Hao Zhang

Postdoctoral Scholar · Geophysics

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Education

University of Southern California — *Los Angeles, CA*

Ph.D. in Geophysics — *2021 - 2025*

- Advisors: John E. Vidale & Yehuda Ben-Zion

Peking University — *Beijing, China*

B.S. in Geophysics — *2016 - 2020*

- Research Advisor: Xiaofei Chen

Professional Appointments

2025 - Now	**Postdoctoral Research Associate**, Seismological Laboratory, Caltech
2021 - 2025	**Graduate Research Assistant**, Department of Earth Sciences, USC
2020 - 2021	**Research Assistant**, Institute of Geophysics, China Earthquake Administration

Awards & Honors

Awards

2025	**Cecil H. and Ida M. Green Postdoctoral Fellowship**, UCSD	*Declined*
	Geophysics Option Postdoctoral Fellowship, Caltech	*$150,000*
2024	**Earth Sciences Graduate Student Research Award**, USC	*$3,000*
2023	**Earth Sciences Graduate Student Research Award**, USC	*$3,000*
2020	**Distinguished Graduate**, PKU	
	Distinguished Graduate, Beijing City	
2019	**Outstanding Researech Award**, PKU	
2017	**May Fourth Scholarship**, PKU	
	Merit Student, PKU	

Scientific Publications

In preparation

[11] **Zhang, H.** & Jordan, T. H., Searching for slow precursors to megathrust earthquakes

Under review

[10] Wu, B., Li, B., **Zhang, H**., Huang, S., Li, G. & Gabriel, A.-A., Near-fault Strong-motion of the 2023 Mw7.8 Kahramanmaraş Earthquake: Insights into High-frequency Radiation Mechanisms (under review for *J. Geophys. Res.*)

[9] **Zhang, H.**, Barbot, S., Yang, Z., Zhang, L., Liu, M. & Platt, J., Large megathrust earthquakes in cold mantle wedge corners under lawsonite blueschist facies (under review for *Nature Communications*)

[8] **Zhang, H.** & Vidale, J. E., Earthquake high-frequency energy radiation scales with rupture complexity (under review for *Science*)

[7] Zhang, S., Houston, H., Wang, B. & **Zhang, H.**, Mapping of absolute stresses around two California earthquakes reveals a very weak crust (under review for *Nature Communications*)

Published

[6] Barbot, S., Güvercin, S. E., Zhang, L., **Zhang, H.** & Yang, Z., Thermobaric activation of fault friction, *Geophys. Res. Lett.*, **52**, e2024GL112959, doi: 10.1029/2024GL112959

[5] **Zhang, H.**, Vidale, J. E. & Wang, W., 2025. Aftershocks on the planar rupture surface of the deep-focus Mw 7.9 Bonin Islands earthquake, *The Seismic Record*, **5**(1): 35–43, doi: 10.1785/0320240035

[4] **Zhang, H.**, Vidale, J. E. & Wang, W., 2024. Scattering evidence for an ancient subducted slab using the unique raypath P*PKP, *Geophys. Res. Lett.*, **51**, e2024GL110130, doi: 10.1029/2024GL110130

[3] **Zhang, H.** & Ben-Zion, Y., 2024. Enhancing regional seismic velocity model with higher-resolution local results using sparse dictionary learning, *J. Geophys. Res.*, **129**, e2023JB027016, doi: 10.1029/2023JB027016

[2] **Zhang, H.**, Meng, H. & Ben-Zion, Y., 2023. Lateral variations across the Southern San Andreas Fault Zone revealed from analysis of traffic signals at a dense seismic array, *Geophys. Res. Lett.*, **50**, e2023GL103759, doi: 10.1029/2023GL103759

[1] Wang, L., Zhou, Y., Zhou, S. & **Zhang, H.**, 2023. Detection of fault zone head waves and the fault interface imaging in the Xianshuihe-Anninghe Fault Zone (Eastern Tibetan Plateau). *Geophys. J. Int.*, **234**(2), 1000-1100, doi: 10.1093/gji/ggad131

Non-peer reviewed

(ii) **Zhang, H.**, 2025. Dynamics and Structure of Subduction Zones Unveiled through Novel Seismic Techniques, Ph.D. Thesis, *Peking University*

(i) **Zhang, H.**, 2020. Frequency-Bessel Transform Method to Extract Higher-Mode Rayleigh Dispersion Curves, B.S. Thesis, *Peking University*

Talks & Conference Contributions

Invited Talks

05/2025 **Seismo Lab Brown Bag Seminar**, Caltech
03/2025 **Geophysics and Tectonics Seminar**, UCLA
07/2023 **euSCI Geophysics Seminar**, PKU

Conference Talks

Zhang, H., 12/2024. A broken mirror in the mantle: seismic scattering evidence for an ancient subducted slab and its long-term stagnation. AGU Fall meeting, Washington, D.C.

Zhang, H., 12/2019. A New Method to Detect and Pick the Fault Zone Head Wave Arrivals and its Application in Xiaojiang Fault Zone of West-Southern China. AGU Fall meeting, San Francisco, CA

Teaching Experience

2022 **Crises of a Planet**, Teaching Assistant *USC*
2019 **The Earth Gravity Field**, Teaching Assistant *PKU*

Project Involvement

STAR *Collaborators: Peter Shearer, John Vidale, Wenyuan Fan, Elizabeth Cochran*
We deploy the **S**an Jacinto **T**raverse **AR**ray consists of five small-scale nodal arrays to investigate earthquake behavior and crustal structure in unprecedented detail. Each array has 80 three-component nodes and an aperture of approximately 200 m.

Rock Friction Database *Collaborators: Sylvain Barbot, Lei Zhang, Mingqi Liu, John Platt*
We aim to develop a database of frictional properties of natural fault gauges by conducting experiments across a range of thermobaric conditions. This effort seeks to enhance our understanding of the factors governing the behavior of earthquakes.

FaultScan *Collaborators: Yehuda Ben-Zion, Florent Brenguier, Yixiao Sheng, Frank Vernon*

This project seeks to transform our ability to directly observe transient deformation within the core of active faults. From 2021 to 2024, I participated in the deployment and maintenance of a dense 2D seismic array focused on the San Jacinto Fault.

ChinArray

The China Array project is designed to establish systematic broadband seismic observations across the entire mainland of China. It operates in multiple stages and is divided into seven geographic regions based on the country's tectonic framework. In 2019, I participated in the deployment of the ChinArray Phase IV in Northeast China.

Outreach & Service

Professional Service

2024-2025 **Lithospheric Dynamics Seminar Organizing Committee**, member *USC*

2025-2026 **AGU Seismology Section Early Career SubCommittee**, member *AGU*

Media Coverage

01/2025 **Aftershock analysis challenges world's deepest earthquake claim**, *SSA*