



भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद Physical Research Laboratory, Ahmedabad

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52_PRL Ka Amrut Vyakhyaan

Wednesday, 27 July 2022

@ 04:00 PM (IST)

“Probing the Universe with radio waves : landmark achievements in India over the years”

Prof. Yashwant Gupta

**Centre Director
National Centre for Radio Astrophysics, Pune.**



<https://youtu.be/oslg1qeRaA0>



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**Title: “Probing the Universe with radio waves :
landmark achievements in India over the years”**

Speaker: Prof. Yashwant Gupta

Centre Director, National Centre for Radio Astrophysics, Pune

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Abstract

The demonstration of how to transmit and receive radio waves, first done by Acharya J.C. Bose in 1895, led to the opening up of a new window to the Universe, namely Radio Astronomy, in the 1940s. India has built up a strong reputation in this new field, starting from a few years after becoming an independent nation. In this presentation, we will trace the fascinating story of Radio Astronomy, with special focus on the landmark achievements in India over the last 60 years or so, starting with the early developments by the pioneers, and stopping briefly at all the major milestones achieved in the country. Special emphasis will be on the major facilities for radio astronomy created in India, such as the GMRT. We will also look briefly at future prospects for this field, globally as well as in India.

The Speaker

Prof. Yashwant Gupta presently at the position of Distinguished Professor in the Tata Institute of Fundamental Research (TIFR), heads TIFR's National Centre for Radio Astrophysics, located in Pune, as the Centre Director. He obtained his M.S. and Ph.D. in Radio Astronomy from the University of California, San Diego in 1990, after completing his Bachelor's degree in Electrical Engineering from IIT Kanpur in 1985. In addition to research in the astrophysics of pulsars (rapidly rotating, highly magnetised neutron stars), Prof. Gupta also has significant involvement in instrumentation and signal processing applications in radio astronomy. He has contributed extensively to the building and running of the GMRT Observatory -- a world class facility (located about 80 km from Pune) built and operated by NCRA. He also spearheads India's participation in the Square Kilometre Array (SKA) project -- an international collaborative project to design and build the next generation global radio astronomy facility. Prof. Gupta was conferred the Shanti Swarup Bhatnagar Prize in the Physical Sciences, for the year 2007. He has been elected a fellow of the National Academy of Sciences of India and also of the Indian Academy of Sciences.



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 astro-molecules 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.

