



Physical Research Laboratory, Ahmedabad

Colloquium 20_08

Speaker: Dr. Dibyendu Chakrabarty
Space and Atmospheric Sciences, PRL, Ahmedabad

Title: "Space weather: From anomaly to insights."

Date and Time: Wednesday, 04 November 2020, 16:00 – 17:00 hrs.

YouTube Link: <https://www.youtube.com/watch?v=Q52BLxcCD00>

Abstract

Space weather can have different meanings depending on the vantage point in space. In a magnetized planet like ours, which is located in a stellar neighbourhood, space weather is primarily controlled by solar disturbances. Radiation, particles in the solar wind, and the "frozen-in" magnetic field popularly known as the interplanetary magnetic field (IMF) carries the solar disturbances to the magnetic cavity of the Earth known as the magnetosphere. The way IMF affects the magnetosphere or the ionosphere depends greatly on the polarity of the IMF. It is known that the southward component of the IMF (IMF Bz) is the most relevant parameter for the northward directed terrestrial magnetic field. The interaction between oppositely directed magnetic fields leads to enhancements in currents and electric fields in the magnetosphere resulting into what is known as a geomagnetic storm. Till date, the disturbances in the ionospheric electric field and currents during geomagnetic storms have been addressed mostly based on the variations in the IMF Bz. However, in recent times, a number of works carried out at PRL have revealed that the ionospheric disturbances in the electric fields and currents can be "anomalous" on many occasions and cannot be explained by taking only the IMF Bz into account. The roles of magnetospheric substorms, solar wind density, and the east-west component of the IMF (IMF By) have been found to be equally important to understand the space weather impacts in a critical manner. In this colloquium, a few such results will be highlighted to show that the so-called "anomalous" observations can truly lead to insights into the understanding of space weather.

The Speaker

Dr. Dibyendu Chakrabarty is an Associate Professor in the Space and Atmospheric Sciences Division of Physical Research Laboratory. He did his Ph.D. from PRL and was a Visiting faculty at the Center for Atmospheric and Space Science (CASS), Utah State University, USA, in the year 2012. Dr. Chakrabarty is the recipient of the Hari Om Ashram Prerit Vikram Sarabhai Research Award, 2015. Dr. Chakrabarty has 67 international peer-reviewed journal publications till date and has written a chapter of a book and a number of review articles. He has delivered invited talks in many national/international conferences and served as elected Convener/Co-convener/Chair. He is presently serving as the Principle Investigator of the Aditya Solar Wind Particle EXperiment (ASPEX) on-board the Aditya-L1 mission of ISRO. He is a member of the Aditya-L1 Space Weather Monitoring and Prediction (ASWMP) committee, which is a national committee constituted by the Indian Space Research Organization in 2020. He has been invited as a working group leader of Pillar 2: Space weather and Earth's atmosphere of the international program PRESTO (Predictability of the Variable Solar-Terrestrial Coupling).

ALL ARE WELCOME

