Applied Dynamical Systems Seminar

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Tuesday, February 21, 2017
1:00p.m., HH-3017

The Principal Eigenvalue for Degenerate Periodic Reaction-Diffusion Systems

Abstract:

In this talk, I will report our recent research on the theory of the principal eigenvalue for an eigenvalue problem associated with a linear time-periodic parabolic cooperative system with some zero diffusion coefficients. We use a generalized Krein-Rutman theorem to overcome the main difficulty induced by the lack of compactness for the solution maps. We first review the Krein-Rutman theorem and Nussbaum's generalization and then present the main results. The developed theory is also applied to a benthic-drift model for a stream population to obtain a threshold type result on its global dynamics in terms of the basic reproduction ratio. This talk is based on a joint work with Drs. Xing Liang and Xiaoqiang Zhao.