

# Xiyuan Bao

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Personal Website

Department of Earth, Planetary, and Space Sciences, University of California, Los Angeles

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EDUCATION     **Ph.D. in Geophysics**, University of California, Los Angeles     2018-Jan 2024  
                  **M.S. in Geophysics**, University of California, Los Angeles     2018-2020  
                  **B.S. of Geophysics with Honors**, University of Science and Technology of China     2014-2018  
                  **Minor in Computer Science**, University of Science and Technology of China     2014-2018

EXPERIENCE     **Postdoctoral Scholar**, University of California, Los Angeles     Jan 2024-  
                  **Graduate Research Assistant**, University of California, Los Angeles     Sep 2018-Jan 2024  
                  *Hotspots from Top to Bottom* (Advisor: Carolina Lithgow-Bertelloni)  
                  **Undergraduate Research Assistant**, University of Science and Technology of China     Sep-May 2018  
                  *Benchmark on CitcomToEllipsis: Spontaneous subduction towards free surface* (Advisor: Wei Leng)  
                  **Visiting Undergraduate**, University of Illinois, Urbana-Champaign     Jun-Aug 2017  
                  *Constraining the Nature of the LLSVPs Using Geoid and Dynamic Topography* (Advisor: Lijun Liu)

RESEARCH     • Experimental and Computational Geodynamics on Terrestrial Planets  
INTERESTS     • Volatile Partition, Cycling and Planetary Habitability

HONORS &     • Study of the Earth's Deep Interior Section Award for Graduate Research, AGU     2023  
AWARDS     • Computers and Geosciences Research Scholarship, IAMG     2022  
                  • Jiuzhang Zhao Talent Program in Earth and Space Sciences, USTC     2015-2018  
                  • Award from National Undergraduate Innovation Training Program, USTC     2017-2018  
                  • Earth Science Climbing Scholarship, USTC     2015, 2017  
                  • Silver Scholarship for Outstanding Students, USTC     2016  
                  • First Prize of Physics Innovation Research Experiment Thesis Competition, USTC     2016

PUBLICATIONS

[3] Zhang, X., Brown, E. L., Zhang, J., Lin, J., **Bao, X.** & Sager, W. W. Magmatism of Shatsky Rise controlled by plume-ridge interactions. *Nature Geoscience*. <https://www.nature.com/articles/s41561-023-01286-0> (2023).

[2] Li, S., Li, J., Ferrand, T. P., Zhou, T., Lv, M., Xi, Z., Maguire, R., Han, G., Li, J., **Bao, X.**, *et al.* Deep geophysical anomalies beneath the Changbaishan Volcano. *Journal of Geophysical Research: Solid Earth*, e2022JB025671. <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2022JB025671> (2023).

[1] **Bao, X.**, Lithgow-Bertelloni, C. R., Jackson, M. G. & Romanowicz, B. On the relative temperatures of Earth's volcanic hotspots and mid-ocean ridges. *Science* **375**, 57–61. ISSN: 0036-8075. <https://www.science.org/doi/10.1126/science.abj8944> (2022).

MANUSCRIPTS     [1] **Bao, X.**, Mittal, T. & Lithgow-Bertelloni, C. R. *Determining Mid-Ocean Ridge Geography from*  
UNDER REVIEW     *Upper Mantle Temperature* Earth and Planetary Science Letters, In revision. <https://essopenarchive.org/users/595629/articles/629520-determining-mid-ocean-ridge-geography-from-upper-mantle-temperature>.

MANUSCRIPTS  
IN PREP

- [4] **Bao, X.**, Cao, Z., Gourley, K. C., Gutierrez, S., Liang, Y., Zhou, D., Buffett, B. A., Mittal, T., Li, J., Pierrehumbert, R., Schaefer, L., Orman, J. V. & Foley, B. J. *Coupled Evolution of Earth's Hydrogen Distribution and Thermal History*.
- [3] Wang, W., Zhang, X., Lin, J., Cheng, Z., **Bao, X.**, Zhang, F., Kelley, K. A., Chen, L. & Chu, F. *Ultra-depleted mantle supporting the Marion Rise: implications for ocean rise dynamics*
- [2] **Bao, X.**, Lithgow-Bertelloni, C. R., Newsome, W. H. & Zuo, X. *SPIVET-UCLA: Python Toolbox for 3-D Scanning Stereoscopic Particle Image Velocimetry and Thermometry*. In prep for *Computers & Geosciences*.
- [1] **Bao, X.** & Lithgow-Bertelloni, C. R. *Towards 4-D plume dynamics of natural thermal convection in viscous fluid* In prep for *Journal of Fluid Mechanics*. Draft available upon request.

