HOMOGENEOUS DYNAMICS, SLICING THEOREMS AND KHINTCHINE'S THEOREM ON FRACTALS

Speaker: Han Zhang

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Time：Monday, September 23, 2024, 14:00-16:30

Venue：Room 106, Shanghai Center for Mathematical Sciences

Abstract： In 1984, Mahler proposed the following question on Diophantine approximation : How close can irrational numbers in the middle-thirds Cantor set be approximated by rational numbers? One way to reformulate Mahler's question is to ask if Khintchine's theorem extends to the middle-thirds Cantor set.

It turns out that random walks on homogenous sapces and slicing theorems in fractal geometry play crucial roles in answering Mahler's question. In this talk, I will survey works regarding Khintchine's theorem on fractals, discuss the connection between homogeneous dynamics and Diophantine approximation, and sketch the proof of Khintchine's theorem on the middle-thirds Cantor set using tools from homogeneous dynamics and certain slicing theorem from fractal geometry.

This is based on a joint work with Timothée Bénard and Weikun He.