R. N., Thissen, C. J., Evans, D. A. D., Slotznick, S. P., Coccioni, R., Yamazaki, T., Kirschvink, J. L. (2021) A Late Cretaceous true polar wander oscillation. *Nature Communications*. **12**, 3629.
- [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. (2020) 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

- [4] Satolli, S., Ferré, E.C., Kars, M., Slotznick, S.P., and Trindade, R.I.F. (2021) Editorial: Advances in Magnetism of Soils and Sediments. *Frontiers in Earth Sciences* **9**, 722670.
- [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.

Note on significance of author order: For papers out of my group with a student or postdoctoral mentee first author where I am deeply involved in all aspects of the science (from project planning to data acquisition to data analysis to writing), I typically take the second author position as the senior author rather than the final author position.

Invited Research Presentations

University of California, Santa Barbara, Earth Science Department Colloquium	April 2023
University of California, Riverside, Hewett Club Department Seminar	April 2023
Johns Hopkins University, Earth and Planetary Sciences Bromery Lecture	April 2023
Earth-Life Science Institute, Tokyo Institute of Technology, 10 th Symposium	Jan. 2022
Lamont-Doherty Earth Observatory, Geodynamics Seminar	Sept. 2021
Lehigh University, EES Department Seminar	Sept. 2021
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., Swanson-Hysell, N.L., Zhang, Y., Clayton, K.E., Wellman, C.H., Tosca, N.J., Strother, P.K. (2023) Reconstructing the paleoenvironment of the Mesoproterozoic Nonesuch Formation and its record of life. GAC-MAC-SGA Meeting.
- Slotznick, S.P., Kreisler, J.***, Benson, J.*, Fu, R., Leavitt, W. (invited, 2023) Signal Preservation: Magnetite Dissolution and Insights into Greigite Formation. Magnetism Information Consortium Meeting.
- Benson, J.*, Slotznick, S.P., Leavitt, W. (2022) Magnetic Iron Sulfide Formation in New Hampshire's Meromictic Lakes. American Geophysical Union Fall Meeting.
- Biasi, J.*, Slotznick, S.P., Karlstrom, L., Lofman, S.**, Warburton, L.** (2022) A Novel Method to Determine the transport lifetimes of igneous intrusions. GSA Abstracts with Programs. Vol 54, No. 5.
- Kreisler, J.**, Slotznick, S.P. (2021) Diagenetic and Deep-Time Implications of Magnetite Preservation in Marine Sediments. American Geophysical Union, Fall Meeting.

- Slotznick, S.P., Swanson-Hysell, N.L., Kirschvink, J. L., Fischer, W. W., Sperling, E., Fairchild, L., Zhang, Y., Webb, S.M., Winston, D. (invited, 2021) “Deep-time” Environmental Magnetism: Untangling Redox Conditions, Diagenesis, Metamorphism. 12th Institute for Rock Magnetism Conference.
- 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.
- 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.
- 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.
- 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	Spring 2020, 2023, Fall 2020
<i>Co-instructor with Dr. Ed Meyer, Prof. Meredith Kelly</i>	
EARS 36 Astrobiology	Summer 2020, Fall 2021
EARS 45-46-47 Field Methods	Fall 2021, 2022, Spring 2022
EARS 58 Stratigraphy and Sedimentary Petrology	Winter 2021, 2023
EARS 201 Fundamentals and Pedagogy in Earth Sciences	Fall 2020, 2021, 2022
<i>Co-instructor with Prof. Meredith Kelly, Prof. Justin Strauss</i>	
EARS 272 Topics in Historical Geobiology	Winter 2021
<i>Co-instructor with Prof. Brenhin Keller</i>	

Supervisory Experience

Supervised and Co-Supervised Postdoctoral Scholars

Joseph Biasi, NSF Postdoctoral Fellowship	2021-2023
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Supervised and Co-Supervised Graduate Students

Laurie Zielinski, PhD Student, Primary Advisor	2022-2027
Jannitta Yao, PhD Student, Committee Member	2022-2027
Olivia Moehl, MSc Student, Advisor	2022-2024
Abdullah al Maruf, MSc Student, Advisor	2022-2024
Hannah Robutka, PhD Student, Committee Member, University of Victoria	2021-2026
Fernando Montaña López, PhD Student, Committee Member	2021-2026
Josephine Benson, MSc Student, Co-advised with Wil Leavitt	2021-2023
George Geier, MSc Student, Committee Member	2021-2023
Alexander Cox, MSc Student, Committee Member	2020-2023
Laura Blum, MSc Student, Committee Member	2020-2022

