



ICTS Astrophysical Relativity Seminar

Title : Demonstrating wormholes as black hole mimickers: A perturbation analysis

Speaker : Poulami Dutta Roy (IIT Kharagpur)

Date : Tuesday, 27th September, 2022

Time : 3:00 pm (IST)

Abstract : Our work intends to establish wormholes as real astrophysical objects by exploring various wormhole models, their black hole 'mimicking' features, and their gravitational wave signatures.

We focus mainly on two classes of spacetimes: (a) a two-parameter Lorentzian wormhole family, (b) a generalized version of the Hayward metric with two different mass parameters in g_{tt} and g_{rr} , which interpolates between wormholes, regular and singular black holes depending on parameter choice. The stability analysis focuses on the behavior of quasi-normal modes for both the spacetime classes under scalar wave propagation. Interestingly, the Lorentzian wormhole family is found to harbor a novel triple barrier potential under axial gravitational perturbation. We also explore the mimicking properties of the ringdown profiles for the classes of spacetime mentioned above and observe the gravitational wave echoes. We hope our study will take us a step closer in developing proper templates for detecting the wormholes through future gravitational wave observations.

Venue : **Offline:** Emmy Noether Seminar Room

Online: Please click on the below link to join the meeting

<https://icts-res-in.zoom.us/j/87407461627?pwd=b25xRy9TdUpZNDBKT1NhMlB6ZG4xZz09>

Meeting ID: 874 0746 1627

Passcode: 272722