



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

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

DEPARTMENTAL SEMINAR

Condensed Matter and Materials Physics

27th April, 2023

11.00 AM

ONLINE/ FERMION

SPEAKER

Dr. Dhiman Bhowmick,
Postdoc at Nanyang Technological University,
Singapore

TITLE OF THE TALK

**DISCRETE TIME CRYSTAL MADE OF TOPOLOGICAL EDGE MAGNONS
IN KAGOME FERROMAGNET**

ABSTRACT

We report the emergence of time-crystalline behavior in the π -Berry phase protected edge states of a Heisenberg ferromagnet on the Kagome lattice in the presence of an external driving field. The magnon amplification due to the external field spontaneously breaks the discrete time translational symmetry, resulting in a discrete time crystal with a period that is twice that of the applied EM field. We discuss the nature of the time crystalline edge states and their stability against various perturbations that are expected in real quantum magnets. We propose an experimental signature to unambiguously detect the time crystalline behavior and identify two recently discovered quasi-2D magnets as potential hosts. We present a first-of-its-kind realization of time crystals at topological edge states, which can be generalized and extrapolated to other bosonic quasi-particle systems that exhibit parametric pumping and topological edge states.

HOST FACULTY

Prof. Tanusri Saha Dasgupta, Senior Professor
