

James Atterholt

Mendenhall Postdoctoral Fellow, U.S. Geological Survey

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Education

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| 2019-2024 | PhD , Geophysics California Institute of Technology (Caltech) Advised by Zhongwen Zhan & Zachary E. Ross Thesis: Fault Zone Structure and Rupture Behavior with Fiber-Optic Sensing and Second Moments |
| 2015-2019 | Bachelor of Science , Mathematics & Geological Sciences Indiana University (IU) Advised by Gary L. Pavlis Thesis: Measurements of P-wave anisotropy in the Homestake Mine |

Appointments

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| 2024-present | Mendenhall Postdoctoral Fellow , U.S. Geological Survey (USGS) |
| 2024-present | Visiting Faculty , Colorado School of Mines |
| 2019-2024 | Graduate Student Researcher , Caltech Seismological Laboratory |
| 2019 | NAGT Summer Intern , USGS |
| 2015-2019 | STARS Research Assistant , IU Geophysics Laboratory |
| 2017 | IRIS Intern , Los Alamos National Laboratory |

Awards and Honors

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| 2024 | Mendenhall Postdoctoral Fellowship , USGS \$193,000 in support over 2 years |
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| 2024 | GPS Award for Academic Excellence in Research , Caltech |
| 2024 | AGU Annual Meeting Outstanding Student Presentation Award |
| 2023 | SSA Annual Meeting Student Presentation Award |
| 2020 | NSF Graduate Research Fellowship \$138,000 in support over 3 years |
| 2019 | Faculty Senior Award , IU Geological Sciences |
| 2019 | Cora B. Hennel Memorial Scholarship , IU Mathematics |
| 2019 | Margaret Russell Edmondson Award , IU Phi Beta Kappa Chapter |
| 2017 | Undergraduate Prize , Mineralogical Society of America |

Journal Publications

- [13] **Atterholt, J.**, Wilding, J.D., Ross, Z.E. (*in review*). The Evolution of Fault Orientation in the 2019 Ridgecrest Earthquake Sequence with a New Long-Term Catalog of Seismicity and Moment Tensors.
- [12] **Atterholt, J.**, Zhan, Z. (*in review*). Fine Scale Southern California Moho Structure Uncovered with Distributed Acoustic Sensing.
- [11] Zhai, Q., Yin, J., Yang, Y., **Atterholt, J.**, Li, J., Husker, A., Zhan, Z. (*in review*). Comprehensive Evaluation of DAS Arrays 1 in California: Instrument Response, Noise Floor, and Amplitude Saturation.
- [10] Bird, E., **Atterholt, J.**, Biondi, E., Yang, Y., Zhan, Z. (*in review*). Imaging the North Bishop Block with Converted Phases Observed through Fiber-Optic Seismology.
- [9] **Atterholt, J.**, Zhan, Z., Yang, Y., Zhu, W. (2024). Imaging the Garlock Fault Zone with a Fiber: A Missing Damage Zone and Hidden Bimaterial Contrast. *Journal of Geophysical Research: Solid Earth*, doi: 10.1029/2024JB028900
- [8] Guo, H., **Atterholt, J.**, McGuire, J.J., Thurber, C. (*in review*). Evidence for low effective stress within the crust of the subducted Gorda plate from the 2022 December M_w 6.4 Ferndale Earthquake Sequence.
- [7] **Atterholt, J.**, Ross, Z.E. (2023). Finite Source Properties of Large Strike-Slip Earthquakes. *Geophysical Journal International*, doi: 10.1093/gji/ggad459
- [6] **Atterholt, J.**, Zhan, Z., and Yang, Y. (2022). Fault zone imaging with distributed acoustic sensing: body-to-surface wave scattering. *Journal of Geophysical Research: Solid Earth*, doi: 10.1029/2022JB025052
- [5] Yang, Y., Zhan, Z., Shen, Z., and **Atterholt, J.** (2022). Fault zone imaging with distributed acoustic sensing: surface-to-surface wave scattering. *Journal of Geophysical Research: Solid Earth*, doi: 10.1029/2022JB024329.
- [4] **Atterholt, J.** and Ross, Z. E. (2022) Bayesian framework for inversion of second-order stress glut moments: application to the 2019 Ridgecrest sequence mainshock. *Journal of Geophysical Research: Solid Earth*, doi: 10.1029/2021JB023780

- [3] **Atterholt, J.**, Zhan, Z., Shen, Z., and Li, Z. (2021) A unified wavefield partitioning approach for distributed acoustic sensing. *Geophysical Journal International*, doi: 10.1093/gji/ggab407
- [2] Yang Y., **Atterholt, J.**, Shen, Z., Muir, J.B., Williams, W.F., Zhan, Z. (2021) Sub-kilometer correlation between near-surface structure and ground motion measured with distributed acoustic sensing. *Geophysical Research Letters*, doi: 10.1029/2021GL096503
- [1] **Atterholt, J.**, Brownlee, S.J., and Pavlis, G.L. (2021). Direct P-wave anisotropy measurements at Homestake Mine: implications for wave propagation in the continental crust. *Geophysical Journal International*, doi: 10.1093/gji/ggaa416

Teaching Experience

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| 2022-2023 | Caltech EQ Fellows Program , Instructor/Mentor |
| 2023 | Plate Tectonics , Teaching Assistant, Caltech |
| 2022 | Geophysical Data Analysis , Teaching Assistant, Caltech |
| 2021 | Seismology , Teaching Assistant, Caltech |

