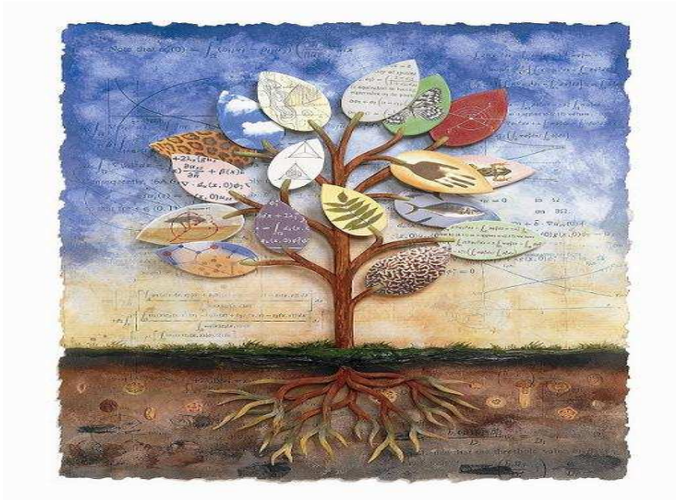

University of Miami
Institute for Theoretical and Mathematical Ecology
in cooperation with the
Department of Mathematics
College of Arts and Sciences

Colloquium

Professor Chris Brooks

Mississippi State University

will present

"Using Network Models to Predict Disease Dynamics"

Friday, January 30, 2009
4:30- 5:30 pm, Ungar Bldg. rm 402

Refreshments served at 4:00 p.m. in CC 521

Abstract

One of the most difficult challenges in controlling the spread of infectious diseases is understanding which hosts in the population are responsible for the greatest number of new infections. The classic example is "Typhoid Mary" Mallon who, as a housekeeper and cook in New York, caused almost 50 cases of Typhoid Fever in the early 20th century. Understanding the contribution of these individuals can be critically important to developing effective control of infectious disease outbreaks. In the past decade or so theoreticians have begun to use network models to account for this kind of host-to-host variation when predicting the rates and routes of disease spread. I will discuss approaches to fitting network models to spatial data and present an analysis of pathogen transmission data from my own work on anther smut transmission among a population of fire pink (Silene virginica). These models provide accurate prediction of the dynamics of infection 1-2 years in advance and may be useful in understanding the role of spatiotemporal variation on the persistence of many host-pathogen systems.