XXXIX International Enlarged Sessions of the Seminar of Ilia Vekua Institute of Applied Mathematics of Ivane Javakhisvili Tbilisi State University April 23-25, 2025 Tbilisi



PROGRAM

## **Organizing Committee**

Jaiani George (Chair) Avazashvili Nikoloz (Co-Chair) Chinchaladze Natalia (Co-chair) Jangveladze Temur (Co-chair) Gulua Bakur (Scientific Secretary, Contact Person, email: bak.gulua@gmail.com) Rukhaia Mikheil (Scientific Secretary, Contact Person, email: mrukhaia@yahoo.com) Gvaramadze Manana (Technical Secretary) Manana Tevdoradze (Technical Secretary) Sharikadze Meri (Technical Secretary) Amaghlobeli Mikheil Antidze Jemal Akhalaia George Aplakovi Aleksadre Baaz Matias (Austria) Bakuradze Malkhaz Babilua Petre Danelia Ana Davitashvili Temur Dundua Besik

Giorgadze Grigor Goginava Ushangi Gogoladze Leri Kharazishvili Alekhander Kharibegashvili Sergo Khimshiashvili George Kiguradze Zurab Kipiani Archil Koplatadze Roman Nadaraya Elizbar Natroshvili David Omanadze Roland Papukashvili Archil Purtukhia Omar Rogava Jemal Shavadze Tea Shavgulidze Ketevan Tadumadze Tamaz Vashakmadze Tamaz Vepkhvadze Teimuraz

The peer-reviewed manuscripts will be published. The source tex and the corresponding pdf files of the English version of the talk, prepared using the template (information how to prepare an article, together with a LaTeX template is available for download from http://www.viam.science.tsu.ge /en\_ses.htm) and not exceeding four A4-format pages should be uploaded in the system http://www.viam.science.tsu.ge/userspace/login

before May 31, 2025.

I. Vekua Institute of Applied Mathematics (University str. 11, 0186 Tbilisi, Georgia).

According to tradition, on April 23 at 11:00a.m. a self-organized visit is planned to the grave of Ilia Vekua in the Mtatsminda Pantheon.

## Participating organizations and independent research units

- A. Eliashvili Institute of Control Systems of the Georgian Technical University (Eliashvili Institute of GTU)
- A. Razmadze Mathematical Institute of I. Javakhishvili Tbilisi State University (Razmadze Institute of TSU)
- A. Tsereteli Kutaisi State University
- Business and Technology University
- European University
- Georgian Instittute of Public Affairs (GIPA)
- Georgian National University (SEU)
- Georgian Technical University (GTU)
- Gori State University
- I. Javakhishvili Tbilisi State University (TSU)
- Ilia State University
- International Black Sea University
- I. Vekua Institute of Applied Mathematics of I. Javakhishvili Tbilisi State University (Vekua Institute of TSU)
- Kutaisi International University
- Niko Muskhelishvili Institute of Computational Mathematics of the Georgian Technical University (Muskhelishvili Institute of GTU)
- M. Nodia Institute of Geophysics of I. Javakhishvili Tbilisi State University (Nodia Institute of TSU)
- Sokhumi State University
- Tbilisi State Medical University
- The Business and Technology University
- University of Georgia
- V. Chavchanidze Institute of Cybernetics of the Georgian Technical University (Chavchanidze Institute of GTU)
- CNR- Istituto per la Scienza e la Tecnologia dei Plasmi, Bari, Italy
- Grenoble University, Grenoble, France
- Joint Institute for Nuclear Research, Dubna Moscow region, Russia
- Institut de Mathématiques de Marseille, France
- Simion Stoilow Institute of Mathematics of the Romanian Academy, Bucharest, Romania
- Stevens Institute of Technology, Hoboken, USA
- University of Nantes, Jean Leray Laboratory of Mathematics, Nantes, France
- University of Antwerp, Department of Biosciences Engineering, Belgium
- University of Portsmouth, Portsmouth, United Kingdom

## Wednesday, April 23

#### Ilia Vekua Lecture Hall

#### 14:00-14:15 Opening

- 14:15:14:55 Lucian Beznea (Simion Stoilow Institute of Mathematics of the Romanian Academy, Bucharest, Romania) Nonlinear dirichlet problem of non-local branching processes
- 14:55:15:35 Valentin A. Zagrebnov (Institut de Mathématiques de Marseille, France) Rogava's theorem and convergence rate of the Lie-Trotter-Kato product formulæ

