On integer distance sets

Marina Iliopoulou

May 13, 2024

Abstract

An integer distance set is a set in the Euclidean plane with the property that all pairwise distances between its points are integers. In this talk we will show that any integer distance set contains all but very few of its points on a single line or circle. This helps us address some questions by Erdös. In particular, we deduce that integer distance sets in general position (no 3 points on a line, no 4 points on a circle) are very sparse, and we derive a near-optimal lower bound on the diameter of any non-collinear integer distance set of a given size. Our proof uses existing refinements of the Bombieri-Pila determinant method. This is joint work with Rachel Greenfeld and Sarah Peluse.