北京理工大學

数学与统计学院学术报告

Falconer estimate for circular and cinematic Furstenberg problem

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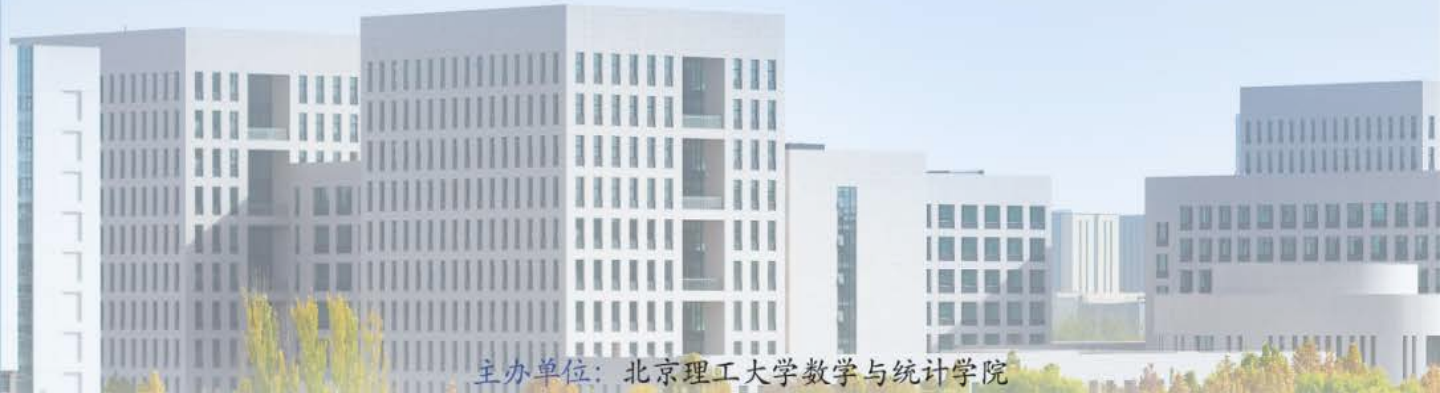
时 间： 2026年11月6日 10:00--11:00

地 点： 腾讯会议：688-466-180

摘 要： We establish a Falconer-type lower bound for the Hausdorff dimension of planar circular Furstenberg sets. More precisely, we show that a circular (u, v)-Furstenberg set has Hausdorff dimension at least u + 1 whenever $0 < u \le 1$, $0 < v \le 3$, and $2u + v \ge 3$. This resolves the circular Furstenberg conjecture of Green, Harris, Ou, Ren, and Tammen in its full Falconer range. The same bound holds for smooth cinematic families of curves.

The proof involves a two-scale decomposition for circle incidences and refined decoupling. In this talk, I will discuss these ideas and the role of Fourier-analytic methods in Falconer-type estimates for Furstenberg problems and projection theory. The proof for cinematic case was developed with the assistance of AI.

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