

William D. Frazer

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Department of Earth and Planetary Sciences, Yale University

210 Whitney Ave

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Education:

Yale University, New Haven CT, USA

Ph.D., Earth and Planetary Sciences, 2024

M.Phil., Earth and Planetary Sciences, 2021

Binghamton University, Binghamton NY, USA

B.S. *cum laude*, Geological Sciences: Geophysics, 2019

Appointments:

Carnegie Postdoctoral Fellow, Forthcoming

Earth and Planets Laboratory, Carnegie Institution for Science

Graduate Student Researcher, 2019-2024

Department of Earth and Planetary Sciences, Yale University

Graduate Research Intern, Fall 2022

Yale Carbon Containment Lab, Yale University

Undergraduate Researcher, 2016-2019

Geophysics and Remote Sensing Laboratory, Binghamton University

IRIS Intern, Summer 2018

IGPP, Scripps Institution of Oceanography, University of California San Diego

Summer Scholar, Summer 2017

Paleoclimate Laboratory, Binghamton University

Publications:

Frazer, W.D., & Park, J. “High-frequency receiver functions on Mars: Evidence for anisotropy,” in prep. for Physics of the Earth and Planetary Interiors special issue “Mars Interior Structure and Evolution after the InSight NASA mission”

Frazer, W.D., & Park, J. “Evidence for Metasomatic Underplating Beneath Bermuda,” in prep.

Frazer, W.D., & Park, J. “No Globally Detectable Seismic Interfaces within Earth’s Mantle Transition Zone: Evidence for Basalt Enrichment,” Earth and Planetary Science Letters, **641C**, 118838, 2024.

Frazer, W.D., & Park, J. “High-resolution mid-mantle imaging with multiple-taper SS-precursor estimates,” Geophysical Journal International, Volume 233, Issue 2, May 2023, Pages 1356–1371, <https://doi.org/10.1093/gji/ggac491>

Frazer, W. D., & Korenaga, J. “Dynamic topography and the nature of deep thick plumes,” Earth and Planetary Science Letters, **578**, 117286, 2022. <https://doi.org/10.1016/j.epsl.2021.117286>

Frazer, W. D., Doran, A. K., & Laske, G., “Benchmarking Automated Rayleigh-Wave Arrival Angle Measurements for USArray Seismograms,” Seismological Research Letters, **93** (2A): 763–776. 2021. <https://doi.org/10.1785/0220210189>

Frazer, W. D., & Park, J., “Seismic evidence of mid-mantle water transport beneath the Yellowstone region,” Geophysical Research Letters, **48**, e2021GL095838. 2021. <https://doi.org/10.1029/2021GL095838>

Nikulin, A., de Smet, T., Baur, J., Frazer, W.D., & Abramowitz, J.C. “Detection and identification of remnant PFM-1 ‘Butterfly Mines’ with a UAV-based thermal-imaging protocol,” Remote Sensing, 10(11), 1642. 2018. <https://doi.org/10.3390/rs10111672>

Nikulin, A., de Smet, T., Frazer, W.D., Baur, J., Abramowitz, J.C., Finan, D., Denara, S., Aglietti, N., & Campos, G. “Drones and “butterflies”: A low-cost UAV system for rapid detection and identification of unconventional minefields,” Journal of Conventional Weapons Destruction, 22.3, 2018.

Awards:

Prize Teaching Fellowship, May 2023
Graduate School of Arts and Science, Yale University
Recognizes outstanding performance and promise as a teacher (Student nominated)
For 2023 EPS 212 Field Trip to Oman

Excellence in Teaching Prize, May 2023
Department of Earth and Planetary Sciences, Yale University
For outstanding contributions to the teaching process
For 2023 EPS 212 Field Trip to Oman

Glenn G. Bartle Class of ’52 Award, May 2019
Department of Geological Sciences, Binghamton University
Awarded to an outstanding senior for academic excellence and service to the department

Distinguish Independent Work, May 2019
Department of Geological Sciences, Binghamton University
Awarded for completion of advanced research as an undergraduate

NSF GRFP Honorable Mention, April 2019
National Science Foundation

Provost's Award for Excellence in Undergraduate Research, April 2019
Binghamton University

Awarded to an undergraduate for excellence in research, scholarship and creative activities that extends beyond traditional course work

Seminars at other institutions:

"A seismic search for water in Earth's mantle transition zone," Earth Sciences departmental seminar, Binghamton University, April 2023

Selected Conference Presentations:

Frazer, W.D., Park, J. "The Martian Lithosphere Beneath the Northern Lowlands May Be Anisotropic." Talk at 2024 Mars Interior and Geophysics After InSight

Link, F., Bourke, J., Acre R.M., **Frazer, W.D.**, Long, M., Loeberich, E., Mountain, G., Wright, J., Kinney, S., Miller, K., Doherty, C., Adamo, L.C., Miller, P., Barstow, N. **"The Rutgers' and Yale Rapid Seismic Array Deployment: Contribution to the 2024 Whitehouse Station, NJ, Earthquake Response – Collaborations, Reactions, and future Education."** Poster at 2024 SSA Annual Meeting

Frazer, W.D., Park, J. "No Globally Detectable Seismic Interfaces within Earth's Mantle Transition Zone: Evidence for Basalt Enrichment." Poster at 2023 AGU Fall Meeting

Frazer, W.D., Park, J. "Does the 520-km discontinuity exist? / A global search for water in Earth's mantle transition zone." Poster at 2023 Interior of the Earth Gordon Research Conference

