



**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

21st March, 2024

4. 00 PM

FERMION / ONLINE

SPEAKER

Dr. Aritra Ghosh,
Prime Minister's Research Fellow,
School of Basic Sciences,
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TITLE OF THE TALK

Contact Geometry and Thermodynamics

ABSTRACT

In this talk, I will discuss some aspects of contact geometry, with particular emphasis on thermodynamics. I will begin with a short introduction to contact geometry, briefly pointing out its relevance to dissipative mechanics. Thermodynamic phase spaces assume the structure of a contact manifold, with the points describing equilibrium states being restricted to certain submanifolds of this phase space. I will discuss gauge transformations and Legendre transforms, and shall also describe thermodynamic processes using contact Hamiltonian dynamics and the contact Hamilton-Jacobi equation, both of which are compatible with each other. Following this, I will describe the emergence of interacting thermodynamic systems from non-interacting ones via deformations induced by contact Hamiltonian vector fields. I will end with some discussion on the notion of metric structures (in the sense of Sasaki), putting emphasis on Hessian metrics and ensemble non-equivalence

HOST FACULTY

Prof. Amitabha Lahiri

Dept. of ASTROPHYSICS AND HIGH ENERGY PHYSICS
