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ICTS Astrophysics & Relativity Seminar

Title : Taming eccentricity in binary black hole mergers

Speaker : Tousif Islam (Kavli Institute for Theoretical Physics, USA)

Date : Friday, 08 August 2025

Time : 11:30 AM (IST)

Abstract : Gravitational-wave (GW) astronomy has entered a truly data-rich era: nearly 100 binary black-hole mergers have now been observed. While most of these systems circularize before entering the LIGO–Virgo–KAGRA sensitivity band, roughly 4%—those formed via dynamical captures or three-body encounters in dense environments such as globular clusters and galactic nuclei—can retain significant eccentricity (up to 0.7). These eccentric mergers offer a direct window into dynamical formation channels, but their detection and interpretation demand waveform models and search strategies far beyond those developed for quasi-circular binaries. In this talk, I will present a unified, theory-guided, data-driven framework that bridges this gap.

Venue : Chern Lecture Hall

Zoom Link: <https://icts-res-in.zoom.us/j/98603835819?pwd=Fqaj5QkHAE5ErfbY53GhCF7lhk9hd0.1>

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