1065-37-198 **M. Drew LaMar*** (mdlama@wm.edu), Department of Applied Science, The College of William and Mary, 311 McGlothlin-Street Hall, Williamsburg, VA 23187, and **Sarah Day** (sday@math.wm.edu). *Global dynamics of pulse-coupled oscillators.*

Networks of coupled oscillators have been used as models in many biological systems, from neural networks to populations of fireflies. Central questions in this area include under what conditions the oscillators will synchronize as well as what type of asynchronous behavior can be observed. In this talk we explore these questions by considering the global dynamics of three pulse-coupled oscillators over various network topologies. Due to the discontinuous nature of the system, we restrict ourselves to appropriate Poincare maps on restricted domains and then use algebraic topological tools to uncover dynamical structures on these regions. (Received September 13, 2010)