

ARITHMETIC PATTERNS IN LARGE SETS

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ABSTRACT. Looking for patterns in sets of numbers is among the oldest and most fundamental mathematical endeavors. A quintessential result in this direction is the Szemerédi theorem which asserts that each subset of integers of positive density contains a finite arithmetic progression of arbitrary length. Often viewed as an example of a "deep" mathematics due to its elaborate and diverse proofs, the Szemerédi theorem has stimulated far-reaching developments in areas as diverse as combinatorics, number theory, harmonic analysis, ergodic theory and model theory. In this talk, I will survey some of the recent progress on the Szemerédi theorem and its generalisations.

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