# Section of Mathematical Logic and Foundations

Chairs: Alexander Kharazishvili, Roland Omanadze Co-chair: Archil Kipiani

## Thursday, April 24

#### Ilia Vekua Lecture Hall

11:00 - 11:20<u>Irakli Chitaia</u>, Roland Omanadze (Department of Mathematics, Faculty of Exact and Natural Sciences of TSU)

Notes on conjunctive reducibility

- **11:20 11:40Mariam Beriashvili<sup>1,3</sup>**, <u>Aleksi Kirtadze<sup>2,3</sup></u> (<sup>1</sup>Vekua Institute of TSU, <sup>2</sup>Razmadze Institute of TSU, <sup>3</sup>GTU) Some properties of the invariant measures in the infinite-dimensional linear polish spaces
- 11:40 12:00 <u>Pridon Alshibaia</u><sup>1</sup>, <u>Revaz Grigolia</u><sup>1,2</sup> (<sup>1</sup>Chavchanidze Institute of GTU, <sup>2</sup>TSU) Free temporal Gödel algebra generated by constant elements

**12:00 - 12:20 Tengiz Tetunashvili** (Vekua Institute of TSU, GTU) The principle of transfinite induction and some paradoxical point sets

Break 12:20 - 12:50

- 12:50 13:10 Mariam Gobronidze<sup>1</sup>, <u>Archil Kipiani</u><sup>2</sup> (<sup>1</sup>The Business and Technology University, <sup>2</sup>Department of Mathematics, Faculty of Exact and Natural Sciences of TSU) *Infinite asimmetric trees and som of their applications*
- 13:10 13:30 <u>Shalva Beriashvili</u><sup>1</sup>, Tamar Kasrashvili<sup>2</sup> (<sup>1</sup>Ilia State University, <sup>2</sup>Vekua Institute of TSU, GTU)

On some versions of isosceles polyhedra

13:30 - 13:50 Lika Beraia (GTU)

Several notes on Mazurkiewicz type sets with respect to the circles

#### **13:50 - 14:10 Marika Khachidze** (GTU) On some applications of Kunen's theorem

# Section of Applied Logics and Programming

Chair: Matthias Baaz (Austria) Co-chair: Jemal Antidze, Besik Dundua, Mikheil Rukhaia

#### Wednesday, April 23 Room № 110 (VIAM)

 10:00 - 10:20Mikheil Rukhaia (Vekua Institute of TSU) Verification of cyber-physical systems in Maude
 10:20 - 10:40<u>Besik Dundua</u><sup>1</sup>, Temur Kutsia<sup>2</sup> (<sup>1</sup>Vekua Institute of TSU, <sup>2</sup>Research Institute of Symbolic Computation, Linz, Austria) Higher-order pattern unification modulo similarity relations
 10:40 - 11:00Merium Hazem Anwar Labib Bishara (International Black Sea University)

Ninference in unranked probabilistic logic 11.00 - 11.20Merihan Hazem Anwar Labib Rishara (International Black Sea University)

11:00 - 11:20Merihan Hazem Anwar Labib Bishara (International Black Sea University) About challenges for inductive logic programming

**11:20 - 11:40Anriette Michel Fouad Bishara** (Vekua Institute of TSU) About ai and unranked probabilistic logic applications

Break 11:40 - 12:00

## 12:00 - 12:20Mariam Dedabrishvili<sup>1</sup>, <u>Tamta Lekishvili<sup>2</sup></u>, Ketevan Dundua<sup>3</sup>, Yuksel

**Ekinci<sup>4</sup>** (<sup>1</sup>International Black Sea University, <sup>2</sup>East European University, <sup>3</sup>Sokhumi State University, <sup>4</sup>University of Portsmouth, Portsmouth, United Kingdom) *Transforming urban environments: ai solutions for city planning and management* 

12:20 - 12:40 Lia Kurtanidze (SEU)

How artificial intelligence has changed the job market

**12:40 - 13:00 Liana Lortkipanidze<sup>1</sup>**, <u>Anna Chutkerashvili</u><sup>2</sup> (Eliashvili Institute of GTU) Online implementation of a Georgian↔ English grammar dictionary

**13:00 – 13:20 Lali Tibua** (Vekua Institute of TSU) The algorithmic process to establish the validity of the formulae with some property of the  $\tau$ -logic

