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Mathematisches Kolloquium

High-Dimensional Equipartitions –

how a blend of algebraic, combinatorial and probabilistic methods solved a 150 year old maths problem

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Eingeladen von den Doktoranden der Mathematik

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A set of size n can be partitioned into subsets of size k if and only if k divides n. But what if instead of partitioning the elements of the ground set, we want to partition all pairs of elements, or all triples, etc.? Under which assumption on n,k,r is it possible to find a collection of subsets of n elements, each of size k, such that every subset of size r is contained in exactly one of them? This was asked by the geometer Jakob Steiner in 1853, but the solution was only found recently. This talk will introduce these "High-dimensional equipartitions" a.k.a. Steiner systems, explain their importance in many areas of mathematics (and for winning the lottery!), and give a glimpse of how algebraic, combinatorial and probabilistic methods have been used to answer Steiner's question and many other problems.

Der Vortrag ist für ein breites Publikum geeignet