



2007 - 2008



**MATHEMATICS COLLOQUIUM SERIES
UNIVERSITY OF CENTRAL FLORIDA**

**Dr. Andrew Nevai
Postdoctoral Fellow
Mathematical Biosciences Institute
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will speak on

Spatial Problems in Mathematical Ecology

ABSTRACT: In this talk, I will introduce two spatial problems in theoretical ecology together with their mathematical solutions.

The first part of the talk concerns competition between plants for sunlight. In it, I use a mechanistic Kolmogorov-type competition model to connect plant population vertical leaf profiles (or VLPs) to the asymptotic behavior of the resulting dynamical system. For different VLPs, conditions can be obtained for either competitive exclusion to occur or stable coexistence at one or more equilibrium points.

The second part of the talk concerns the spatial spread of infectious diseases. Here, I use a family of SI-type models to examine the ability of a disease, such as rabies, to invade or persist in a spatially heterogeneous habitat. I will discuss properties of the disease-free equilibrium and the behavior of the endemic equilibrium as the mobility of healthy individuals becomes very small relative to that of infecteds. The family of disease models consists variously of systems of difference equations (which I will emphasize), ODEs, and reaction-diffusion equations.

DATE: Tuesday, January 22, 2008
TIME: 10:30 – 11:30am
PLACE: MAP 318

Refreshments will be served