1146-34-20   **Ting-Hao Hsu*** (`t.hsu@math.miami.edu`), University of Miami, 1365 Memorial Drive, Coral Gables, FL 33146, and **Gail S. K. Wolkowicz** (`wolkowic@mcmaster.ca`), McMaster University, 1280 Main Street West, Hamilton, Ontario L8S 4K1, Canada. *A Criterion for the Existence of Relaxation Oscillations with Applications to Predator-Prey Systems and an Epidemic Model.*

Predator-prey models that possess limit cycles have been studied extensively in the literature. In this talk, we use fast-slow dynamics to study predator-prey systems with small predator death rates, and derive new characteristic functions that determine the location and the stability of relaxation oscillations. This criterion determines the number and the global stability of limit cycles for some planar predator-prey systems. We also extend the criterion to some three-dimensional systems, including chemostat predator-prey systems and an epidemic model. (Received November 19, 2018)