1159-60-164 **Si Tang*** (sit218@lehigh.edu), **Rick Durrett**, **Matthew Junge** and **Steven Lalley**.

Phase-transition and critical behavior in the chase-escape Model.

Chase-Escape is a simple stochastic model that describes a predator-prey interaction. In this model, there are two types of particles, red and blue. Red particles colonize adjacent empty sites at an exponential rate λ_R, whereas blue particles take over adjacent red sites at exponential rate λ_B, but can never colonize empty sites directly. Numerical simulations suggest that there is a critical value p_c for the relative growth rate $p := \lambda_R/\lambda_B$. When $p < p_c$, red particles will always go extinct, and when $p > p_c$ mutual survival of both types of particles becomes possible. In particular, $p_c \approx 0.50$ for the square lattice case ($\mathbb{Z}^2$). In this talk, we will discuss the critical behavior near p_c as well as a few special cases where we can prove the existence of such a phase transition and find the precise value of p_c. (Received August 04, 2020)