The rearrangement inequality meets Tverberg

Alexander Polyanskii

16 November 2025

In this talk, I will discuss the so-called tight colorful no-dimensional Tverberg theorem. A special case of this result states that for any sequences

$$X = (x_1, \dots, x_n) \quad \text{and} \quad Y = (y_1, \dots, y_n)$$

of points in a Euclidean space, contained in balls of radii R_X and R_Y, respectively (not necessarily with the same center), one can reenumerate the points of Y so that the pointwise-sum sequence

$$Z = (x_1 + y_1, \dots, x_n + y_n)$$

is contained in a ball of radius R_Z satisfying

$$R_Z^2 \le R_X^2 + R_Y^2.$$

The proof relies on a vector form of the standard rearrangement inequality for two sequences. Joint work with Polina Barabanshchikova and Grigory Ivanov.