

ICTS Skype Seminar

Title : Fate of Many Body Localization under Periodic Drive: Connection to Chaos and Random Matrix Theory

Speaker : Sayak Ray, Indian Institute of Science Education and Research Kolkata

Date : Wednesday, January 9, 2019

Time : 11:30 AM

Venue : Obaid Siddiqi Meeting Room, ICTS Campus, Bangalore

Abstract : In this work we consider an one-dimensional system of bosons in the presence of Aubry-Andre (AA) potential subjected to two types of periodic drives leading to distinct physical phenomena. In the first case, the periodic modulation of optical lattice leads to a drive induced delocalization phenomena and the second driving protocol gives rise to tilting of the bichromatic lattice exhibiting an unusual delocalization within a domain of frequency interval. Such a drive induced delocalization has a classical root to dynamical chaos which has been explored in the corresponding non-interacting systems. Extending our analysis for the hardcore bosons with nearest neighbour interaction we demonstrate an approach to diagnose chaos in a driven many body system from the saturation value, temperature dependence and statistics of the out-of-time-order-commutator (OTOC) as well as establishes its connection with thermalization in interacting quantum systems.

Reference:

1. “Drive-induced delocalization in the Aubry-Andre model”, S. Ray, A. Ghosh, and S. Sinha, Phys. Rev. E 97, 010101(R) (2018).
2. “Signature of Chaos and Delocalization in a Periodically Driven Many Body System: An Out-of-Time-Order-Correlation Study”, S. Ray, S. Sinha and K. Sengupta, Phys. Rev. A **98**, 053631 (2018).