## **Unique ~ 6 K to ~ 10000 K**

## **Experimental facilities**



**HISTA** - High Intensity Shock Tube for Astrochemistry

## Laboratory Astrochemistry

Astrochemistry laboratory in PRL has two major experimental facilities that can simulate the extreme conditions experienced in the Interstellar Medium (ISM) and in the Solar System. The Simulator for Astro-Molecules Temperature (SALT) is capable of recreating conditions at Low commensurate to those experienced by the cold dust in the ISM. In PRL, the physico-chemical nature of icy mantle analogues are explored using InfraRed (IR) spectroscopic technique and chemical reactions initiated by keV electron gun. In addition, Vacuum UltraViolet (VUV) photoabsorption spectroscopy and VUV photo-irradiation of the icy mantles are carried out using the synchrotron facilities worldwide. PRL hosts the AstroChemical Ices Database (ACID), to date, the extensive database for VUV spectra of molecular ices. The low temperature astrochemistry experimental facility in PRL had led to the discovery of reversible phase changes in astrochemical ices.

In order to understand the shock processing of dust in the ISM and impact-induced shock in the Solar System bodies, PRL has a dedicated High Intensity Shock Tube for Astrochemistry (HISTA). To-date, it is the only known dedicated shock tube available internationally for astrochemistry. Our experiments on the shock processing of biomolecules had led to the finding of complex macroscale structures made in an instant (within 2 millisecond) - a step ahead in our understanding on the *Origin of Life*.