Colloquium

University of Texas at Arlington- Mathematics Department

Proudly presents

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PROFESSOR

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Texas Tech University

Friday, November 13, 2009

3:00pm

304 Pickard Hall

"Modeling a Zoonotic Disease: Multiple Hosts, Spatial Heterogeneity and Seasonal Variation"

Abstract:

Approximately sixty percent of human pathogens are zoonotic (of animal origin). Understanding the dynamics of the disease in the animal reservoir is necessary for prevention of human infection and for disease control in the reservoir population. In this investigation, we concentrate on hantaviruses. These are rodent-borne zoonotic agents that cause hemorrhagic fever with renal syndrome in Europe and Asia and hantavirus pulmonary syndrome in the Americas. We formulate several models, systems of differential equations and continuous time Markov chain models, for spread of hantavirus among rodent populations. The models include multiple hosts, spatially heterogeneous landscapes and seasonal variation. Through model analyses, calculation of the basic reproduction number, and numerical simulations, we gain a better understanding of (1) the contributions of multiple hosts to maintenance of the pathogen in the wild, (2) the evolution of new hantavirus strains and (3) how seasonal variation coupled with rodent outbreaks increase the likelihood of human exposure to the virus.

Refreshments served before the talk and socializing will follow after

http://www.uta.edu/math/pages/main/seminar.htm