ICTS Seminar

Title   : Symmetries as Algebras: From Novel Symmetries to Hydrodynamics in Quantum Many-Body Systems

Speaker : Sanjay Moudgalya (Technical University of Munich, Germany)

Date   : Wednesday, 12 February 2025

Time   : 11:30 AM (IST)

Abstract : The study of symmetry plays a fundamental role in many areas of physics. Traditionally, most symmetries considered in the literature are on-site unitary symmetries with well-defined group structures. However, recent discoveries — such as dynamical phenomena known as weak ergodicity breaking in quantum many-body systems, and novel phases of matter obtained from generalized symmetries in quantum field theories — have called for a redefinition of symmetry. In this talk, I will introduce a general framework for understanding symmetries through commutant algebras, illustrate the novel symmetries that emerge from this approach, and explore their connections to weak ergodicity breaking and generalized symmetries. I will also demonstrate how this perspective naturally leads to a definition of hydrodynamic modes associated with the symmetries, which govern the late-time dynamics of correlation functions and entanglement. Overall, this framework provides a powerful mathematical tool for analyzing symmetries and their associated physical phenomena.

Venue   : Madhava Lecture Hall
Zoom Link: https://icts-res-in.zoom.us/j/97611276085?pwd=4fH1WZvvJtFpFym4cEx1uPQwvpD5mu.1
Meeting ID: 976 1127 6085
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