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Matthew Kahle* (mkahle@math.osu.edu), Dept. of Mathematics, Ohio State University, 231 W. 18th Ave., Columbus, OH 43210. *Recent progress in random topology.*

The study of random topological spaces: manifolds, simplicial complexes, knots, and groups, has received a lot of attention in recent years. This talk will mostly focus on random simplicial complexes, and especially on a certain kind of topological phase transition, where the probability that a certain homology group is trivial passes from 0 to 1 within a narrow window. The archetypal result in this area is the Erdős–Rényi theorem, which characterizes the threshold edge probability where the random graph becomes connected.

One recent breakthrough has been in the application of Garland’s method, which allows one to prove homology-vanishing theorems by showing that certain Laplacians have large spectral gaps. This reduces problems in random topology to understanding eigenvalues of certain random matrices, and the method has been surprisingly successful.

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