

abstract

MEMBERS SEMINAR

Topic:

Speaker:

Affiliation:

Date:

Time/Room:

The polynomial Szemerédi theorem of Bergelson and Leibman states that every integer subset with positive density contains infinitely many configurations of the form $x, x+p_1(n), \dots, x+p_k(n)$, where p_1, \dots, p_k is any fixed family of integer polynomials with zero constant term. Unlike Szemerédi's theorem on arithmetic progressions the only known proof of this result uses ergodic theory. Recent developments in ergodic theory have enabled us to show that integer subsets with positive density in fact contain "many" polynomial patterns, where "many" means at least as many as in the random case. For example Bergelson, Host and Kra showed that we can always find "many" arithmetic progressions of length 4 with fixed step (surprisingly this fails for length 5 progressions). Jointly with Kra we showed that a similar result holds for polynomial patterns arising from any set of linearly independent polynomials. I am going to discuss several recent results in this direction.