ZHE JIA

Research Assistant Professor
The University of Texas Institute for Geophysics (UTIG)
zjia@ig.utexas.edu — jiazhe868.github.io — (626) 240-9629 — Google Scholar

APPOINTMENTS

The University of Texas at Austin **2024–present**
Research Assistant Professor, Institute for Geophysics (UTIG)

Scripps Institution of Oceanography, UC San Diego **2022–2024**
Cecil H. and Ida M. Green Postdoctoral Fellow

EDUCATION

California Institute of Technology Pasadena, CA
Ph.D. in Geophysics, 2022 (M.S. awarded 2019) **2016–2022**

University of Science and Technology of China Hefei, China
M.S. in Geophysics **2013–2016**
B.S. in the School for the Gifted Young (SCGY) **2009–2013**

TECHNICAL SKILLS

AI & Machine Learning: PyTorch, TensorFlow, Transformers, CNNs, GNNs, Neural Operators, Scikit-learn
Scientific Computing: Bayesian Inference (MCMC), Inverse Problems, High-Performance Computing (HPC)
Programming & Data: Python, C++, MATLAB, Shell, Git, Docker, Big Data Processing (Petabyte-scale)

AWARDS AND HONORS

Wiley's Top Downloaded Article Award 2024
Cecil H. and Ida M. Green Postdoctoral Fellowship, UCSD 2022
Student Presentation Award, Seismological Society of America (SSA) 2022
GPS Graduate Fellowship, California Institute of Technology 2016
China National Scholarship for Graduate Students 2015
Outstanding Undergraduate Student Award, USTC 2013
Outstanding Undergraduate Student Scholarship, USTC 2011
Outstanding Freshman Scholarship, USTC 2009

PUBLICATIONS

*Denotes student I mentored.

Under review

24 Gu, W.*, **Jia, Z.**, Chu, R., Ni, S., Sheng, M., Wang, Q., Yang, J., (2025) Complex rupture of the 2024 M7.1 Earthquake in the Nankai Trough Induced by Ridge Subduction. *Under review in Earth and Planetary Science Letters.*

23 Li, Y., Ribe, N., **Jia, Z.**, (2025) Large-scale slab dynamics as drivers of seismicity: modeling earthquakes in the Izu-Bonin-Mariana subduction zones. *Under review in Earth and Planetary Science Letters.*

22 Han, H., Ni, S., Meng, Q., Gu, W., **Jia, Z.**, Zhang, B., Zhang, H., Zhou, Y., Sheng, M., (2025) Study of the complex rupture pattern at both shallow and deep depths for the 2022 Luding Ms6.8 Earthquake. *Under review in Bulletin of the Seismological Society of America.*

Peer-reviewed

21 **Jia, Z.**, Shearer, P.M., Fan, W., (2026) Rupture directivity from energy envelope deconvolution: theory and application to 58 Ridgecrest M 3.5–5.5 earthquakes. *Journal of Geophysical Research: Solid Earth.* doi.org/10.1029/2024JB029683

20 **Jia, Z.**, Mao, W., Flores M., Barra, S., Ruiz, S., Potin, B., Becker, T.W., Moreno, M., Baez, J.C., Ceroni, D., Cabrera, L., (2025) Deep intra-slab rupture and mechanism transition of the 2024 Mw 7.4 Calama earthquake. *Nature Communications.* doi.org/10.1038/s41467-025-63480-5

19 **Jia, Z.**, Fan, W., Mao, W., Shearer, P.M., May, D.A., (2025) Dual mechanism transition controls rupture development of large deep earthquakes. *AGU Advances.* doi.org/10.1029/2025AV001701

18 Kutschera, F., **Jia, Z.**, Oryan, B., Wong, J. W. C., Fan, W., & Gabriel, A. A. (2024). Rapid earthquake-tsunami modeling: The multi-event, multi-segment complexity of the 2024 Mw 7.5 Noto Peninsula Earthquake governs tsunami generation. *Geophysical Research Letters.* doi.org/10.31223/X5ZX1S

17 **Jia, Z.**, Jin, Z., Marchandon, M., Ulrich, T., Gabriel, A., Fan, W., Shearer, P.M., Zou, X., Rekoske, J., Bulut, F., Garagon, A., Fialko, Y. (2023) The complex dynamics of the 2023 Kahramanmaraş, Turkey, Mw 7.8-7.7 earthquake doublet. *Science.* (On cover). doi.org/10.1126/science.adi0685

16 **Jia, Z.**, Zhan, Z., Kanamori, H. (2022) The 2021 South Sandwich Island Mw 8.2 earthquake: a slow event sandwiched between regular ruptures. *Geophysical Research Letters.* doi.org/10.1029/2021GL097104

15 **Jia, Z.**, Zhan, Z., Helmberger, D. (2022), Bayesian differential moment tensor inversion: theory and application to the North Korea nuclear tests. *Geophysical Journal International.* doi.org/10.1093/gji/ggac053

14 **Jia, Z.**, Clayton, R. (2021), Determination of near surface shear-wave velocities in the central Los Angeles Basin with dense arrays. *Journal of Geophysical Research: Solid Earth.* (On cover) doi.org/10.1029/2020JB021369

