

## **ICTS Statistical Physics Journal Club Seminar**

Title : Periodically refreshed baths to simulate open quantum many-body dynamics

Speaker : Archak Purkayastha (Trinity College Dublin, Ireland)

Date : Thursday, 28<sup>th</sup> January 2021

Time : 03:00 pm (IST)

Abstract : Obtaining dynamics of an interacting quantum many-body system connected to multiple baths initially at different, finite, temperatures and chemical potentials is a challenging problem. This is due to both the prevalence of strong correlations in the system and the infinite nature of the baths. Here we show that it is possible to accurately simulate the dynamics a wide class of such open quantum many-body systems with finite and rather small-sized baths, when the baths are refreshed to their original initial states periodically after a carefully chosen time interval. We show how this method, when combined with tensor network techniques, significantly simplifies the dynamics by allowing a continuous time non-Markovian dynamics to be mapped to a discrete time Markov process. We call this method: Periodically Refreshed Baths (PREB). We demonstrate that this method provides relatively easy access to numerically exact non-Markovian dynamics of open quantum many-body systems in parameter regimes where other numerical and analytical methods are known to struggle.

Venue : Please click on the link to join the meeting.

<https://zoom.us/j/98611514187?pwd=eVlYR3lmQ21BRUMvMVdUTnc5b0hGdz09>

Meeting ID: 986 1151 4187

Passcode: 063478