

# Zhongtian Zhang

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## Appointments

2023– **Carnegie Postdoctoral Fellow**  
Earth and Planets Laboratory, Carnegie Science

## Education

2017–2023 **Yale University**  
**Ph.D.**, Earth & Planetary Sciences (2023)  
**M.Phil.**, Geology & Geophysics (2019)

2013–2017 **Nanjing University**  
**B.Sc.**, Geology (2017)

## Publications

### Articles: Submitted

[13] **Zhang, Z.**, Driscoll, P. E., Inefficient loss of moderately volatile elements from exposed planetesimal magma oceans. Under review.

### Articles: Published or In-press

[12] **Zhang, Z.**, Wang, J., 2024. Quantification of classical and non-classical crystallization pathways in calcite precipitation. *Earth Planet. Sci. Lett.* 636, 118712. <https://doi.org/10.1016/j.epsl.2024.118712>.

[11] **Zhang, Z.**, 2024. Trace elements in IVA iron meteorites explained by limited solid-liquid equilibration during inward solidification. *Icarus*. 408, 115860. <https://doi.org/10.1016/j.icarus.2023.115860>.

[10] **Zhang, Z.**, 2023. Ice sublimation in planetesimals formed at the outward migrating snowline. *Astrophys. J. Lett.* 956 (1), L25. <https://doi.org/10.3847/2041-8213/acfdaa>

[9] **Zhang, Z.**, Bercovici, D., 2023. Generation of a measurable magnetic field in a metal asteroid with a rubble-pile inner core. *Proc. Natl. Acad. Sci.* 120 (32), e2221696120. <https://doi.org/10.1073/pnas.2221696120> (Press releases: [Yale News](#), [APS Physics Magazine](#))

- [8] Gong, Z., Evans, D. A. D., **Zhang, Z.**, Yan, C., 2023. Mid-Proterozoic geomagnetic field was more consistent with a dipole than a quadrupole. *Geology*. 51 (6), 571–575. <https://doi.org/10.1130/G50941.1>
- [7] **Zhang, Z.**, Bercovici, D., Elkins-Tanton, L. T., 2023. Melt migration in rubble-pile planetesimals: Implications for the formation of primitive achondrites. *Earth Planet. Sci. Lett.* 605, 118019. <https://doi.org/10.1016/j.epsl.2023.118019>
- [6] **Zhang, Z.**, Bercovici, D., Elkins-Tanton, L. T., 2022. Cold compaction and macro-porosity removal in rubble-pile asteroids: 2. Applications. *J. Geophys. Res., Planets* 127, e2022JE007343. <https://doi.org/10.1029/2022JE007343>
- [5] **Zhang, Z.**, Bercovici, D., Elkins-Tanton, L. T., 2022. Cold compaction and macro-porosity removal in rubble-pile asteroids: 1. Theory. *J. Geophys. Res., Planets* 127, e2022JE007342. <https://doi.org/10.1029/2022JE007342>
- [4] **Zhang, Z.**, Bercovici, D., Jordan, J.S., 2021. A two-phase model for the evolution of planetary embryos with implications for the formation of Mars. *J. Geophys. Res., Planets* 126, e2020JE006754. <https://doi.org/10.1029/2020JE006754> (Editor's highlight)
- [3] **Zhang, Z.**, Karato, S.-I., 2021. The effect of pressure on grain-growth kinetics in olivine aggregates with some geophysical applications. *J. Geophys. Res., Solid Earth* 126, e2020JB020886. <https://doi.org/10.1029/2020JB020886>
- [2] **Zhang, Z.**, Wu, B., Wang, T., Hui, H., 2020. Settling of immiscible droplets: A theoretical model for the missing link between microscopic and outcrop observations. *J. Geophys. Res., Solid Earth* 125, e2019JB018829. <https://doi.org/10.1029/2019JB018829>
- [1] Xu, Y., Tang, W., Hui, H., Rudnick, R. L., Shang, S., **Zhang, Z.**, 2019. Reconciling the discrepancy between the dehydration rates in mantle olivine and pyroxene during xenolith emplacement. *Geochim. Cosmochim. Acta*. 267, 179–195. <https://doi.org/10.1016/j.gca.2019.09.023>

