



Souradeep Mukherjee

Ph.D. Student in Earth and Planetary Sciences, admitted Autumn 2023

Bio

BIO

Souradeep is an Exploration Geologist-turned-AI Researcher developing decision-making algorithms to discover high-grade mineral deposits. With almost a decade of experience in on-field exploration of critical & strategic mineral deposits, he is now using his computer to unlock the full potential of mineral discovery.

Souradeep is currently a Doctoral Researcher at Stanford Mineral-X. His current work focuses on fusing multi-element soil geochemistry with 3D geological inference to build predictive models for subsurface intrusion-hosted Ni-Cu sulfide mineralization in the Curaçá Valley, Brazil. By leveraging machine learning, geostatistics, and compositional data analysis, he aims to reduce geological uncertainty and operational costs in mineral targeting, transforming how exploration is conducted in under-explored terrains.

Prior to Stanford, Souradeep held several technical and supervisory roles at the Atomic Minerals Directorate for Exploration and Research (AMD), Government of India, where he spearheaded multiple national-scale mineral exploration campaigns. He led the exploration and evaluation of uranium-bearing sediments in the Bhima Basin, the mapping of lithium-rich pegmatites in Karnataka, and the delineation of heavy mineral sand deposits across the east coast of India. His work included advanced geological mapping, structural interpretation, kinematic analysis, downhole geophysics, petrological microscopy, and geostatistical modeling—skills that now enrich his algorithmic thinking in research.

His research interests span compositional data analysis, geospatial modeling, machine learning for Earth systems, building intelligent decision making agents for mineral exploration and mineral prospectivity analysis. He is particularly passionate about bridging the gap between traditional geosciences and computational intelligence to power the next generation of resource discovery tools.

When he's not deep into code or core samples, Souradeep contributes to scientific outreach, mentors young geoscientists, and advocates for data transparency and sustainability in the mining sector. He is also a writer, a poet and loves to write pieces on existential philosophy.

EDUCATION AND CERTIFICATIONS

- M.Tech, Homi Bhabha National Institute, Mumbai , Exploration Geo-sciences (Strategic Minerals) (2019)
- M.Sc.Tech, Indian Institute of Technology, Dhanbad , Applied Geology (2017)
- B.Sc (H), University of Calcutta , Geology (Honors) (2014)

LINKS

- Mineral-X Initiative: <https://mineralx.stanford.edu>

- LinkedIn: <https://www.linkedin.com/in/souradeep-mukherjee-792334209/>

Professional

WORK EXPERIENCE

- Scientific Officer (Geology) - Atomic Minerals Directorate for Exploration and Research, Department of Atomic Energy (India) (August 1, 2017 - August 14, 2023)