Falconer Distances problem in Euclidean Spaces

Chun-Yen Shen
Department of Mathematics
National Taiwan University

Abstract

The well-known Falconer conjecture states that any compact set $E \subset R^d$ with $\dim_H(E) > \frac{d}{2}$ (Hausdorff dimension), its distance set $\Delta(E) = \{|x-y|, x, y \in E\}$ has positive Lebesgue measure. This conjecture is widely open and has been one of the most active research topics in the area of Harmonic analysis and Geometric measure theory. In this talk, we will talk about our recent new result that proves a stronger distance result for general product sets. Our result is the first one that improves the previous result of Mattila and Sjölin in 1999 for general product sets.