

## **Seminar**

### **Fragility and heterogeneity in glass forming liquids and characterization of the yield transition under oscillatory shear**

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Many aspects of glassy behaviour and the glass transition, and the properties of glasses, remain incompletely understood and are subjects of active scientific inquiry. The relationship between dynamics and thermodynamics, the role of growing length scales in determining relaxation time scales, the nature of the glass transition and related transitions such as jamming and yielding, are some major themes of investigation. This thesis explores some of these themes. A major theme of this thesis is to understand to what extent the dynamical behaviour of supercooled liquids can be described by thermodynamics when various controlling factors are tuned to change dynamical properties. In addition to the more familiar control parameters such as temperature and density, we have explored the effects of tuning the barriers to bond breaking and the softness of the particle interactions. Understanding the origin of fragility, the rapidity of rise of relaxation times with change of temperature etc, from the microscopic point of view in the supercooled liquid is important to understand, and may suggest new approaches for designing liquids of desired dynamical behaviour. The validity of the Adam-Gibbs relation relating thermodynamics and dynamics, as applied to different quantifiers of dynamics, will be discussed. Analysis of the yielding behaviour of a model amorphous solid under cyclic shear deformation will also be presented.

***Monday, Jul 31<sup>st</sup> 2017***

***11:30 AM (Tea/Coffee at 11:15 AM)***

***Auditorium, TIFR (FReT-B)***