List of achivements of Egor Kolpakov

1) The article is called "Proof of Radon's theorem by lowering the dimension"
It is proposed for publication in the collection "matematicheskoye prosveshcheniye"

Annotation

There is the classical Radon theorem, see [1].

Given integer $d \geq 1$ and $d+2$ points in d-dimensional space $\mathbb{R}^d$. Then these points can be divided into two disjoint subsets whose convex hulls have a non-empty intersection.

The original formal proof of this theorem, see [2]. It is usually an effect. In this article, this is another proof of it, by lowering the dimension. It gives the next, stronger result.

The partition of the set of points into two subsets, convex hulls that intersect exactly one point, is called *Radon.*

Quantitative Radon Theorem. *For any integer $d \geq 1$ and $d+2$ points in general positions in the d-dimensional space $\mathbb{R}^d$. Then the Radon partition of the set of these points exists and is unique.*

The Radon theorem is related to the following theorems, which can be proved by lowering the dimension, see [3].

Conway-Gordon-Sachs theorem. *For any 6 points in space, no 4 of which lie in the same plane, there are two entangled triangles with vertices at these points.*

Van Kampen-Flores theorem. *Among any 7 points in the four-dimensional space $\mathbb{R}^4$, you can choose two disjoint triples of points such that the triangles with vertices in them intersect .*

References

[1] https://ru.wikipedia.org/wiki/Теорема_Радона (in Russian)

[2] J. Radon, Mengen konvexer Körper, die einen gemeinsamen Punkt enthalten, Math. Ann. Vol. 83 (1921), 113—115. (in Deutsch)

[3] A. Skopenkov, On van Kampen-Flores, Conway-Gordon-Sachs and Radon theorems

https://arxiv.org/abs/1704.00300v1
[4] A. Skopenkov, Realizability of hypergraphs and Ramsey link theory
https://arxiv.org/abs/1402.0658