1135-65-1033 **Matthew A Beauregard*** (beauregama@sfasu.edu), **Rana Parshad** and **Joshua Padgett**. *A variable nonlinear splitting algorithm for reaction diffusion systems with self and cross-diffusion.*

Self and cross-diffusion are important nonlinear spatial derivative terms that are included into biological models of predator-prey interactions. Self-diffusion models overcrowding effects, while cross-diffusion incorporates the response of one species in light of the concentration of another. In this talk, a new nonlinear operator splitting method is presented that directly incorporates both self and cross-diffusion into a computational efficient design. The numerical analysis guarantees the accuracy and criteria for stability. Numerical experiments display its efficiency in simulating a generalized Shigesada-Kawasaki-Teramoto (SKT) model. (Received September 18, 2017)