Theoretical Statistics and Mathematics Unit
Indian Statistical Institute
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SEMINAR

Date: November 30, 2026
Time: 04:00 PM

VENUE:
L-1, 3rd Floor, A.N. Kolmogorov Bhavan, ISI Kolkata

SPEAKER:
Bodhisatta Das
Stat-Math Unit, ISI Kolkata

TITLE:
Structural Transitions from Short- to Long-Range Dependence

Stat-Math Unit, ISI Kolkata

ABSTRACT:

We investigate how the dependence structure of a random system influences its macroscopic behaviour, with particular emphasis on the temporal clustering of rare events. For instance, we may ask how frequently large cumulative excess returns occur or whether the losses incurred by an insurance company exhibit any noticeable temporal patterns. We classify dependence structures into three categories: short memory, long positive memory, and negative memory. We study the clustering behaviour of rare events arising from various moving-average processes and explore how these distinct dependence structures shape the system's macroscopic properties. Moving beyond discrete-time linear processes, we extend our analysis to Lévy-driven continuous-time moving-average processes. We also uncover a related phase transition in random matrix theory. By introducing dependence among the entries of a Gaussian random matrix, we identify an unusual scaling in the fluctuation of extreme eigenvalues under long-range dependence.

ALL ARE CORDIALLY INVITED

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