Applied Dynamical Systems Seminar

Ms. Ruiwen Wu,
Memorial University

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12-1pm, HH-3017

Dynamics of a Predator-Prey System with a Mate-finding Allee Effect

Abstract:

We consider a ratio-dependent predator-prey system with a mate-finding Allee effect on prey. The stability properties of the equilibria and a complete bifurcation analysis, including the existence of saddle-node, Hopf and Bogdanov-Takens bifurcations, have been proved analytically and numerically. The blow-up method has been applied to investigate the structure of a neighborhood of the origin. Our mathematical results show that the mate-finding Allee effect can reduce the complexity of system behaviors and it can be a destabilizing force as well, which implies that both prey and predator may become extinct. This talk is based on a joint work with Dr. Xiuxiang Liu.