Wednesday Talk Series
Date: Wednesday, November 12, 2025
Time: 04:00 PM-5:00 PM
Venue: Mithal Hall, Department of Earth Sciences, IIT Roorkee

Application of PRISMA Hyperspectral data for mapping Alteration minerals associated with Copper Sulfide Mineralisation: A case study from Neem Ka Thana Belt, Rajasthan, India.

Speaker: Angana Saikia

Abstract: As the global market faces rising demand for critical minerals, the need for innovative, efficient and environmentally sustainable exploration techniques has reached a critical juncture. Recently, Hyperspectral remote sensing or Imaging Spectroscopy has emerged as a transformative technology in mineral exploration, offering unique capabilities for identifying and mapping mineral deposits with high spectral and spatial precision. This work focuses on utilising the "PRecursore IperSpettrale della Missione Applicativa" (PRISMA) hyperspectral sensor to detect and map alteration minerals associated with Cu-S mineralisation in the Neem Ka Thana Cu Belt of Rajasthan, India. We detected key alteration minerals, including muscovite, illite, chlorite, montmorillonite and Fe-oxide and hydroxides such as goethite, hematite, and limonite, by targeting their diagnostic absorption features. The resulting spectral maps highlighting the spatial distribution of the targeted mineral groups were validated with field investigations and laboratory assessments. The study demonstrates that the integration of hyperspectral analysis with conventional geological techniques can help to understand the mineral distribution and associated alteration processes. The use of PRISMA hyperspectral data provides a powerful, non-invasive means for reconnaissance mapping of exposed lithologies, delivering targeted information that is crucial for optimising subsequent field investigations and drilling operations.

Brief introduction: Ms Angana Saikia is an MHRD SRF working in the field of Remote Sensing under the supervision of Prof. Ajanta Goswami. She holds a B.Sc. in Geology from JB University, Assam, and an M.Sc. in Applied Geology from Dibrugarh University, Assam with gold medal in 2020. For her doctoral thesis, she is working on the integration of remote sensing and ground-based geological datasets for lithological classification and mineral exploration along the Albitite line in Western India.