Students' Annual Seminar
A tale of flowing solids
Paswa Nath

While common sense says that solids are rigid, careful arguments show that all solids under infinitesimal strain must eventually flow. Resolution of this paradoxical result lies at the core of our understanding of the behavior of solids under deformation. I will talk about a framework within which the paradox is reconciled and extract conditions wherein stable, rigid, crystalline solids are possible. Failure of ideal crystals is determined by a kinetic process similar to the decay of supercooled phases following quenches across a first-order phase boundary. This fresh conceptual viewpoint curiously allows us to study failure of perfect crystalline solids in quantitative detail without invoking specifics of many-body, defect–defect interactions, raising hope of a more unified description of materials in the future.

References:

On the existence of thermodynamically stable rigid solids, P. Nath et. al. PNAS 2018 115 (19)

Friday, Feb 8th 2019

2:00 PM (Tea/Coffee at 1:45 PM)

Seminar Hall, TIFR-H