



भारतीय खगोलभौतिकी संस्थान
INDIAN INSTITUTE OF ASTROPHYSICS
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स्नातक अध्ययन मंडल **Board of Graduate Studies.**

Visiting Student's Programme Seminar

Speaker: Ms. Prarthana G,
(MSc - St. Joseph University)

शीर्षक Title: The Study of Induced Magnetic Fields on Martian Ionosphere using MAVEN Observation

सार Abstract

Unlike Earth, Mars lacks a global dynamo magnetic field but possesses strong, asymmetric crustal magnetic anomalies, primarily in its southern hemisphere. This absence of a global shield makes Mars highly susceptible to solar wind and interplanetary magnetic field (IMF) interactions, leading to the formation of an induced magnetosphere. These interactions critically reshape the ionospheric structure and drive atmospheric escape. In this study, we quantify induced magnetic fields using data from the Mars Atmospheric Volatile Evolution (MAVEN) mission's magnetometer (MAG), which provides vector magnetic field measurements along the spacecraft trajectory in Mars Solar Orbital (MSO) coordinates. We have derived induced fields by subtracting the crustal fields (derived from Morschhausers model) from MAG measured fields across ~10,000 orbits. Our results reveal that induced fields are strongly altitude-dependent, peaking below 200 km due to ionospheric currents and strong crustal fields. The Dayside-dominated (vs. nightside), consistent with enhanced solar wind compression. The Local time variations showed strong induced fields around 15 to 20 hr. Global maps confirm southern hemisphere predominance, implying crustal fields anchor draped IMF lines, allowing penetration to low altitudes (~130 km). We discuss implications of these findings and future goals in the talk.

सोमवार Monday 23, जून June 2025

Venue: प्रेक्षागृह Auditorium

Time: 11:30 AM

सभी का स्वागत है All are welcome.