

## ICTS Astrophysics & Relativity Seminar

**Title** : The Faint and the Furious: What are the Lowest Mass Stars that Explode as Core-Collapse Supernovae?

**Speaker** : Kaustav Kashyap Das (California Institute of Technology, United States)

**Date** : Thursday, 30 January 2025

**Time** : 3:30 PM (IST)

**Abstract** : Core-collapse supernovae (CC SNe), the explosive deaths of massive stars, play a pivotal role in galactic chemical evolution, star formation, and the creation of neutron stars or black holes. However, the fate of stars in the  $\sim 8\text{--}12$  solar mass range remains poorly understood. These stars occupy the critical boundary between those that form neutron stars and those that end as white dwarfs. Despite comprising  $\sim 50\%$  of massive stars that explode, such events are rarely observed, likely due to their connection with faint, hard-to-detect low-luminosity SNe.

I will present results from the Zwicky Transient Facility Census of the Local Universe, the largest volumetric SN survey to date, focusing on the landscape of low-luminosity CC SNe. By examining candidate supernovae in this mass range, I will evaluate whether they can account for the missing SNe population and provide insights into the fate of these stars. I will conclude by discussing how future time-domain surveys will further advance this field.

**Venue** : Feynman Lecture Hall

Zoom Link: <https://icts-res-in.zoom.us/j/93870075705?pwd=mKt40j6MvvXWdGrvEabUJJ8kaE9Yfc.1>

Meeting ID: 938 7007 5705

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