Finitely forcible limits of graphs

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Abstract

The recently emerged theory of combinatorial limits has opened new links between analysis, combinatorics, computer science, group theory and probability theory. Combinatorial limits give an analytic way of representing large discrete objects. This talk will be focused on limits of graphs that are uniquely determined by finitely many constraints. Motivated by applications in extremal combinatorics, Lovász and Szegedy (2011) conjectured that the space of typical vertices of every finitely forcible graph limit must be compact and have finite dimension. The latter would imply that weak regularity partitions of such graph limits have the number of their parts bounded by a polynomial in ε^{-1}. We provide counterexamples to both conjectures and we also show that there exist finitely forcible graph limits where the number of parts of their weak regularity partitions is almost exponential in ε^{-2}, which almost matches the known tight lower bound in the general case.

The talk is based on joint work with Jacob W. Cooper, Roman Glebov, Tomáš Kaiser, Tereza Klimošová, Jonathan A. Noel and Jan Volec.

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