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TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS Seminar

Title : Stellar Dynamics and Astrophysical Transients in Centers of Galaxies

Speaker : Karamveer Kaur (Technion - Israel Institute of Technology, Israel)

Date : Thursday, 06 November 2025

Time : 3:30 PM (IST)

Abstract : The centers of many galaxies host dense star clusters known as nuclear star clusters, often surrounding a central massive black hole (MBH). Various dynamical processes can funnel stars and compact objects, such as stellar-mass black holes, into the vicinity of the MBH. In these extremely dense environments, close encounters between stellar objects are common. As a result, galactic nuclei act as fertile grounds for a diverse range of multi-messenger transients, including tidal disruption events (TDEs) and extreme mass ratio inspirals (EMRIs).

In this talk, I will explore the physical mechanisms governing the dynamics of nuclear star clusters and the various formation channels of transients such as TDEs and EMRIs. Each dynamical channel leaves a distinct signature on the event rates and observable properties of these phenomena. The observational facilities, including wide-field survey instruments like the Vera C. Rubin Observatory and upcoming low-frequency gravitational wave detectors such as LISA and TianQin, will play a crucial role in testing these predictions and constraining the physical conditions in galactic nuclei.

Venue : Online

Zoom Link: <https://icts-res-in.zoom.us/j/92389163350?pwd=oaLB8S33iz5YZMTUXbjEMKD8t0VV0W.1>

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