

# Shujuan Mao

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🔍 Google scholar profile

**Research Interests:** Environmental Seismology, Groundwater Hydrology, Geothermal Energy, Carbon Capture & Storage, Volcano Monitoring, 4D Seismology

## Education

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- **Ph.D. in Geophysics** Sept. 2015–Aug. 2021  
○ **Massachusetts Institute of Technology**, Cambridge, MA
  - Thesis: *Monitoring and Imaging Seismic Velocity Changes Across Temporal and Spatial Scales*
  - Co-advisors: Prof. Robert D. van der Hilst and Prof. Michel Campillo
- **B.S. in Geophysics** Sept. 2011–July 2015  
○ **Peking University**, Beijing, China
  - Thesis: *Detection and Relocation of Micro-Seismicity Around Zipingpu Reservoir in Sichuan, China*
  - Advisor: Prof. Jieyuan (Jerry) Ning

## Academic Appointments

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- **Tenure-Track Assistant Professor** Aug. 2024–present  
○ **The University of Texas at Austin**, Dept. of Earth and Planetary Sciences
- **Postdoctoral Researcher** May–July 2024  
○ **CNRS at Institut des Sciences de la Terre (ISTerre)**, Grenoble, France
  - Advisor: Prof. Michel Campillo
- **Thompson Postdoctoral Fellow** Jan. 2022–Apr. 2024  
○ **Stanford Doerr School of Sustainability**, Dept. of Geophysics
  - Co-advisors: Prof. Gregory C. Beroza and Prof. William L. Ellsworth
- **Research Assistant/Specialist** June 2016–Dec. 2021  
○ **Massachusetts Institute of Technology**, Dept. of Earth, Atmos. & Planet. Sci.
  - Co-advisors: Prof. Robert D. van der Hilst and Prof. Michel Campillo
- **Visiting Student** Jan. 2016–Dec. 2021  
○ **Institut des Sciences de la Terre (ISTerre)**, Grenoble, France
  - Collaborators: The Waves & Structures Group
- **Research Intern** June–Sept. 2014  
○ **University of Toronto**, Dept. of Physics
  - Advisor: Prof. Qinya Liu

## Honors & Awards

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- 2024 Early Career Travel Grant (Seismological Society of America)
- 2022 George A. Thompson Postdoctoral Fellowship (Stanford University)
- 2021 Top 5 Most Cited Papers 2020 (*Geophysical Journal International*)
- 2020 Top Downloaded Paper 2018–2019 (*Geophysical Research Letters*)

- 2015 M. Nafi Toksöz Fellowship (Massachusetts Institute of Technology)
- 2015 Outstanding Undergraduate of Peking University
- 2014 Guang-Hua Scholarship (Peking University)
- 2014 Globalink Research Fellowship (Mitacs Foundation, Canada)
- 2013 Liu Guang-Ding Geophysics Scholarship (Peking University)
- 2012 Merit Student of Peking University
- 2010 First Prize for *National Olympiad of Mathematics in Provinces, China*
- 2010 Silver Medal for *China Girls Mathematical Olympiad* (with participants from China, Russia, Singapore, U.K., U.S., etc.)

## Publications

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\* indicates the corresponding author

- **Mao, S.\***, Ellsworth, W. L., Zheng, Y., Beroza, G. C. (2024). How Fast, How Deep, and How Much? – Seismic Sensing of Groundwater Recharge from the Atmospheric-River Storms of 2023. *In revision*. [\[SSA Meeting Highlight\]](#)
- Shi, Y., Wen, J., Ning, J.\*, Jiang, Y., Chen, L., **Mao, S.**, Wu, H., Wang, X., & Zhao, Z. (2024). High-Speed Rail: A Novel Seismic Source for Near-Surface Monitoring. *Submitted*.
- **Mao, S.\***, Ellsworth, W. L., Beroza, G. C. (2023). Adaptive Coda-Wave Imaging with Voronoi Tessellation. *Journal of Geophysical Research: Solid Earth*, e2023JB026592. [pdf](#)
- **Mao, S.\***, Lecointre, A., van der Hilst, R. D., & Campillo, M. (2022). Space-Time Monitoring of Groundwater Fluctuations with Passive Seismic Interferometry. *Nature Communications*, 13, 4643. [pdf](#) [Covered by \[MIT News\]](#) [\[Eos Magazine\]](#) [\[SCEC Newsletter\]](#)
- **Mao, S.\*** (2021). Monitoring and Imaging Seismic Velocity Changes Across Temporal and Spatial Scales. *Doctoral Dissertation, Massachusetts Institute of Technology*. [pdf](#)
- **Mao, S.\***, Mordret, A., Campillo, M., Fang, H., & van der Hilst, R. D. (2020). On The Measurement of Seismic Traveltime Changes in the Time-Frequency Domain with Wavelet Cross-Spectrum Analysis. *Geophysical Journal International*, 221(1), 550-568. [pdf](#) [\[Top 5 Most Cited Papers in GJI, 2020\]](#)
- Mordret, A.\*, Courbis, R., Brenguier, F., Chmiel, M., Garambois, S., **Mao, S.**, Boué P., Campmen, X., Lecocq, T., van der Veen, W., & Hollis, D. (2020). Noise-based Ballistic Wave Passive Seismic Monitoring–Part 2: Surface Waves. *Geophysical Journal International*, 221(1), 692-705. [pdf](#)
- **Mao, S.\***, Campillo, M., van der Hilst, R. D., Brenguier, F., Stehly, L., & Hillers, G. (2019). High Temporal Resolution Monitoring of Small Variations in Crustal Strain by Dense Seismic Arrays. *Geophysical Research Letters*, 46(1), 128-137. [pdf](#) [\[Top Downloaded Paper in GRL, 2018-2019\]](#)
- Brenguier, F.\*, Mordret, A., Lynch, R., Courbis, R., Campbell, X., Boué P., Chmiel, M., Garambois, S., **Mao, S.**, Takano T., & Lecocq T. (2019). Monitoring of fields using body and surface waves reconstructed from passive seismic ambient noise. *SEG International Exposition and Annual Meeting*, p. D043S104R007, SEG. [pdf](#)
- Wu, M., **Mao, S.**, Ning, J.\*, Tang, Q., & Jiang, Y. (2018). Fault Structure Detection by Matched Filter Technique. *Peking University Academic Journal*, 54(4), 730-738. (In Chinese) [pdf](#)

