



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

DEPARTMENTAL SEMINAR

Physics of Complex Systems

16th August, 2023

3.00 PM

ONLINE / FERMION

SPEAKER



**Dr. Ion Santra, Research Associate,
Theoretical Physics, RRI, Bangalore**

TITLE OF THE TALK

Activity driven energy transport

ABSTRACT

Energy transport in low-dimensional systems connected to thermal reservoirs has been a topic of great interest in the statistical physics community. Of late, 'active particles', which have their own energy depot, have emerged as paradigmatic examples of reservoirs out of equilibrium. How are the transport properties of an extended system modified when driven by such 'active reservoirs'? In this talk, I will present some of our recent works which are an attempt to begin answering this question. First, I will discuss a simple way of modeling an active reservoir and then and then talk about the energy current flowing through an ordered harmonic chain coupled to two different active reservoirs at the two ends. I will show that the stationary state is characterized by a non-vanishing energy current which has some interesting non-trivial properties, like a negative differential conductivity and an additional current reversal. I will also discuss some universal and specific properties of the activity driven stationary state, with respect to the microscopic dynamics of the constituents of the active reservoirs.

HOST FACULTY

**Dr. Urna Basu, Assistant Professor
DEPT. OF PHYSICS OF COMPLEX SYSTEMS**
