Remarks on Danzer's problem

Danzer asked whether there is a discrete subset of the plane which intersects every convex subset of area one, and such that the number of points in a ball around the origin grows like $O(T^2)$. So far no such sets have been found. A potential source of examples are cut and project sets such as the vertices of a Penrose tiling. In joint work with Yaar Solomon, we show that cut and project sets are not Danzer sets. The method uses dynamical and algebraic techniques, and in particular Ratner's theorem on homogeneous flows and the classification of Q-structures on algebraic groups.

Joint work with Noa Eidelstein.