

# **Fourier analysis and approximate structure in additive combinatorics**

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Given a somewhat large subset  $A$  of  $F_p^n$ , an  $n$ -dimensional vector space over  $F_p$ , must the sumset  $A + A + A$  contain a large subspace? Can we say anything interesting about  $A$  itself, based solely on its size? In this two-part talk I shall introduce Fourier analysis on finite abelian groups and show how this can be used to deal with questions such as these. This will involve a version of the notion of almost-periodicity, which we shall be able to translate into tangible combinatorial results. I plan to assume very few prerequisites.