1145-45-1905 **Alan Dyson*** (acd313@lehigh.edu). *Existence of Traveling Fronts and Pulses in Lateral Inhibition Neuronal Networks with Sigmoidal Firing Rate Functions.*

Electrode recordings have revealed the existence of traveling waves (in terms of voltage) that propagate across the mammalian cortex following the presence of certain stimuli. Considering experimental findings and known properties of neurons, a common mathematical, population-level approach to encapsulating such behavior is to coarse grain time and space in the form of neural field models and attempt to study the existence, uniqueness, and stability of such waves.

In this talk, we discuss the role of the implicit function theorem on Banach spaces in proving the existence of traveling fronts when synaptic coupling kernels model nonlocal, lateral inhibition. Our results are inspired by the seminal study of monotone traveling fronts in neural field models (Ermentrout and McLeod, 1993). We also discuss techniques for proving the existence of traveling pulses in singularly perturbed systems using the theory of invariant stable and unstable manifolds in dynamical systems. (Received September 24, 2018)