

## Sarah P. Slotznick

Department of Earth Sciences  
Dartmouth College  
HB6105 Fairchild Hall  
Hanover, NH 03755  
sslotz@dartmouth.edu

### 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 Visiting Fellowship                | May 2018              |
| Institute for Rock Magnetism Visiting Fellowship                | March 2017            |
| 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

- [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., and 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 MgAl<sub>2</sub>O<sub>4</sub> 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                     | April 2020    |
| 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., 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.
- Tobin, T.S., Roberts, E.M., Slotznick, S.P., Biasi, J.A., Clarke, J., O'Connor, P.M., Skinner, S.M., West, A.R., Kirschvink, J.L, and Lamanna, M.C. (2019) Biostratigraphic and detrital zircon geochronological age assignment of late Cretaceous sedimentary exposures on Robertson Island, Antarctica. *GSA Abstracts with Programs*, Vol. 50.
- Carrero, S., Sharrar, A., Slotznick, S., Swanson-Hysell, N., Banfield, J. and Gilbert, B. (2019) Trace Metals are Retained during the Circumneutral Weathering of the Pyritic Mancos Shale. *Goldschmidt2019*.
- 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. 8<sup>th</sup> 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, 34<sup>th</sup> Annual Brisbane, Australia, Abstract #1654.

### Teaching Experience

- |   |             |
|---|-------------|
| Ge124a Paleomagnetism and Magnetostratigraphy   | Spring 2015 |
| <i>Field Teaching Assistant and Lab Teacher for Prof. Joseph Kirschvink</i>                 |             |
| Ge11b / Ge104 Earth and the Biosphere / Introduction to Geobiology                          | Winter 2014 |
| <i>Lab and Lecture Teaching Assistant for Profs. Joseph Kirschvink and Woodward Fischer</i> |             |
| Ge124a and b Paleomagnetism and Magnetostratigraphy   | Spring 2013 |
| <i>Field, Lab, and Lecture Teaching Assistant for Prof. Joseph Kirschvink</i>               |             |
| Ge136b Regional Field Geology of the Southwestern United States                             | Winter 2012 |
| <i>Teaching Assistant for Prof. Joseph Kirschvink</i>                                       |             |

### Supervisory Experience

- |   |                         |
|---|-------------------------|
| 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 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>   |                      |
| Agouron 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>         |                      |

### 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  
 Panelist for NASA Exobiology Program

|  |                      |
|--|----------------------|
| 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         |