



भारतीय खगोलभौतिकी संस्थान  
**INDIAN INSTITUTE OF ASTROPHYSICS**  
कोरमंगला Koramangala, बेंगलूरु Bengaluru – 560034.

स्नातक अध्ययन मंडल **Board of Graduate Studies.**

### **Visiting Student's Programme Seminar**

**Title:** A comparative study of SN 2023ixf from early to late nebular phases

**Speaker:** Ms. Vasudha Choudhary,  
(MSc – Central University of Haryana)

#### **सार Abstract**

Core-collapse supernovae play a significant role in understanding the evolution of stars and galaxies. In this talk, we focus on Type II supernovae, particularly the Type IIP subclass. A representative example is SN 2023ixf. Initial theoretical models and early post-explosion spectra suggested that the progenitor star experienced substantial mass loss before the explosion. However, later analyses identified SN 2023ixf as a typical Type II supernova, raising further questions about its nature. Our study examines the evolving profiles of the Balmer lines, which point to early interaction between the supernova shock and the surrounding circumstellar material (CSM). In addition, the appearance of various metal lines in the very late nebular spectrum provides insights into the progenitor's evolution and core mass properties. These spectral features offer clues about the interior structure of the progenitor and the explosion dynamics. To explore these aspects in a broader context, we compare SN 2023ixf with the well-studied Type II supernovae SN 2017eaw and SN 2017gmr. Through this comparison, we tried to understand how differences in progenitor environments and mass-loss histories influence spectral evolution across various post-explosion stages. Our study also emphasises the need to examine the long-term behaviour of Type II supernovae to gain a more complete picture of their evolution.

शुक्रवार Friday 13, जून June 2025

Time: 2:30 PM

प्रेक्षागृह Auditorium

सभी का स्वागत है All are welcome.