



## The Department of Mathematics

Presents

***Christina Hamlet, Ph.D. (Faculty Candidate)***

Tulane University

**Tuesday, February 16, 2016**

**11:00AM – 12:00PM**

**PB 390**

## **Mathematical and computational modeling of a swimming lamprey with sensory feedback**

### ***Abstract:***

The swimming of a simple vertebrate, the lamprey, can shed light on how a flexible body can couple with a fluid environment to swim rapidly and efficiently. Animals use stretch-receptor information to sense how their bodies are bending (proprioception), and then adjust the neural signals to their muscles to improve performance. We will present recent progress in the development of a computational model of a lamprey swimming in a viscous, incompressible fluid where a simple central pattern generator model, based on phase oscillators, is coupled to the evolving body dynamics of the swimmer through curvature and curvature derivative feedback. The system is numerically simulated using the immersed boundary method. We will examine how the emergent swimming behavior and cost of transport depends upon these functional forms of proprioceptive feedback chosen in the model.