ICTS Colloquium

Title : How Much Physics Does a Reduced Model Need?

Speaker : Sanghasri Mukhopadhyay (International Institute of Information Technology Bangalore)

Date : Wednesday, 18 November 2026

Time : 11:30 AM (IST)

Abstract : How far can we simplify a physical description without losing the prediction we care about? I will explore this question through electrically driven thin liquid films, considering both the growth of free-surface disturbances and the transmission of fluctuations from an unsteady liquid supply. Motivated by questions in microfluidics, these examples connect reduced-order modeling to understanding and predicting interfacial flows. Their common challenge is identifying which physical mechanisms and dynamical variables to retain under a given operating condition. Using asymptotic reasoning, stability analysis, and nonlinear calculations, I will discuss how we test a reduced description and interpret its limitations. The emphasis will be on how the physical question and the quantity we seek to predict guide the choice of model and the evidence needed to assess its answer.

Venue : Emmy Noether Seminar Room
Zoom Meeting: https://zoom.us/j/99414568063?pwd=PieW0xocmeEfljE4yv4K6FrJUPKDHe.1
Meeting ID: 994 1456 8063
Passcode: 203050