



भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद Physical Research Laboratory, Ahmedabad

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77_PRL Ka Amrut Vyakhyaan

Wednesday, 22 February 2023

@ 04:00 PM (IST)

**“Apollo to Artemis: The Science and
Exploration of the Moon”**

Prof. Mahesh Anand

Professor
School of Physical Sciences,
The Open University, Milton Keynes, UK



Venue: [K R Ramanathan Auditorium,](#)
PRL Main Campus, Ahmedabad



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Title: “Apollo to Artemis: The Science and Exploration of the Moon”

Speaker: Prof. Mahesh Anand

Professor, School of Physical Sciences, The Open University, Milton Keynes, UK

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Abstract

The Moon’s pull on our imagination is unrivalled, as best demonstrated by the Apollo programme. Fifty years on, humanity stands at the crossroads of technological advancement and scientific knowledge, ushering in a new era of human and robotic space exploration. Scientific discoveries relating to the history of water and other associated volatiles on and in the Moon have renewed global interest in lunar exploration. Thus, the Moon is becoming a favourite target for established and emerging space-faring nations and commercial entities. In addition to national pride and scientific curiosity, the renaissance in lunar exploration is also driven by an increased realisation of the Moon as a technology testbed for exploring more distant bodies such as Mars and asteroids.

The possibility of utilising the Moon and its constituents as resources for sustaining an extended presence on its surface has heralded an era of 'New Space' by attracting private and commercial bodies towards lunar exploration, guided by scientific insights derived from continuing research on lunar samples.

Our vision of the future sees a sustainable presence of humans based on the lunar surface. For this, the natural resources present there must be explored and utilised. The coming decades are likely to witness the realisation of Living on the Moon, enabled by research that is commonly termed lunar in situ resource utilisation (ISRU).

The Speaker

Professor Mahesh Anand is a Professor of Planetary Science and Exploration at The Open University, UK. He received his early education in India (BSc – BHU; MSc – IITB) and a PhD from the University of Cambridge, UK in 2001. He subsequently worked as a researcher at the University of Tennessee, USA and at the Natural History Museum in London before joining The Open University in 2005.

Prof. Mahesh’s research work has spanned geological studies of ancient igneous terrains on Earth to diamonds to lunar, Martian and other meteoritic samples. His recent research has focussed on understanding the history of volatiles in lunar samples, specifically, the abundance, distribution and source(s) of water in the lunar interior.

Prof. Mahesh has supervised over 30 PhD students and postdocs and has published over 100 research papers in journals of high-scientific standing. His other research interests include the application of scientific knowledge derived from fundamental research to inform planetary exploration programmes.

Prof. Mahesh currently chairs the UK node of the NASA Solar System Exploration Research Virtual Institute (SSERVI) comprising over 100 members from 15 UK higher education institutions.



About PRL

The Physical Research Laboratory (PRL), known as the “cradle of space science” in India, is one



of the premier research institutes founded in 1947 by Prof. Vikram Sarabhai, a renowned Cosmic Ray Scientist, a great visionary and institution builder. PRL played a seminal role in producing a highly motivated cadre of space scientists and the technologists of highest international repute. The first scientific rocket launched from Thumba on 21st November-1963 and many other rockets launched thereafter contained payloads developed at PRL. Dr. Sarabhai initiated many of these scientific and technical activities at PRL which eventually led to the formation of the Indian Space Research Organization (ISRO). Therefore, PRL is known as the “cradle of space science” in India. Further, the research in the area

of Plasma Physics expanded to the formation of the Institute of Plasma Research (IPR).

As an institution PRL is unique in that it conducts fundamental research in a wide range of research areas from the Earth to the cosmos, and comprising Astronomy and Astrophysics; Solar Physics; Space and Atmospheric Sciences; Theoretical Physics; Geosciences; Atomic, Molecular and Optical Physics, Astrochemistry; and Planetary Sciences and Space Exploration. PRL is one of the rare research institutes of international repute wherein research in such diverse fields of sciences is carried out using several state-of-the-art experimental facilities that exist under one umbrella.

Along with the ongoing research, several new initiatives have been taken up during the last few years. The Multi-Application Solar Telescope (MAST) at Udaipur Solar Observatory has been operationalized. PRL initiated scientific programmes in frontier areas of research, which include a search for exo-planets, laboratory studies of interstellar grains, laboratory synthesis of cold astromolecules and experimental studies in the field of quantum optics. PRL is also developing several scientific payloads as a part of ISRO’s larger vision and contributing to roadmap for competitive scientific exploration of the solar system and beyond. In particular, PRL has been contributing significantly not only in building instruments for space missions, such as Chandrayaan-1, Chandrayaan-2, AstroSat and upcoming Aditya-L1, Chandrayaan-3 and planetary and space missions, but also by bringing out new and insightful science results.

PRL contributes to several national and international research programmes and to human resource development through its Doctoral and Post-Doctoral Programmes, capacity building programmes, such as UN Course on Space Science, and science and engineering internship programmes. PRL contributes significantly to society through its Outreach Programmes by periodically organizing science exhibitions and Open Houses, planned visits of students of various school and college to PRL, and popular talks at various institutions to not only share the excitements of the advancements of contemporary scientific findings but also to encourage students to take up sciences as their research career.

