

Departmental Colloquium

Hitting questions for stochastic processes and stochastic PDE

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Abstract: Hitting questions play a central role in the theory of stochastic processes. For example, we could consider our wealth as a random process and think of “striking it rich” as an example of this random process hitting the set of rich values. Here is a purely mathematical example. It is well known that Brownian motion hits points in one dimension, but not in higher dimensions. For a general Markov process, we can determine whether the process hits a given set in terms of potential theory. There has also been a huge amount of work on the related question of when a process has multiple points. For stochastic partial differential equations (SPDE), much less is known, but there has been a growing number of papers on the topic in recent years. Potential theory provides an answer in principle. But unfortunately, solutions to SPDE are infinite dimensional processes, and the potential theory is intractable. As usual, the critical case is the most difficult. We will give a brief survey of known results, followed by a discussion of an ongoing project with R. Dalang, Y. Xiao, and S. Tindel which promises to answer questions about hitting points and the existence of multiple points in the critical case.

Friday, September 30 at 3:00 PM in SEO 636