



**S N BOSE NATIONAL CENTRE
FOR BASIC SCIENCES**

Block JD, Sector III, Salt Lake, Kolkata 700 106

DEPARTMENTAL SEMINAR **Theoretical Sciences**

08th December'2021

3.00PM

ONLINE

SPEAKER

Dr. Tanay Nag
Postdoc, RWTH Aachen University, Germany

TITLE OF THE TALK

**Systematic generation of dynamical higher-order topological insulator
and superconductor phases in three dimensions**

ABSTRACT

In the recent times, the higher-order topological (HOT) phases, harboring boundary modes of lower dimension than their usual ones, have been proposed with unconventional bulk-boundary correspondence. We have come up with a general framework to construct the HOT insulator and superconductor (with s-wave superconductivity) phases, preserving unitary chiral and anti-unitary particle hole symmetries, with appropriate Wilson-Dirac masses. We periodically kick these mass terms to generate the ladder of HOT phases that are only protected by the anti-unitary particle-hole symmetry while the static system remains in the lower-order topological or trivial phase. We characterize these static and dynamic HOT phases with suitable topological invariants namely, quadrupolar moment, octupolar moment, and Wannier spectra. At the end, we connect it to the recent experimental findings to highlight the relevance of this field.

HOST FACULTY

Prof. Punyabrata Pradhan and Dr. Sunandan Gangopadhyay

DEPT. OF THEORETICAL SCIENCES
