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Geometric additive combinatorics via o-minimality

In this talk I will introduce (gently!) o-minimality as a tool for doing additive combinatorics in geometric settings, based on joint work with Jacob Fox and Matthew Kwan.

As an application, if we remove all line segments contained in a "nice" subset $M \subset \mathbb{R}^n$ (e.g. $M = \{e^{2x^2 - e^{log(xyz)log(x+yz)}}/3x - x^{x-y} <= 6\} \subset \mathbb{R}^3$), then the probability that a randomly signed sum of nonzero vectors $\sum \epsilon_i v_i$ lies in M is $n^{-\frac{1}{2}+o(1)}$, essentially matching the $O(n^{-1/2})$ bound from classical Littlewood–Offord theory for M a single point.