

# 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

### SELECTED AWARDS

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|------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| 2025 | <b>Cecil H. and Ida M. Green Postdoctoral Fellowship</b> , UCSD<br><b>Geophysics Option Postdoctoral Fellowship</b> , Caltech | <i>Declined</i><br>\$75,000/yr |
| 2024 | <b>Earth Sciences Graduate Student Research Award</b> , USC                                                                   | \$3,000                        |
| 2023 | <b>Earth Sciences Graduate Student Research Award</b> , USC                                                                   | \$3,000                        |
| 2020 | <b>Distinguished Graduate</b> , PKU<br><b>Distinguished Graduate</b> , Beijing City                                           |                                |
| 2019 | <b>Outstanding Research Award</b> , PKU                                                                                       |                                |
| 2017 | <b>May Fourth Scholarship</b> , PKU<br><b>Merit Student</b> , PKU                                                             |                                |

## Scientific Publications

### IN PREPARATION

- [14] **Zhang, H.**, Zhan, Z. & Minchew, B., Seismic evidence of sediment accumulation beneath an Antarctic ice stream  
[13] Yao J., Wang W., Shearer P., Vidale J. E., Wang R., **Zhang H.**, Xu X. & Fialko Y., Tidal triggering of earthquakes intensified by abrupt stress changes within the Coso geothermal field

### UNDER REVIEW

- [12] **Zhang, H.** & Zhan, Z., Illuminating ruptures of moderate earthquakes with multi-fibre networks, under review in *Sci. Adv.*  
[11] Cui, T., Wang, W., Vidale, J. E., **Zhang, H.**, Luo, H. & Ai, Y., Multidecadal-scale stability of multi-scale core-mantle boundary: insights from core-reflected waves of repeating earthquakes, under review in *Geophys. Res. Lett.*

- [10] **Zhang, H.** & Vidale, J. E., Earthquake Shaking Scales with Rupture Complexity Revealed by Aftershock Pattern, under review in *Proc. Nat. Acad. Sci.*
- [9] Zhang, S., Houston, H., Wang, B. & **Zhang, H.**, Mapping of absolute stresses around two California earthquakes reveals a very weak crust, under review in *Earth Planet. Sci. Lett.*

## PUBLISHED

- [10] **Zhang, H.**, Barbot, S., Yang, Z., Zhang, L., Liu, M. & Platt, J., Large megathrust earthquakes in cold mantle wedge corners under lawsonite blueschist facies, accepted by *Nat. Commun.*
- [7] 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, *J. Geophys. Res.*, **130**, e2025JB031757, doi: 10.1029/2025JB031757
- [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 Xi-anhuihe-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, *University of Southern California*
- (i) **Zhang, H.**, 2020. Frequency-Bessel Transform Method to Extract Higher-Mode Rayleigh Dispersion Curves, B.S. Thesis, *Peking University*

## Talks & Conference Contributions

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### INVITED TALKS

- 02/2026 **Lithospheric Dynamics Seminar**, USC
- 01/2026 **Geophysics and Tectonics Seminar**, UCLA
- 05/2025 **Seismo Lab Brown Bag Seminar**, Caltech
- 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

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

USC  
PKU

Project Involvement \_\_\_\_\_

**GLASS** *Co-PIs: Zhongwen Zhan, Joel Steinkraus*  
**G**rounding Zone **L**ong-term **A**coustic **S**ensing of **S**tructure: A distributed acoustic sensing instrument with a fiber optic array aims to create the first-ever “movie” of ice-structure motion that has been largely hidden from our view. The GLASS project will provide high-resolution seismic measurements at a key region in Antarctica where ice sheets transition from grounded ice to floating ice shelves and will study the influence of grounding line dynamics to basal melting and ice flow. This ground-truth is essential to advancing fundamental research on grounding-zone dynamics and long-term cryosphere monitoring.

**STAR** *Co-PIs: Peter Shearer, John Vidale, Wenyan Fan, Elizabeth Cochran*  
We deploy the **S**an Jacinto **T**ransverse **A**rray 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** *Co-PIs: Sylvain Barbot, Lei Zhang*  
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** *Co-PIs: Yehuda Ben-Zion, Florent Brenguier*  
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-Now	<b>Reviewer of <i>Nat. Commun.</i>, <i>JGR: Solid Earth</i>, <i>GRL</i>, and others</b>	
2024-2025	<b>Lithospheric Dynamics Seminar Organizing Committee, member</b>	USC
2025-2026	<b>AGU Seismology Section Early Career SubCommittee, member</b>	AGU

MEDIA COVERAGE

01/2025	<b>Aftershock analysis challenges world’s deepest earthquake claim, <a href="#">SSA</a></b>
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