1146-05-316 **Vladimir Itskov** (abk170@psu.edu), **Alex B. Kunin*** (abk170@psu.edu) and **Zvi H. Rosen**.
The Polar Complex of Hyperplane Neural Codes.

The firing patterns of neurons in sensory systems give rise to combinatorial codes, i.e. subsets of the boolean lattice. These firing patterns represent the abstract intersection patterns of subsets of a Euclidean space, and an open problem is identifying the combinatorial properties of neural codes which distinguish the geometric properties of the corresponding subsets. We introduce the polar complex, a simplicial complex associated to any combinatorial code, and use this complex and its associated Stanley-Reisner ideal to to identify some distinguishing characteristics of codes arising from feed-forward neural networks. We demonstrate the polar complex of such codes is shellable, and make connections to other questions in the study of boolean functions. (Received January 25, 2019)