Physical Research Laboratory, Ahmedabad

Colloquium 19 - 13

Speaker: **Dr Umesh Kadhane**

Associate Professor,
Head of the Physics Department,
Indian Institute of Space Science and Technology, Thiruvananthapuram.

Title: **"Understanding radiation tolerance of PAHs in space and role of collective excitation"**

Time: **Wednesday, 18 September 2019, 16.00 hrs.**

Venue: **K.R. Ramanathan Auditorium, PRL**

Abstract

Polycyclic aromatic hydrocarbons (PAH) have emerged as strong candidates to explain the origin of infrared emission bands and diffused interstellar bands in astronomical spectra. A large amount of work is being done to understand the survival of these molecules in the harsh interstellar environment. A major channel of excitation namely collective excitation, which is common to all PAHs, has largely remained unexplored till recently. With the help of a series of multi-dimensional investigations spread over nearly 10 years, we have been able to identify the exact role of collective excitation and its after-effects in PAHs exposed to harsh electromagnetic as well as charged particle radiation. This talk presents a comprehensive sketch of this research, including the in-house instrumentation development.

The Speaker

Dr. Umesh Kadhane completed his PhD in the field of ion-molecule collisions from TIFR, Mumbai followed by more than three years of experience with ion-storage devices and mass spectrometry at the University of Aarhus, Denmark and the University of Paris Sud, Orsay, France. He started his academic career as a teacher at the Dept. of Physics, IIT Madras in Dec. 2008. Two years later, he moved to the newly formed Indian Institute of Space Science and Technology, Trivandrum. For the last decade, he has worked towards developing in-house two major mass spectroscopy and electron spectrometry systems. He has guided several undergraduate and post graduate students, as well as five PhD students. Apart form academics, he is also involved in multiple space research related activities. This includes substantial contribution in diagnostics systems, simulations and overall system development of Electric Propulsion Systems (EPS) being developed by LPSC, Valiamala (ISRO) for the Indian space program. Presently he is the deputy project director for the High Thrust EPS for LPSC. He is also a principle investigator for three major payload activities at IIST including the plasma measurement instrumentation payload around Earth, Mars and Venus. He has also setup two new laboratories at IIST for space research which includes, electric propulsion diagnostics laboratory (EPDL) and the Sensors and payload development laboratory for SSPACE (SPDL-S).

He is an avid educator with a keen interest in disseminating scientific theory and ideas among the wider student community and public.

Tea at 15:30 hrs

ALL ARE WELCOME