

Varun Manilal
Graduate Student
Department of Earth and Planetary Sciences, Yale University

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Educational History

PhD in Planetary Sciences

Yale University, New Haven
Jan. 2024 – Present
(Ph.D. began at Arizona State University, Tempe; program transferred to Yale University in Aug 2025)
Advisor: Dr. Damanveer Grewal
Research focus: Experimental constraints on core formation in oxidized planetesimals

B.S.-M.S. in Physical Sciences

National Institute of Science Education and Research (NISER), Bhubaneswar, India
Aug. 2018 – Jul. 2023
Advisor: Dr. Liton Majumdar
Thesis: Simulating Observation of Ices in Protoplanetary Disks

Peer Reviewed Publications and Manuscripts

1. Grewal, D.S., **Manilal, V.** (2025) Implications of differentiated late accretion for the volatile inventory in the bulk silicate Earth. *The Planetary Science Journal*, 6, 13 doi: 10.3847/PSJ/ad9606
2. Maitrey, S., Majumdar, L., **Manilal, V.**, Srivastava, B., Rayalacheruvu, P., Willacy, K., Herbst, E. (2025) Role of Diffusive and Non-Diffusive Grain-Surface Processes in Cold Cores: Insights from the PEGASIS Three-Phase Astrochemical Model. *Astronomy & Astrophysics* 699, A332, doi:10.1051/0004-6361/202554717
3. Grewal, D.S., Zhang, Z., **Manilal, V.**, Kruijer, T.S., Bottke W.F., Stewart S.T. (2025) Protracted Core Formation and Impact Disruptions Shaped the Earliest Outer Solar System Planetesimals. *Science Advances* 11:40, doi: 10.1126/sciadv.adw1668
4. **Manilal, V.**, Tsuno, K., Kuwahara, H., Wittmann, A., Pommier, A., Till, C., Grewal, D.S. (2026) Percolative Core Formation in Oxidized Planetesimals - I: Experiments on Melt Migration in Olivine Aggregates. *Geochimica et Cosmochimica Acta*, doi: 10.1016/j.gca.2026.06.018
5. Bhattacharjee, S., Thakur, H., **Manilal, V.**, Kita, N., Guan, Y., Hammett, M., Wostbrock, J., Wittmann, A., Kitajima, K., Garvie, L., Grewal, D.S. (2026) Prolonged redox evolution drives carbonate precipitation in CI chondrites (*Science Advances: under revision*)
6. Tsuno, K., Kuwahara, H., **Manilal, V.**, Wittmann, A., Leinenweber, K., Irifune, T., Grewal, D.S. (2026) Experimental evidence for metallic melt trapping in the deep Martian mantle: Implications for inefficient melt segregation and highly siderophile element retention (*Earth and Planetary Science Letters: under revision*)

Teaching/Research Experience

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- Graduate Research Assistant, Yale University, Jan. 2026 – Present
 - EPS 1100 Teaching Assistant, “Dynamic Earth”, Yale University, Fall 2025
 - Graduate Research Assistant, Arizona State University, May 2024 – Jul. 2025
 - SES 128 Teaching Assistant, “Exploration of the Universe”, Arizona State University, Spring 2024
 - Talk on Planet Formation, SES 126: “Exploration of the Universe”, Arizona State University, Spring 2024
 - Project Fellow, NISER, Aug. 2023 – Dec. 2023

Abstracts / Conference presentations

1. **Manilal, V.**, Majumdar, L., Srivastava, B. Unveiling the chemical composition of ice giants during their formation. Strange New Worlds Conference (2023).

Fellowships and Awards

1. DISHA Fellowship, 2018-2023
Fellowship awarded by DAE (Dept. of Atomic Energy), Govt. of India (~\$5000)
2. Best Poster Award, Strange New Worlds Conference, 2023

Analytical and Technical Skills

1. Experimental methods: Piston-cylinder apparatus, multi-anvil press, gas-mixing furnace
 2. Analytical techniques: Electron Probe Micro Analyzer (EPMA), Scanning Electron Microscope (SEM)
 3. Programming: Python, FORTRAN, C++
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