1116-35-1766 **Jerome Goddard II*** (jgoddard@aum.edu), Department of Mathematics & Computer Science, Auburn University Montgomery, P.O. Box 244023, Montgomery, AL 36124, and **R. Shivaji** (shivaji@uncg.edu). *Modeling the effects of U-shaped density dependent dispersal via reaction diffusion equations.*

Dispersal is broadly defined as movement from one habitat patch to another and typically is considered to encompass three stages: 1) emigration, 2) inter-patch movement, & 3) immigration. Dispersal can have both beneficial and detrimental effects on the persistence of spatially structured systems. Recent empirical results indicate that certain organisms' emigration from a patch is dependent on their own density—known as density dependent emigration. In fact, a U-shaped relationship between density and emigration has been observed in several organisms in field studies. To date, little is known about the patch-level consequences of such a dispersal strategy. In this talk, we will discuss a population model built upon the reaction diffusion framework that is designed to model the patch-level effects of U-shaped density dependent emigration. In particular, we will discuss the existence and stability properties of positive steady state solutions to this model for both one- and two-dimensional habitat patches. A brief discussion regarding ecological conclusions of the model's predictions will also be included. Several methods from nonlinear analysis will be employed such as time map analysis (quadrature method), sub-super solutions, and linearized stability analysis. (Received September 21, 2015)