Service

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| 2022-present | Manuscript Reviewer , <i>Seismological Research Letters</i> , <i>Journal of Geophysical Research – Solid Earth</i> , <i>Communications Earth & Environment</i> , <i>Scientific Reports</i> , <i>Seismica</i> |
| 2023-2024 | Project Mentor , High School Student Researchers, Caltech |
| 2022-2023 | Curriculum Developer / Instructor , Caltech EQ Fellows Program |
| 2021-2022 | Organizer , Caltech Seismological Laboratory Seminar |
| 2016-2019 | Editorial Board Member , <i>IU Journal of Undergraduate Research</i> |

Seminars

- [4] **Indiana University Department of Earth and Atmospheric Sciences**, Invited Talk, 2024
Title: Top to Bottom Structure of the Garlock Fault with DAS
- [3] **John Wesley Powell Center for Analysis and Synthesis**, Invited Talk, 2024
Title: Fault Zone Imaging with DAS: A Case Study at the Garlock Fault
- [2] **California Institute of Technology**, Brown Bag Seminar, 2024
Title: Exploring Fine-Scale Crustal Structure with Fiber Optic Seismology

- [1] **Lawrence Livermore National Laboratory**, GMP Guest Seminar, 2023
Title: Illuminating the Multiscale Structure of the Garlock Fault Zone with Distributed Acoustic Sensing

Select Oral Presentations

- [4] **Atterholt, J.**, Zhan, Z. (2023) Illuminating Moho Variability Across the Garlock Fault with Distributed Acoustic Sensing. AGU Fall Meeting, San Francisco.
- [5] **Atterholt, J.**, Zhan, Z., Yang, Y., Zhu, W. (2023) The Top-to-Bottom Structure of the Garlock Fault Zone Uncovered with Fiber Sensing. AGU Fall Meeting, San Francisco.
- [3] **Atterholt, J.**, Zhan, Z., Yang, Y., and Zhu, W. (2023) High-Resolution Fault Zone Imaging with Distributed Acoustic Sensing. SSA Annual Meeting, Puerto Rico. **Invited.**
- [2] **Atterholt, J.**, Zhan, Z., Yang, Y., and Zhu, W. (2022) Imaging the Garlock Fault Zone using distributed acoustic sensing. AGU Fall Meeting, Chicago.
- [1] **Atterholt, J.** and Ross, Z.E. (2022). Global evaluation of large strike-slip ruptures using a Bayesian estimation of stress glut second moments. AGU Fall Meeting, Chicago.

Select Poster Presentations

- [10] Bird, E., **Atterholt, J.**, Yang, Y., Biondi E., and Zhan, Z. (2023). Joint Inversion for Shallow Subsurface Velocity Structure near Bishop, CA. AGU Fall Meeting, San Francisco.
- [9] Barbour, A., McGuire, J., and **Atterholt, J.** (2023) Site effects at the meter scale from fiber optic and nodal seismic sensing. AGU Fall Meeting, San Francisco.
- [8] **Atterholt, J.** and Ross, Z.E. (2023). Finite Source Properties of Large Strike-Slip Earthquakes. SSA Annual Meeting, Puerto Rico.
- [7] **Atterholt, J.** and Ross, Z.E. (2021). Bayesian framework for inversion of second-order stress glut moments: application to the 2019 Ridgecrest sequence mainshock. AGU Fall Meeting, New Orleans.
- [6] **Atterholt, J.**, and Zhan, Z. (2021). Fault zone mapping at intermediate scales using scattered waves recorded by distributed acoustic sensing. AGU Fall Meeting, New Orleans.
- [5] Yang, Y., **Atterholt, J.**, Shen, Z., Muir, J.B., Williams, E.F., and Zhan, Z. (2021). Urban seismic hazard mapping with distributed acoustic sensing. AGU Fall Meeting, New Orleans.

- [4] **Atterholt, J.**, Zhan, Z., Shen, Z., and Li, Z. (2020). A unified wavefield partitioning approach for distributed acoustic sensing. AGU Fall Meeting, Online.
- [3] Williams, E.F., Martins, H.F., Fernandez-Ruiz, M.R., **Atterholt, J.**, Shen, Z., Martin-Lopez, S., Gonzalez-Herraez, M., Callies, J., and Zhan, Z. (2020). Ocean surface gravity wave interferometry with seafloor DAS. AGU Fall Meeting, Online.
- [2] **Atterholt, J.** and Pavlis, G.L. (2018). Measurements of P wave anisotropy using active source seismic data in the Homestake Mine. GSA Annual Meeting, Indianapolis.
- [1] **Atterholt, J.**, Chen, T., Snelson, and C.M., Mellors, R.J. (2017). Attenuation model using the large-N array from the Source Physics Experiment. AGU Fall Meeting, New Orleans.

Field Experience

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| 2023 | Nodal deployment in Los Angeles County , Contributor, Caltech |
| 2022 | Seismic survey across Garlock Fault , Designer and organizer, Caltech |
| 2019 | Seismic survey across Seattle Fault , Contributor, USGS |
| 2019 | Seismic survey in Wabash Valley Fault Zone , Contributor, USGS |
| 2018 | Field mapping in the Tobacco Root Mountains , Student, IU |