DR. ETHAN LOPES

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EDUCATION

Stanford University — **Stanford, CA**
Ph.D. in Geophysics — *September 2021 – September 2026*
Thesis Advisor: Prof. Sonia Tikoo

Williams College — **Williamstown, MA**
B.A. in Astrophysics and Geosciences with honors — *September 2016 – June 2020*

PH.D. THESIS

"Serpentinization in the Lab and Nature: Magnetic Insights Into Thermochemical Alteration Processes"
Ph.D. — *September 2021 – September 2026*
My dissertation *involved collaborative, expedition-based science*, with a significant focus on analyzing rock samples recovered from the Mid-Atlantic Ridge. I examined how the magnetic properties of altered mantle rocks (serpentinites) can be used to constrain hydrothermal system temperatures, preserve kinematic evidence of oceanic mountain-building events, and track the formation of hazardous nanoparticles in burned serpentinite-derived soils. *As an experimentalist*, I also integrated rock physics, and engineering approaches into my research, including instrument troubleshooting and analog sample fabrication.

PROFESSIONAL EXPERIENCE

Scripps Institution of Oceanography Postdoctoral Research Position — **La Jolla, CA**
Postdoctoral Fellowship supervised by Prof. Alec Brenner — *November 2026 – est. October 2027*
- Working 40 hours/week
- Conducting research on how the magnetic properties of highly altered oceanic rocks can be reliable magnetic recorders across geological time as well as tracers of critical mineral deposits.
- Planning fieldwork in the Pilbara region of Western Australia (the Outback) and a research expedition to the East Pacific Rise, pending funding.

Stanford Research Assistant/Teaching Assistant — **Stanford, CA**
TA positions supervised by Profs. Tiziana Vanorio and Anton Ermakov — *October 2023 – August 2026*
- Worked 40 hours/week
- After passing my PhD program's qualification exam (Master's degree equivalent), I was funded through research and teaching assistantship positions
- Teaching assistant for the following classes: "Laboratory Characterization of Properties of Rocks and Geomaterials" and "Geophysical Exploration of Ocean Worlds in the Solar System"

AmeriCorps Service Member — **Reno, NV**
Truckee Meadows Parks Foundation Naturalist Educator — *February 2021- August 2021*
- Worked 40 hours/week
- Helped advance the Truckee Meadows Parks Foundation's mission to enhance the communities' livability through public engagement, education, and the sustainability of parks, open spaces, and trails
- Designed and implemented NGSS based curricula for K-12 students of the Washoe County School District
- Of 272 students reached, 68% reported an increased interest in pursuing a scientific career
- Initiated bilingual program incorporated in lesson plans and website marketing with the intention of making science more accessible to families of Hispanic backgrounds

NASA Goddard Space Flight Center Planetary Internship — **Greenbelt, MD**
GEM Fellowship supervised by Dr. Terry Hurford — *June 2021 –August 2021*
- Worked 30 hours/week
- Improved upon a dynamic model for predicting lunar seismicity using model bootstrapping existing Apollo data
- Explored the implications of these results for future Europa seismic missions

Lawrence Berkeley National Laboratory Geophysics Internship — **Berkeley, CA**
BLUR Fellowship supervised by Dr. Michael Commer — *August 2020 – December 2020*
- Worked 40 hours/week
- Developed a machine learning algorithm using Python-based SIMPeg and PyTorch coding packages for simulated crosswell electromagnetic imaging data in order to improve carbon capture and storage techniques
- Used algorithm to apply a complex factor to correct for steel-casing-induced numerical errors

PROFESSIONAL AWARDS

• **NSF Graduate Research Fellowship Program (GRFP) Fellow** • Graduate Education for Minorities (GEM) Full Fellow • International Ocean Discovery Program (IODP) Expedition 399 Researcher • IODP Post-Expedition Award • Institute for Rock Magnetism (IRM) Visiting Fellow (2x) Stanford Enhancing Diversity Graduate Education Fellow • Fulbright Semifinalist • Keck Northeast Astronomy Consortium (KNAC) Fellow • Sigma Xi Member

PUBLICATIONS

Lopes, E., Tikoo, S., Namayandeh., A., Fendorf, S., 2026. Magnetic Properties of Heated Fe-Rich Soils as Proxies for Burn Temperature and Nanoparticulate Formation. *Environmental Science & Technology*.