# Section of Algebra, Geometry and Number Theory

Chairs: Mikhail Amaghlobeli, George Khimshiashvili, Teimuraz Vepkhvadze, Malkhaz Bakuradze Co-chair: Ketevan Shavgulidze

Thursday, April 24 Room № 133 (VIAM)

11:00 - 11:20 Mikheil Amaglobeli <sup>1</sup> , Tengiz Bokelavadze <sup>2</sup> , Alexei Myasnikov <sup>3</sup> ( <sup>1</sup> Department of
Mathematics of TSU, <sup>2</sup> A. Tsereteli State University, Department of Mathematics, <sup>3</sup> Stevens Institute of
Technology, Hoboken, USA)
The structure of the free two-generated R-group of nilpotency class 2, where
R = Q[t]
11:20 - 11:40 Teimuraz Vepkhvadze (Department of Mathematics of TSU)
Representing positive integers by binary forms with even discriminant
11:40 - 12:00 <u>Ilia Tavkhelidze<sup>1</sup></u> , Johan Gielis <sup>2</sup> , Mamanti Rogava <sup>3</sup> ( <sup>1</sup> Department of Mathematics of TSU,
<sup>2</sup> University of Antwerp, Department of Bio-Engineering Sciences, Antwerp, Belgium,
<sup>3</sup> University "Geomedi")
The main differences between chordal and radial sections of GML bodies
12:00 - 12:20 Ketevan Shavgulidze (Department of Mathematics of TSU)
On the spaces of spherical polynomials and generalized theta-series for quadratic

forms of six variables

**12:20 - 12:40 Gocha Todua** (European University) Tensor structures of tangential fibrations of T(Vn )

# **Section of Real Analysis**

Chairs: Ushangi Goginava, Leri Gogoladze Co-chair: Aleksandre Aplakovi, Ana Danelia

#### Thursday, April 24 Room № 110 (VIAM)

14:00 - 14:20 Teimuraz Akhobadze (Department of Mathematics of TSU) On a generalization of bounded variation 14:20 - 14:40 Shakro Tetunashvili<sup>1,2</sup>, <u>Tengiz Tetunashvili<sup>1,3</sup></u> (<sup>1</sup>GTU, <sup>2</sup>Razmadze Institute of TSU, <sup>3</sup>Vekua Institute of TSU) On the existence and approximating properties of universal representing functions for certain classes of functions 14:40 - 15:00 Lerry Gogoladze (Department of Mathematics of TSU) On the convergence and summability of general fourier series 15:00 - 15:20 Giorgi Tutberidze<sup>1,2</sup>, Vakhtang. Tsagareishvili<sup>1</sup>, Giorgi Cagareishvili<sup>1</sup> (<sup>1,2</sup>I. Javakhishvili Tbilisi State University, <sup>2</sup>I. Javakhishvili Tbilisi State University, The University of Georgia) The problem of convergence of general fourier series for functions of class  $Lip\alpha (0 < \alpha < 1)$ 15:20 - 15:40 Ana Danelia (Department of Mathematics of TSU) Conjugate functions and the modulus of smoothness of fractional order 15:40 - 16:00 Givi Nadibaidze (Department of Mathematics of TSU)

On the rearranged double block-orthonormal systems

**16:00 - 16:20 Tamaz Karchava<sup>1</sup>**, <u>Aleksandre Aplakovi<sup>2</sup></u> (<sup>1</sup>Sokhumi State University, <sup>2</sup>TSU) On the absolute convergence of fourier series

# Section of Complex Analysis and Applications

Dedicated to the 80th Birthday of Doctor Nikoloz Avazashvili

Chair: Grigor Giorgadze Co-chair: George Akhalaia

Wednesday, April 23 Room № 133 (VIAM)

16:00 - 16:20 <u>Gia Giorgadze</u>, Gega Gulagashvili (Vekua Institute of TSU) On approximation of matrix functions and deformation of complex structures of vector bundles
16:20 - 16:40 Vagner Jikia (Chavchanidze Institute of GTU) Regular coulomb functions
16:40 - 17:00 <u>Giorgi Makatsaria</u><sup>1</sup>, Nino Manjavidze<sup>2</sup> (<sup>1</sup>Chavchanidze Institute of GTU, <sup>2</sup>Ilia State University) On one genetic invariant of elliptic systems in the plane
17:00 - 17:20 Giorgi Kakulashvili (Chavchanidze Institute of GTU) Connection between hypergeometrical and Heun's general differential equations
17:20 - 17:40 Irakli Sikharulidze (TSU) Hirzebruch-Riemann-Roch theorem
17:40 - 18:00 Nugzar Makhaldiani (Joint Institute for Nuclear Research, Russia)

