

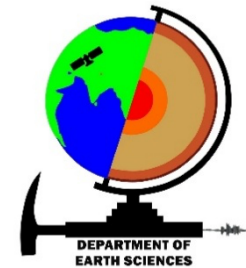


Wednesday Talk Series

Date: Wednesday, December 17, 2025

Time: 04:00 PM-5:00 PM

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



Tectonic control on the channel offset orientations in the Ganga foreland basin: A neotectonic perspective

Speaker: Rahul Kumar Choudhury



Abstract: The present study investigates 2,202 number of channel-offset orientations in the Ganga Foreland Basin to evaluate their relationship with neotectonic activity. The observed variation in offset orientations reflects the combined influence of plate motion, regional stress regime, compressional and extensional structures, subsurface basement ridges, and faults. Approximately 53.52% of the offsets are oriented NE–SW, parallel to the Indian plate motion, while the remaining offsets trend NW–SE, aligned with the Himalayan compressional direction, with dominant concentrations between $N40^{\circ}$ – 60° E and $N40^{\circ}$ – 60° W. NW–SE oriented offsets are associated with compressional stresses generated by the northward movement of the Indian plate, which produces parallel faults and joints subsequently followed by river channels. The decrease in compressional intensity away from the Himalaya results in fewer NW–SE offsets toward the basin interior, up to the influence of the Delhi–Sargodha Ridge. In contrast, NE–SW offsets in the central basin are controlled by NE–SW trending basement faults and ridges, with variable strike-slip components. The higher proportion of NW–SE offsets in the eastern basin corresponds to enhanced crustal shortening, while E–W–trending long offsets near the basin margins reflect strike-slip deformation and shallow thrust splays parallel to the Himalayan Frontal Thrust.

Brief introduction: Rahul Kumar Choudhury is a Research Scholar in the Department of Earth Sciences at IIT Roorkee, working under the supervision of Prof. Pitambar Pati. He holds a B.Sc. in Geology from DD University, Odisha, and an M.Sc. in Applied Geology from IIT Roorkee. His research focuses on the identification, spatial distribution, and temporal evolution of channel offset segments in the Ganga Foreland Basin in response to active tectonics and sedimentary processes.