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

DEPARTMENTAL SEMINAR

Physics of Complex Systems

31st March,2023 **3.00 PM** **ONLINE / FERMION**

SPEAKER

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TITLE OF THE TALK

Dynamic density functional theory for a Brownian fluid

ABSTRACT

We discuss the model of a Brownian fluid in terms of coarse-grained density function using stochastic and deterministic equations of hydrodynamics. These equations study the behaviour of a system of passive particles and the active matter of self-propelled particles in other situations. The collective density is used in a reduced description of the dynamics, primarily formulated starting from a set of collective modes of the system. We discuss how starting from a set of microscopic balance equations for the collective modes, the coarse-grained description with smooth spatiotemporal dependencies is obtained. We demonstrate that the appearance of the self-propelling terms and the breaking of Galilean invariances in the equations for the active-matter hydrodynamics are linked to the equations of motion of the individual particles.

HOST FACULTY

Prof. Punyabrata Pradhan, Professor
DEPT. OF PHYSICS OF COMPLEX SYSTEMS

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