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स्नातक अध्ययन मंडल **Board of Graduate Studies**

IIA - CU - PhD (Tech) Public Ph.D viva-voce examination

Speaker: Ramya M Anche

Title: DETERMINATION OF POLARIMETRIC CAPABILITIES OF ASTRONOMICAL TELESCOPES

सार Abstract

Polarimetric observations of celestial objects reveal information regarding the magnetic field, scattered dust, and planetary atmosphere. A potential problem in carrying out polarimetry in astronomy is the polarization introduced by the telescope and instrument optics to the incoming light. Hence, it is necessary to estimate the polarization effects for any telescope before the design of a polarimeter.

We have developed a polarization model to estimate the polarization effects from the telescope optics of one of the next-generation large telescopes, the Thirty Meter Telescope (TMT). Analysis has been carried out to study the effects of the segments of the primary mirror of TMT and to understand their impact on instrumental polarization and crosstalk. Polarization aberrations due to telescope optics have been estimated for the adaptive optics system to ascertain their effect on the final PSF of the telescope. This is useful in the design of second-generation instruments for TMT with high contrast and high spatial resolution capabilities. We also propose a design technique for the mitigation of the polarization effects due to the telescope optics in future polarimetric instruments.

The polarization ray tracing algorithm, which was used to develop the polarization model for TMT, was also used to develop a polarization model for the Multi-Application Solar Telescope (MAST). The results of the analytical model were verified experimentally to understand the deviations between the model and the observations. A reasonably good match is seen between the model and the observed Mueller matrix elements.

Finally, for an understanding of the science requirements, we have studied the polarimetric properties of a few nova systems as a case study. The studies were conducted using linear polarization data obtained with imaging and photopolarimeters available on the existing 1-2 m class telescopes.

सोमवार Monday, 13 जनवरी January 2020

Venue: प्रेक्षागृह Auditorium

Time: 11:00 AM

सभी का स्वागत है All are welcome.