

Discrete versus continuous geometry

Talk by Dmitri Krioukov

Understanding the intricate relationships between standard notions in the differential geometry of continuum objects – such as Euclidean spaces, Riemannian, and Lorentzian manifolds – and various notions of discrete geometry applicable to combinatorial objects – such as graphs, hypergraphs, simplicial complexes, and causal sets – presents a complex and often enigmatic challenge. Despite this complexity, the potential applications of these, often speculative, connections are vast, encompassing fields ranging from neuroscience to quantum gravity. In this talk, I will review some important recent advances in this exciting research area, focusing on rigorous results that bridge the emerging field of network geometry with established mathematical facts in continuous geometry. This exploration aims to shed light on the profound and sometimes surprising connections that unify these two seemingly disparate domains.