S N BOSE NATIONAL CENTRE
FOR BASIC SCIENCES
Block JD, Sector III, Salt Lake, Kolkata 700 106

DEPARTMENTAL SEMINAR

Department of Astrophysics and High Energy Physics

20th June,2024 **4.00 PM** **FERMION / ONLINE**

SPEAKER

Dr. Shreya Banerjee,
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TITLE OF THE TALK

Primordial black holes and induced gravitational waves in non-singular matter bouncing cosmology

ABSTRACT

In this talk, we present a novel model-independent generic mechanism for primordial black hole formation within the context of non-singular matter bouncing cosmology. In particular, considering a short duration transition from the matter contracting phase to the Hot Big Bang expanding Universe, we find naturally enhanced curvature perturbations on very small scales which can collapse and form primordial black holes. Interestingly, the primordial black hole masses that we find can lie within the observationally unconstrained asteroid-mass window, potentially explaining the totality of dark matter. Remarkably, the enhanced curvature perturbations, collapsing to primordial black holes, can induce as well a stochastic gravitational-wave background, being potentially detectable by future experiments, in particular by SKA, PTAs, LISA and ET, hence serving as a new portal to probe the potential bouncing nature of the initial conditions prevailed in the early Universe.

HOST FACULTY

Prof. Archan S Majumdar
Dept. of ASTROPHYSICS AND HIGH ENERGY PHYSICS

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