Lopes, E., Parsons, A., Tikoo., S., Deans, J., John, B., Kuehn, R., 2026. Along-Strike Variability Recorded within an Oceanic Core Complex's Footwall Rotation: Paleomagnetic Evidence from the Atlantis Massif. *Geology*, in review.

Lopes, E., Tikoo, S., Ju, O., Mells, J., Hatfield, R., Vanorio, T. and Expedition 399 Scientists, 2026. A Depth-Resolved Magnetic Profile of Serpentinized Oceanic Lithosphere at Atlantis Massif: Implications for Marine Magnetic Surveys. *JGR Solid Earth*, in prep.

McCall, N., Gulick, S., Tikoo, S., Bhandari, A., Hesse, M., Vanorio, T., Malenda, M., Chaffee, T., **Lopes, E.**, Rasmussen, C., Kring, D., Wittmann, A., Ketcham, R., Le Ber, E., Lofi, J. and Loggia, D., 2026. Comparative study of the porosity and permeability of Chicxulub peak-ring rocks. *Icarus*, p.117385.

Brazelton, W., Cavazos, O., Robare, J. , Southam, G., Suhonen, J., Wang, F., Lang, S., McCaig, A., Blum, P., Abe, N., Brazelton, W., Coltat, R., Deans, J., Dickerson, K., Godard, M., John, B., Klein, F., Kuehn, R., Lin, K., Liu, H., **Lopes, E.**, Nozaka, T., Parsons, A., Pathak, V., Reagan, M., Savov, I., Schwarzenbach, E., Sissmann, G., Wheat, C. G, 2026. An interdisciplinary approach to sampling hard rock cores of the oceanic crust for microbiological and biogeochemical research. *Scientific Drilling*, *35*(2), 159-169.

Jung, J., Gaal, S., Tikoo, S., **Lopes, E.**, Mells, J., Burns, D., Hatfield, R., 2026. Magnetization records of terrestrial weathering in the Sericho pallasite. *Meteoritics & Planetary Science*.

Lang, S., Wheat, C., Dickerson, K., Reagan, M., Savov, I., Robare, J., Brazelton, W., Suhonen, J., Cavazos, O., McCaig, A., Blum, P., Abe, N., Coltat, R., Deans, J., Godard, M., John, B., Klein, F., Kuehn, R., Lin, K., Lissenberg, J., Liu, H., **Lopes, E.**, Nozaka, T., Parsons, A., Pathak, V., Rodgers, J., Seewald, J., Sims, K., Sylva, S. and Wang, F., 2025. Hydrogen and single carbon constituents in the oceanic ultramafic dominated lithosphere. *Geochimica et Cosmochimica Acta*.

Namayandeh, A., Lamb, C., Sarabia, J., Shakouri, M., **Lopes, E.**, Lezama Pacheco, J., Honeyman, A., Coker A., Stewart B., Tikoo S., Peak D., Fendorf, S. (2025). Nonlinear redox transformations of chromium in soil during wildfire heating: the critical role of iron mineralogy. *Environmental Science & Technology*, *59*(50), 27623-27634.

Lissenberg, J., McCaig, A., Lang, S., Blum, P., Abe, N., Brazelton, W., Coltat, R., Deans, J., Dickerson, K., Godard, M., John, B., Klein, F., Kuehn, R., Lin, K., Liu, H., **Lopes, E.**, Nozaka, T., Parsons, A., Pathak, V., Reagan, M., Robare, J., Savov, I., Schwarzenbach, E., Sissmann, G., Southam, G., Wang, F., Wheat, G., Anderson, L., Treadwell, S., 2024. A long section of serpentinized depleted mantle peridotite. *Science*, *385*(6709), pp.623-629.

Lopes, E., Long, M.D., Karabinos, P. and Aragon, J.C., 2020. SKS splitting and upper mantle anisotropy beneath the southern New England Appalachians: Constraints from the dense SEISConn array. *Geochemistry, Geophysics, Geosystems*, *21*(12), p.e2020GC009401.

BOOK CHAPTERS

McCaig, A.M., Lang, S.Q., Blum, P., Abe, N., Brazelton, W., Coltat, R., Deans, J., Dickerson, K., Godard, M., John, B., Klein, F., Kuehn, R., Lin, K., Liu, H., **Lopes, E.**, Nozaka, T., Parsons, A., Pathak, V., Reagan, M., Robare, J., Savov, I., Schwarzenbach, E., Sissmann, G., Southam, G., Wang, F., Wheat, G., 2025. Building Blocks of Life, Atlantis Massif. Proceedings of the International Ocean Discovery Program, 399: College Station, TX (International Ocean Discovery Program). https://doi.org/10.14379/iodp.proc.399.2025

- Primary author of the paleomagnetism section of the IODP Exp 399 Proceedings; participated in the editorial meeting to revise and finalize the text which included serving as an editor for other disciplinary sections.

