

Seminar

Predicting the Non-equilibrium Properties of Polymer Films

Sivasurender Chandran

University of Freiburg, Germany

Despite intense efforts, our understanding of various puzzling properties of polymer thin films (e.g. negative thermal expansion coefficient) is still unsatisfactory. Although such intriguing behavior has been interpreted to be related to changes that the chain conformations of polymers undergo during preparation stages, we lack a quantitative understanding of the preparation induced non-equilibrium conformations and its effects on the macroscopic properties of polymer films. In this talk, I will highlight our recent experiments demonstrating that the behavior of polymer films can be tuned by controlled preparation pathways, defined through a dimensionless parameter p that relates the processing time with the characteristic relaxation time of polymers. We revealed scaling relations between p and the amount of preparation-induced residual stresses and the corresponding relaxation times. In addition, I will briefly discuss the future experimental prospects, especially, aiming at exploiting processing induced non-equilibrium states of polymers for controlling their properties.

Thursday, Jan 3rd 2019

2:00 PM (Tea/Coffee at 1:30 PM)

Seminar Hall, TIFR-H