

MONDAY

# COLLOQUIUM

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## Clustering and Correlations from fluctuating Environments and Interactions

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15 Apr 2025 (Tuesday) | 16:00 Hrs (Tea / Coffee 15:45 Hrs) | Venue: TIFRH Auditorium

Shared histories lead to strong correlations. Thus, particles which find themselves in the same randomly evolving environment have a tendency to cluster and approach an interesting state.

This talk is about such states, their scaling properties, and how they develop in time. A key signature is that the scaled correlation function is singular at small argument, with either a cusp or a divergence, pointing to giant fluctuations.

Such fluctuation-dominated states lie between ordered and disordered states, yet differ in an essential way from customary critical states. They also arise in an equilibrium Ising model with long-range interactions, where some of their properties can be characterised analytically. Possible manifestations in the context of biology (clustering of membrane components on cell surfaces) and granular media (vibrated rods) will also be discussed.