



# Physical Research Laboratory, Ahmedabad

## Colloquium 20\_06

- Speaker:** Dr. Mudit Kumar Srivastava  
Astronomy & Astrophysics Division, PRL, Ahmedabad
- Title:** “Search for Symbiotic Systems: The ASTROSAT Revelation”
- Date and Time:** Wednesday, 21 October 2020, 16:00 – 17:00 hrs
- YouTube Link:** <https://youtu.be/6Cq6lufJqyM>

### Abstract

Symbiotic stars are the interacting binary systems that typically consist of a hot compact white dwarf and a cool giant star. The interaction between a very hot white dwarf and a very cool red giant causes phenomena which are unique to such systems and make the Symbiotic system of stars a unique astrophysical laboratory. Being one of the most intriguing astrophysical objects, they have been studied for decades. Nevertheless, there are properties of these systems which have not been understood properly. The symbiotic phenomenon is powered by the hot components of this system viz. white dwarf and accretion disk. Emissions from these two peak in the UV range and hence cannot be probed with traditional ground-based observations. In recent times, space-based observations have thrown additional light on the properties of symbiotic systems. In particular, an ordinary red giant “SU Lyn” was discovered in X-rays which raised suspicion that it may harbour a hidden white dwarf, thereby making it a promising candidate of a new hitherto unknown class of symbiotic system. We, at PRL, have probed SU Lyn using Ultra-Violet Imaging Telescope (UVIT) aboard ASTROSAT satellite mission in addition to its ground-based optical-NIR spectroscopy. Utilizing a lesser-known spectroscopy capability of UVIT, we have successfully confirmed the symbiotic nature of the SU Lyn. The confirmation of SU Lyn as a new class of Symbiotics has opened up an incognito window to discover and study more objects of this kind. It also carries a great significance in order to solve the puzzle of a very small number of known Symbiotics, given the fact that the known population of Symbiotics are nearly a factor of thousand less than the predicted ones. To the best of our knowledge, this is the first study that utilizes the UV spectroscopy capability of UVIT/ASTROSAT in its five years of operations.

### The Speaker

Dr. Mudit Srivastava is currently working as Assistant Professor in the Astronomy & Astrophysics Division, PRL, Ahmedabad. Dr. Srivastava finished his Masters in Physics from IIT Kanpur in 2004 and did his Ph.D. from Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, in 2010 with a specialization in Optical Astronomical Instrumentation. During his Ph.D. he worked extensively on the back-end instrumentation for the IUCAA Girawali Observatory (IGO) and the instrumentation studies of Ultraviolet Imaging Telescope (UVIT), a payload on board ASTROSAT mission. Later, he was a postdoctoral fellow at the Leibniz Institute for Astrophysics Potsdam (AIP), Germany. At AIP Potsdam, he worked on the laboratory sub-system characterization of MUSE (Multi-Unit Spectroscopic Explorer)- an Integral Field Spectrograph on ESO 8m very large telescope (VLT). He has had a couple of years of industry experience as well, before joining PRL in 2014, wherein he worked on the electron microscope based instrumentation for the semiconductor industry at KLA-Tencor. At PRL, he has mostly been working on the instrumentation development program for PRL Mt. Abu observatory. He has been the PI of a recently developed spectrograph-camera named MFOSC-P for PRL 1.2m telescope. His observational interests lie in the studies of symbiotic systems and novae.

**ALL ARE WELCOME**

