## 1163-92-550 Nalin Fonseka (fonsekan@carolinau.edu), James T. Cronin (jcronin@lsu.edu) and Jerome Goddard II\* (jgoddard@aum.edu), Department of Mathematics, P.O. Box 244023, Montgomery, AL 36124-4023, and Ratnasingham Shivaji (r\_shivaji@uncg.edu). Can density dependent emigration enhance or even counteract a patch-level Allee effect?

The relationship between conspecific density and the probability of emigrating from a patch can play an essential role in determining the population-dynamic consequences of an Allee effect. In this talk, we will employ a theoretical model based upon the reaction diffusion framework to answer the question: "can density dependent emigration enhance or even counteract a patch-level Allee effect?" The model assumes that a population is diffusing and growing according to a weak Allee effect growth rate inside a focal patch, but the organism's emigration probability is dependent on conspecific density. The habitat patch is one-dimensional and is surrounded by a tuneable hostile matrix. In particular, we consider five different forms of density dependent emigration (DDE) that have been noted in previous empirical studies. Our results are obtained mathematically through the method of sub-super solutions, time map analysis, and numerical computations using Wolfram Mathematica. (Received September 09, 2020)