भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद

Physical Research Laboratory, Ahmedabad

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PRL Ka Amrut Vyakhyaan-12

Wednesday, 20 October 2021

@ 16:00 hrs. (IST)

"EARTH SYSTEM SCIENCE FOR SOCIO-ECONOMIC BENEFITS"

Dr. M. Rajeevan

Former Secretary,

Ministry of Earth Sciences, Govt. of India.

YouTube https://youtu.be/wIe6JoJs-aM

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Title: "Earth System Science for Socio-Economic Benefits"

Speaker: Dr. M. Rajeevan

Former Secretary, Ministry of Earth Sciences, Govt. of India.

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Abstract

Earth System Science considers interactions between the Earth's spheres, Atmosphere, Hydrosphere, Cryosphere, Lithosphere, and the Biosphere, as well as the impact of human societies on these components. Earth System Science Services include weather and climate, Ocean, Coastal State and Seismological Services. Ministry of Earth Sciences provides these services for the benefit of the country through its scientific programs. During the past 8-10 years, Government had invested in improving the quality of Earth System Services in the country. This timely investment has led to the substantial improvement in weather and climate forecasts and warnings, Ocean state forecasts and warnings, Tsunami warnings, better monitoring of earthquakes. In this vyakhyaan the progress made during last 8-10 years in Earth System Science Services will be discussed. Particularly the points to be discussed will be; a) details of atmospheric and oceanic observational network and mathematical modeling strategy, b) the improvement in monsoon forecasts, warnings of Tropical cyclones, heavy rainfall, flash floods and heat waves, ocean state, storm surges, Tsunamis, c) development of technologies for drinking water for islands, restoration of beaches from coastal erosion, d) Air and Sea Water quality monitoring and prediction, e) development of technologies for deep sea exploration and mining, f) exploration of marine biodiversity and marine living resources, g) Ocean Survey and Exploration h) Seismological network and research on Earthquakes, i) exploration of three poles (Arctic, Antarctic and Himalayas). Finally, the future prospects and details of scientific programs planned for next five years will be also discussed.

The Speaker

Dr. Madhavan Nair Rajeevan obtained his B.Sc. and M.Sc. (Physics) degrees from Madurai Kamaraj University and Ph.D. from the University of Pune. He joined the India Meteorological Department (IMD) in 1985. He was responsible for preparing the high spatial resolution gridded all India daily rainfall and temperature time series and making it publicly available while serving as the Director of the National Climate Centre (IMD), Pune. He, then moved to the National Atmospheric Research Laboratory, Gadanki in 2008 where he led the numerical weather forecasting group. Dr. Rajeevan shifted to the Ministry of Earth Sciences as Advisor in 2012 and then briefly served as Director of the Indian Institute of Tropical Meteorology, Pune in 2015 before becoming the Secretary, Ministry of Earth Sciences, Government of India, in December 2015. Dr. Rajeevan has made original and significant contributions to Monsoon Variability and Monsoon Prediction including operational long-range forecasts of monsoon seasonal rainfall, Climate Change and Extreme Weather Events, Cloud-Radiation Interaction and Satellite applications, and Aerosol Radiative Forcing. He took a major initiative and provided the leadership for launching the ambitious Indian Deep Ocean Mission aimed at deep ocean exploration of resources and research on Marine Biology and Biodiversity. This initiative will boost the Blue Economy initiatives of the Government of India. He was actively involved in framing up the Arctic and Blue Economy Policies for India. He has published more than 140 research papers with an h-index of 50 and total citations of 10400. For his scientific contributions, he is honored with the Fellowship of three Indian Science Academies, namely, IASc, INSA and NASI.

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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.