

Many Body Localization and Eigenstate Order
Prof. Dr. Shivaji Sondhi
Department of Physics, Princeton University, USA

Abstract:

Recent advances in our understanding of the quantum statistical mechanics of isolated quantum systems have focused attention on the properties of individual many-body eigenstates of large systems. While these advances have deepened our understanding of thermal/ergodic systems, they are even more crucial for understanding the properties of many body localized systems where statistical mechanics breaks down. In particular, as I will describe, many body localized systems can exhibit phase transitions while remaining localized wherein the properties of their eigenstates change in singular fashion even as naive statistical mechanical averages are entirely smooth.