ICTS String Seminar

Title : Classical black hole thermodynamics and entropy bounds in higher derivative theories of gravity

Speaker : Nilay Kundu (Indian Institute of Technology Kanpur)

Date : Wednesday, 26 March 2025

Time : 3:30 PM (IST)

Abstract : In this talk, we will start by discussing the second law of black hole thermodynamics within any diffeomorphism invariant theory of gravity, focusing on linearized fluctuations around stationary black holes. We will briefly discuss how an analysis of the off-shell structure of equations of motion can lead us to define an entropy current on the horizon of dynamical black holes with a non-negative divergence.
Furthermore, we will discuss a classical version of the covariant entropy bound — known as the Bousso bound — in theories when higher derivative terms are treated as small corrections to Einstein's general relativity. We will highlight configurations potentially violating this bound and propose modifications by incorporating the higher derivative contributions to avoid this. Our modifications involve replacing the Bekenstein-Hawking area term with Wald's definition for black hole entropy, motivated by results from the laws of black hole mechanics in higher derivative theories.

Venue : Emmy Noether Seminar Room
Zoom Link: https://icts-res-in.zoom.us/j/88092766911?pwd=R3ZrVk9yeW96ZmQ4ZG9KRzVhenRKZz09
Meeting ID: 880 9276 6911
Passcode: 232322