# THE KAKEYA CONJECTURE: WHERE DOES IT COME FROM AND WHY IS IT IMPORTANT?

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Abstract. The Kakeya conjecture is a fundamental problem about the geometry of Euclidean space. Roughly speaking, it asks to what extent lines which point in different directions can be packed together in a small space. In the plane the problem is relatively straightforward and was settled in the 1970s. In three dimensional space it is much more difficult and was only recently resolved in a monumental and groundbreaking work of Hong Wang and Joshua Zahl. In this lecture, I will describe the origins of the Kakeya conjecture, with a particular focus on its classical connections to Fourier analysis. The goal is to give a sense of why the problem is considered so central to mathematical analysis, and thereby underscore the importance of the Wang–Zahl result.