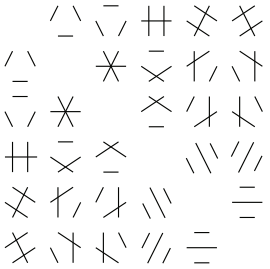
Mathematics Seminar



Rocky Mountain Algebraic Combinatorics Seminar

Multiple correlation sequences and nilsequences along sparse sets

Anh Le
University of Denver

Originating from Furstenberg's proof of Szemerédi's theorem, multiple correlation sequences are dynamical objects that capture arithmetic progressions in dense sets of integers. Bergelson, Host, a nd Kra showed that a multiple correlation sequence can be decomposed into a structural component called nilsequence and an error term, which has a zero average along $\mathbb{N}$. Frantzikinakis ask ed whether the error term has a zero average along sparse subsets of $\mathbb{N}$, such as the set of primes or the set of powers of 2. In this talk, I give the answer to this question, and if tim e permits, sketch a proof of for the single correlation case using Herglotz's spectral theorem.

Configurations in dense sets, positive definite functions, and Fourier transforms

John Griesmer
Colorado School of Mines

László Lovász once asked: what is the cardinality of the largest subset of $\{1, \ldots, n\}$ containing no two elements which differ by a perfect square? He conjectured that such a set must have cardinality o(n). Hillel Furstenberg and András Sárközy proved this conjecture (independently) in the 1970s. We will see how this problem is an instance of an extremal problem about Cayley graphs, and we will discuss some related problems. We will also present Furstenberg's proof and the requisite background, including a proof of Herglotz's theorem that every positive definite function on Z is the Fourier transform of a positive measure on [0,1].

Weber 223
4–6 pm, Friday, November 8, 2024
(Refreshments 3:30–4 pm)
Colorado State University
4 pm, Friday, November 8, 2024

This is a joint Denver U / CU Boulder / U of Wyoming / CSU seminar that meets biweekly.
Anyone interested is welcome to join us at a local restaurant for dinner after the talks.

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