UCLA Department of Physics & Astronomy

COLLOQUIUM

Thursday, May 27, 2021 at 4 p.m.

Many-body localization and thermalization: some fundamentals of quantum statistical mechanics

David Huse
Princeton University

Most physical systems that contain many interacting degrees of freedom that are excited to energies well above of the ground state do act as a “bath” or “reservoir” for their own subsystems and thus go to thermal equilibrium under the system’s own dynamics, without any coupling to an external environment. This fundamental and long-studied process is called “thermalization”, and has been an active subject of recent research, motivated by atomic, condensed matter, and high energy physics. One class of systems that fail to thermalize are systems that are many-body localized (MBL), which is the interacting version of Anderson localization. Such MBL systems instead remain localized near their initial state. There is a novel dynamic quantum phase transition between many-body localization and thermalization. I will give an overview of these topics.

This talk will be given in hybrid format, with actual physical chalk, blackboard and speaker. Electronic and digital technology will only be used for the live video link.

Undergraduates Welcome!