



Wednesday Talk Series

Date: Wednesday, November 19, 2025

Time: 04:00 PM-5:00 PM

Venue: Mithal Hall, Department of Earth Sciences, IIT Roorkee



Paleoclimate Reconstruction from Wetland Deposits of Manipur, NE India

Speaker: Yumnam Rojit Singh



Abstract: Manipur, Northeast (NE) India, is an important region for monsoon studies due to its distinct topography and proximity to the Bay of Bengal. Despite its climate sensitivity and numerous well-preserved wetlands and lakes, paleoclimate studies from this region remain negligible. This study provides the first high-resolution organic geochemical proxy records ($\delta^{13}\text{C}_{\text{TOC}}$, $\delta^{15}\text{N}$, TOC, TN) from a 210-cm long wetland core to reconstruct past environmental and climatic changes. $\delta^{13}\text{C}_{\text{TOC}}$ values and C/N ratios were used to determine the sources of organic matter. The results suggested that approximately 81.25% of the organic matter is derived from a mixture of terrestrial plants and aquatic plankton. The proxy data reveal several cold and dry climatic phases at depths of 210-180 cm, 120-85cm, and 50-10 cm, marked by low TOC and TN, reflecting low productivity in the region. This was accompanied by an increase in $\delta^{15}\text{N}$, suggesting denitrification under suboxic conditions, likely caused by reduced runoff. On the other hand, the interval from 165 to 120 cm shows a gradual increase in TOC and TN, along with lower $\delta^{14}\text{N}$ values, indicating high productivity due to increased runoff. Elevated $\delta^{13}\text{C}$ values during this interval imply enhanced microbial activity and organic matter decomposition under warm and wet conditions, collectively reflecting a shift toward a relatively warmer and wetter climatic condition.

Brief introduction: Yumnam Rojit Singh is an MHRD fellow conducting research in Palaeoceanography and Palaeoclimatology in the Integrated Paleoclimate Lab (IPal), Dept. of Earth Sciences, IIT Roorkee, under the supervision of Prof. Champoungam Panmei. He holds his B.Sc. in Geology from D.M. College of Science, Imphal, Manipur, and his M.Sc. in Applied Geology from IIT Roorkee, Uttarakhand. His doctoral research focuses on the study of Paleoenvironmental and Paleoclimate using wetlands and lake sediments from Manipur, Northeast India.