1116-VC-1466 **Caitlin R. Lienkaemper*** (clienkaemper@hmc.edu). *Obstructions to Convexity in Neural Codes.*

How does the brain encode the spatial structure of the external world? One way is through hippocampal neurons called place cells, which become associated to convex regions of space known as their receptive fields: each place cell fires at a high rate precisely when the animal is in the receptive field. The firing patterns of multiple place cells form what is known as a convex neural code. How can we tell when a neural code is convex? To address this question, Giusti and Itskov identified a local obstruction, defined via the topology of a code's simplicial complex, and proved that convex neural codes have no local obstructions. Curto et al. proved the converse for all neural codes on at most four neurons. Via a counterexample on five neurons, we show that this converse is false in general. Additionally, we describe our work in classifying neural codes on five neurons, supported by our enumeration of connected simplicial complexes on five vertices. Finally, we discuss the relationship between convex sets and good covers. (Received September 20, 2015)