## Invited Talks

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### At Research Institutions

- 01/2025 SeismoLab Seminar, California Institute of Technology
- 10/2024 Dept of Geology and Geophysics, University of Utah
- 09/2024 Hydrogeology Department, Orange County Water District
- 09/2024 Bureau of Economic Geology, UT Austin
- 07/2024 Hydrogeophysics Research Exchange, Sorbonne Université (Paris, France)\*
- 04/2024 Hydrology Research Seminar, Colorado State University\*
- 02/2024 Dept of Earth, Planetary and Space Sciences, UC Los Angeles
- 10/2023 State Key Lab of Marine Geology, Tongji University (Shanghai, China)\*
- 10/2023 Dept of Geosciences, University of Wisconsin-Madison
- 10/2023 Dept of Earth, Environmental and Planetary Sciences, Rice University
- 07/2023 School of Earth Sciences, Zhejiang University (Hangzhou, China)
- 03/2023 Dept of Geological Sciences, UT Austin
- 03/2023 Dept of Earth Sciences, University of Toronto
- 03/2023 Dept of Earth Sciences, University of Connecticut
- 01/2023 Dept of Earth and Planetary Sciences, UC Santa Cruz
- 11/2022 Dept of Earth and Planetary Sciences, UC Riverside
- 10/2022 Geophysics Seminar, Georgia Institute of Technology\*
- 10/2022 Berkeley Seismology Lab Seminar, UC Berkeley
- 11/2021 Geophysics Seminar Series, University of Toronto\*
- 04/2021 SeismoLab Special Seminar, California Institute of Technology\*
- 04/2021 Geophysics Departmental Symposium, Stanford University\*
- 04/2021 Sustainability Geophysics Project, National University of Singapore\*

### At Conferences & Workshops

- 10/2024 Eastern Section-Seismological Society of America Annual Meeting (Atlanta, GA)
- 06/2024 Summer School on *Passive Imaging & Monitoring in Wave Physics* (Cargèse, France)
- 08/2023 3rd International Meeting for Applied Geoscience and Energy (IMAGE), *Special Session: SEG/AGU Hydrogeophysics* (Houston, TX)
- 07/2023 Summer School on *Algorithms and Programs in Seismology* (hosted by USTC & Seismological Society of China)
- 04/2023 EGU General Assembly, Session: *Advances in monitoring and studying the presence and migration of fluids within the crust using multi-disciplinary approaches* (Vienna, Austria)
- 03/2023 EarthScope Monthly Webinar
- 02/2023 Munich Earth Winter School on *Environmental Seismology* (Bayrischzell, Germany)
- 12/2022 EAGE Workshop on *Geophysical Aspects of Smart Cities* (Hong Kong, China)
- 08/2022 Geophysics Summer School (Peking University & Geophysical Society of Beijing)
- 06/2022 NSF SAGE/GAGE Community Science Workshop (Pittsburgh, U.S.)

