भारतीय खगोलभौतिकी संस्थान
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स्नातक अध्ययन मंडल Board of Graduate Studies.

STUDENT SEMINAR
(Part of Comprehensive Examination)

Speaker: Mr. Sayan Panda

Title: Magnetic Field and Dust in High Latitude Clouds: A case study on MBM12

सार Abstract

MBM12 is one of the nearest high-latitude molecular clouds and provides an excellent laboratory for investigating the role of magnetic fields in the evolution of diffuse molecular clouds. We present a multiwavelength study of the magnetic field morphology and physical properties of MBM 12 using optical polarimetry, Planck polarization data, and far-infrared dust emission maps. The plane-of-sky magnetic field structure was traced using R-band stellar polarization measurements together with Planck 353 GHz dust polarization observations. The optical and submillimeter data reveal a coherent large-scale magnetic field orientation across the cloud, whereas localized deviations in the optical polarization vectors indicate small-scale perturbations within denser regions. A comparison of the magnetic field orientations derived from optical and Planck data suggests that the large-scale field remains ordered, although increased angular dispersion is observed on smaller spatial scales. To investigate the cloud's physical conditions, we performed modified blackbody spectral energy distribution fitting using Planck 353, 545, and 857 GHz data together with IRIS 100 μm observations. The resulting dust temperature and column density maps were used to characterise the cloud structure and estimate its volume density. Using the modified Davis–Chandrasekhar–Fermi method, we derived the plane-of-sky magnetic field strength from the observed polarization angle dispersion and molecular gas velocity dispersion.

सोमवार Monday 21, सितम्बर September 2026

Venue: प्रेक्षागृह Auditorium

Time: 2:30 PM

सभी का स्वागत है All are welcome.