

International  
Online Conference



**Algebraic  
and Geometric  
Methods of Analysis**

dedicate to the memory  
of Yuriy Trokhymchuk  
(17.03.1928-18.12.2019)

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

## ORGANIZERS

- Ministry of Education and Science of Ukraine
- Odesa National Academy of Food Technologies
- Institute of Mathematics of the National Academy of Sciences of Ukraine
- Taras Shevchenko National University of Kyiv
- International Geometry Center
- Kyiv Mathematical Society

## SCIENTIFIC COMMITTEE

**Drozd Yu.**

*(Kyiv, Ukraine)*

**Maksymenko S.**

*(Kyiv, Ukraine)*

**Plaksa S.**

*(Kyiv, Ukraine)*

**Prishlyak A.**

*(Kyiv, Ukraine)*

**Bakhtin O.**

*(Kyiv, Ukraine)*

**Balan V.**

*(Bucharest, Romania)*

**Banakh T.**

*(Lviv, Ukraine)*

**Borysenko O.**

*(Kharkiv, Ukraine)*

**Cherevko Ye.**

*(Odesa, Ukraine)*

**Fedchenko Yu.**

*(Odesa, Ukraine)*

**Karlova O.**

*(Chernivtsi, Ukraine)*

**Kiosak V.**

*(Odessa, Ukraine)*

**Konovenko N.**

*(Odessa, Ukraine)*

**Lyubashenko V.**

*(Kyiv, Ukraine)*

**Matsumoto K.**

*(Yamagata, Japan)*

**Mormul P.**

*(Warsaw, Poland)*

**Mykhailyuk V.**

*(Chernivtsi, Ukraine)*

**Plachta L.**

*(Krakov, Poland)*

**Pokas S.**

*(Odessa, Ukraine)*

**Sabitov I.**

*(Moscow, Russia)*

**Savchenko O.**

*(Kherson, Ukraine)*

**Sergeeva A.**

*(Odessa, Ukraine)*

**Shelekhov A.**

*(Tver, Russia)*

**Zarichnyi M.**

*(Lviv, Ukraine)*

#### ADMINISTRATIVE COMMITTEE

- Egorov B., chairman, rector of the ONAFT;
- Povarova N., deputy chairman, Pro-rector for scientific work of the ONAFT;
- Mardar M., Pro-rector for scientific-pedagogical work and international communications of the ONAFT;
- Fedosov S., Director of the International Cooperation Center of the ONAFT;
- Kotlik S., Director of the P.M. Platonov Educational-scientific institute of computer systems and technologies "Industry 4.0";
- Lishchenko N. Dean of faculty of the computer systems and automation ONAFT

#### ORGANIZING COMMITTEE

Cherevko Ye.  
Eftekharinasab K.  
Fedchenko Yu.  
Feshchenko B.  
Khohlyk O.

Klishchuk B.  
Konovenko N.  
Kravchenko A.  
Kuznietsova I.  
Maksymenko S.

Osadchuk E.  
Plakosh A.  
Prus A.  
Sergeeva A.  
Soroka Yu.

# About longest and shortest chords passing through a fixed point

Aliyev Yagub

(ADA University, Ahmadbey Aghaoglu str. 61 Baku, 1008)

*E-mail:* yaliyev@ada.edu.az

A new method to construct a tangent to the conchoid of Nicomedes or limaçon of Pascal curves is discussed. Some interesting properties of the cardioid curve (which is a special case of limaçon of Pascal) are investigated. The following problem is studied: "Given a line  $k$  and two points  $A$  and  $B$  on one side of  $k$ , find point  $C$  such that the sum of lengths of segments  $CD$  and  $CE$  is minimal, where  $D$  and  $E$  are intersections of line  $k$  with lines  $CA$  and  $CB$ , respectively". This problem is dual to the classic problem to find shortest segment inscribed to a given angle and passing through a given point. Part of this problem was solved and the remaining part is left as an open question. The problem to find ellipse's longest or shortest chord passing through a given point, is also considered. For the solution the curve named as ophiuride is used.

The following Lemma is used.

