Speaker: Abhishek Pal Majumder (University of Reading)

Date: 22/10/2024 at 13:15 in 1 West 3.107

Title: Long-time behaviour of some semi-Markov modulated diffusions

Abstract:
Regime-switching processes have proved to be indispensable in the modeling of various phenomena in econometrics and physical science, allowing model parameters that traditionally were considered to be constant to fluctuate in a stochastic manner in line with empirical findings. We study diffusion processes of the Ornstein-Uhlenbeck type where the drift and the diffusion coefficients are functions of an underlying semi-Markov process that admits a limiting distribution on a countable state space with some regularity conditions. Exact long-time behavior of the original process is determined for the three cases corresponding to the expected drift strictly greater, equal, or strictly less than zero, respectively. The time asymptotic behaviors are naturally expressed in terms of the solutions to the well-studied distributional fixed-point equation $X = AX + B$ in law, where X is independent of (A, B).