## Invited seminars

2024 Division of Geological and Planetary Sciences, California Institute of Technology  
 Department of Geosciences, Stony Brook University  
 Department of Mineral Sciences, Smithsonian National Museum of Natural History

## Conference presentations

- [10] **Zhang, Z.**, “Fluid transport in planetesimals and implications for early-stage planet formation”, 31<sup>st</sup> Meeting of the Small Bodies Assessment Group (Invited Early-Career Talk, July 2024)
- [9] **Zhang, Z.**, “Trace elements in IVA iron meteorites explained by limited solid-liquid equilibration during inward solidification”, AGU Fall Meeting (Poster, December 2023)
- [8] **Zhang, Z.**, “Melt migration in planetary embryos and planetesimals: Implications for Mars and primitive achondrite parent bodies”, Gordon Research Seminars/Conference: Interior of the Earth (Talk for

GRS/Poster for GRC, June 2023)

[7] **Zhang, Z.**, “Metallic rubble piles: Implications for the paleomagnetic record of IVA iron meteorite and the densities of M-type asteroids”, Gordon Research Seminars/Conference: Origins of Solar Systems (Poster, June 2023)

[6] **Zhang, Z.**, Bercovici, D., Elkins-Tanton, L. T., “Melt migration in rubble-pile planetesimals: Implications for the formation of primitive achondrites”, AGU Fall Meeting (Talk, December 2022)

[5] **Zhang, Z.**, Bercovici, D., Elkins-Tanton, L. T., “The physics of cold compaction as a constraint for interpreting the density of asteroid (16) Psyche”, AGU Fall Meeting (Poster, December 2021)

[4] **Zhang, Z.**, Bercovici, D., Elkins-Tanton, L. T., “Cold compaction in rubble-pile asteroid”, Psyche Team Meeting IX (Talk, October 2021)

[3] **Zhang, Z.**, Karato, S.-I., “The effect of pressure on grain-growth kinetics in olivine aggregates”, AGU Fall Meeting (Talk, December 2020)

[2] **Zhang, Z.**, Bercovici, D., Jordan, J. S., “Heat transport in partially molten bodies with strong internal heating”, AGU Fall Meeting (Poster, December 2019)

[1] **Zhang, Z.**, Wu, B., Wang, T., Hui, H., “Segregation of immiscible liquids: From droplet size to plutonic scale”, AGU Fall Meeting (Poster, December 2016)

## Honors

2023 **Carnegie Postdoctoral Fellowship** (Earth and Planets Laboratory, Carnegie Science)

2022 **Elias Loomis Prize** (Department of Earth & Planetary Sciences, Yale University)

## Teaching experience

### Teaching Fellowship at Yale University

Fall 2020 EPS 456/556 Introduction to Seismology

Spring 2020 G&G275b/F&ES716b Renewable Energy

Fall 2019 G&G 428/528 Science of Complex Systems

## Service

**Peer review** for Science Advances (1), Journal of Geophysical Research: Planets (4), Geochimica et Cosmochimica Acta (1), Physics of the Earth and Planetary Interiors (1), iScience (1)

**Colloquium committee**, Department of Earth & Planetary Sciences, Yale University (2018–2021)

**Treasurer, Dana Club**, Department of Earth & Planetary Sciences, Yale University (2019–2020)

**IC-FG (International Community and First Generation students) working group**, IDEA (Inclusion, Diversity, Equity, Anti-racism and Anti-discrimination) committee of Department of Earth & Planetary Sciences, Yale University (2022–2023)

**DiMhCi (Disability, Mental health, and Chronic illness) working group**, IDEA committee of  
Department of Earth & Planetary Sciences, Yale University (2022–2023)

August 26, 2024