ICTS Skype Seminar

Title : Eigenstate phases of a disordered spin chain with finite non-abelian symmetry

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Date : Tuesday, December 12, 2017

Time : 10:00 AM

Venue : Amal Raychaudhuri Meeting Room, ICTS Campus, Bangalore

Abstract : Work from recent years has demonstrated that the eigenstate thermalization hypothesis (ETH) could be violated in a generic class of interacting systems with strong disorder. This phenomenon, called many-body localization (MBL) is characterized by slow spreading of entanglement and absence of transport. Potter and Vasseur [1] recently investigated the compatibility of MBL with various global symmetries. They conjecture that MBL is incompatible with non-abelian symmetries unless they are spontaneously broken to an abelian subgroup. I will present results from our work [2] where we explicitly test their conjectures. We build a local spin Hamiltonian invariant under the simplest non-abelian group, S_3 and numerically investigate its properties. Using full entanglement distributions and level statistics, we observe a thermal phase and an MBL phase, where S_3 is spontaneously broken down to Z_3, consistent with their conjectures. We also observe a third region where S_3 is unbroken and whose signatures are inconsistent with both MBL and thermal phases. I speculate about the identity of this region and mention some ongoing work to ascertain it.