1145-55-2366 **Ann E. Sizemore*** (annsize@seas.upenn.edu) and **Danielle S. Bassett**. *Meaningful Voids: Applying Algebraic Topology to Network Neuroscience.*

A web of interacting pieces and parts is a common construct in neuroscience, making techniques from network science invaluable for analyses and interpretation at nearly any biological scale. While network science has assuredly progressed our understanding of the brain, by nature network techniques are most tuned towards densely connected network motifs such as communities. Algebraic topology, a branch of mathematics neighboring graph theory, instead sees voids or topological cavities within the network and thus offers a unique but complementary perspective on network structure. We first give a gentle introduction to applied algebraic topology and demonstrate how topological voids in networks interact with common network statistics. We show that topological voids exist at multiple levels and areas of neuroscience, from chromatin to cognition, and suggest that these gaps may be essential for proper function. Finally we discuss interpretations and explore the possibility of functionally relevant topological voids in other biological systems. (Received September 25, 2018)