Zhongtian Zhang

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Appointments

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

Education

2023 Ph.D., Earth & Planetary Sciences, Yale University
2019 M.Phil., Geology & Geophysics, Yale University
2017 B.Sc., Geology, Nanjing University

Publications

Articles: Submitted

[14] Grewal, D., **Zhang, Z.**, Manilal, V., Kruijer, T., Bottke, W., Stewart, S., Protracted core formation and impact disruptions shaped the earliest outer solar system planetesimals. Submitted.

Articles: Published or In-press

[13] **Zhang, Z.**, Driscoll, P. E., 2025. Inefficient loss of moderately volatile elements from exposed planetesimal magma oceans. 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

2025 Department of Geophysical Sciences, The University of Chicago
Earth and Planets Laboratory, Carnegie Institution for Science

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

Conference presentations

[10] **Zhang, Z.**, "Fluid transport in planetesimals and implications for early-stage planet formation", 31st 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 heatin", 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)

Proposal panelist for NASA (1)

Proposal reviewer (non-panelist) for NASA (1), European Research Council (1)

Session conveyor for AGU Fall Meeting, DI009: Insights into planetary formation and evolution from interdisciplinary perspectives (2024)

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)