

Applied Dynamical Systems Seminar

Dr. Juan Zhang
Shanxi University, China

Wednesday, November 16, 2016
2:00p.m., HH-3017

*Analysis of H7N9 avian flu
transmission via the dynamical systems approach*

Abstract:

The dynamical systems approach is an effective way to explore the transmission mechanism of infectious diseases, predict their future development and assess the prevention and control measures. For example, this approach has been used to determine the original infection source of H7N9, a newly emerging virus in China. Although H7N9 has not aroused massive outbreaks, recurrence in every winter makes it essential to control the spread. It is believed that the most effective control measure is to locate the original infection source and cut off the source of infection from human. However, the original infection source and the internal transmission mechanism of the new virus are not totally clear. In order to determine the original infection source of H7N9, we establish an ODE model with migratory bird, resident bird, domestic poultry and human population, and view migratory bird, resident bird, domestic poultry as original infection source respectively to fit the true dynamics during the 2013 pandemic. By comparing the date fitting results and corresponding Akaike Information Criterion (AIC) values, we conclude that migrant birds are most likely the original infection source. In a future work, we will develop a PDE model to investigate the behavior of migratory birds and the spatial transmission of disease with the migration of birds.