



# भारतीय खगोलभौतिकी संस्थान Indian Institute of Astrophysics

## IIA Colloquium

11:30 a.m., Wednesday, 21 January 2026

IIA Auditorium

### Multi-messenger Signatures in Strong Gravity Regimes

**Prof. S. Shankaranarayanan**  
Indian Institute of Technology, Bombay



Opening a new wavelength window on the electromagnetic spectrum has always resulted in novel discoveries. While Gravitational wave astrophysics is in its infancy, gravitational waves in the audio frequency range have uncovered many new astrophysical phenomena, sparking intriguing inquiries. Naturally, the question arises: can gravitational waves at different frequencies offer distinct insights into the cosmos? The talk will discuss two physical processes that result from the interaction of electromagnetic fields in the strong gravity backgrounds. In the first process, the strong magnetic fields of the neutron star convert incoming gravitational waves to electromagnetic waves, which can explain the origin of non-repeating fast radio bursts. In the second process, a black hole's gravitational field transforms electromagnetic pulse from a energetic electromagnetic source. This can potentially identify solitary stellar mass black holes in the Milky Way galaxy. Thus, the dynamics of the strong gravity regime near compact objects can provide a unique perspective of the high-energy phenomena that are relatively unexplored.

High Tea at auditorium lounge at 11:00 a.m.

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