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Powering Source of Gamma Ray Burst Associated Supernovae: Spin-down Millisecond Magnetar?

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The diversity in the observed properties of different types of supernovae (SNe) are crucial to understanding how the life of stars ends differently. Diversity among underlying powering mechanisms may play a vital role among other possible factors (e.g., progenitor, environment). Unique properties and scarcity of Gamma-ray bursts (GRBs) associated SNe (GRB-SNe) seek attention and are exciting for investigating their underlying powering sources. There are three traditional standard models to explain the properties of most of the SNe; radio-active decay of Ni-56 (RD), spin-down millisecond magnetar (MAG), and ejecta-circumstellar interaction (CSM). A magnetar with a spin period of 1 millisecond, mass of 1.4 solar masses, and radius of 10 kilometers has a rotational energy reservoir of nearly 2.2x10ˆ53 ergs, hence can explain the light-curves of various types of SNe, including GRB-SNe. With a given opportunity, I would like to talk about how milliseconds magnetars are the most favorable powering sources of GRB-SNe and will discuss the ultimate tools, such as MOSFiT, MINIM, TigerFit, etc., to probe their characteristics.

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Classification de Session: Contributed talks