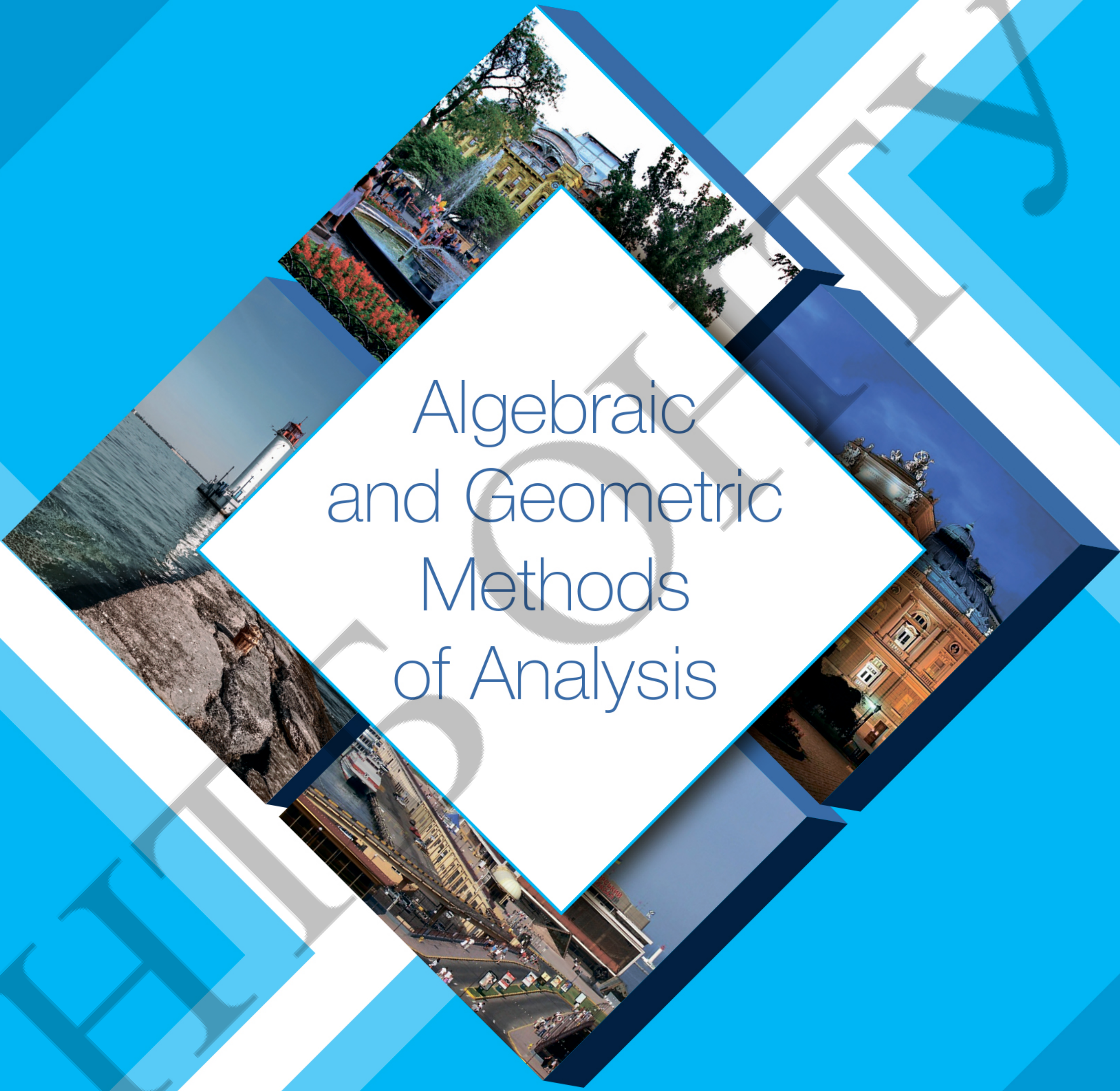
International
Scientific Conference



Algebraic and Geometric Methods of Analysis

27-30 May 2024

Odesa, Ukraine

The purpose of this conference is to bring together researchers in geometry, topology, algebra, analysis and dynamical systems and to provide for them a forum to present their recent work to colleagues from different nationalities. This way we aim to stimulate discussion about the latest findings in geometrical and topological methods in analysis and to increase international collaboration.

The conference continues the traditional annual conference «Geometry in Odesa» holding from 2004, and hosted by Odesa National University of Technology (Odesa National Academy of Food Technologies till 2021). From 2017 the conference was renamed to «Algebraic and geometric methods of analysis» (AGMA).

The Conference languages: Ukrainian and English.

List of topics

- Algebraic methods in geometry
- Differential geometry in the large
- Geometry and topology of differentiable manifolds
- General and algebraic topology
- Dynamical systems and their applications
- Geometric and topological methods in natural sciences
- Geometric problems in mathematical analysis

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- Odesa National University of Technology, Ukraine
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Interplay of Global Implicit Functions and Critical Point Theory in Infinite Dimensional Spaces

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Consider a nonlinear equation of the form:

$$\Phi(\mathsf{e}, \mathsf{g}) = \mathbf{0}, \tag{1}$$

where e, g, and $\mathbf{0}$ belong to arbitrary Fréchet spaces, and $\mathbf{0}$ represents the zero element. We establish sufficient conditions under which it is possible to globally and uniquely solve Equation (1) for g in terms of e, with the solution mapping $\mathcal{K}$ being differentiable, such that Φ does not lose the derivative.

Applying the obtained global implicit function theorem, we will establish sufficient conditions for the global existence and uniqueness of the solution over the entire time of the following initial value problem that involves the loss of one derivative:

$$y'(t) = \Phi(t, y(t), e), \tag{2}$$

where the initial conditions are fixed both in time and in arbitrary Fréchet spaces.

We also generalize the Lagrange multiplier method, which involves finding critical points of a mapping subject to a set of constraints, and apply the results to extend the Nehari method for locating critical points.

The full details can be found in [1].

References

[1] Kaveh Eftekharinasab. Global Implicit Function Theorems and Critical Point Theory in Fréchet Spaces. *arXiv preprint arXiv:2404.00286*, 2024.

Spherical Analysis on Fuzzy Lie Groups

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Let G be a locally compact Lie group and $\mathfrak{g}$ its Lie algebra. We consider a fuzzy analogue of G, denoted by $\mathfrak{G}_{\mathfrak{f}}$ called a fuzzy Lie group. Spherical functions on $\mathfrak{G}_{\mathfrak{f}}$ are constructed and a version of the existence result of the Helgason-spherical function on G is then established on $\mathfrak{G}_{\mathfrak{f}}$.