Speaker: Daniel Jerison  
Department of Mathematics,  
Stanford University

Title: Regeneration times for reversible Markov chains

Abstract:
A regeneration time for a Markov chain is a random time at which the chain “starts anew” from a specified distribution. The definition was introduced by Nummelin to prove convergence results for discrete time chains on general state spaces using the techniques of renewal theory. More recently, regeneration times have proved useful in implementing Markov chain Monte Carlo sampling schemes.

A nearly periodic Markov chain can regenerate fairly often while converging to its stationary distribution very slowly. In this talk, I will show that if the chain is reversible with nonnegative eigenvalues, it must converge to stationarity on the same time scale as its regeneration time. Using the method of drift and minorization, I will explore the implications of this result for chains used in MCMC as well as different types of finite chains.