



Physical Research Laboratory, Ahmedabad

COLLOQUIUM - 13 - 03

Speaker: Dr. Manoj Puravankara
University of Rochester, Rochester, USA.

Title: Infrared Spectroscopy of Protostars with Spitzer & Herschel: Probing the earliest stages of stellar birth

Abstract

Protostars are new born stars and represent the earliest stages of star formation. The protostellar phase is of fundamental importance as it is during this phase that the final stellar mass is determined and the protoplanetary disks, the birth places of planetary systems, are formed. And yet, protostellar evolution remains the least understood phase of star formation. The early evolution of protostars is driven by the competition between infall, accretion and outflows, processes that can heat up the surrounding gas to temperatures of several 100 K to several 1000 K. Many of the important cooling lines of the warm and hot circumstellar gas fall in the mid- and far-infrared wavelengths. These lines provide valuable diagnostics of the physical conditions (density & temperature), elemental abundance and spatial extent of the emitting gas, and, thereby offer vital clues on the heating mechanisms. Infrared spectroscopy, thus, is a powerful tool to study the energetic processes that shape protostellar evolution. We have analyzed 5-200 micron spectra of some 100 protostars from the nearby star forming regions, obtained with the Spitzer and Herschel space telescopes. The protostars in our sample span three orders of magnitude in luminosity and are in various stages of evolution; this is the largest such sample of protostars to date, for which mid- and far-infrared spectra have been obtained and analyzed. I will present our analysis and discuss our main results, which provide new insights into our understanding of the earliest stages of star formation.

The Speaker

Dr. Manoj Puravankara completed his Ph.D. from Indian Institute of Astrophysics, Bangalore in 2005. He was a postdoctoral fellow at the Inter-University Center for Astronomy and Astrophysics, Pune (2005) and at the Academia Sinica Institute of Astronomy and Astrophysics (ASIAA), Taipei (2005-2007). He has been a research associate at the University of Rochester from 2007 - 2012. He has recently been awarded a visiting fellowship at the Max Planck Institute for Astronomy, Heidelberg, Germany. His primary research interests are in the field of star and planet formation and he has been carrying out multi-wavelength observations using major international ground-based and space facilities for his research. He is a leading member of several key program teams which use Spitzer and Herschel infrared space telescopes for star and planet formation studies. He has published over 30 research articles in peer-reviewed journals.

Wednesday: 16 January, 2013, 16:00 hrs.

K.R. Ramanathan Auditorium, PRL

Tea at 15:30 hrs

ALL ARE WELCOME



Let us pledge, to make this year,
A YEAR OF NEW SCIENCE, NEW DISCOVERIES and DEEPER SOCIETAL COMMITMENT