Fractal calculus and integrable systems

# Section of Ordinary Differential Equations and Optimal Control

Chairs: Roman Koplatadze, Tamaz Tadumadze Co-chair: Tea Shavadze

Friday, April 25 Room № 110 (VIAM)

12:00 - 12:20 Tamaz Tadumadze <sup>1,2</sup> , <u>Tea Shavadze<sup>1</sup></u> , Abdeljalil Nachaoui <sup>3</sup> ( <sup>1</sup> Vekua Institute of	
TSU, <sup>2</sup> Department of Mathematics of TSU, <sup>3</sup> University of Nantes, Jean Leray Laboratory of	
Mathematics, Nantes, France)	
The local representation formulas of solution for controlled functional-differential	
equations with several delays taking into account variation of the initial moment and	
discontinuity of the initial condition	
12:20 - 12:40 Roman Koplatadze (Department of Mathematics of TSU, Vekua Institute of TSU)	
On the asymptotic behavior of solutions of the higher order ordinary linear differential	
equation	
12:40 - 13:00 Akaki Gabelaia (Department of Computational Mathematics of GTU)	
Experience in forecasting residential real estate price index in Georgia and forecast	
estimates	
13:00 - 13:20 Zviad Kalichava <sup>1</sup> , Kakhaber Odisharia <sup>2</sup> , Nona Janikashvili <sup>3</sup> , Vladimer	
Odisharia <sup>4</sup> ( <sup>1</sup> Muskhelishvili Institute of GTU, <sup>2</sup> EMCoS LLC, <sup>3</sup> Tbilisi State Medical University,	
<sup>4</sup> Department of Mathematics of TSU)	
Nonlinear mathematical models of immunopathogenesis and combination treatment of	
rheumatoid arthritis considering il6	
13:20 - 13:40 Phridon Dvalishvili <sup>1</sup> , Aleksandre Mosidze <sup>2</sup> , Mikheil Nikoleishvili <sup>3</sup> ( <sup>1</sup> Department of	
Computer Sciences of TSU, <sup>2</sup> <sup>2</sup> Free University of Tbilisi, Department of Mathematics, <sup>3</sup> Georgian	
Instittute of Public Affairs (GIPA))	
Optimization of the disbalance for one differential model of market relations with a	
non-linear functional and delay in control	
13:40 - 14:00 Nika Gorgodze <sup>1</sup> , Lela Alkhazishvili <sup>2</sup> , Ia Ramishvili <sup>3</sup> ( <sup>1</sup> A. Tsereteli State University,	
Department of Mathematics, <sup>2</sup> Department of Computer Sciences of TSU, <sup>3</sup> GTU)	
Representation formulas of solution for controlled functional-differential equations	
with several constant delays taking into account variation of the initial moment and	
continuity of the initial condition	

# **Section of Partial Differential Equations**

Chairs: Temur Jangveladze, Sergo Kharibegashvili, David Natroshvili Co-chair: Zurab Kiguradze

## Wednesday, April 23 Ilia Vekua Lecture Hall

16:00 - 16:20	<u>Teona Bibilashvili</u> <sup>1</sup> , Sergo Kharibegashvili <sup>2</sup> (Faculty of Informatics and Control Systems of GTU, <sup>2</sup> GTU)
	The Dirichlet characteristic problem for one class of high-order nonlinear hyperbolic
	systems
16:20 - 16:40	Mikheil Gagoshidze (Vekua Institute of TSU)
	Approximate solution of one system of partial differential equations using machine learning
16:40 - 17:00	Levan Giorgashvili, Shota Zazashvili (GTU)
	Some boundary value problems of the theory of consolidation with double porosity
17:00 - 17:20	<u>Giorgi Gochoshvili</u> <sup>1</sup> , Maia Mrevlishvili <sup>2</sup> ( <sup>1</sup> Department of mathematics of GTU, <sup>2</sup> Ilia State University)
	Iteration method for the Neumann problem in the case of the Helmholtz equation
17:20 - 17:40	Revaz Kakubava, Nani Salia (Faculty of Informatics and Control Systems of GTU)
	Probabilistic methods in solving of analytical problems
17:40 - 18:00	David Natroshvili (Vekua Institute of TSU, GTU)
	Iteration method for the Dirichlet problem of the elasticity theory of anisotropic bodies
18:00 - 18:20	Irine Sigua, Markoz Chanturia (GTU)
	Some generalizations and applications of Duhamel principle
18:20 - 18:40	<b>Teimuraz Chkhikvadze</b> (Department of Mathematics of TSU, Vekua Institute of TSU) On the fourth-order nonlinear parabolic integro-differential equation
18:40 - 19:00	<b>Temur Jangveladze</b> (Vekua Institute of TSU, GTU)
	On one system of nonlinear partial differential equations

