1131-14-153 **Kaitlyn Phillipson*** (kphillip@stedwards.edu), 3001 South Congress Ave., Austin, TX 78704, and **Sarah Ayman Goldrup**. *Structure of the Neural Ideal for Convex and Non-convex Codes.* Preliminary report.

Combinatorial codes can be used to represent neural activity, called neural codes. It has been found that certain neurons fire in convex regions in the stimulus space. Given a neural code, how can we determine if it can represent convex sets? Complete conditions for convexity are still unknown. One tool for investigating this problem is a polynomial ideal that encodes the combinatorial information about the neural code, called the neural ideal. We can extract from this ideal a special set of generators called the canonical form, which represent minimal relationships among the stimulus space. Another well-known set of generators for an ideal is the Gröbner basis. Recent results show some cases where the canonical form is a Gröbner basis for the neural ideal. A natural question, then, is how does this relate to the convexity of the neural code itself? We will discuss some results on the connection between convexity and determining if the canonical form is a Gröbner basis for the neural ideal. (Received July 12, 2017)