

# DEPARTMENT OF PHYSICS

## Condensed Matter Seminar

Thursday, March 21, 2019

11:30 A.M.

1080 Physics Research Building  
Smith Seminar Room

**Rajdeep Sensarma**

*Tata Institute of Fundamental  
Research, Mumbai*



### **“Memories of Initial States In Dynamics of Many Body Localized Systems”**

Strongly disordered interacting systems cannot act as a thermal bath for a subsystem, a phenomenon called many body localization. At long times, the system still remembers the initial state it started from, leading to a breakdown of applicability of equilibrium statistical mechanics. This memory of initial states has been measured in recent experiments in ultracold atomic systems. We develop a new field theoretic description which can describe non-equilibrium dynamics of many body systems starting from arbitrary initial conditions. We use this to derive exact answers for the experimental observables in the non-interacting system. In the interacting systems, we show that the bath generated during the dynamics remembers the initial condition, leading to a finite memory in these systems.

**FACULTY HOST: NANDINI TRIVEDI**



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