BANGALORE SCHOOL ON STATISTICAL PHYSICS - XIV (2023)

Course 4: Stochastic Resetting
Lecturer: Arnab Pal, IMSc, Chennai

Outline: These lectures aim at introducing the concept of resetting, starting from the fundamentals. The objective is to teach theoretical tools, derive the key results and then show how they can be applied in practice.

Content:

Lecture 1: Preliminaries on diffusion, Fokker-Planck equation, and Poisson process. Introduction to resetting; diffusion with resetting; methods; steady state and transient properties

Lecture 2: First passage properties of diffusion under resetting

Lecture 3: Why and when resetting works? Theory of optimal resetting rate and connection to the "Inspection Paradox"

Lecture 4: Application I – Home range search and lessons gathered from experiments on resetting

Lecture 5: Application II – Chemical kinetics and Queues

Tutorial: Observable statistics under resetting and other results if time permits.