

Title: Efficient regularity lemmas in higher-order Fourier analysis

Abstract: Since Szemerédi's seminal work in the 70s, regularity lemmas have proven to be of fundamental importance in several areas of discrete mathematics. This talk will survey recent work on regularity decompositions of subsets of finite abelian groups under additional assumptions such as stability or bounded VC-dimension, which turn out to have particularly desirable properties. In the second half of the talk, we will describe recent joint work with Caroline Terry (The Ohio State University) which extends this theme to the realm of higher-order Fourier analysis.