
THE WEIZMANN INSTITUTE OF SCIENCE
FACULTY OF MATHEMATICS AND COMPUTER SCIENCE
Geometric Functional Analysis and Probability Seminar

Room 155 ,Ziskind Building
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Homological connectivity and percolation in random geometric complexes

Abstract:

Connectivity and percolation are two well studied phenomena in random graphs. In this talk we will discuss higher-dimensional analogues of connectivity and percolation that occur in random simplicial complexes. Simplicial complexes are a natural generalization of graphs, consisting of vertices, edges, triangles, tetrahedra, and higher dimensional simplexes. We will mainly focus on random geometric complexes. These complexes are generated by taking the vertices to be a random point process, and adding simplexes according to their geometric configuration. Our generalized notions of connectivity and percolation use the language of homology - an algebraic-topological structure representing cycles of different dimensions. In this talk we will review some recent progress in characterizing and analyzing these phenomena, as well as describing related phase transitions.