1139-92-627 **Jim Cronin**, **Jerome Goddard II*** (jgoddard@aum.edu) and **R. Shivaji**. *Effects of patch matrix and individual movement response on population persistence at the patch-level.*

Fragmentation creates landscape-level spatial heterogeneity leading to declines in abundance of a resident species as the fragmented landscape becomes more susceptible to edge effects between the remnant habitat patches and the surrounding lower quality matrix. In this presentation, we formalize the connection between small-scale movement and patch-level predictions of persistence through a reaction-diffusion model. This model incorporates essential information about edge-mediated effects such as patch preference and movement behavior. We mathematically analyze the model's predictions of persistence with a general logistic-type growth term and explore their sensitivity to demographic attributes both in the patch and matrix, as well as patch size. Finally, we illustrate the utility of this framework with a well-studied planthopper species living in a highly fragmented landscape. Using experimentally derived data from various sources to parameterize the model, we show that, qualitatively, the model results are in accord with experimental predictions regarding minimum patch size of the species. Through application of a sensitivity analysis, we also suggest a ranking of the most important model parameters based on which parameter will cause the largest model output variance. (Received February 20, 2018)