INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE
2A & 2B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

Org. by

School of Physical Sciences

Title:	**Percolation in Fock space and many-body localisation**
Speaker:	**David Logan, Oxford University and I.I.Sc., Bangalore**
Date:	**April 15, 2019 (Monday)**
Time:	**4:00 p.m.**
Venue:	**Physics Seminar Room - C406,3rd Floor, Centenary Building, IACS**
Abstract:	Classical percolation models in Fock space are constructed and studied, as proxies for the quantum many-body localisation transition. Percolation rules are defined for two models of disordered quantum spin-chains, using their microscopic quantum Hamiltonians and the topologies of the associated Fock-space graphs. The existence of the percolation transition, and its critical properties, are deduced in several ways: exact solution for the critical disorder and correlation length exponent, systematic numerical study of the statistics and scaling of Fock-space clusters, and physical arguments based on freezing of local real-space segments of spins. Local observables averaged over Fock-space clusters are also shown to carry signatures of the transition, with their behaviour in direct analogy to that of corresponding eigenstate expectation values across the MBL transition. Fock-space clusters can likewise be explored under a mapping to kinetically constrained models; dynamics within this framework also show the ergodicity-breaking transition, and permit access to system sizes some two orders of magnitude larger than those possible for exact enumeration.

All are cordially invited to attend the seminar