Sarah P. Slotznick

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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
North Cascades National Park, Stehekin District, Stehekin, WA

Intern, Exhibits Department — Spring 2010
Montshire Museum of Science, Norwich, VT

Intern, Mauna Loa Geology, USGS Hawaii Volcano Observatory, — Fall 2009
Hawaii National Park, HI

Interpreter, GSA GeoCorps America Intern, — Summer 2009
Glacier National Park, West Lakes District, West Glacier, MT

Funding (Total: $822,224)

NSF EAR- 2321013, Sedimentary Geology and Paleobiology — 2023-2026
Lead PI, Collaborative Research: Micro- and Macroscopic Eukaryotic Life and its Preservation within the Mesoproterozoic Lower Belt Supergroup ($269,822)

CompX Faculty Grant — 2023
Co-PI Geoffroy Hautier, From Earth to Mars: Atomic Level Probing of Hydrohematite's Magnetism ($20,000)

Brookhaven National Laboratory—National Synchrotron Lightsource II — 2023
Beamline Time Proposal for 22-IR-2, Infrared Microspectroscopic Studies of Naturally Formed H-doped Hematite (27 cycles)

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 2020-2024
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)

Honors and Awards

2020 Editors' Citation for Excellence in Refereeing May 2021
Geochemistry, Geophysics, Geosystems
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*

[24] Slotznick, S. P., Egli, R., Lascu, I. (2023) Magnetofossils: Relicts and Records of Deep Time and Space. *Elements.*

[23] 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 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-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.de6aspz;oik 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., Trinajstic, 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

Rice University, EEPS Department Seminar	August 2023
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, 10th 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 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

Al Maruf, A.*, Slotznick, S.P., van Malottki, S., Chen, S.A., Heaney, P.J., Hautier, G. (2024) Phase-stability and magnetic properties of natural hydrogenated hematite – a potential water containing mineral on Mars. American Physical Society March Meeting.

Slotznick, S. P., Robutka, H.*, Coogan, L.A. (invited, 2023) The Mineralogical Evolution of Hydrothermal Iron from Vent Source to Sediment. American Geophysical Union 2023 Meeting.

Moehl, O.*, Slotznick, S.P. (2023) Magnetostratigraphy of Mesoproterozoic mudstones of Montana: Assessing potential correlation of the Appekunny and Greyson Formations, Belt Supergroup, USA. American Geophysical Union 2023 Meeting.

Newell, C. R., Tasistro-Hart, A., Anttila, E., Slotznick, S.P., Macdonald, F. (2023) Cycling through the Grand Canyon: geochemical and magnetic variability of parasequences in the Tonian Chuar Group distinguish between a lacustrine and marine setting. GSA Abstracts with Programs, Vol. 55, No. 6.

Zielinski, L.A.*, Slotznick, S.P. (2023) Revisiting the paleomagnetism of the Spokane Formation. Tobacco Root Geological Society 48th Annual Field Conference.

Slotznick, S.P., Swanson-Hysell, N.L., Zhang, Y., Clayton, K.E., Wellman, C.H., Tosca, N.J., Strother, P.K. (keynote, 2023) Reconstructing the paleoenvironment of the Mesoproterozoic Nonesuch Formation and its record of life. GAC-MAC-SGA Meeting.

Warburton, L.**, Biasi, J.*, Kontak, D.J., Slotznick, S.P. (2023) Magnetostratigraphic constraints on the end-Triassic North Mountain Basalts (Nova Scotia, Canada) eruption timeline. 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. Magnetics 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.

Teaching Experience

EARS 1 How the Earth Works	S2020, S2023, F2020
Co-instructor with Dr. Ed Meyer, Prof. Meredith Kelly	
EARS 36 Astrobiology	X2020, F2021, W2024
EARS 45-46-47 Field Methods	F2021-2023 S2022
EARS 58 Stratigraphy and Sedimentary Petrology	W2021, 2023
EARS 201 Fundamentals and Pedagogy in Earth Sciences	F2020-2023
Co-instructor with Prof. Meredith Kelly, Prof. Justin Strauss	
EARS 272 Topics in Historical Geobiology	W2021
Co-instructor with Prof. Brenhin Keller	

