Physical Research Laboratory, Ahmedabad

Special Colloquium 19 - 14

Speaker: **Dr. M Shanmugam**
Engineer – SF, Physical Research Laboratory.
Title: **" Scientific experiments onboard Chandrayaan-2 mission: PRL's contribution "**
Time: **Thursday, 03 October 2019, 16.00 hrs.**
Venue: **K.R. Ramanathan Auditorium, PRL**

Abstract

The second Indian mission to the Moon Chandrayaan-2, was a logical extension of the first Indian Moon mission – Chandrayaan-1, and it consisted of an orbiter, lander named Vikram and a rover named Pragyan. Chandrayaan-2 was launched on 22nd July, 2019 and the composite module was inserted into lunar orbit on 20th August, 2019. The Chandrayaan-2 mission aimed to carry forward the legacy of Chandrayaan-1 with the help of a wide range of advanced scientific instruments for global scale lunar studies as well as in-situ studies around the landing site. It is a matter of pride for the Physical Research Laboratory that we had scientific experiments on all three components of Chandrayaan-2 *viz.* the orbiter, the Vikram lander and the Pragyaan rover.

The Solar X-ray Monitor (XSM) onboard the Chandrayaan-2 Orbiter is aimed at generating global elemental maps along with its companion instrument the Chandrayaan-2 Large Area Soft X-ray Spectrometer (CLASS). The objective of Chandra's Surface Thermophysical Experiment (ChaSTE) onboard the Vikram Lander was to obtain the temperature profile and thermal conductivity within the top 10 cm of the lunar surface. The Alpha Particle X-ray Spectrometer (APXS) onboard the Pragyan Rover was designed to carry out in-situ elemental composition measurements of rock and soil samples around the landing site. In this talk, I will present design details, salient features and the performance of both the XSM and APXS payloads flown on the Chandrayaan-2 mission.

The Speaker

Dr. M. Shanmugam completed his B.E in Electronics and Telecommunication Engineering in the year 2000, from the University of Madras. After this, he worked in the field of Very Large Scale Integrated (VLSI) circuit design for about 2 years before joining the Physical Research Laboratory (PRL) in 2002, where he was part of the High Energy X-ray spectrometer (HEX) payload developed by PRL for the Chandrayaan-1 mission. After completion of the HEX instrument, he has taken the responsibility of developing two instruments for Chandrayaan-2 namely, the Solar X-ray Monitor (XSM) onboard the orbiter and the Alpha Particle X-ray Spectrometer (APXS) onboard the rover. He is designated as the Deputy Project Director for the APXS and XSM payloads onboard the Chandrayaan-2 mission and also for the Aditya Solar wind Particle EXperiment (ASPEX) onboard the Aditya-L1 mission, which is proposed to be launched in the first half of 2020.

While at PRL, he completed his M. Tech in Electronics, from Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat in 2012 and then his Ph.D in the year 2016, from Dharmsinh Desai University (DDU), Nadiad. In his Ph. D thesis, he proposed a new, novel technique for measuring the leakage current in Silicon Detectors to study its radiation damage effects in space. This technique has been implemented in the XSM payload onboard Chandrayaan-2.

He has significantly contributed in initiating the space payload development activity at PRL which paved the way for proposing several instruments for the upcoming planetary missions of ISRO.

He is the recipient of the "ISRO Team Excellence Award for the Chandrayaan-1 payload instruments" for the year 2008 and the Lunar Planetary Institute (LPI) career development award, USA for the year 2011. He has over 25 publications.

Tea at 15:30 hrs

ALL ARE WELCOME