

# THE RANDOM GEOMETRIC GRAPH

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Assume that random points in Euclidean space are chosen with respect to a Poisson point process. Connect two points by an edge if their distance is below some threshold. This generates the random geometric graph which was introduced by Gilbert and Renyi. The Vietoris-Rips complex is the flag-complex of the random geometric graph.

In this talk we will present old and new results on the asymptotic behavior of the random geometric graph and the Vietoris-Rips complex. Functionals of interest are the number of edges, faces, and volume-power functionals. Expectation, variance asymptotics, and limit theorems are stated. The methods include the Malliavin calculus on Poisson functionals, Stein's method, and suitable concentration inequalities.