# Section of Probability Theory and Mathematical Statistics

Dedicated to the 90th Birthday of Professor Elizbar Nadaraya

Chairs: Elizbar Nadaraia, Omar Purtukhia Co-chair: Petre Babilua

#### Wednesday, April 23 TSU, XI building, the office of prof. Gvanji Mania № 335

- 16:00 16:00 <u>Petre Babilua</u><sup>1</sup>, Elizbar Nadaraya<sup>1,2</sup> (<sup>1</sup>Department of Mathematics of TSU, <sup>2</sup>Vekua Institute of TSU)
- 16:00 16:00 On one nonparametric estimation of the Poisson regression function
   16:00 16:00 Kartlos Kachiashvili<sup>1</sup>, Nitis Mukhopadhyay<sup>2</sup>, Jioseb Kachiashvili<sup>3</sup> (<sup>1</sup>Faculty of Informatics and Control Systems of GTU, Vekua Institute of TSU, Muskhelishvili Institute of GTU, <sup>2</sup>Department of Statistics, University of Connecticut, U.S.A., <sup>3</sup>Faculty of Informatics and Control Systems of GTU, Muskhelishvili Institute of GTU) Constrained bayesian method for testing composite hypotheses concerning normal distribution with equal parameters
   16:40 17:00 Levan Katsitadze (<sup>1</sup>Department of Mathematics of TSU)
- **16:40 17:00 Levan Katsitadze** ("Department of Mathematics of TSU) On the empirical process of regression
- **17:00 17:20 Besik Chikvinidze** (Chavchanidze Institute of GTU, Department of Mathematics of TSU) Solving linear second order backward stochastic differential equations (2bsde) in markowian case
- 17:20 17:40 Zurab Kvatadze<sup>1</sup>, Beqnu Parjiani<sup>1</sup> Tsiala Kvatadze<sup>2</sup> (<sup>1</sup>Department of Mathematics of GTU, <sup>2</sup>Black Sea University)
- **17:40 18:00** The law of large numbers for some classes of dependent random variables Institute of TSU) Constructive martingale representation of a one non-smooth path-dependent Brownian functional
- **18:00 18:20 Zurab Zerakidze** (Gori State University) *About statistical structures*

# Section of Mechanics of Continua

#### Dedicated to the 80th Birthday of Professor George Jaiani

Chair of the session Natalia Chinchaladze

Wednesday, April 23 Room № 110 (VIAM)

- **16:00 16:00 George Jaiani** (Vekua Institute of TSU, Department of Mathematics of TSU) *Hierarchical models for the thermoelastic deformation of chiral porous prismatic shells*
- **16:20 16:20** <u>Gia Avalishvili</u><sup>1</sup>, Mariam Avalishvili<sup>2</sup> (<sup>1</sup>TSU, <sup>2</sup>University of Georgia) Investigation of high-order approximations of dual- phase-lag model of thermoelastic solids
- **16:40 17:00 Giorgi Kapanadze** (Vekua Institute of TSU, Razmadze Institute of TSU) The problem of finding an equally rigid contour for a rhombus in the plane theory of elasticity
- **17:00 17:20 Roman Janjgava** (Vekua Institute of TSU) On the elastic equilibrium of porous disks rotating with a constant angular velocity
- **17:20 17:40** <u>Badri Tsutskiridze</u><sup>1</sup>, Levan Jikidze<sup>2</sup>, M. Tsutskiridze<sup>3</sup>, E. Elerdashvili<sup>4</sup> (<sup>1</sup>Department of Mathematics of GTU, Department of engineering mechanics and technical expertise in construction of GTU, <sup>3</sup>Grenoble University, Grenoble, France, <sup>4</sup>Department of mathematics of GTU) *Pulsation flow of incompressible electrically conducting liquid with heat transfer*
- 17:40 18:00 Guranda Charkseliani<sup>2</sup>, <u>Bakur Gulua</u><sup>1,2</sup> (<sup>1</sup>Vekua Institute of TSU, <sup>2</sup>Sokhumi State University)

