Topology of Random Geometric Complexes
Omer Bobrowski, Technion - Israel Institute of Technology

A random geometric complex is an abstract simplicial complex whose vertices are generated by a random point process in a metric space, and higher-order simplexes are added according to a prescribed set of rules that depend on the geometric configuration of the vertices. In this talk we will review recent advances in the study of the homology of random geometric complexes. Loosely speaking, homology is a topological-algebraic structure that contains information about cycles of various dimensions in the complex. We will discuss phase transitions related to the appearance and vanishing of homology, as well the limiting distributions for the Betti numbers of these complexes. Of a particular interest is the behavior of random geometric complexes in the thermodynamic limit which will be discussed as well.