

TATA INSTITUTE OF FUNDAMENTAL RESEARCH
DEPARTMENT OF ASTRONOMY & ASTROPHYSICS

SPECIAL ASTRONOMY SEMINAR

January 3, 2011

- Speaker : **Prof. S. R. Kulkarni**
California Institute of Technology, USA
- Title : The Restless Universe (Palomar Transient Factory)
- When : Wednesday, 05 January, 2011 at 14.30 hrs**
- Where : Lecture Theatre (AG-69)

(A. Gopakumar)

Abstract

Cosmic explosions were first noted nearly two thousand years ago. However, secure recognition and study began only a hundred years ago. What was once termed as Stella Nova (new stars) are now divided into two major families, novae and supernovae (with real distinct classes in each). Equally the variable stars have a rich phenomenology. Together, supernovae and variable stars have contributed richly to key problems in modern astrophysics: distances to galaxies, cosmography and build up of elements in the Universe.

The Palomar Transient Factory (PTF), an innovative 2-telescope system, was designed to explicitly to chart the transient sky with a particular focus on events which lie in the nova-supernova gap. PTF is now finding an extragalactic transient every 20 minutes and a Galactic (strong) variable every 10 minutes. Extensive spectroscopy and photometry allowed us: to identify an emerging class of ultra-luminous supernovae, discover luminous red novae, undertake UV spectroscopy of Ia supernovae, discover low budget supernovae, clarify sub-classes of core collapse and thermo-nuclear explosions, map the systematics of core collapse supernovae, identify a trove of eclipsing binaries and the curious AM Cvn's.