Frazer, W.D., Park, J. "Global High-Resolution mid-Mantle Imaging with Multiple-Taper SS-Precursor Estimates." Poster at 2023 EGU General Assembly

Laske, G., **Frazer, W.D.**, Doran, A.K. **"Benchmarking Automated Rayleigh-Wave Arrival Angle Measurements for USArray Seismograms."** Poster at 2023 EGU General Assembly

Frazer, W.D., Park, J. "Global High-Resolution mid-Mantle Imaging with Multiple-Taper SS-Precursor Estimates." Talk at 2022 AGU Fall Meeting

Frazer, W.D., Link, F., Wolf, J. "Improving Shear-wave Splitting Estimates with Multiple-taper Spectral Analysis." Poster at 2022 AGU Fall Meeting

Frazer, W.D., Park, J. "Multiple-Taper Correlation to Detect Precursors to SS Earthquake Waves." Talk at 2022 Multitaper Spectral Analysis Workshop at Banff Research Station

Frazer, W.D., Park, J. “Searching for Mid-Mantle Water with Multitaper-Correlation SS Precursors.” Talk at 2022 EGU General Assembly

Frazer, W.D., Park, J. “Searching for Mid-Mantle Water with Multitaper-Correlation SS Precursors.” Poster at 2021 AGU Fall Meeting

Frazer, W.D., Park, J. “Seismic evidence of mid-mantle water transport beneath the Yellowstone region.” Poster at 2021 General Assembly of the European Seismological Commission

Frazer, W.D., Park, J. Chen, M. “Receiver Functions of the Transition Zone Below Yellowstone: Searching for Water.” Poster at 2020 AGU Fall Meeting

Frazer, W.D., Laske, G., Doran, A.K. “Surface-wave arrival angles and wave-propagation effects at the USArray Transportable Array.” Poster at 2018 AGU Fall Meeting

Frazer, W.D., Bourke, J.R., de Smet, T., Nikulin, A. “Geophysical Survey of Poverty Point UNESCO World Heritage Site Mound A.” Poster at 2017 AGU Fall Meeting

Field Work:

The Rutgers’ and Yale Rapid Seismic Array Deployment, Spring 2024

NJ, USA (~2 days total); Installation instruments after April 5th, 2024 Whitehouse Station Event

New England Seismic Network (NEST), Summer 2019; Summer 2021; Summer 2022

VT, NH, MA, USA (~12 days total); Installation and maintenance of seismic stations in the NEST array

R/V Marcus G. Langseth, Summer 2019

Off coast Aleutian Islands, AK, USA (~20 Days); Active source seismic survey as part of the Alaska Amphibious Community Seismic Experiment

R/V Robert Gordon Sproul, Summer 2018

Off coast San Diego, CA, USA (~3 Days); Deployment of ocean bottom seismometers for testing of novel pressure gauges and local sediment structure

Nantahala National Forest, Summer 2018

NC, USA (~10 days); Geophysical survey including magnetometry, resistivity, ground penetrating radar, and photogrammetry of multiple archeological sites

Poverty Point, Summer 2017

LA, USA (~7 Days); Geophysical survey including magnetometry, active source seismic, resistivity, ground penetrating radar of UNESCO World Heritage Site

Teaching:

Teaching Fellow, EPS 212, Global Tectonics, Spring 2024 (Group of 35)

Responsible for organizing, leading, and participating in 10 Day spring break field trip to Sicily

Teaching Fellow, EPS 212, Global Tectonics, Spring 2023 (Group of 53)

Responsible for organizing, leading, and participating in 10 Day spring break field trip to Oman

Teaching Fellow EPS 312, Structural Geology, Fall 2022

Responsible for running labs, holding office hours, and grading weekly homework assignments

Teaching Fellow EPS 210, Geology of North America, Spring 2022

Responsible for holding office hours and grading weekly homework assignments

Teaching Fellow, EPS 212, Global Tectonics, Spring 2022 (Group of 16)

Responsible for organizing, leading, and participating in weeklong spring break field trip to Death Valley National Park, CA, USA

Teaching Fellow, EPS 110, Dynamic Earth, Fall 2020

Responsible for holding office hours, grading weekly homework assignments and exams

Teaching Fellow, G&G 100, Natural Disasters Fall 2019

Responsible for grading weekly homework assignments and exams

Computational Skills

Python, MATLAB, high performance computing (Slurm), AxiSEM3D, UNIX, MacOS, Windows
Familiar with Fortran, R, GMT

Service:

Manuscript reviewer, 2022-Present

for Geophysical Journal International, Geophysical Research Letters, Journal of Geophysical Research: Solid Earth

Peer mentor, 2023-Present

Yale EPS Graduate Student Peer Mentoring Program

Department field trip coordinator, Spring 2023 (trip June 2023)

Organized seminar, logistics, and field guide for two-week Yale EPS field trip to Greece

Co-convener, EGU 2023

Physics-based earthquake modeling and engineering sessions

Dana Club Co-President, 2021-2022

Head of Yale EPS graduate student organization. Responsible for serving as a liaison between students and faculty in addition to coordinating social events

Co-representative for Geophysics, 2021-2022
Yale EPS Colloquium Committee

Department field trip co-coordinator, Spring 2021 (trip June 2021)
Organized logistics for three-week Yale EPS field trip to the Western USA

Professional and Scientific Society Membership:

American Geophysical Union, 2017-Present
European Geoscience Union, 2022-Present