

ICTS Seminar

Title : Interfaces in Space and Time: Assembly in Biological Membranes and Glassy Materials

Speaker : Shachi Katira (University of California, Berkeley)

Date : Monday, 21st December 2020

Time : 03:00 pm (IST)

Abstract : I present a mechanism for a force of assembly and mobility for transmembrane proteins in lipid bilayers. This force arises as a pre-transition (or pre-melting) effect due to the first-order phase transition between ordered and disordered phases of the membrane. Using the statistical mechanics theory of the hydrophobic effect and large-scale molecular simulation, I show that under certain conditions, a protein embedded in a disordered membrane can stabilize a microscopic order–disorder interface bearing a finite interfacial stiffness. When two such proteins approach each other, they assemble to reduce the overall interfacial energy. I show that the effect is mediated by proximity to the order–disorder phase transition and the size and hydrophobic mismatch of the protein. I then apply this idea to dynamical first-order phase transitions, such as those found in models of glassy dynamics, to define and quantify a dynamical analog of thermodynamic interfacial tension. As a result of this dynamical interfacial tension, 'solutes' in space–time exhibit an equivalent self-assembly in the space of trajectories. I discuss the relevance of these results to understand slow, collective dynamics seen in glass-forming materials.

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

<https://zoom.us/j/93935314241?pwd=dk8xUDNlM3NnQWpraXAuYmRVcUNxUT09>

Meeting ID: 939 3531 4241

Passcode: 701977

