

Shujuan Mao

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🔗 Google scholar profile

Research Interests: Environmental Seismology, Hydrogeophysics, Low-Carbon Energy, Critical-Zone Processes, Passive Seismic Monitoring, Time-Lapse Imaging, Diffuse Wavefield

Education

- **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

- **Tenure-Track Assistant Professor** starting Aug. 2024
○ **University of Texas at Austin**, Dept. of Earth and Planetary Sciences
- **G. A. Thompson Postdoctoral Fellow** Jan. 2022–present
○ **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 Scholar** June 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

- 2022 George A. Thompson Postdoctoral Fellow (Stanford University)
- 2021 Top 5 Most Cited Papers in 2020 (*Geophysical Journal International*)
- 2020 Top Downloaded Paper 2018–2019 (*Geophysical Research Letters*)
- 2015 M. Nafi Toksöz Fellowship (Massachusetts Institute of Technology)
- 2015 Outstanding Graduate of Peking University
- 2014 Guang-Hua Scholarship (Peking University)
- 2014 Mitacs Globalink Research Fellowship (Mitacs Foundation, Canada)

- 2013 Liu Guang-Ding Geophysics Scholarship (Peking University)
- 2012 Merit Student of Peking University
- 2010 First Prize in *National Olympiad of Mathematics in Provinces, China*
- 2010 Silver Medal in *China Girls Mathematical Olympiad* (with participants from China, Russia, Singapore, U.K., U.S., etc.)

Publications

- **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](#) [Featured 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](#) [\[Top Downloaded Paper 2018-2019 GRL\]](#)
- Wu, M., **Mao, S.**, Ning, J.*, Tang, Q., & Jiang, Y. (2018). Fault Structure Detection by Matched Filter Technique. *Acta Scientiarum Naturalium Universitatis Pekinensis*, 54(4), 730-738. (In Chinese) [pdf](#)

* indicates corresponding author

Invited Talks

- 10/2023 State Key Lab of Marine Geology Seminar, Tongji University (Shanghai, China, virtual)
- 10/2023 Geosciences Departmental Seminar, University of Wisconsin-Madison
- 10/2023 Department Seminar, Earth, Environmental and Planetary Sciences, Rice University
- 08/2023 3rd International Meeting for Applied Geoscience and Energy (IMAGE), Special Session: SEG/AGU Hydrogeophysics (Houston, TX)
- 07/2023 Workshop on Algorithms and Programs in Seismology (in Hohhot, China, held by University of Science and Technology of China & Seismological Society of China)
- 07/2023 Department Seminar, School of Earth Sciences, Zhejiang University (Hangzhou, 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 Geological Sciences Departmental Seminar, UT Austin
- 03/2023 Earth Sciences Departmental Seminar, University of Toronto
- 03/2023 EarthScope Monthly Webinar Series (online)
- 03/2023 Earth Sciences Departmental Seminar, University of Connecticut
- 02/2023 Munich Earth *Skience* School on Environmental Seismology (Bayrischzell, Germany)
- 01/2023 Earth and Planetary Sciences Department Seminar, UC Santa Cruz
- 12/2022 EAGE Workshop on Geophysical Aspects of Smart Cities (Hong Kong, China)
- 11/2022 Hewett Club Lecture Series, Earth and Planetary Sciences, UC Riverside
- 10/2022 Geophysics Seminar, Georgia Institute of Technology (virtual)
- 10/2022 Berkeley Seismology Lab Seminar, UC Berkeley
- 08/2022 Hongshan Geophysics Summer School (held by Peking University & Geophysics Society of Beijing)
- 06/2022 Plenary talk at SAGE/GAGE (Seismological/Geodetic Facilities for the Advancement of Geoscience) 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, U.S.)
- 11/2021 Geophysics Seminar Series, University of Toronto (virtual)
- 09/2021 SEG Post-Convention Workshop on Geophysical Methods and Applications for Sustainable Cities (virtual)
- 04/2021 Caltech SeismoLab Special Seminar, California Institute of Technology (virtual)
- 04/2021 Geophysics Departmental Seminar, Stanford University (virtual)
- 04/2021 Radar Interferometry Group Seminar, UT Austin (virtual)
- 04/2021 Sustainability Geophysics Project Seminar, National University of Singapore (virtual)

