

Students' Annual Seminar

Possible Universal Relation Between Short time β -relaxation and Long time α -relaxation in Glass-forming Liquids

Rajsekhar Das

Relaxation processes in supercooled liquids are known to exhibit interesting as well as complex behavior. One of the hallmarks of this relaxation process observed in the measured auto correlation function is occurrence of multiple steps of relaxation. The shorter time relaxation is known as the β -relaxation which is believed to be due to the motion of particles in the cage formed by their neighbors. On the other hand longer time relaxation, the α -relaxation is believed to be the main relaxation process in the liquids. The timescales of these two relaxations processes dramatically separate out with supercooling. In spite of decades of researches, it is still not clearly known how these relaxation processes are related to each other. In this work we show that, there is a possible universal relation between short time β -relaxation and the long time α -relaxation. This relation is found to be quite robust across many different model systems. Finally we show that length scale obtained from the finite size scaling analysis of β timescale is same as that of length scale associated with the dynamic heterogeneity in both two and three dimensions.

Thursday, Mar 1st 2018

05:00 PM (Tea/Coffee at 03:30 PM)

Seminar Hall, TIFR-H