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

DEPARTMENTAL SEMINAR

Physics of Complex Systems

01st May,2023 **12.00 noon** **ONLINE / FERMION**

SPEAKER

Dr. Himadri Shekhar Dhar,
Assistant Professor, IIT Bombay

TITLE OF THE TALK

Transfer and protection of quantum information in hybrid systems

ABSTRACT

Hybrid quantum systems based on spin ensembles with a comb-shaped spectrum have shown exciting properties as efficient quantum memories. In this talk, we present a theoretical study of such atomic frequency combs in the strong coupling limit, using tensor-network methods. Our results demonstrate that arbitrary multi-photon states inside the cavity are almost perfectly transferred to the spin ensemble and re-emitted at periodic time intervals, with fidelity values near unity. Moreover, for a general, inhomogeneous spin ensemble, quantum information stored can still be protected from errors by using parametric, external driving.

HOST FACULTY

Dr. Manik Banik, Associate Professor
DEPT. OF PHYSICS OF COMPLEX SYSTEMS

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