Selected Conference Presentations

- Talk at *Annual Western Groundwater Congress* held by GRA (Groundwater Resources Association), 2022, Sacramento, U.S. **Mao, S.**, Lecointre, A., van der Hilst, R. D., & Campillo, M. *Space-Time Monitoring of Groundwater Fluctuations via Seismic Interferometry.*
- Talk at *SCITS (Stanford Center for Induced and Triggered Seismicity) Affiliates Fall Meeting*, 2022, Stanford, U.S. **Mao, S.**, Ellsworth, W. L., & Beroza, G. C. *Ambient Field Monitoring of Seismic Velocity with Application to Groundwater, Disposal and Production.*
- (Highlighted) talk at *EGU General Assembly*, 2022, Online & in Vienna, Austria. **Mao, S.**, Lecointre, A., van der Hilst, R. D., & Campillo, M. *Space-Time Monitoring of Groundwater Fluctuations with Passive Seismic Interferometry.*
- Talk at *Seismology Student Workshop* held by *Lamont-Doherty Earth Observatory, Columbia University*, 2021, Online. **Mao, S.**, Mordret, A., Campillo, M., Fang, H., & van der Hilst, R. *Measuring Seismic Travel-Time Changes in the Time-Frequency Domain with Wavelet Analysis.*
- Talk at *AGU Fall Meeting*, 2019, San Francisco, U.S. **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 *Passive Seismic Functional-Image Workshop*, 2019, Grenoble, France. **Mao, S.**, Mordret, A., Campillo, M., Fang, H., & van der Hilst, R. *On The Measurement of Seismic Travel-Time Changes in the Time-Frequency Domain with Wavelet Cross-Spectrum Analysis*.
- Talk at *EGU General Assembly*, 2019, Vienna, Austria. **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 *AGU Fall Meeting*, 2017, New Orleans, U.S. **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*.
- Poster at *Ambient Noise Imaging and Monitoring Workshop*, 2017, Cargèse, France **Mao, S.**, Campillo, M., van der Hilst, R. D., Brenguier, F., Stehly, L., & Hillers, G. *Tidally- and Thermally-Induced Seismic Velocity Changes Observed by Dense Seismic Arrays*.
- Talk at *MIT ERL (Earth Resources Laboratory) Consortium Meeting*, 2017, Cambridge, U.S. **Mao, S.**, Campillo, M., van der Hilst, R. D., Brenguier, F., Stehly, L., & Hillers, G. *Tidally- and Thermally-Induced Seismic Velocity Changes Observed by Dense Arrays*
- Talk at *AGU Fall Meeting*, 2016, San Francisco, U.S. **Mao, S.**, Campillo, M., van der Hilst, R. D., Brenguier, F., Stehly, L., & Hillers, G. *Noise-Based Seismic Measurements of Tide-Induced Velocity Changes from Large-N Arrays at the Piton de la Fournaise Volcano*.

Fellowship grants

- 2022 G. A. Thompson Postdoctoral Fellowship (Stanford University, \$168,375 USD)
- 2014 Globalink Research Fellowship (Mitacs Canada Foundation, \$4,500 CAD plus travel)

Mentoring & Teaching

- **Invited lecturer** for Summer Workshop on *Algorithms and Programs in Seismology* in Hohhot, China, 07/2023. (~200 in-person participants, over 6,000 online views of live-streamed session and 16,000 views of video recording per lecture)
- **Invited lecturer** for Munich Earth Science Winter School on *Environmental Seismology*, virtual & in Bayrischzell, Germany, 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
- **Invited lecturer** for Hongshan Geophysics Summer School, virtual, 08/2022. (~400 audience in live-streamed session)
- **Invited lecturer** for Summer School on *Passive Imaging & Monitoring in Wave Physics* in Cargèse, France, 04/2022.
- **Mentor** in ESAC (Student Advisory Committee of Dept. of Earth, Atmos. and Planet. Sci., MIT) Peer Mentoring Program in 2017–2018 and 2020–2021

Academic Services & Affiliations

- **Co-Convener** at 2024 SSA Annual Meeting for Session: *Climate Change and Environmental Seismology* (submitted)
- **Primary Convener & Session Chair** at 2023 AGU Fall Meeting
 - *S005 Ambient-Field Seismology: Advancements in Theory, Methodology, and Applications*
 - 3 oral sessions and 3 poster sessions
- **Primary Convener & Session Chair** at 2022 AGU Fall Meeting
 - *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 2022 AGU Fall Meeting
- **Journal reviewer** for *Geophysical Journal International*, *Geophysical Research Letters*, *IEEE Transactions on Geoscience and Remote Sensing*, *Journal of Geophysical Research: Solid Earth*, *Science*, *Seismological Research Letters*, and *The Seismic Record*
- **Member** of *American Geophysical Union (AGU)*, *European Geophysical Union (EGU)*, *Society of Exploration Geophysicists (SEG)*, *Southern California Earthquake Center (SCEC)*, *Seismological Society of America (SSA)*