

## **ICTS M.Sc Project Seminar**

Title : A computational study of active surfaces

Speaker : Praneet Kumar Singh, ICTS-TIFR, Bengaluru

Date : Tuesday, November 30, 2021

Time : 10:00 am (IST)

Abstract : Pattern formation in active materials are implicated in various cellular processes such as cytokinesis or cell polarity, and even at the level of developing embryos. Typical theoretical studies of such patterns are formulated on a fixed geometry. However, many morphogenetic processes in cell and developmental biology involve dynamical geometry changes driven by these active patterns. The complicated geometric nonlinearities involved in the theory of active surfaces make exact analytical solutions for non-trivial cases hard to obtain. As such, robust numerical methods are essential to tackle these difficult problems that couple pattern formation, the geometry of shape, and biological signaling. In this thesis, we have developed an analytical and computational framework that combines aspects of discrete differential geometry, shape calculus, and the finite-element method for studying the dynamics of active surfaces with embedded patterns. We will illustrate our approach by discussing a few problems in geometric flows and actively deforming surfaces.

Venue : Please click on the below link to join the seminar

<https://us06web.zoom.us/j/88440074636?pwd=UE0zUmZaSldKc3B4dHovTEJHRWUrZz09>

Meeting ID: 884 4007 4636

Passcode: 989822