



**S N BOSE NATIONAL CENTRE  
FOR BASIC SCIENCES**

*Block JD, Sector III, Salt Lake, Kolkata 700 106*

# **DEPARTMENTAL SEMINAR**

# **Astrophysics and Cosmology**

**21<sup>st</sup> July, 2022**

**4.00 pm**

**ONLINE**

## **SPEAKER**

**Prof. Banibrata Mukhopadhyay,  
Professor, Department of Physics, Indian Institute of Science,  
Bangalore**

## **TITLE OF THE TALK**

**MAGNETICALLY DOMINATED ACCRETION FLOWS TO  
PROBE BLACK HOLE PROPERTIES**

## **ABSTRACT**

An optically thin accretion disk with advection in the hard state seems to be corroborated with the jet formation around a black hole. However, most plausibly, a powerful jet is triggered by the presence of strong magnetic fields in the disk around a rotating black hole, even though launching mechanism may be involved with nonmagnetic processes. Observationally also, disk and jet luminosities are correlated. Therefore, to understand jet physics, the underlying accretion disk has to be understood properly in the first place. We explore how large scale strong magnetic field helps in transporting angular momentum, over alpha-viscosity based transport, depending on the field geometry. Interestingly, while above a critical accretion rate the accretion disk turns out to be thermally unstable, in the presence of strong magnetic fields the disk regains its stability.

This increases the upper limit of accretion rate in optically thin flows, which has far reaching implications including explanation of powerful accreting sources and inferring the properties of the underlying black hole including that in ultra-luminous X-ray sources.

## **HOST FACULTY**

**Dr. Ramkrishna Das**

**Associate Professor & Seminar Coordinator, Astrophysics & Cosmology**

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