ICTS String Seminar

Title : Replica analysis of entanglement properties and conditions for islands

Speaker : Arvind Shekar (University of Southampton, United Kingdom)

Date : Monday, 24 February 2025

Time : 3:30 PM (IST)

Abstract : Entanglement entropy (EE) quantifies entanglement between quantum systems and hence is a useful measure. However, its study in dimensions >2 has been mostly limited to flat backgrounds, CFT vacuum states in specific subregions. I will present a systematic analysis of the properties of EE in curved backgrounds using the replica approach. We will explore the analytic (q−1) expansion of Rényi entropy Sq and its variations; the setup applies to generic variations, from symmetry transformations to variations of the background metric or entangling region. This framework elegantly reproduces and generalises results from the literature on EE in different dimensions, backgrounds, and states. We will then apply this to EE in static black hole backgrounds under specific scaling transformations. We will show that the presence of "islands" (discussed to emerge with quantum corrections and yields the Page curve) imposes constraints on the scaling of EE and consequently on the QFT spectrum.

Venue : Chern Lecture Hall
Zoom Link: https://icts-res-in.zoom.us/j/88092766911?pwd=R3ZrVk9yeW96ZmQ4ZG9KRzVhenRKZz09
Meeting ID: 880 9276 6911
Passcode: 232322