INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE

2A & 2B, Raja S. C. Mullick Road, Jadavpur, Kolkata-700 032

School of Physical Sciences

SEMINAR NOTICE

Title : **Prospects for determining the nature of the secondaries of extreme mass-ratio inspirals using the spin-induced quadrupole deformation.**

Speaker : **Dr. Mostafizur Rahman, Indian Institute of Technology, Gandhinagar**

Date : **August 11, 2022 (Thursday)**

Time : **15:00 hours (IST)**

Venue : **Physics Seminar Room (C-406), 3rd Floor, Centenary Building, IACS**

Abstract:

Extreme mass-ratio inspirals (EMRIs) are among the most promising sources for future space-based gravitational wave detector LISA. Over the long inspiral period, the EMRI emits gravitational waves that carry very accurate information about the physical parameters of the system. In this talk, I will discuss the gravitational wave radiation from an EMRI system consisting of a supermassive Kerr black hole (the primary object) and a spinning stellar-mass compact object (the secondary object). The quadrupolar deformation induced by the spin of the secondary is different for different astrophysical objects. We compute the effect of the quadrupolar deformation on the GW phase. Using Fisher-Information analysis, we show that LISA can probe the imprints of quadrupolar deformation on the GW phase for certain astrophysical objects and allows us to identify them.

All are cordially invited to attend the seminar.