



ICTS Thesis Defense Seminar

Title : Physics of Cytokinesis

Speaker : Aditya Singh Rajput (ICTS-TIFR, Bengaluru)

Date : Friday, 10 April 2026

Time : 12:00 PM (IST)

Abstract : Cell division is a fundamental biological process that ensures the segregation of genetic material and also involves dramatic changes in the cellular geometry, leading to cytokinesis: the cleavage of a cell giving rise to two daughter cells. In metazoans, cytokinesis is orchestrated by flows resulting from active stress gradients in the actomyosin cortex -- a thin film comprising myosin motors, actin filaments, and other associated macromolecules. In this thesis, we develop a theory for the geometrodynamics of the cortex treated as an active surface. At high activity, we observe self-organised dynamics of the cytokinetic furrow and concomitant myosin patterns, which agree well with experimental measurements during the first division in the *C. elegans* embryo. Through RNAi perturbations, we further test our theoretical predictions about the emergence of asymmetries during cytokinesis. This work suggests that the self-organised geometrodynamics of active fluid surfaces underlies cytokinesis.

Venue : Zoom link: <https://icts-res-in.zoom.us/j/96361862661?pwd=unyVqFAGob5JK0Xhf373rigT6QXlt1.1>
Meeting ID: 963 6186 2661
Passcode: 101011