PUBLIC-FACING SERVICE

- Pertenecer (2023-2026) – program designed to introduce K-12 students from local communities to careers in the environmental sciences and geosciences. This includes organizing lab visits and leading interactive experiments.
- SDSS Recruitment Ambassador (2021-2026) – engaged with prospective students of SDSS programs
- SURGE PA coordinator (2022) – managed weekly workshops and panel discussions designed to foster academic and professional growth among scholars who champion inclusion
- Greater Akron Hindu Sewa Sammitee (2020-2021) – physics tutor for a group of 25 Bhutanese and Nepalese refugees studying for their GED science exam

*Recipient of the Stanford Doerr School of Sustainability's (SDSS) Excellence in Community award, which is presented to 1-2 people within the school who "demonstrated leadership and commitment to service through local or university-wide activities, community building, recruitment and outreach efforts."

SCIENTIFIC SERVICE

Reviewing

- Executive secretary for NASA Solar System Science proposals (SCUBED25)
- Peer reviewer for Geochemistry, Geophysics, and Geosystems (G^3)

Research mentorship

SURGE Advisee: Lily Muehlenhard '27 June 2024 – August 2025

- Project objective was to characterize the degree of alteration and the resulting changes in rock magnetic properties that may arise from experiment-induced oxidation of extraterrestrial samples
- REU program focused on introducing underrepresented students who are new to research

SESUR Advisee: Olivia Ju '27 April 2024 - October 2024

- Taught an undergraduate researcher how to conduct microscopy, rock magnetic, and paleomagnetic experiments
- Scientific work spanned 10 weeks and focused on characterizing the magnetic carriers of my Atlantis Massif samples
- Mentee presented research results at a fall scientific symposium

Peer Mentorship

- EDGE (2021-2026) – Stanford-sponsored program dedicated to fostering a vibrant educational environment for students across departments. I assisted my mentee with her successful NSF GRFP fellowship application.
- Montoya Scholars Mentor (2023-2024) - El Centro-sponsored program that pairs grad students with first year undergraduate students from Hispanic and Latinx backgrounds

UNDERGRADUATE EXPERIENCES

Yale University Seismology Internship **New Haven, CT**

Summer Science Research supervised by Professor Maureen Long *June 2019 – July 2019*

- Completed necessary field work and initial shear wave splitting measurements as part of yearlong thesis
- First author in paper summarizing results, which contain MatLab-generated stereoplots and fast wave plots
- Conducted field work installing seismometers for a seismic array in central New England

Colgate University Astrogeology Internship **Hamilton, NY**

KNAC REU Fellowship supervised by Jonathan Levine *June 2018 – July 2018*

- Worked on saturation correction and standard normalization for a portable mass spectrometer
- Research focused on perfecting an autonomous instrument to date planetary samples in-situ on Mars
- Presented research and submitted paper at KNAC Research Symposium held at Middlebury College

Williams College Teaching Assistant **Williamstown, MA**

Various positions in the Astronomy and Geosciences Departments *September 2017 - May 2020*

- *Observatory (5x)*: Instructed Intro. to Astro. students how to recognize constellations and operate telescopes, including 24-inch Cassegrain with color CCD camera, 4-inch Stellarvue, and 6-inch Meade refractor
- *Geos 102 (2x), 201, 203*: Lead lab sessions and helped teach students about introductory geology, geomorphology, and structural geology

Nevada Terawatt Facility Physics Internship **Stead, NV**

Research assistant supervised by Aaron Covington *July 2017 - August 2017*

- Calibrated visible spectrometers by taking data from HeNe laser and Broad Spectrum Lamp-Low
- Collected emission line data and fit them to known carbon species transitions

ADDITIONAL INFORMATION

- **Languages:** Fluent in written and spoken Spanish, Basic proficiency in German, ¾ through Duolingo Russian
- **Programs:** Python, MatLab, Mathematica, R, Schlumberger Petrel, ArcGIS, IRAF
- **Other:** AAUS Scientific Diver, Lifeguard (2020-2022), Helped set up the Stanford Paleomagnetism Laboratory