

DEPARTMENT OF MATHEMATICS & STATISTICS



UNIVERSITY
OF WYOMING

Thursday

November 7, 2019

4:10 - 5:00 pm AG 1030

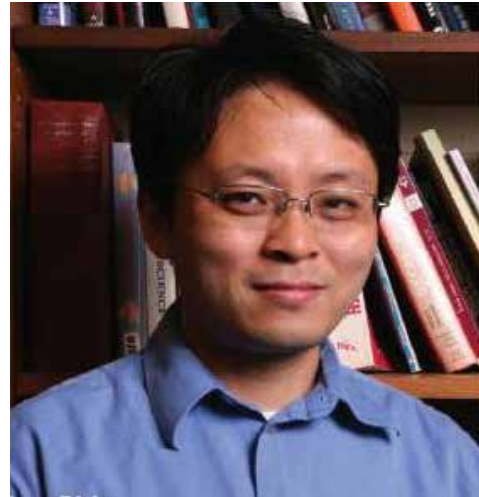
Reception before the talk:

RH 261 at 3:30 pm

Junping Shi

Professor of Mathematics

William & Mary University



Effect of Nonlocal Interaction on the Spatial-temporal Pattern Formation of Reaction-diffusion Systems

Abstract:

In reaction-diffusion models describing biological and chemical interactions, some dispersal and interaction can be of nonlocal nature. First we show that in some models from cellular biology or ecology depending on the spatial average of density functions instead of local density functions, such nonlocal spatial average can induce instability of constant steady state, which is different from classical Turing instability. In particular, for systems of two equations containing spatial averages, spatially non-homogeneous time-periodic orbits could occur through bifurcations from the constant steady state. Examples from a nonlocal predator-prey model, a pollen tube tip model and a marsh grass model will be used to demonstrate such pattern formation.

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