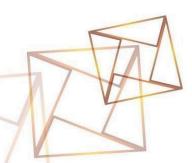
TATA INSTITUTE OF FUNDAMENTAL RESEARCH



## **ICTS Astrophysics & Relativity Seminar**

Title : Energy Extraction from the Black Hole by a Highly Magnetized Thin Disk: Insights from 3D

**GRMHD Simulations** 

**Speaker**: Prasun Dhang (University of Colorado Boulder, USA)

Date: Tuesday, 08 October 2024

**Time** : 3:00 PM (IST)

Abstract: The presence of a strong, large-scale magnetic field in an accretion flow leads to the

extraction of the rotational energy of the black hole through the Blandford-Znajek (BZ) process, believed to power relativistic jets in various astrophysical sources. I will present the results of 3D GRMHD simulations of a highly magnetized cold thin disk surrounding a black hole, exploring the extraction of its rotational energy through the BZ process. Our findings reveal a weaker dependence of magnetic flux on black hole spin in a thin cold disk compared to hot accretion flows, and a significant fraction of extracted energy is potentially channelled into winds or disk radiation rather than the jet. I will highlight the implications of our results for understanding X-ray corona formation, black hole spin measurements, and interpreting transient phenomena, and discuss how strong magnetic fields enhance disk radiative

efficiency.

**Venue**: Feynman Lecture Hall

Zoom Link: https://icts-res-in.zoom.us/i/99848005139?pwd=G40UCzEXeccJicDJbpujvEkS7KmOa4.1

Meeting ID: 998 4800 5139

Passcode: 202030