Number Theory Seminar

Monday, April 28th, 2025

2:00-3:00 pm in Hume 321

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Decoupling for fractal subsets on the parabola

Abstract

Consider the n-th generation of the Cantor set (or its generalizations) on $[0, 1]$. Lifting this to the parabola, one can ask for the size of the associated decoupling constant. From a number theoretic perspective, this would count solutions to Vinogradov with digital restrictions. In certain cases, due to sparseness of intervals in the Cantor set, the Bourgain-Demeter bound is worse than the trivial bound. We give a bound that relies on the sparseness (as opposed to the smallest scale). Numerous open questions will be raised. This is joint work with Alan Chang, Jaume de Dios Pont, Rachel Greenfeld, Asgar Jamneshan, and José Madrid.