



भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद

Physical Research Laboratory, Ahmedabad

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**PRL Ka Amrut Vyakhyaan-14**

**Wednesday, 03 November 2021**

**@ 16:00 hrs. (IST)**

**“Opportunities and Challenges  
beyond Mangalyaan in Inter-  
planetary Missions and Plane-  
tary Protection Measures”**

**Prof. V. Adimurthy**

ISRO Honorary Distinguished Professor,  
Vikram Sarabhai Space Centre,  
Thiruvananthapuram



[https://youtu.be/zD\\_nZURYYZQ](https://youtu.be/zD_nZURYYZQ)

## **PRL ka Amrut Vyakhyaan-14**

### **Title: “Opportunities and Challenges beyond Mangalyaan in Interplanetary Missions and Planetary Protection Measures”**

**Speaker: Prof. V. Adimurthy**

ISRO Honorary Distinguished Professor,  
Vikram Sarabhai Space Centre, Thiruvananthapuram.

**On Wednesday, 03 November 2021**

#### **Abstract**

With the path breaking background of Chandrayaan and Mangalyaan missions, exciting possibilities of space exploration are in the offing in understanding the infinitude of the universe. In the domain of earth orbital, lunar and interplanetary missions, many new and innovative ideas are introduced in the recent decades. Future space endeavors will give us an excellent platform to enhance the quality of life and environment. However, increased space activities lead us to new issues, like the need to manage the detrimental effects of space debris. It is also recognized that there is a small but definite probability of large near-Earth asteroids (NEAs) impacting our planet. Today's technology is mature enough for formulating suitable mitigation measures to avert a NEA impact catastrophe should such a need arise. This talk gives an overview of some of these exciting future technologies and scientific possibilities. These challenges are sure to inspire and occupy new generations of Indian students, scientists, engineers, educators, legal experts and administrators.

#### **The Speaker**

Prof. Adimurthy received his Ph.D. degree from IIT, Kanpur in 1973 for his work on hypersonic Low density flows over reentry bodies. Following this, he joined the Indian Space Research Organisation in March 1973. During the five decades of his professional career, he made significant individual contributions to knowledge in the areas of aerodynamics, flight dynamics, trajectory optimization, space dynamics, space debris studies, lunar and interplanetary mission design, and multi-disciplinary design optimization. From 2011, he is Co-Editor of the Journal Acta Astronautica of the International Academy of Astronautics. Prof. V. Adimurthy is presently ISRO Honorary Distinguished Professor. Earlier he served as Prof. Satish Dhawan Professor and Senior Advisor (Interplanetary Missions) at ISRO and as Associate Director of Vikram Sarabhai Space Centre, and Dean (R&D) of the Indian Institute of Space Science and Technology, Trivandrum.

Prof. Adimurthy is the Chairman of the Mars Mission Study Team whose Report of 2011 provided the conceptual design for India's Mars Orbiter Mission. A Vision for future Indian solar system exploration is also formulated in 2017 by the Solar System Exploration Study Team headed by Prof. Adimurthy. He is also instrumental in submitting the 2021 Report of the Committee chaired by him for the Generation of Revised Indian Atmospheric Model, assimilating and quality processing 45 years of segmented observation data. Prof. Adimurthy is a Fellow of the Indian National Academy of Engineering. He is the Vice-President of the Aeronautical Society of India during the period 2008-2019. He is an Academician of the International Academy of Astronautics, and Senior Fellow of the Alexander von Humboldt Foundation, Germany. He is a Fellow of the Systems Society of India, and the Astronautical Society of India. From 1999 to 2012, Prof. Adimurthy served as the Indian Representative in the Inter Agency Space Debris Coordination Committee (IADC) and was twice the Chairman of this international forum during 2002-2003 and also in 2009-2010. Prof. Adimurthy was awarded the National Aeronautical Prize in 2005. He received the 1997 Astronautical Society of India Award. In 2007, he received the Dept. of Space Performance Excellence Award. Prof. Adimurthy received the Padma Shri Award 2012 for his contributions to Science and Engineering. He received the IAA Laurels for Team Achievement Award 2013 for Chandrayaan-1 at the International Academy of Astronautics Meeting at Beijing. He received the Biennial ISRO Outstanding Achievement Award 2014, and Indian National Academy of Engineering Prof. Jai Krishna Memorial Award 2016.



## 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.

