

## ICTS Seminar

- Title** : Did a Low-Mass Supernova Trigger the Formation of the Solar System? Clues from Stable Isotopes and  $^{10}\text{Be}$
- Speaker** : Projjwal Banerjee, Shanghai Jiao Tong University, China
- Date** : Friday, January 27, 2017
- Time** : 3:00 pm
- Venue** : Emmy Noether Seminar Room, ICTS Campus, Bangalore
- Abstract** : About 4.6 billion years ago, some event disturbed a cloud of gas and dust, triggering the gravitational collapse that led to the formation of the solar system. A core-collapse supernova, whose shock wave is capable of compressing such a cloud, is an obvious candidate for the initiating event. This hypothesis can be tested because supernovae also produce telltale patterns of short-lived radionuclides, which would be preserved today as isotopic anomalies. Previous studies of the forensic evidence have been inconclusive, finding a pattern of isotopes differing from that produced in conventional supernova models. Here we argue that these difficulties either do not arise or are mitigated if the initiating supernova was a special type, low in mass and explosion energy. Key to our conclusion is the demonstration that short-lived  $^{10}\text{Be}$  can be readily synthesized in such supernovae by neutrino interactions, while anomalies in stable isotopes are suppressed.