Supervisory Experience

Supervised and Co-Supervised Postdoctoral Scholars

Joseph Biasi, NSF Postdoctoral Fellowship	2021-2023

Supervised and Co-Supervised Graduate Students

Laurie Zielinski, PhD Student, Primary Advisor	2022-2027
Olivia Moehl, MSc Student, Advisor	2022-2024
Abdullah al Maruf, MSc Student, Primary Advisor	2022-2024
Hannah Robutka, PhD Student, Committee Member, University of Victoria	2021-2026
Josephine Benson, MSc Student, Co-advised with Wil Leavitt	2021-2023

Graduate Student Committee Member

Jannitta Yao, PhD Student, Committee Member	2022-2027
Fernando Montaño Lopez, PhD Student, Committee Member	2021-2026
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 Senior Thesis

London Warburton, Leave Term & Senior Thesis, Co-Advisor	2022-2023
Jack Kreisler, Leave Term Grant & Senior Thesis, Advisor	2021-2022
Theodore Green, Senior Fellowship, Secondary Advisor	2020-2021

Supervised and Co-Supervised Undergraduate Students

Napu Blas, EARS Undergrad Research Assistantship, Advisor	Winter 2024
Reva Gandhi, Women in Science Project Internship, Advisor	Winter-Spring 2024
Juliya Vizbaras, Undergraduate Research Assistantship, Advisor	Fall 2023
Spencer Meek, Leave Term Grant & Research Assistantship, Advisor	Spring-Summer 2023
Abigail Paquette, Women in Science Project Internship, Advisor	Winter-Spring 2023

Maria Groveza, Leave Term & Presidential Scholar, Co-Advisor — Summer 2022-Spring 2023
Sophia Haley, Undergraduate Research Assistantship, Advisor — Summer 2022
Sami Lofman, Undergraduate Research Assistantship, Advisor — Summer 2021-Summer 2022
Dylan Davis, Presidential Scholar Assistantship, Advisor — Fall 2020-Spring 2021

Field Expeditions

Huronian Supergroup, Ontario and Québec, Canada — June 2023
Paleomagnetic sample collection as part of larger stratigraphic and geochemical project

Belt-Purcell Supergroup, MT — August 2022, 2023
PI of stratigraphic and paleomagnetic collection fieldtrip

Digby, Annapolis, and Kings Counties, Nova Scotia, Canada — June 2022
Stratigrapher and second-in-command for paleomagnetic sampling

Grand Canyon National Park, AZ — April 2022
Co-PI of magnetics sample collection trip in Neo and Mesoproterozoic strata

Ashland, Iron, Gogebic, Ontonagon Counties, WI and MI — July 2018, June 2021
Co-leader of stratigraphic measurement and paleomagnetic sampling trip

Mpumalanga, Gauteng, and North West Provinces, South Africa — Aug. 2016, Sept. 2017
Leader of paleomagnetic sampling for Paleoproterozoic paleogeography

James Ross, Snow Hill, Vega, and Seymour Islands, Antarctica — Feb.-March 2016
Second-in-Command for paleomagnetic and paleontological sampling

Glacier National Park, MT — Aug. 2014, July 2015
Leader of sample collection trips to understand iron redox in Belt-Purcell Supergroup

Agouron Field Course, Belt-Purcell Supergroup, MT and ID — July 2013
Assistant Organizer, collection/educational trip to explore Mesoproterozoic strata

Belle Fourche and Hot Springs, SD — June-July 2013
Logistics coordinator, long-core and paleomagnetic sampling

Apiro and San Severino, Italy — July 2012
Logistics coordinator, long-core and paleomagnetic sampling for True Polar Wander

Sand Creek, Rumsey Hills, CA — March 2012
Logistics coordinator, long-core sampling to understand Cordilleran tectonics

Isla Angel de la Guarda, Baja California, Mexico — November 2011
Field assistant, paleomagnetic sampling to understand opening of the Gulf of California

James Ross, Snow Hill, Vega, and Seymour Islands, Antarctica — Feb.-March 2011
Field assistant, paleomagnetic sampling for late Cretaceous magnetostratigraphy

Professional Service

Reviewer for Earth and Planetary Science Letters, Geology, G-Cubed, Precambrian Research, Geochimica et Cosmochimica Acta, Geophysical Journal International, 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, Chair, and OSPA Judge for AGU Fall Meeting	Dec. 2023
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	Sept. 2013-Dec. 2016
Geomagnetism and Paleomagnetism Section	

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