Wednesday Talk Series
Date: Wednesday, September 24, 2025
Time: 04:00 PM-5:00 PM
Venue: Mithal Hall, Department of Earth Sciences, IIT Roorkee

A multi-proxy analysis exploring the depositional environment, climate and sedimentation dynamics of Tertiary Indus Basin, Western Ladakh

Speaker: Bibhukalyan Acharya

Abstract:

Indus Basin Sedimentary Rocks (IBSR) deposited within the Indus-Tsangpo Suture Zone (ITSZ) are an archive of pre-, syn-, and post-tectono-sedimentary processes from Late Cretaceous to Late Miocene. While multiple sections across IBSR have been studied to infer depositional environment, provenance, age, and tectono-sedimentary evolution, the information remains fragmentary. This study explores the stratigraphy, sedimentology, and provenance of IBSR in the western basin along Chiktan Nala. It corroborates data from lateral sections in paleo depositional environment reconstruction, considering paleo-tectonic dynamics. Our results show that the previously interpreted stratigraphy of IBSR along Chiktan Nala, based on field observation, incorrectly represents a shallow tidal sea, likely due to a lack of a multi-proxy approach. We suggest that IBSR along Chiktan Nala represents post-collisional continental clastic fill with no marine ingression. In a braided-meandering fluvio-lacustrine-alluvial fan setting, detritus provenance evolved from the Ladakh Arc (LA) to the Dras Arc (DA) through time and space. Continental sedimentation initiated at ~44Ma, spanning till ~18Ma, after which the regional counter thrust system led to basin inversion and southward tilt. This led to axiality of basin drainage, resulting in a primary west flow that emerged in the southern flank of the basin, possibly the Indus.

Brief introduction: Bibhukalyan Acharya is a PhD Scholar (MHRD) in the Department of Earth Sciences, IIT Roorkee, working under the supervision of Prof. Pradeep Srivastava. His doctoral research involves multi-proxy analysis exploring the depositional environment, climate and sedimentation dynamics of the Tertiary Indus Basin in Western Ladakh, India. He holds a B.Sc. (Geology) from Dharanidhar University, Keonjhar, Odisha, M.Sc. (Applied Geology) and an M.Tech. (Geoexploration) from IIT Bombay.