ICTS Astrophysics and Relativity Seminar (HYBRID)

Title : Probing dissipative effects in neutron stars using gravitational waves.

Speaker : Abhishek Hegade Kumbale Raveesha (Illinois Center for Advanced Studies of the Universe)

Date : Thursday, 04th January 2024

Time : 03:30 PM (IST)

Abstract : Tidal interactions in binary neutron star systems allow us to extract information about the equation of state inside a neutron star from gravitational wave observations. In this talk, we discuss how one could potentially probe out-of-equilibrium effects inside a neutron star by modeling the effects of tidal dissipation during the inspiral of a binary neutron star system. To account for dissipative effects such as viscosity, we introduce a new dissipative tidal deformability parameter and show that this term contributes to the gravitational wave phase at the 4th post-Newtonian (PN) order for quasi-circular binaries. This contribution receives a large finite-size enhancement by the stellar compactness, analogous to the case of the tidal deformability, which makes the parameter potentially measurable with ground-based gravitational wave detectors. In this talk, we will discuss our derivation of this result, present the constraints on the dissipative tidal deformability from analyzing the GW170817 data, and discuss how these results can be used to constrain out-of-equilibrium properties of neutron stars.

Venue : **Offline:** Emmy Noether Seminar Room (ICTS)

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

https://icts-res-in.zoom.us/j/97073757266?pwd=MHlVN3drN0FMbi9OK3ZkeWUwSjJFZz09

Meeting ID: 970 7375 7266

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