$S_t \circ c(h)(a_s)_{ti} c(s) + \mathfrak{S}_e m^i n(a_r)$

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Invasions and Attractiveness

Joe Stover
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Time and Place: Monday April 7, 2008; 3:30–4:30 p.m.; LCB 219

Biological invasions are increasingly coming under the public radar. If an invasion is occurring, should we be concerned at all, and why? Mathematical modeling is one tool to help us understand this phenomenon. The contact process is the basic building block for interacting particle system models used to study invasions. An interacting particle system is a Markov Process whose state space is collections of particles distributed on an integer lattice. The states change according to stochastic transition rates. If we know our process is monotone and has a unique stationary distribution, then we can use the Propp-Wilson Algorithm to sample exactly from it. The property of monotonicity is not easy to define specifically for more complicated particle models. But if we can build a model and prove that it is monotone, then we can look at the stationary behavior using PW. In this talk, I will outline the path that led me to a general theory of monotonicity for a certain class of interacting particle systems and talk about a new invasion model that falls within this theoretical framework.