Graz University of Technology

Institut für Diskrete Mathematik

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Random simplicial complexes: a survey

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After their introduction in 1947 by Erdős, random graphs had a great impact on discrete mathematics and computer science. Since graphs are one-dimensional simplicial complexes, it is natural to develop an analogous theory for k-dimensional random simplicial complexes, for all $k \geq 1$. In 2006, Linial and Meshulam introduced a first model for the random $2-$dimensional simplicial complex, and since then many scientists focused their attention on this subject, laying the foundations of the application of the probabilistic method in topology.

In this talk I would like to explain the L-M model and the notion of 'homological connectivity'. Then, I would like to survey some of the work done in recent years on random simplicial complexes, presenting a different natural model and new results obtained working by analogy with the $G(n,p)$ theory.

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