
FERNANDO XUANCHENG SHAO, University of Kentucky

Recent developments on the polynomial Szemerédi theorem

As a special case of the celebrated theorem of Bergelson and Leibman (the polynomial Szemerédi theorem), any positive density subset of the integers must contain a polynomial progression of the form $x, x + y, x + y^2$ with y nonzero. In the last five years since the pioneering work of Peluse and Prendiville, there have been numerous developments on the quantitative aspects of such results. I will give a brief overview of these recent developments, before describing a two-dimensional version and a "popular" version of the polynomial Szemerédi theorem for the pattern $x, x + y, x + y^2$. The talk includes joint works with Sarah Peluse, Sean Prendiville, and Mengdi Wang.