Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Seminar

First-Passage Processes: Martingales and the Defect Technique

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First-passage time, the moment a process first satisfies a condition (e.g., reaching a specific spatial point for the first time), is a fundamental concept in stochastic dynamics. In this seminar, we explore recent tools for analysing first-passage statistics in both continuous and discrete space-time. In the continuous space-time setting, we show how Martingales can be employed with remarkable efficiency in obtaining first-passage statistics. On the other hand, we use Montroll's defect technique to tackle the problem in discrete space-time. Using these approaches, we analyse first-passage problems in various Markovian and non-Markovian processes, including biased diffusion and run-and-tumble walks with applications in movement ecology and a quantum measurement engine.

Tuesday, Feb 4th 2025

16:00 Hrs (Tea / Coffee 15:45 Hrs)

Auditorium, TIFRH