**Lemma 1.** *Let  $c_1$  and  $c_2$  be two arbitrary smooth curves. Let  $O$  be a given point and let a line through this point intersect the curves  $c_1$  and  $c_2$  at points  $A$  and  $B$ . If the length of segment  $AB$  is maximal/minimal or constant and the tangents to the curves  $c_1$  and  $c_2$  at points  $A$  and  $B$  are not perpendicular or parallel to the line  $AB$  then these tangents intersect at a point  $C$  such that for the perpendicular  $CD$  of the line  $AB$  the equality  $|OA| = |BD|$  holds true.*

## REFERENCES

- [1] Anghel N., On the constructability with ruler and compass of a minimum chord in a parabola, *Libertas Math.* 17, 9-12 (1997).
- [2] Anghel N., Geometric loci associated to certain minimal chords in convex regions, *J. Geom.* 66, No.1-2, 1-16 (1999).
- [3] Anghel N., Minimal chords in angular regions., *Forum Geom.* 4, 111-115, electronic only (2004).

## Зміст

|  |           |
|--|-----------|
| <b>E. Afanas'eva</b> <i>Finitely bi-Lipschitz homeomorphisms between Finsler manifolds</i>   | <b>3</b>  |
| <b>Aliyev Yagub</b> <i>About longest and shortest chords passing through a fixed point</i>   | <b>5</b>  |
| <b>S. Antonyan</b> <i>Some equivariant properties of Milnor's construction</i>   | <b>6</b>  |
| <b>K. Antoshyna, S. Kozerenko</b> <i>Commuting sets for topological set operators</i>  | <b>7</b>  |
| <b>B. Apanasov</b> <i>Asymptotic analysis of quasi-regular mappings in space</i>   | <b>8</b>  |
| <b>M. J. Atteya</b> <i>Generalized <math>(\sigma, \tau)</math>-derivations on associative rings satisfying certain identities</i>  | <b>10</b> |
| <b>V. Balan</b> <i>The Tucker HO-SVD and the anisotropy of Finslerian geometric models</i>   | <b>11</b> |
| <b>V. Balashchenko, D. Vylegzhanin</b> <i>Invariant structures on homogeneous <math>\Phi</math>-spaces and Lie groups</i>  | <b>13</b> |
| <b>T. Banakh</b> <i>Every 2-dimensional Banach space has the Mazur-Ulam property</i>   | <b>15</b> |
| <b>A. Bandura, V. Baksa, O. Skaskiv</b> <i>A connection between <math>L</math>-index of vector-valued entire function and <math>L</math>-index of each its component</i>         | <b>16</b> |
| <b>B. Baratov, Yu. Eshkabilov</b> <i>Separable cubic stochastic operators</i>  | <b>18</b> |
| <b>V. Bilet, O. Dovgoshey</b> <i>Asymptotically equivalent subspaces of metric spaces</i>  | <b>20</b> |
| <b>E. Bonacci</b> <i>Isomorphic issues about the CTCs in Quantum Physics</i>   | <b>22</b> |
| <b>P. Petrenko, A. Andreev</b> <i>Geometrical Langlands Ramifications and Differential Operators Classification by Verma Module Extensions</i>                                   | <b>23</b> |
| <b>Y. Cherevko, V. Berezovski, J. Mikeš, Y. Fedchenko</b> <i>Conharmonic Transformations of Locally Conformal Kähler Manifolds</i>   | <b>24</b> |
| <b>V. Chernov</b> <i>Applications of Linking to the Study of Causality</i>   | <b>26</b> |
| <b>A. Bakhtin, I. Denega</b> <i>Problem on extremal decomposition of the complex plane</i>   | <b>27</b> |
| <b>A. Dikarev, A. S. Galaev</b> <i>Parallel spinors on Lorentzian Weyl spaces</i>  | <b>29</b> |
| <b>Yu. A. Drozd</b> <i>Matrix problems, triangulated categories and stable homotopy types</i>  | <b>30</b> |
| <b>V. S. Dryuma</b> <i>On the properties smooth manifolds defined by intersections</i>   | <b>31</b> |
| <b>K. Eftekharinasab</b> <i>Some applications of transversality for infinite dimensional manifolds</i>   | <b>33</b> |
| <b>S. Favorov</b> <i>Uniqueness theorems for almost periodic objects</i>   | <b>34</b> |
| <b>V. Fedorchuk, V. Fedorchuk</b> <i>On symmetry reduction and some classes of invariant solutions of the <math>(1 + 3)</math>-dimensional homogeneous Monge-Ampère equation</i> | <b>35</b> |
| <b>B. Feshchenko</b> <i>Deformations of circle-valued Morse functions on 2-torus</i>   | <b>37</b> |