



Physical Research Laboratory, Ahmedabad

Special Colloquium 16-11

- Speaker:** Dr. Bidya Binay Karak
Post Doctoral Fellow, High Altitude Observatory, National Centre for Atmospheric Research, Boulder, USA
- Title:** “Solar Magnetic Fields and Cycles: Understanding the Dynamo Mechanism”
- Time:** Thursday, 29 September 2016, 16.00 hrs.
- Venue:** K. R. Ramanathan Auditorium, PRL

Abstract

The number of sunspots observed on the surface of the Sun varies cyclically with a period of about 11 years. This is popularly known as the solar cycle. Sunspots are the manifestations of strong large-scale magnetic fields of the Sun. These fields are produced by the magnetohydrodynamics dynamo mechanisms in the convection zone. Due to highly nonlinear nature of the dynamo processes and the extreme parameters of the solar convection zone, the origin of the solar magnetic cycle is still not completely understood. I shall first demonstrate our effort in understanding this magnetic cycle using mean-field dynamo models. Then I shall highlight a special class of dynamo models, the Babcock-Leighton dynamos, in which the poloidal field is generated from the decay and dispersal of tilted bipolar magnetic regions on the solar surface. I shall illustrate that these models are able to explain some basic features of the solar cycle.

The Speaker

Dr. Bidya Binay Karak completed his MSc (2009) and PhD (2013) in Physics from IISC, Bangalore. He moved to Stockholm, Sweden as a Nordic Institute for Theoretical Physics fellow. He is one of the recipients of the prestigious NASA Jack Eddy Fellowship in 2015. His current area of research is Magnetohydrodynamics and its applications in the Sun and other stars, dynamo theory, astrophysical fluids, turbulence, convection, magnetic fields, sunspots and solar cycle. His other area of research interests include large-scale flows such as differential rotation and meridional circulation in the solar convection zone, waves and oscillations in solar corona. He has several international publications to his credit.

Tea at 15:30 hrs.

ALL ARE WELCOME