13 Liu, H., Gurnis, M., Leng, W., **Jia, Z.**, Zhan Z. (2021), Tonga slab morphology and stress variations controlled by a relic slab: Implications for deep earthquakes in the Tonga-Fiji region. *Geophysical Research Letters.* doi.org/10.1029/2020GL091331

12 **Jia, Z.**, Wang, X., Zhan, Z. (2020), Multifault models of the 2019 Ridgecrest sequence highlight complementary slip and fault junction instability. *Geophysical Research Letters.* doi.org/10.1029/2020GL089802

11 **Jia, Z.**, Shen, Z., Zhan, Z., Li, C., Peng, Z., Gurnis, M. (2020), The 2018 Fiji Mw 8.2 and 7.9 deep earthquakes: One doublet in two slabs. *Earth and Planetary Science Letters.* doi.org/10.1016/j.epsl.2019.115997

10 Zhang, X.*, **Jia, Z.**, Ross, Z., Clayton, R. (2020), Extracting dispersion curves from ambient noise correlations using deep learning. *IEEE Transactions on Geoscience and Remote Sensing*. doi.org/10.1109/TGRS.2020.2992043

9 Bai, Q.*, Ni, S., Chu, R., **Jia, Z.**, (2020), gCAPjoint, A software package for full moment tensor inversion of moderately strong earthquakes with local and teleseismic waveforms. *Seismological Research Letters*. doi.org/10.1785/0220200031

8 Ross, Z.E., Idini, B., **Jia, Z.**, Stephenson, O.L., Zhong, M., Wang, X., Zhan, Z., Simons, M., Fielding, E.J., Yun, S.H. and Hauksson, E. (2019), Hierarchical interlocked orthogonal faulting in the 2019 Ridgecrest earthquake sequence. *Science*. doi.org/10.1126/science.aaz0109

7 Zha, X., **Jia, Z.**, Dai, Z., Lu, Z. (2019), The cause of the 2011 Hawthorne (Nevada) earthquake swarm constrained by seismic and InSAR methods. *Journal of Geodesy*. doi.org/10.1007/s00190-018-1212-5

6 **Jia, Z.**, Ni, S., Chu, R., Zhan, Z. (2017), Joint inversion for earthquake depths using local waveforms and amplitude spectra of Rayleigh waves. *Pure and Applied Geophysics*. doi.org/10.1007/s00024-016-1373-1

5 Chen, W., Ni, S., Kanamori, H., Wei, S., **Jia, Z.**, Zhu, L. (2015), CAPjoint, a computer software package for joint inversion of moderate earthquake source parameters with local and teleseismic waveforms. *Seismological Research Letters*. doi.org/10.1785/0220140167

4 **Jia, Z.**, Chen, W., Chu, R. (2013), Preliminary study on aftershock decay rate of the 2013 Ms7.0 Lushan earthquake. *Earthquake Science*. doi.org/10.1007/s11589-013-0050-z

Non-peer reviewed

3 **Jia, Z.** (2022), Resolving earthquake source complexities in the heterogeneous Earth, *Ph.D. Thesis*, California Institute of Technology. doi.org/10.7907/na72-6395

2 Zhan Z., **Jia, Z.**, Helmberger, D. (2020), Bayesian differential moment tensor inversion of clustered nuclear tests, *AFRL Technical Report*.

1 **Jia, Z.** (2016), Joint inversion methods for source parameter determination under point source approximation, *M.S. Thesis*, University of Science and Technology of China.

GRANTS

Awarded Grants

- **UTIG Blue Sky Award** (PI), $8k, 2025–26
  Predicting the final magnitude of earthquakes using machine learning.
- **UC San Diego IGPP Green Scholar Award** (PI), $138k, 2022–24
  Understanding earthquakes in diverse earth environments.
- **USGS Award G19AP00030** (Student Contributor), $93k, 2019–20
  Rapid Characterization of First-Order complexity of Large Earthquakes. PI: Zhongwen Zhan.
- **AFRL Award FA9453-18-C-0058** (Student Contributor), $200k, 2018–20
  Bayesian differential moment tensor inversion of clustered nuclear tests. PIs: Zhongwen Zhan, Don V. Helmberger.

Pending Proposals

- **NSF Structure and Physics of the Solid Earth** (Lead PI), $433k
  Collaborative research: Unraveling global earthquake rupture complexities and their physical controls by synergizing systematic source inversion and dynamic-rupture simulation.

- **USGS Earthquake Hazard Program** (PI), $95k
  Rapid characterization of rupture complexity across magnitudes: multi-subevent inversion and energy deconvolution approaches.

- **USGS Earthquake Hazard Program** (co-PI), $101k
  Integrating earthquake seismology and laboratory experiments to quantify how fault zone heterogeneity affects earthquake stress drops.