Supervised and Co-Supervised Undergraduate Students

Spencer Meek, Undergraduate Research Assistantship, Advisor	Spring 2023
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Abigail Paquette, Women in Science Project Internship, Advisor	Winter-Spring 2023
London Warburton, Leave Term Grant & Senior Thesis, Co-Advisor	Summer 2022-Spring 2023
Maria Groveza, Leave Term Grant & Presidential Scholar, Co-Advisor	2022-2023
Sophia Haley, Undergraduate Research Assistantship, Advisor	Summer 2022
Sami Lofman, Undergraduate Research Assistantship, Advisor	Summer 2021-Summer 2022
Jack Kreisler, Leave Term Grant & Senior Thesis, Advisor	Spring 2021-Fall 2022
Theodore Green, Senior Fellowship, Secondary Advisor	Summer 2020-Spring 2021
Dylan Davis, Presidential Scholar Assistantship, Advisor	Fall 2020-Spring 2021

Field Expeditions

Belt-Purcell Supergroup, MT	August 2022
<i>PI of paleomagnetic sample collection fieldtrip to Belt-Purcell Supergroup</i>	
Digby, Annapolis, and Kings Counties, Nova Scotia, Canada	June 2022
<i>Stratigrapher and second-in-command for paleomagnetic sampling</i>	
Grand Canyon National Park, AZ	April 2022
<i>Co-PI of sample collection trip</i>	
Ashland, Iron, Gogebic, Ontonagon Counties, WI and MI	June-July 2021
<i>Co-leader of stratigraphic measurement trip</i>	
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

Brookhaven National Laboratory—National Synchrotron Lightsource II	2023
<i>Beamline Time Proposal for 22-IR-2, Infrared Microspectroscopic Studies of Naturally Formed H-doped Hematite (27 cycles)</i>	
G. Norman Albree Trust Fund	2022

Co-PI Wil Leavitt, Acquisition of field spectrophotometer and chlorophyll probes (\$9,600.01)

NAGT Early Career Geoscience Faculty Workshop Stipend 2021
Stipend to cover conference fees (\$850)

NSF EAR-2018253, Major Research Instrumentation Grant 2020-2023
MRI: Acquisition of a Superconducting Rock Magnetometer System for Earth Sciences Research (\$509,952)

Institute for Rock Magnetism Visiting Fellowships 2017, 2018, 2022
Quantifying Goethite in Sedimentary Rocks (2022; \$4,000); 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)

Professional Service

Reviewer for Earth and Planetary Science Letters, Geology, G-Cubed, Precambrian Research, Geochimica et Cosmochimica Acta, Catena, Astrobiology, Geostandards and Geoanalytical Research

Review Editor for Frontiers in Earth Science, Geomagnetism and Paleomagnetism Section

Topic Editor for Frontiers in Earth Science Research Topic: *Advances in Magnetism of Soils and Sediments*

Panelist for NASA Exobiology Program

Reviewer for American Chemical Society Petroleum Research Fund

Reviewer for beamline time proposals at Stanford Synchrotron Radiation Lightsource

Magnetic Information Consortium, Advisory Committee Member	Sept 2022-present
Session Convener for AGU Fall Meeting	Dec. 2022
Session Convener, Chair, and OSPA Liaison/Judge for AGU Fall Meeting	Dec. 2021
Session Convener, Chair, and OSPA Liaison/Judge 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 <i>Geomagnetism and Paleomagnetism Section</i>	Sept. 2013-Dec. 2016

Science Advisor for PBS/BBC NOVA series	Jan. 2022-Oct. 2022
Expert Science Reviewer for ARC Educational Books	Sept. 2021-May 2022
MIT Educational Counselor, alumni interviewer of undergrad applicants	Oct. 2010-present
Mentoring Coordinator for Society of Women in the Physical Sciences	Sept. 2018-2019
Mentor with UC Berkeley's Society of Women in the Physical Sciences	Sept. 2016-2019
Mentor in Caltech's Women Mentoring Women Program	Oct. 2013-June 2016
Caltech Graduate Honor Council	Oct. 2010-June 2016