भौतिक अनुसंधान प्रयोगशाला, अहमदाबाद

Physical Research Laboratory, Ahmedabad

https://www.prl.res.in/prl-eng/prlat75

62_PRL Ka Amrut Vyakhyaan

Thursday, 06 October 2022

@ 04:00 PM (IST)

"SUN EARTH SYSTEM AND SPACE WEATHER: a historical approach- Physics"

Dr. Christine Amory-Mazaudier

Sorbonne Université, Ecole polytechnique,
Institut Polytechnique de Paris, Université Paris Saclay,
Observatoire de Paris,
CNRS, Laboratoire de Physique des Plasmas,
Paris, France.

https://youtu.be/AyydlY4RS9g

62_PRL ka Amrut Vyakhyaan

Title: "SUN EARTH SYSTEM AND SPACE WEATHER: a historical approach-Physics"

Speaker: Dr. Christine Amory-Mazaudier

Sorbonne Université, Ecole polytechnique, Institut Polytechnique de Paris, Université Paris Saclay, Observatoire de Paris, CNRS, Laboratoire de Physique des Plasmas, Paris, France

On Thursday, 06 October 2022

Abstract

The purpose of Space Weather is the systemic study of the Sun-Earth system, in order to determine the impact of solar events on the Earth's electromagnetic environment. This talk proposes a new transdisciplinary approach of the Sun-Earth system using the universal physical process of the dynamo. The dynamo process is based on two important parameters of the different plasmas of the sun-earth system which are the motion and the magnetic field. There are four large-scale permanent dynamos in the Sun-Earth system: the solar dynamo, the earth dynamo, the solar wind-magnetosphere dynamo, and the ionospheric dynamo, known since many decades. These four dynamos are studied in different scientific disciplines. This transdisciplinary approach links all these dynamos in order to understand the variations of the Earth's electromagnetic environment which affects our new technologies as the one of GNSS (Global Navigation Satellite System) and as a consequence our daily life.

The Speaker

Dr. Christine Amory-Mazaudier is professionally qualified in the fields of computer science (Master-1972), administration (MBA-1979) and physics (Master-1973, PhD-1974 and state thesis-1983). She was a teacher in National Education (1971-1975), an engineer at CEA (Center for Atomic Energy) from 1976 to 1977, and a researcher at CNRS (National Center for Scientific Research) from 1978 to 2014. She is currently a Senior Scientist at the laboratory of Plasma Physics/Polytechnique at Sorbonne Universities. She was visiting professor at the Bells University in Nigeria from 2012 to 2016 and 'Staff Associate' at the ICTP (Abdus Salam International Center for Theoretical Physics) from 2014 to 2020. Since 1990 she is involved in international projects, IEEY (International Equatorial Electrojet Year 1992-1994), IHY (International Heliophysics Year 2007-2009) and ISWI (International Space Weather Initiative 2010-2012). She developed a systemic approach of the Sun-Earth system based on the Dynamo process. In the framework of the international projects, Dr. Amory-Mazaudier has trained or co-trained 10 master's students and 44 doctoral students in different countries of Europe, Africa, Asia and the USA. She has over 144 peer-reviewed scientific articles to her credit. In the late 1990s, she founded the GIRGEA (International Geophysical Research Group Europe Africa www.girgea.org). She is a member of the steering committee of the ISWI network which is part of the UN program on Space Weather, and also an expert in a capacity building using GNSS in the UN ICG (International Committee for GNSS). She has received many awards or recognition from scientific organizations, which include, a Certificate of Merit awarded in 2007 by AGU and IUGG for the work done in IHY, Fellowship of the Nigerian Geophysical Society in 2014, Fellow of the African Geophysical Society, Marcel Nicolet Medal awarded by European Space Weather community in 2015, Campaign Medal, awarded by the Academy of Science of Vietnam in 2017, Certificate of Appreciation / ICPF 2022, Nepal Physical Society in 2022 and the most coveted Vikram Sarabhai Medal jointly awarded by ISRO and COSPAR in this year 2022.

PRL@75 · PLATINUM JUBILEE · INDIA@75 · Azadi Ka Amrit Mahotsav

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.

PRL@75 · PLATINUM JUBILEE · INDIA@75 · Azadi Ka Amrit Mahotsav