



## ICTS Seminar

**Title** : Many-body chaos in a glass: Classical to quantum and back again

**Speaker** : Sumilan Banerjee, Indian Institute of Science, Bengaluru

**Date** : Tuesday, June 08, 2021

**Time** : 3:00 pm (IST)

**Abstract** : Chaotic quantum systems with Lyapunov exponent  $\lambda_L$  obey a remarkable upper bound  $\lambda_L \leq 2\pi k_B T / \hbar$  at temperature  $T$ , implying a divergence of the bound in the classical limit  $\hbar \rightarrow 0$ . Following this trend, does a quantum system necessarily become 'more chaotic' when quantum fluctuations are reduced? I will explore this question by computing  $\lambda_L(\hbar, T)$  in the quantum spherical p-spin glass model, where  $\hbar$  can be continuously varied. I will show that the approach to the classical limit could be non-trivial, with non-monotonic dependence of  $\lambda_L$  on  $\hbar$  close to the dynamical glass transition temperature  $T_d$ . The results in the classical limit ( $\hbar \rightarrow 0$ ) naturally describe chaos in super-cooled liquid in structural glasses. I will also discuss chaos in the replica symmetry breaking spin glass phase. If time permits, I will briefly discuss many-body chaos across Kosterlitz-Thouless and Ising transitions in the classical limit of two-dimensional XXZ spin model.

**Venue** : Please click on the below link to join the meeting

<https://zoom.us/j/91458471087?pwd=QURYWUtPeHloMWp5Vlc1clV0bzBwUT09>

Meeting ID: 914 5847 1087

Passcode: 654084