

Wenhao Zhao

Email: wenhao_zhao@brown.edu Phone: +1 401-430-5291 Website: www.zhaowenhao.com
Google Scholar: [Profile](#) ORCID: [0000-0002-9271-0821](https://orcid.org/0000-0002-9271-0821)

Education

Ph.D. in Geology 2022–Present Brown University, Providence, Rhode Island, USA
Research Focus: Geological Sciences

M.S. in Geochemistry 2019–2022 Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China

B.E. in Resources Exploration Engineering 2015–2019 China University of Petroleum - East China, Qingdao, China

Research Interests

- Thermal evolution of the Earth and Moon
- Geochemical analysis of lunar samples
- Nano-geoscience based on atom probe tomography

Publications

In Preparation

1. **Zhao, W.**, Lau, H., Parman, S., & Head III, J.W. (2025). “Tidal Heating of the Lunar Magma Ocean.” arXiv preprint arXiv:2511.19946

First-Author Publications

1. **Zhao, W.**, Wang, B.W., Gu, L.X., Tang, X., Liu, Y., Awais, M., Liu, X.C., Li, X.H., Hu, R., et al. (2023). “Nanoscale evidence of zircon-coffinite-xenotime solid solution observed by atom probe tomography.” *Chemical Geology*, 638, 121697.
2. **Zhao, W.**, Li, Q., Liu, Y., Tang, G., Ling, X., Li, J., & Li, X. (2022). “Long-term reproducibility of SIMS zircon U-Pb geochronology.” *Journal of Earth Science*, 33(1), 17–24.

Co-Authored Publications

1. Wang, B.W., Zhang, Q.W.L., Chen, Y., **Zhao, W.**, Liu, Y., Tang, G.Q., Ma, H.X., Su, B., et al. (2024). “Returned samples indicate volcanism on the Moon 120 million years ago.” *Science*, 385(6713), 1077–1080.
2. Wang, X., Head, J.W., **Zhao, W.**, Chen, Y., Zhou, Q., Zhu, J., Wu, B., Liu, J., & Li, C. (2024). “Lunar farside samples returned by Chang’E-6 mission: significance for understanding the South Pole-Aitken Basin stratigraphic history.” *The Astronomical Journal*, 168(6), 247.

3. Wang, X., Head, J.W., Qian, Y., **Zhao, W.**, Liu, J., Gao, Y., & Wu, B. (2024). “Possible Lithological Types and Scientific Significance of the Sample to be Returned by Chang’E-6 Mission.” In *55th Lunar and Planetary Science Conference*, 3040, 1873.
4. Huang, Y.S., Zhao, W.H., Liu, Y., Yang, Y.H., Tang, G.Q., Li, Y., Li, X.H., Zhao, H., et al. (2022). “U–Pb dating of andradite-rich garnet by SIMS.” *Journal of Analytical Atomic Spectrometry*, 37(5), 1109–1118.

Research Experience

Tidal Heating of the Moon 2023–Present

- Developed and implemented long-term orbital and thermal evolution models of the Moon using MATLAB
- Investigated the effects of tidal heating on the thermal evolution of the lunar magma ocean

Atom Probe Study of Olivine Grain Boundaries in Picritic Basalt 2022–2023

- Conducted atom probe tomography analysis on olivine grain boundaries in picritic samples
- Investigated elemental distribution and compositional variations at the nanoscale

Atom Probe Analysis of Trace Elements in High-U Zircon 2020–2022

- Performed atom probe tomography on uranium-rich zircon samples
- Analyzed trace element partitioning and nanoscale heterogeneity in zircon grains

Long-term Reproducibility of SIMS Zircon U-Pb Geochronology 2019–2021

- Analyzed over 10,000 zircon standard measurements from laboratory databases
- Evaluated long-term reproducibility and precision of SIMS U-Pb dating techniques
- Processed and compiled multi-laboratory Excel datasets for statistical analysis

Development of SIMS U-Pb Dating Method for Garnet 2019–2020

- Developed and optimized secondary ion mass spectrometry (SIMS) protocols for garnet U-Pb dating
- Calibrated instrumental bias and established analytical procedures for accurate age determination
- Tested methodology on standard and natural garnet samples

Awards and Honors

- First Place, Student Oral Presentation – NASA Exploration Science Forum 2025

- National Scholarship for Undergraduate, Ministry of Education, China – 2017
- First-Class Scholarship for Undergraduate – China University of Petroleum - East China, 2018
- First-Class Scholarship for Undergraduate – China University of Petroleum - East China, 2016

Academic Service

- Reviewer – *Geochimica et Cosmochimica Acta*, 2026