INVITED TALKS

DeFord Seminar, Jackson School of Geosciences, UT Austin	Apr 2025
Megathrust Modeling Framework PI Meeting, Washington DC	Dec 2024
Invited Seminars at USTC, Nanjing University, Zhejiang University, University of Chinese Academy of Sciences	Apr-May 2024
Bureau Seminar Series, Bureau of Economic Geology	Apr 2024
Geophysics Seminar, Nanjing University	Apr 2024
Geology-Geophysics Seminar, Zhejiang University	Apr 2024
Department Seminar, University of Science and Technology of China	Apr 2024
University of Texas Institute for Geophysics Seminar Series, UTIG	Apr 2024
Seismological Laboratory Seminar Series, Caltech	Oct 2023
Institute of Geology and Geophysics Seminar, Chinese Academy of Sciences	Oct 2023
Hydro90 Community Seminar Series	Sep 2023
Earth and Space Sciences Seminar Series, Southern University of Science and Technology	Sep 2023
Lithospheric Dynamics Seminar Series, University of Southern California	Aug 2023
IGPP Seminar Series, Scripps Institution of Oceanography	Sep 2022
Seismological Society of America Annual Meeting, Bellevue, WA	Apr 2022
Los Alamos National Laboratory Geophysics Seminar	Apr 2022
Air Force Research Laboratory Technical Interchange Meeting	Jan 2021 & Jan 2019
School of Earth and Space Sciences Seminar, Peking University	Feb 2019

MEDIA COVERAGE

Researchers Discover Mechanism That Can Ramp Up Magnitude of Certain Earthquakes	*JSG News*, Sep 2025
Shedding Light on the Mysteries of Deep Earthquakes	*EOS*, Jun 2025
Study traces Turkey quake to interrupted 'chat' between fault lines	*The Hindu*, Sep 2023
The Unexpected Physics Behind Turkey's Devastating 2023 Earthquakes	*UCSD Today*, Aug 2023
Study shows California can learn from Turkey's devastating earthquake	*KBPS News*, Aug 2023
Explaining the Slow Surprise in the Middle of the Sandwich	*SSA News*, Apr 2022
Source of mysterious global tsunami found near Antarctica	*National Geographic*, Feb 2022
A tsunami caught experts by surprise. Now, they're starting to understand why	*NBC News*, Feb 2022
Hidden magnitude-8.2 earthquake source of mysterious 2021 global tsunami	*AGU Press Release*, Feb 2022
Biggest California earthquake in decades ruptured on at least 24 faults	*Los Angeles Times*, Nov 2019
Caltech, NASA Find Web of Ruptures in Ridgecrest Quake	*NASA JPL News*, Oct 2019
Lessons from Ridgecrest earthquake sequence	*Caltech News*, Oct 2019
Many others	

TEACHING

Lecturer

Environmental and Earthquake Seismology (UT Austin GEO 391)	2025–26
Frontiers in Earthquake Physics (UT Austin GEO 291)	2025–26
Physics of the Earth (guest lecturer, UT Austin GEO 354/384D)	2024–25
SeismoChat (UCSD SIOG-239)	2022–23
Introduction to Geophysics (guest lecturer, Caltech Ge-102)	2017–18

Teaching Assistant

Plate Tectonics (Caltech Ge-161)	2020–21
Seismology (Caltech Ge-162)	2019–20
Earth and Environment (Caltech Ge-1)	2018–19
Introduction to Geophysics (Caltech Ge-102)	2017–18
Mechanics (USTC General)	2014–15

MENTORING

Advisor

Wangwang Gu, Exchange Postdoc
Junpeng Li, PhD Student
Anna Vu, Undergraduate Researcher

Research Mentor

Chao Song, Postdoc
Qipeng Bai, PhD Student
Jim Zhang, Undergraduate Researcher

PhD Advisory Committees

McKenzie M Carlson, Sujith Swaminadhan, Trevor Brooks

PROFESSIONAL SERVICE

Reviewer **2019–present**

National Science Foundation (NSF) proposals; *Bulletin of the Seismological Society of America*, *Communications Earth* & Environment, *Computers* & Geosciences, *Earth and Planetary Science Letters*, *Geophysical Journal International*, *Geophysical Research Letters*, *IEEE Transactions on Geoscience and Remote Sensing*, *Journal of Geophysical Research: Earth Surface*, *Journal of Geophysical Research: Solid Earth*, *Nature Communications*, *Physics of the Earth and Planetary Interiors*, *Science*, *Science Advances*, *Science China Earth Sciences*, *Seismica*, *Seismological Research Letters*, *Tectonophysics*, *The Seismic Record*, and others.

Session Convener

Seismological Society of America Annual Meeting	2024, 2025
American Geophysical Union Fall Meeting	2022, 2023

Organizer

UT Institute for Geophysics Seminar Series	2025–26
Scripps Institution of Oceanography IGPP Seminar Series	2022–23
IGPP Seismology and Earthquake Geodesy Weekly Chat	2022–23
Caltech Seismological Laboratory Seminar Series	2018–19
Caltech GPS Social Events	2017–18

University Service

Graduate Studies Committee	2024–present
Annual Performance Evaluation Committee	2024-25

MEMBERSHIPS

American Geophysical Union (AGU)	2014–present
Southern California Earthquake Center (SCEC)	2017–present
Seismological Society of America (SSA)	2018–present