Physical Research Laboratory, Ahmedabad

Colloquium 15-10

Speaker: Dr. Chaitanya GIRI

Postdoctoral Scientist, Max Planck Institute for Solar System Research, Germany

Title: "Detection of organics with MOMA onboard 2018 ExoMars Rover : Future Prospects of GC – MS in Solar System Exploration"

Time: Wednesday, 15 July 2015, 16.00 hrs.

Venue: K. R. Ramanathan Auditorium, PRL

Abstract

Gas Chromatograph-Mass Spectrometer's (GC-MS) have been regular payloads on board space exploration missions aiming to identify extra-terrestrial organics *in situ*. Analytical chemists, across wide fields of research, acknowledge this technique as 'Gold Standard'. GC-MS are space-proven and have identified several organics in the atmosphere of Titan (ACP/Cassini-Huygens), on comets (COSAC/Rosetta) and to a certain extent on Mars surface (Viking Biological Experiments/Viking; SAM/Mars Science Laboratory). The perchlorate and iron sulphate enriched Noachian–Hesperian terrains of Mars pose a great challenge for the usual pyrolysis driven GC-MS in detecting complex organics, if present, in their native state. In the pursuit of detecting organics in the challenging Mars surface environment, the Mars Organic Molecule Analyzer (MOMA) will be a key rover scientific instrument on board the ESA/Roscosmos ExoMars mission, scheduled for launch in 2018. With MOMA, a combined GC-MS–LD-MS (Laser Desorption–Mass Spectrometer), cutting-edge instrumental strategies have been developed to overcome the effects of organic-antagonistic environment as well as detect background organics delivered to Mars by meteorites. This talk will focus on the ongoing research and development of MOMA and mention its COSAC heritage; the latter has earned rich scientific dividends. The COSAC on board the Philae Lander recently made successful *in situ* detections of organics emanating from the nucleus of comet 67/Churyumov–Gerasimenko. The talk will settle with the future prospects of GC-MS technology for asteroid, cometary and planetary exploration and in the overall advancement of the transdiciplinary astro-bio-geo-chemical sciences.

The Speaker

Dr. Chaitanya Giri did his B.Sc. in Chemistry and M.Sc. in Biophysics from University of Mumbai. He was awarded Ph.D. in Chemistry from University of Nice Sophia Antipolis, France. Dr. Giri is currently a Co-Investigator of the Cometary Sampling and Composition Experiment (COSAC), which is on board the Philae Lander of ESA's Rosetta Mission. His primary field of research is analytical and experimental studies of chemical compositions of extraterrestrial surfaces and exploring organics on several Solar System bodies. His current research interests are – development of analytical chemistry space-craft instrumentation, laboratory simulation of cometary environments, and characterization of complex organic material. His scientific research has been published in various high impact factor peer-reviewed scientific journals while his outreach writings have appeared in several national and international news websites Ministry of External Affairs (website), The Diplomat, Fair Observer, Rediff, AAAS Science Careers, Swarajya, Indian Express, and Mid-Day to name a few. Dr. Giri is the recipient of the Max Planck Society's Dieter Rampacher Prize for the year 2014. He was also awarded the Rising Star Award from the Alumni Association of Ramnarain Ruia College, University of Mumbai in 2015. He is a member of the Working Group on Origin of Life at Göttingen Academy of Sciences and Humanities.

Tea at 15:30 hrs.

ALL ARE WELCOME