



अंतर्राष्ट्रीय सैद्धांतिक विज्ञान केंद्र
International Centre for Theoretical Sciences

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भारत सरकार के परमाणु ऊर्जा विभाग की एक स्वायत्त संस्थान एवं समविश्वविद्यालय

An Autonomous Institution of the Department of Atomic Energy of Government of India and a Deemed to be University

ICTS Fluid Dynamics Seminar

Title : Understanding erosion, deposition, and particle transport dynamics in turbulent fluid flow

Speaker : Durbar Roy (ICTS-TIFR, Bengaluru)

Date : Friday, 05 June 2026

Time : 11:30 AM (IST)

Abstract : Motivated by geomorphological bedforms such as dunes in various aeolian and subaqueous environments, we study the interaction of a fluid flow with a granular structure. The flow field interacting with the granular structure results in erosion, deposition, and transport, which eventually leads to the temporal evolution of the structure. The evolved granular structure causes the flow field to change, resulting in a coupling between the flow and the structure. Operating in a regime where hydrodynamic time scales are fast in comparison to the erosion time scale, we develop a quasi-steady 2D weakly non-similar turbulent boundary layer framework to compute the hydrodynamic shear stress, which then couples to mass conservation of the granular structure for its evolution. This framework allows us to model the formation and evolution of various bedforms like ripples and dunes. If time permits, we will also discuss some preliminary data from our particle-resolved DNS study.

Venue : Emmy Noether Seminar Room

Zoom Link: <https://icts-res-in.zoom.us/j/98486602678?pwd=17YieXrZTVNcUV6oyXZkX7cRiewTG7.1>

Meeting ID: 984 8660 2678

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