

Applied Dynamical Systems Seminar

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**Monday, October 1, 2012
12:00p.m., HH-3017**

Principal Eigenvalues and Basic Reproduction Numbers for Reaction-Diffusion Models

Abstract:

In this talk, I will report our recent research on the basic reproduction number for reaction-diffusion epidemic models with compartmental structure, and its characterization in terms of the principal eigenvalue of an elliptic eigenvalue problem. Due to the lack of diffusion terms in some equations, the solution maps are not compact. This motivated us to study the existence of the principal eigenvalue for the eigenvalue problem associated with such a linear system of parabolic type, which is different from the standard application of the celebrated Krein-Rutman theorem. Our developed theory also applies to non-epidemic spatial population models under appropriate assumptions. As an illustrative example, we analyse the influence of spatial heterogeneity on disease spread for the rabies model. This talk is based on my joint work with Wendi Wang.