



# भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद Physical Research Laboratory, Ahmedabad

[HTTPS://WWW.PRL.RES.IN](https://www.prl.res.in)

**PRL Ka Amrut Vyakhyaan-20**  
**Wednesday, 15 December 2021**  
**@ 16:00 hrs. (IST)**



<https://youtu.be/M4Gh5K6yoKg>



# **PRL ka Amrut Vyakhyaan-20**

**Title: “Future Colliders”**

**Speaker: Prof. Sreerup Raychaudhuri**

Professor, Department of Theoretical Physics,  
Tata Institute of Fundamental Research, Mumbai

**On Wednesday, 15 December 2021**

## **Abstract**

The runaway success of the Standard Model of particle physics has largely been due to a succession of beautiful experiments carried out at colliding-beam machines, or colliders. The most important of them, the LHC at CERN, has been running since 2009 and it discovered the Higgs boson in 2012. However, the LHC now faces a midlife crisis, since the last seven years have been singularly barren of new discoveries. Particle physicists are, therefore, already planning for the next generation of colliders, of even higher energy, which may lead us to a deeper understanding of Nature than the Standard Model affords. This talk will carry out a broad survey of some of these plans and the issues involved.

## **The Speaker**

Prof. Sreerup Raychaudhuri did his M.Sc. and Ph.D. from the University of Calcutta. He then was a Post Doctoral Fellow at TIFR, Mumbai and CERN, Geneva, before joining the IIT Kanpur as a faculty member in 1999. He moved to TIFR, Mumbai in 2007 where he is currently a Professor in the Department of Theoretical Physics. Prof. Sreerup Raychaudhuri is a theoretical physicist who works on the physics of elementary particles and their interactions. His research interests lie in interfacing theory with experiments, especially in the physics of electroweak interactions. He is also interested in the popularisation and history of science. He has around 50 publications in peer reviewed journals and has published two books.

## 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.

