

Harsh Thakur

PhD Student, Earth and Planetary Sciences, Yale University

h.thakur@yale.edu | Google Scholar

Research interests: Cosmochemistry; planetary science; meteorites; origin and early evolution of the Solar System

Education

Yale University 2025 to present

PhD in Earth and Planetary Sciences

Arizona State University 2024 to 2025

Graduate study in Earth and Space Exploration

Indian Institute of Science, Bangalore 2019 to 2024

B.S. and M.S. (Research), Major in Earth Sciences, Minor in Physics

Research Experience

Silicon and Iron Isotope Systematics of CB and CH Chondrites Aug. 2024 to present

Advisor: Prof. Damanveer Grewal

Arizona State University and Yale University

- Investigating Si and Fe isotope compositions of CB and CH chondrules, bulk silicate fractions, and metal separates to test evaporation, condensation, and metal and silicate sorting during impact plume processing.
- Integrating isotope data with petrographic and chemical constraints to evaluate links among CBa, CBb, CH, and related CR chondrites.
- Preparing manuscripts on Si and Fe isotope systematics.

Radiogenic and Stable Sr Isotope Composition of HED Meteorites Aug. 2023 to Apr. 2024

M.S. thesis advisor: Prof. Ramananda Chakrabarti

Indian Institute of Science

- Measured $^{87}\text{Sr}/^{86}\text{Sr}$ and $\delta^{88}\text{Sr}$ in HED meteorites, including the first $\delta^{88}\text{Sr}$ data for howardites, to constrain volatile depletion and low Rb/Sr basalt formation on Vesta.
- Presented results at MetSoc 2024.

Modeling the Sources of Lunar Mare Basalts Mapped by Chandrayaan-2 May 2023 to June 2023

Summer intern advisor: Dr. Shyama Narendranath

Indian Space Research Organisation

- Modeled lunar magma ocean crystallization using FXMOTR and gradient descent optimization to infer mantle cumulate contributions.
- Compared model outputs with Chandrayaan-2 CLASS elemental data for lunar mare regions; manuscript in preparation and abstract presented at LEAG 2023.

Petrogenesis and Geochemistry of Fall HED Meteorites June 2022 to May 2023

B.S. thesis advisors: Prof. Ramananda Chakrabarti and Dr. Dwijesh Ray

Institutions: Indian Institute of Science, Bangalore; Physical Research Laboratory, Ahmedabad

- Conducted petrographic and geochemical analyses of four HED meteorite falls using EPMA and ICP-MS.
- Modeled basaltic and cumulate eucrite formation, rare earth element and moderately siderophile element variations, and impact contamination by carbonaceous chondrite material.
- Manuscript under review; abstract presented at MetSoc 2023.

Aqueous Alteration in CM Parent Bodies in the Early Solar System May 2021 to July 2021

Summer research advisor: Prof. Ramananda Chakrabarti

Indian Institute of Science

- Synthesized published data for CM1 and CM2 chondrites, with emphasis on trace element patterns, rare

earth elements, and Ca isotope systematics.

- Compared mass spectrometric methods and standards used in Ca isotope studies.

Conference Presentations

AOGS 2024, <i>Radiogenic ($^{87}\text{Sr}/^{86}\text{Sr}$) and Stable ($\delta^{88}\text{Sr}$) Strontium Isotopic Composition of the HED Meteorites</i>	June 2024
LEAG 2023, <i>Modeling the Sources of Lunar Mare Basalts Mapped by Chandrayaan-2</i>	Sept. 2023
MetSoc 2023, <i>Petrogenesis and Geochemistry of Fall HED Meteorites</i>	Aug. 2023
MetMESS 2022, <i>The Lakangaon Eucrite, a Unique, Noncumulate Piece of Rock from Vesta</i>	Nov. 2022

Field Training

Inter-University Exchange Program on Sustainable Earth, Niigata University, Japan July 2023
MEXT-funded field program including sedimentology, fossil collection, Fossa Magna Museum, plate boundary field observations, and natural hazard and natural gas research laboratory visits.

Field Trip to KGF, Kolar Gold Fields, Karnataka, India Feb. 2023
Field training at Kolar Gold Fields on the Archean Dharwar Craton, including observations of banded iron formation and amphibolite textures.

Technical Skills

Clean lab and chromatography: clean laboratory sample preparation, acid digestion, ion exchange column chromatography, isotope separation workflows

Analytical: MC-ICP-MS, ICP-MS, ICP-OES, TIMS, SIMS 6F/7F, EPMA mapping and quantitative analysis

Data, modeling, and software: Python, MATLAB, OriginPro, Git, L^AT_EX, FXMOTR, SPICE Suite, SciDavis

Preliminary experimental experience: piston cylinder, gas mixing furnace, and multi anvil press experiments

Awards

- Early Career Researcher Travel Award to attend LEAG at Johns Hopkins APL, Sept. 2023
- Barringer Crater Company Travel Award to attend MetSoc at UCLA, Aug. 2023
- MEXT fellowship for three week exchange program at Niigata University, July 2023
- Indian Institute of Science Scholarship for the five year B.S./M.S. (Research) dual degree program

Teaching, Leadership, and Service

Teaching Fellow, <i>Fossil Fuels and World Energy</i> , Yale University	Aug. to Dec. 2025
Tutorial Assistant, <i>Introduction to Earth and its Environment</i> , IISc	Jan. to Apr. 2023
Co-Founder, Investments and Learning Club under EntIISc	Nov. 2021 to Nov. 2022
Coordinator, Pravega, annual science, technology, and cultural festival at IISc	Oct. 2020 to Sept. 2021
Volunteer, Notebook Drive, IISc student nonprofit education initiative	Nov. 2019 to Apr. 2024
Volunteer, Science for Rural India, IISc science education initiative	July 2022 to Apr. 2024

Languages

English, Hindi, and Marathi: fluent.