ICTS | INTERNATIONAL CENTRE for THEORETICAL SCIENCES

TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS Seminar

Title : Rigidity transition in flowing materials: Memory, Mechanical Tunability and Stress Patterns

Speaker : Vinutha H A (Georgetown University)

Date : Wednesday, 27 March 2024

Time : 03:30 PM (IST)

Abstract : Many solids in our environment possess an amorphous structure and exist in non-equilibrium states. This category encompasses a wide array of materials, ranging from high-strength substances like glass, plastics, and cement to softer, adaptable materials like sand, pastes, and biological matter. These solids form under non-equilibrium conditions such as compression, shear deformation, rapid cooling, aggregation, and biological processes. These materials exhibit intriguing stress patterns, like force chains in granular materials or trapped stresses in Prince Rupert's glass, leading to unique mechanical properties. However, the role of flow properties in the onset of rigidity transition remains poorly understood. Understanding this is crucial for developing a unified framework for rigidity transition in non-equilibrium systems. In my talk, I'll discuss this using examples from granular matter, yield stress fluids, dense suspensions, soft particulate gels, and glasses, and discuss open challenges. The complexity of their flow behavior stems from underlying structural and temporal correlations. Understanding how these complex flows cease in materials has significant practical implications and offers a pathway to designing solids with desired mechanical responses..

Venue : Madhava Lecture Hall & Online

Please click on the below link to join the seminar

https://icts-res-in.zoom.us/j/97166159744?pwd=WkFtQ1VCdFBGSFVudjk5S0xGaDFuQT09

Meeting ID: 971 6615 9744

Passcode: 262627