

APPLIED MATHEMATICS COLLOQUIUM

Date: Friday April 14, 2017

Time: 2:30 – 3:30 pm

Location: MC Room 204

Stationary Dirac concentrations in an integro-PDE arising from evolution of dispersal

Professor King-Yeung Lam

Department of Mathematics
Ohio State University

Abstract: We consider an integro-PDE model for a population structured by the spatial variables and a trait variable affecting the dispersal coefficients. Competition for resource is local in spatial variables, but nonlocal in the trait variable. We focus on the asymptotic profile of positive steady state solutions. Our result shows that in the limit of small mutation rate, the solution remains regular in the spatial variables and yet concentrates in the trait variable and forms Dirac concentrations (i) at one boundary point; (ii) the interior; or (iii) at both boundary points. In particular, evolutionary branching is found in spatially heterogeneous but temporally constant environment. Other connections to notions and concepts in evolutionary game theory will also be discussed. This is joint work with Wenrui Hao (MBI) and Yuan Lou (Ohio State).