Rahul Kumar
Curriculum Vitae

Name: Dr. Rahul Kumar
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Research Interests

Geochemistry, Cosmochemistry, Astrobiology, Planetary Science, Image processing, and Machine learning.

Education

- **2020-2025 Ph. D. in Planetary Science,** Okayama University, Japan
  Dissertation: "Development of a micro-organic-matter identifier and its application to characterise insoluble organic matter in carbonaceous chondrites and Ryugu samples"
  Advisor: Tak Kunihiro and Christian Potiszil
- **2015-2020 Integrated Masters of Technology in Applied Geology (JEE-Advanced-2015),** Indian Institute of Technology Indian School of Mines (IIT-ISM) Dhanbad, India
  Thesis: “Organic Matter Signatures from 3.2 Ga Singhbhum, Banded Iron Formation, India”.
  Advisor: Prof. AS Venkatesh
- **2012-2014: Higher Secondary School,** Delhi Public School, Ranchi, Jharkhand, Science stream.
- **2002-2012: Primary + Secondary School,** DAV Public School, Patratu, Ramgarh, Jharkhand.

Publications

1. Kumar, R., Kobayashi, K., Potiszil, C., & Kunihiro, T. (2025). Development of a technique to identify μm-sized organic matter in asteroidal material: An approach using machine learning. *Applied Computing and Geosciences*, *27*, 100277. https://doi.org/10.1016/j.acags.2025.100277. Impact Factor-3.2

2. Nakamura et.al, On the origin and evolution of the asteroid Ryugu: A comprehensive geochemical perspective, *Proceedings of the Japan Academy. Series B, Physical and biological sciences, 6,* 227-282, 2022. Impact Factor-4.1

Professional Experience

- **Assistant Professor,** Indian Institute of Technology (Indian School of Mines) Dhanbad, April 2026- present

- **Research Assistant**, Okayama University, December 2020- September 2025
    - Assisted in comprehensive analytical study of asteroid Ryugu sample return.
    - Processed and analyzed spectroscopy data from energy dispersive spectroscopy.
    - Isotope estimation from maps obtained by secondary ion mass spectroscopy.
- **Teaching Assistant**, Okayama University, December 2020- September 2025
    - Mentored students in summer school, interpret results obtained from spectroscopic machines.

Conference Presentations

- Development of identifying μm-sized organic matter in carbonaceous chondrites: A method for classification combined with machine learning, Japan Geoscience Union, 2025
- Characterization of correlated micron to nano scale Organic Matter in Ryugu., 7th Global Moon Village Workshop & Symposium, 2023, Japan, 2023.

Awards and Honors

- T Banaji Scholarship, Japan Educational Exchanges and Services (JEES), 2022-2025.
- Student research fund, Okayama University, 2022.
- IPM scholarship, Okayama University, 2020-2021.
- Summer research school, University College London, 2019.

Technical Skills

- **Programming and Software:** Python, Machine learning, Image processing, Computer vision, and MATLAB,
- **Laboratory Techniques:** Optical Microscopy, Scanning Electron Microscopy, Energy Dispersive Spectroscopy, Raman Spectroscopy, Secondary Ion Mass Spectroscopy, Desorption Electrospray Ionization Mass Spectroscopy, and Transmission Electron Microscopy.

Professional Affiliations

- Member, Japan Geoscience Union, 2024-2025

Outreach and Service

- Volunteered for the 7th Global Moon Village Workshop & Symposium, 2023. Poster presentation on, “Characterization of correlated micron to nano scale Organic Matter in Ryugu.”