

Applications of nonstandard analysis in combinatorics of numbers

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In several areas of combinatorics of numbers, diverse non-elementary techniques are used by researchers, including ergodic theory, Fourier analysis, (discrete) topological dynamics, and algebra on the space of ultrafilters on \mathbb{N} . In the last years, also nonstandard analysis found successful applications in aspects of Ramsey theory and in combinatorial properties of sets of integers which depend on density. In my talk, I will survey some recent new results in this area. In particular, I will present a result on a conjecture of Erdős' about the existence of sumsets $A+B$ (with A and B infinite) inside any set of natural numbers with positive asymptotic density.