Department Colloquium

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Sticky Kakeya sets in $\mathbb{R}^3$

Abstract:
A Kakeya set is a set of points in $\mathbb{R}^n$ which contains a unit line segment in every direction. The Kakeya conjecture states that the dimension of any Kakeya set is $n$. This conjecture remains wide open for all $n \geq 3$.

Together with Josh Zahl, we study a special collection of the Kakeya sets, namely the sticky Kakeya sets where the line segments in nearby directions stay close. We prove that sticky Kakeya sets in $\mathbb{R}^3$ have dimension 3. In this talk, we will discuss background of the problem and its connection to analysis, combinatorics, and geometric measure theory.

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