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ICTS Mathematics Seminar

Title : Supergeometric stochastic systems and SIC POVMs

Speaker : Subhobrata Chatterjee (Department of Mathematics, UC Davis.)

Date : Monday, 24 August 2026

Time : 03:30 PM (IST)

Abstract : We propose a supergeometric model [1] describing measurements and dynamics of physical systems with both continuous and discrete degrees of freedom. The model treats time on the same footing as other physical degrees of freedom. Our geometric data is not only quite minimal viz. a supersymplectic manifold with odd dimensional body, but canonically incorporates dynamics. A measurement theory must come with a notion of states, observables and expectations. Our states are quantum mechanical, observable are functions on the supersymplectic manifold and expectation values are given by a fiberwise Hodge pairing. We also study non-trivial statistics of superobservables [2] using a distinguished set of non-homogeneous superfunctions labelled by the atoms of a free Boolean algebra.

SIC POVMs are a maximally symmetric class of positive operator-valued measures that are central objects in quantum information theory and quantum tomography. Zauner conjectured [3] they exist for every finite dimensional complex Hilbert space. Despite their simple definition, they are notoriously hard to study analytically. We will present some preliminary ideas on how supermeasurement theory serves as a potentially powerful tool to study SICs.

Venue : Emmy Noether Seminar Room

ZoomMeeting: <https://icts-res-in.zoom.us/j/97778794499?pwd=nVDhjCGHtaZFEMVPMnEs7ul2kkuSMM.1>

Meeting ID: 977 7879 4499

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