# Expander Graphs
in Theoretical and Applied Contexts
Blockseminar, Wintersemester 2022/23

Expander graphs are finite graphs, in which every vertex has only few neighbors, but many edges need to be cut if one wants to divide the graph into two big pieces. The picture below shows an example.

The methods used to study and construct expanders vary from combinatorics and geometric group theory to probabilistic methods. Explicit constructions of expanders also have useful applications in computer science, such as error correcting codes.

In this seminar, we focus on the construction and study of expanders but will also get insight into applications. For instance, we will introduce Property (T) groups and use their Cayley graphs to construct expander graphs. Random walks in graphs and the eigenvalues of the associated matrices will also play an important role.
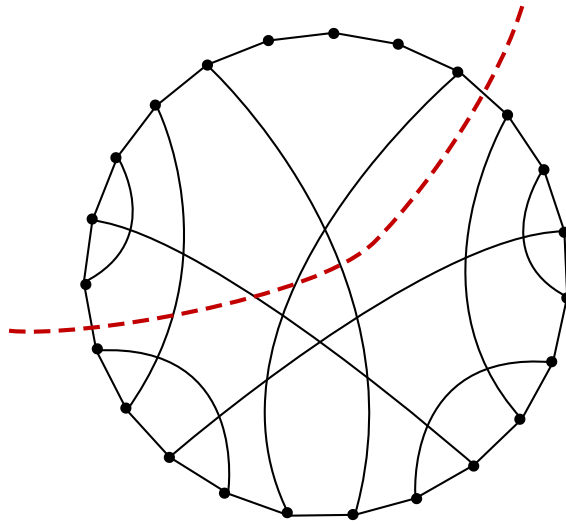
The seminar is aimed at (advanced) Bachelor and Master students. No particular prerequisites are required, but an affinity to groups could be useful, for instance obtained in one of the courses EAZ, GGT, Algebra, Lie Algebras or Algebraic Topology.

Seminar dates	Blockseminar after the end of the term, 01.03.–03.03.2023
Format	60 minute talks in German or English
Seminar program	on the seminar's homepage: `https://topology.math.kit.edu/28_1172.php`

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