ORAL  
PRESENTATIONS

- [11] **Invited: Hotspots from Top to Bottom** Geophysics Seminar (University of Science and Technology of China, Anhui, China).
- [10] **Invited: Illuminating Mantle Convection: Unraveling Plume Dynamics over LLSVPs in the Laboratory** AGU Fall Meeting 2023 (San Francisco, CA, US, Dec. 2023).
- [9] **Invited: Hotspots from Top to Bottom** Earth Sciences Seminar (University of Southern California, CA, US, Oct. 2023).
- [8] *The plume zoo of thermal LLSVPs* AGU Fall Meeting 2022 (Chicago, IL, US, Dec. 2022), V26A-02.
- [7] *Coupled Evolution of Earth's Hydrogen Distribution and Thermal History* AGU Fall Meeting 2022 (Chicago, IL, US, Dec. 2022), MR33A-06.
- [6] **Invited: Hotspots from Top to Bottom** Seismo Lab Seminar (California Institute of Technology, CA, US, Nov. 2022).
- [5] **Invited: Are hotspots hotter than ridges?** IGCP 648 Virtual Seminar Series (Curtin University, Australia, Nov. 2022), Series 5, Seminar 5. <https://www.youtube.com/watch?v=30B21c7NGIY>.
- [4] *Experimental Investigation of Purely Thermal LLSVPs* UCLA EPSS Seismology and Tectonics Seminar (UCLA, CA, US, May 2022).
- [3] *Accurate Prediction of Ocean Basins Using Upper Mantle Potential Temperatures* AGU Fall Meeting 2021 (New Orleans, LA, US, Dec. 2021), DI34A-05.
- [2] *Accurate Prediction of Ocean Basins Using Upper Mantle Potential Temperatures* UCLA EPSS Geology/Geophysics Seminar (UCLA, CA, US, Oct. 2021).
- [1] *Correlation of geochemical signals with MORB and OIB temperatures* UCLA EPSS Geocheminar (UCLA, CA, US, Oct. 2019).

POSTER  
PRESENTATIONS

- [9] **Bao, X.** in. AGU Fall Meeting 2023 (San Francisco, CA, US, Dec. 2023).
- [8] **Bao, X.** & Lithgow-Bertelloni, C. R. in. 2023 Gordon Research Seminar: Interior of the Earth (Mount Holyoke College, MA, US, June 2023).
- [7] **Bao, X.** & Lithgow-Bertelloni, C. R. in. Seismo Lab Centennial (California Institute of Technology, US, Nov. 2022).
- [6] **Bao, X.** & Lithgow-Bertelloni, C. R. in. 2022 Ada Lovelace Workshop on Numerical Modelling of Mantle and Lithosphere Dynamics (Hévíz, Hungary, Aug. 2022).
- [5] **Bao, X.** & Lithgow-Bertelloni, C. R. in. CIDER2022 (University of California, Berkeley, CA, US, July 2022).
- [4] **Bao, X.**, Lithgow-Bertelloni, C. R. & Jackson, M. G. in. AGU Fall Meeting 2020 (San Francisco, CA, US, Dec. 2020), DI007–0006.
- [3] Wang, Y., Liu, L. & **Bao, X.** in. AGU Fall Meeting 2020 (San Francisco, CA, US, Dec. 2020), DI005–0005.
- [2] **Bao, X.**, Lithgow-Bertelloni, C. R. & Jackson, M. G. in. AGU Fall Meeting 2019 (San Francisco, CA, US, Dec. 2019), DI41D–0028.
- [1] **Bao, X.** & Lithgow-Bertelloni, C. R. in. 2019 Gordon Research Seminar: Interior of the Earth (Mount Holyoke College, MA, US, June 2019).

PROFESSIONAL  
SERVICE

- *The Structure and Composition of the Lower Mantle*, **Discussion Leader**, Gordon Research Seminar 2023
- Reviewer for *Journal of Geophysical Research: Solid Earth*
- *Advances in Mantle Convection and Planetary Evolution*, **Primary Session Convener and Chair**, AGU Fall Meeting 2022, **X Bao**, KA O’Farrell, BJ Foley, D Degen, FD Munch

OTHER SERVICE

- Committee Member of UCLA EPSS Family Mentorship Program (EFMP)

OUTREACH

- *Rheology, Plate Tectonics with Food* Saturday Science Academy, UCLA/Charles R. Drew University Mar 2023
- *Why Hawaii is a volcano? How do Alaskan volcanos differ?* EYU, UCLA Nov 2022
- **Media Interview** about our *cold hotspots*, e.g. *ScienceNews*, *New Scientist*<sup>1,2</sup> *Popular Science*, and *Deutschlandfunk* Jan 2022
- **Invited Outreach Article** *Rocks beneath volcanic hotspots can be surprisingly cool* Jan 2022
- *The sweet smell of Earth’s mantle: Why is Hawaii a volcano?* EYU, UCLA Nov 2020, 2021
- Lab visit from Tokyo Tech. UCLA Feb 2020
- *Why is Hawaii a volcano?* Explore Your Universe, UCLA Nov 2019

TEACHING  
EXPERIENCE

- *Blue Planet: Introduction to Oceanography*, Teaching Assistant, UCLA Spring 2020
- *Earthquakes*, Teaching Assistant, UCLA Spring 2019, Fall 2021

MENTORING  
EXPERIENCE

- Jade Wight, undergrad, *Modeling Mantle Plumes and Their Effect on Dynamic Topography*, won 2020 *Deane Oberste-Lehn Scholarship*, UCLA Oct 2019 - Jun 2021
- Wan Ki (Arthur) Lo, undergrad, *Dynamics of Adjacent Mantle Plumes through Physical and Computer Simulations*, won 2021 *Harold and Mayla Sullwold Scholarship*, UCLA Jan 2020 - Jun 2022
- Kavya Agarwal, undergrad, *Compositional and thermodynamical effect on mantle plumes; Critical plume merge distance with shadowgraph*, IIT Sep 2021 - Aug 2022