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Susmita Sadhu* (susmita.sadhu@gcsu.edu). *Mixed-mode oscillations as long transient dynamics in a predator-prey model with timescale separation.*

Several ecosystems exhibit long transient behavior and may experience sudden transition to another state under seemingly constant environment. In this talk, I will present a singularly perturbed three-species predator-prey model featuring fast prey dynamics and slow dynamics of the predators, where chaotic transients are observed in a neighborhood of a “singular Hopf” bifurcation as the system approaches a periodic attractor. The transient dynamics consist of complex oscillatory patterns known as mixed mode oscillations (MMOs), featuring concatenation of long epochs of small amplitude oscillations and large amplitude oscillations. The transients could persist for thousands of generations, reflecting that dynamics on an ecological timescale can be completely different than asymptotic dynamics. The goal of this talk is to obtain conditions that will be used to determine whether a trajectory exhibits another cycle of MMO dynamics (leading to a population outbreak) before reaching its asymptotic state. (Received September 16, 2019)