THE UNIVERSITY OF CHICAGO

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STATISTICS COLLOQUIUM

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STOCHASTIC PROCESSES FOR POINT PATTERN DATA

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ABSTRACT

Point pattern data are ubiquitous in the natural and social sciences, with applications in fields like neuroscience, ecology, genetics, social networks and economics. The simplest model of such data is the Poisson process, with more complicated extensions including renewal processes, Matern repulsive processes and Hawkes processes. The Poisson process also underlies function and measure-valued stochastic processes like Markov jump processes (used in stochastic chemical kinetics, for instance), and completely random measures or Levy processes (used in Bayesian nonparametrics). In this talk, I will show how the latter connection allows the development of flexible models as well as efficient (and exact) Markov chain Monte Carlo algorithms. The resulting models and algorithms have wide applicability; I will consider problems from neuroscience, genetics and biometrics.

For further information and inquiries about building access for persons with disabilities, please contact Kirsten Wellman at 773.702.8333 or send her an email at kwellman@galton.uchicago.edu. If you wish to subscribe to our email list, please visit the following website: https://lists.uchicago.edu/web/arc/statseminars.