- 04/2022 Summer School on *Passive Imaging & Monitoring in Wave Physics* (Cargèse, France)
- 12/2021 AGU Fall Meeting, Session: *Advancing the Use of Geophysical & Geodetic Methods for Groundwater Science and Management* (New Orleans, LA)
- 09/2021 SEG Post-Convention Workshop on *Geophysical Methods and Applications for Sustainable Cities* (Denver, CO)
- 04/2019 Passive Seismic Functional-Image Workshop (Grenoble, France)
- 06/2017 MIT Earth Resources Laboratory (ERL) Consortium Annual Meeting (Cambridge, MA)

## Selected Conference Participation

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- Bakulin, A., **Mao, S.**, & Fomel, S. *Geophysical Use Cases for Long-Term Monitoring*. Contributed talk at *4th IMAGE (International Meeting for Applied Geoscience and Energy) Post-Convention Workshop*, 2024, Houston, TX
- **Mao, S.**, Lecointre, A., van der Hilst, R. D., & Campillo, M. *Space-Time Monitoring of Groundwater Fluctuations via Seismic Interferometry*. Talk at *Annual Western Groundwater Congress* organized by *GRA (Groundwater Resources Association of California)*, 2022, Sacramento, CA.
- **Mao, S.**, Ellsworth, W. L., & Beroza, G. C. *Ambient Field Monitoring of Seismic Velocity with Application to Groundwater, Disposal and Production*. Talk at *SCITS (Stanford Center for Induced and Triggered Seismicity) Affiliates Meeting*, 2022, Stanford, U.S.
- **Mao, S.**, Lecointre, A., van der Hilst, R. D., & Campillo, M. *Space-Time Monitoring of Groundwater Fluctuations with Passive Seismic Interferometry*. Highlighted talk at *EGU General Assembly*, 2021, Online & in Vienna, Austria.
- **Mao, S.**, Lecointre, A., Wang, Q., van der Hilst, R. D., & Campillo, M. *Noise-Based Monitoring of Spatiotemporal Changes in Crustal Seismic Wavespeed Across Southern California*. Talk at *AGU Fall Meeting*, 2019, San Francisco, CA
- **Mao, S.**, Mordret, A., Campillo, M., Fang, H., & van der Hilst, R. *A New Approach to Measuring Time- and Frequency-Dependent Seismic Velocity Evolution*. Talk at *EGU General Assembly*, 2019, Vienna, Austria.
- **Mao, S.**, Campillo, M., van der Hilst, R. D., Brenguier, F., & Hillers, G. *Monitoring Daily and Sub-Daily Variations in Crustal Strain with Dense Seismic Arrays*. Talk at *AGU Fall Meeting*, 2017, New Orleans, LA

## Mentoring & Teaching

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- **Invited lecturer** for Summer School on *Algorithms and Programs in Seismology* in Hohhot, China, 07/2023. Taught one session on software and one session on applications.
- **Invited lecturer** for Munich Earth Science Winter School on *Environmental Seismology*, Bayrischzell, Germany & virtual, 02/2023.
- **Mentor** in the Clean Water Science Network (CWSN) Mentorship Program, 2022–2023, mentored a graduate student at Federal University of Rio Grande do Sul, Brazil.
- **Guest lecturer** for *GP130 Introduction to Seismology* at Stanford University, Fall 2022.
- **Mentor** in ESAC (Student Advisory Committee in the Dept of EAPS, MIT) Peer Mentoring Program in 2017–2018 and 2020–2021

## Academic Services & Affiliations

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- **Planning Committee Member**, 2025 SSA Topical Meeting on *Environmental Seismology*
- **Primary Convener**, 2024 AGU Fall Meeting, *Session S006. Ambient-Field Seismology: Advances in Theory, Methodology, and Applications* (received 38 abstracts)
- **Co-Convener**, 2024 AGU Fall Meeting, *Session NS013. Seismic Imaging and Monitoring in Environmental, Urban, and Energy Contexts* (received 42 abstracts)
- **Plenary Co-Chair**, 2024 NSF SAGE/GAGE Community Science Workshop, *Session 4: New Science, Technologies, and Innovations*
- **Co-Convener**, 2024 SSA Annual Meeting, *Session: Climate Change & Environmental Seismology*
- **Primary Convener**, 2023 AGU Fall Meeting, *Session S005. Ambient-Field Seismology: Advancements in Theory, Methodology, and Applications* (3 oral sessions and 3 poster sessions)
- **Primary Convener**, 2022 AGU Fall Meeting, *Session S008. Exploiting the Ambient Seismic Field: Opportunities from New Sources, Methodologies, and Instrumentations* (2 oral sessions and 2 poster sessions)
- **Judge** for Outstanding Student Presentation Award at AGU Fall Meeting, 2022 & 2023
- **Reviewer** for *Science, Earth and Planetary Science Letters, Geophysical Journal International, Geophysical Research Letters, IEEE Transactions on Geoscience and Remote Sensing, Journal of Geophysical Research: Solid Earth, Seismological Research Letters, The Seismic Record, and Water Resources Research*
- **Member** of *American Geophysical Union (AGU), European Geophysical Union (EGU), Statewide California Earthquake Center (SCEC), Society of Exploration Geophysicists (SEG), Seismological Society of America (SSA)*