# Randomness and quasi-randomness in Ramsey theory

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## Abstract

Ramsey theory is a branch of Discrete Mathematics which concerns with structures which necessarily appear if a large object is colored/partitioned. Cornerstones of the area are for example van der Waerden's theorem and Ramsey's theorem. The former states that if the first $n$ integers are colored with two colors, then there is a monochromatic arithmetic progression of length $k$, provided $n = n(k)$ is sufficiently large. The later states that every coloring of the edges of the complete graph on $n$ vertices with two colors yields a monochromatic clique of size $k$, if $n = n(k)$ is sufficiently large.

Within Ramsey theory probabilistic and quasi-random methods have taken a prominent rôle since the early days. Erdős' probabilistic construction of Ramsey lower bound and applications of quasi-randomness in the seminal works of Roth and of Szemerédi on van der Waerden's theorem define paradigms of the area which remain central up to date.

The aim of this talk is to give an introduction into the area and present selected results, old and new.

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