



भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद Physical Research Laboratory, Ahmedabad

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59_PRL Ka Amrut Vyakhyaan

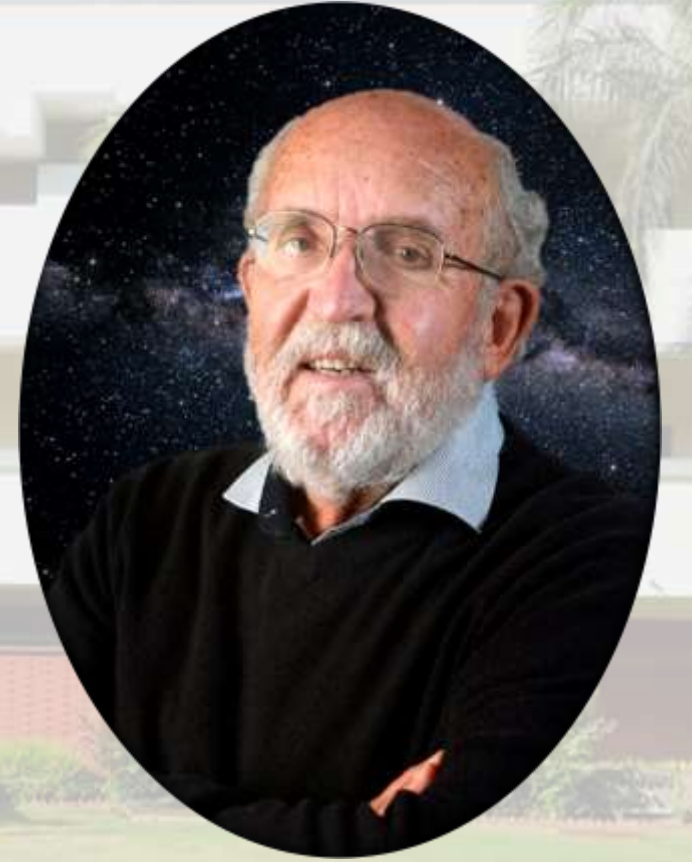
Wednesday, 14 September 2022

@ 04:00 PM (IST)

**“Other Worlds in the Cosmos?
The Search for Planets Similar to
our Earth and...
perhaps Sheltering Life!”**

Prof. Michel Mayor, Nobel Laureate

**Emeritus Professor,
University of Geneva, Switzerland.**



<https://youtu.be/XmP3gT8D7R8>



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**Title: “Other Worlds in the Cosmos? The Search for Planets
Similar to our Earth and... perhaps Sheltering Life!”**

Speaker: Prof. Michel Mayor, Nobel Laureate

Emeritus Professor, University of Geneva, Switzerland

On Wednesday, 14 September 2022

Abstract

“Do there exist many worlds, or is there but a single world? This is one of the most noble and exalted questions in the study of Nature.”
-Albertus Magnus (circa 1200–1280)

Are there other Worlds in the universe? Does life exist elsewhere in the cosmos? The technology of our time has made it possible to transform this dream of antiquity into a fascinating field of current astrophysics. Twenty-six years after the discovery of a first planet orbiting a star like our sun, a few thousand planetary systems have been discovered. These first discoveries revealed to us the astonishing diversity of these systems, very different from our solar system. After the euphoria of these first discoveries, the era of studying the atmospheres of exoplanets is now beginning. Fascinating, despite the enormous contrast between the luminosity of the star and that very weak, reflected by the planet, the analysis of the atmospheres begins and will benefit from space telescopes and giant telescopes on the ground (up to diameters of 39m). Does life exist in other places in the cosmos? - Vertiginous question - The analysis of planetary atmospheres may reveal biosignatures, these spectral characteristics induced by the development of life. Advances in

The Speaker

Born in Lausanne in 1942, Professor Michel Mayor grew up in Aigle before studying physics at the University of Lausanne and obtaining a doctorate in astrophysics at the University of Geneva in 1971. After completing his thesis on the dynamics of spiral galaxies, he developed a new type of spectrograph, an instrument capable of measuring the speed of stars, with colleagues from the Geneva and Marseille observatories, to verify his predictions. This was the beginning of his interest in the study of stellar motion, stellar kinematics, and the beginning of his passion for the development of increasingly sensitive stellar spectrographs.

A new instrument, designed and built-in collaboration with the Observatoire de Haute-Provence and Marseille in the early 1990s, will finally achieve the sensitivity required to detect the weak gravitational perturbations induced by planets orbiting other stars similar to our Sun.

On 6 October 1995, Michel Mayor, professor at the Observatory of the Faculty of Science of the University of Geneva (UNIGE), and his doctoral student at the time, Didier Queloz, announced to the international scientific community the detection of the first planet outside the solar system, exoplanet 51 Pegasi b. An exoplanet orbiting a star comparable to our Sun, some 50 light years from Earth. This incredible announcement opened the way for thousands of researchers and launched the 'century of exoplanets', of which there have been more than 5000 to date. Prof. Mayor and Prof. Didier Queloz were awarded one half of the 2019 Nobel Prize in Physics for the discovery of the exoplanet 51 Pegasi b.

Professor of astrophysics at the University of Geneva since 1984, he was director of the Department of Astronomy from 1998 to 2004. Since 2007, he has been an honorary professor. He is a foreign member of the French Academy of Sciences, the US National Academy of Sciences, the American Academy of Arts and Sciences and the Royal Academy of Sciences of Spain. He is also an honorary member of the Royal Astronomical Society of the United Kingdom and the European Geosciences Union. Nine universities have awarded him honorary doctorates. His research has been awarded many major scientific prizes, including the E. Balzan (2000) and Run Run Shaw (2005) prizes, the Albert-Einstein Medal (2004), Ambartsumian (2010), Frontier of Knowledge (2012), the Gold Medal of the Royal Astronomical Society of Great Britain (2015), the Kyoto (2015) and Wolf (2017) prizes.



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.

