International
Online Conference

Algebraic and Geometric Methods of Analysis

dedicate to the memory
of Yuriy Trokhymchuk
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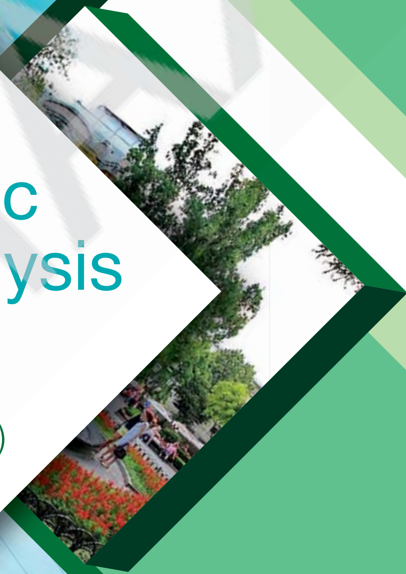

May 25-28, 2021
Odesa, Ukraine

List of topics

- Topological methods in analysis
- Geometric problems of complex and mathematical analysis
- Algebraic methods in geometry
- Differential geometry in the whole
- Geometry and topology of differentiable manifolds
- General and algebraic topology
- Geometric and topological methods in natural sciences

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Uniform measures in Euclidean space

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A uniform measure in Euclidean space $\mathbb{R}^d$ is a measure that assigns to each ball $B(x,r)$ with center x in the support of the measure, a mass dependent of r and independent of the choice of x.

For example any invariant measure of a subgroup of the isometry group of $\mathbb{R}^d$ is uniform, and this sub-class of uniform measures are called homogeneous measures. There are known a few examples of non-homogeneous uniform measures, such as the volume measure of the "light cone" $\{x^2+y^2+z^2=w^2\}\subset\mathbb{R}^4$.

The study of uniform measures in Euclidean space was initiated by David Preiss as the crucial ingredient of his 1987 proof of the Besicovitch conjecture [4], and one motivation for extending this study is to understand the structure of measures in general geometry. It is known (see [1]) that a uniform measure must be a multiple of the k-dimensional area measure restricted to a k-dimensional analytic variety, and the classification of k-dimensional uniform measures remains a difficult open problem, still open even in the plane (see also [2], [3]). I will present a classification [5] of 1-dimensional uniform measures in $\mathbb{R}^d$, and mention some open questions for more general dimensions. This is joint work with Paul Laurain, from Paris 7 University.

References

[1] Bernd Kirchheim, David Preiss. Uniformly distributed measures in Euclidean spaces. *Math. Scand.*, 90(1):152–160, 2002.

[2] Oldřich Kowalski and David Preiss. Besicovitch-type properties of measures and submanifolds. *J. Reine Angew. Math.*, 379:115–151, 1987.

[3] A. Nimer. Conical 3-uniform measure: a family of new examples and characterizations. *arXiv:1608.02604*, 2016.

[4] David Preiss. Geometry of measures in $\mathbf{R}^n$: distribution, rectifiability, and densities. *Ann. of Math. (2)*, 125(3):537–643, 1987.

[5] Paul Laurain, Mircea Petrache. Classification of uniformly distributed measures of dimension 1 in general codimension, To appear in *Asian J. Math.*, 2021.