Boundary value problems for the circular ring with triple voids

**18:00 - 18:20 Natela Zirakashvili** (Vekua Institute of TSU) Study of stress-strain state of eccentric circular ring

# Section of Mathematical Modeling and Numerical Analysis

#### Dedicated to the 80th Birthday of Professor Tamaz Kaladze and Dazmir Shulaia

Chairs: Teimuraz Davitashvili, Jemal Rogava, Tamaz Vashakmadze Co-chair: Archil Papukashvili

## Wednesday, April 23

Ilia Vekua Lecture Hall

- **11:00 11:20** <u>**Tamaz Vashakmadze**</u> (Vekua Institute of TSU, Department of Mathematics of TSU) On the construction of a class of refined theories for shells
- **11:20 11:40** <u>Giorgi Buzhghulashvili</u>, Tamaz Vashakmadze (Vekua Institute of TSU, Department of Mathematics of TSU) Alternative method of the asymptotic expansion
- **11:40 12:00 David Gulua** (GTU) The perturbation algorithm for the realization of a high-order finite difference approximation for an evolutionary equation
- **12:00 12:20** Jemal Rogava<sup>1,2</sup>, <u>Zurab Vashakidze</u><sup>2,3</sup> (<sup>1</sup>Faculty of Exact and Natural Sciences of TSU, <sup>2</sup>Vekua Institute of TSU, <sup>3</sup>V. Kupradze Institute of Mathematics, The University of Georgia) An approximate solution scheme for a system of nonlinear abstract hyperbolic equations
- **12:20 12:40** Nino Khatiashvili (Vekua Institute of TSU) On the perfect fluid flow in the infinite reservoir with the polygonal bottom

12:40 - 13:00 <u>Archil Papukashvili</u><sup>1,2</sup>, Giorgi Geladze<sup>1</sup>, Meri Sharikadze<sup>1</sup> (<sup>1</sup>Vekua Institute of TSU, <sup>2</sup>School of Science and Technology of the University of Georgia) On the approximate solution of the j. Ball's beam equationin the case of pressure dependence of effective viscosity

#### Thursday, April 24 Room № 110(VIAM)

- **11:00 11:20** Zviad Kalichava<sup>1</sup>, Jemal Peradze<sup>2</sup>, Zviad Tsiklauri<sup>3</sup> (<sup>1</sup>Muskhelishvili Institute of GTU, <sup>2</sup>TSU, <sup>3</sup>GTU) Solution method for an initial and time dependent boundary values problem for a dynamic beam Kirchhoff type nonlinear differential equation
- 11:20 11:40 Jemal Peradze<sup>1</sup>, <u>Nikoloz Kachakhidze<sup>2</sup></u> (<sup>1</sup>TSU, <sup>2</sup>GTU) Computer verification of a method for solving nonlinear initial and time-dependent boundary value problems for a string and a beam
- **11:40 12:00** <u>Edison Abramidze</u>, Elene Abramidze (<sup>1</sup>Muskhelishvili Institute of GTU) Numerical analysis of the deformed state of a structure composed of layered rotational shell elements with different configurations
- 12:00 12:20 Temur Chilachava<sup>1</sup>, <u>Gia Kvashilava<sup>2</sup></u>, George Pochkhua<sup>3</sup> (Sokhumi State University) Computer modeling of the interactions between the Georgian, Colchian, and Svan populations
- **12:20 12:40** George Bolotashvili (Chavchanidze Institute of GTU) Non-integer vertex of the initial relaxation polytope of the linear ordering problem and the corresponding cut-off facets, an example
- 12:40 13:00 <u>Khatuna Elbakidze<sup>1,4</sup></u>, Oleg Kharshiladze<sup>2</sup>, Luka Tsulukidze<sup>2</sup>, Aleksandre Ghurchumelia<sup>2</sup>, Luca Sorriso-Valvo<sup>3</sup>, Teimuraz Matiashvili<sup>2</sup> (<sup>1</sup>Vekua Institute of TSU,

<sup>2</sup>Nodia Institute of TSU, <sup>3</sup>CNR- Istituto per la Scienza e la Tecnologia dei Plasmi, Bari, Italy, <sup>4</sup>Business and Technology University)

Analyzing geomagnetic data from Dusheti observatory using machine learning models during the intense magnetic storms of 2024

## 13:00 - 13:20 <u>Teimuraz Davitashvili</u><sup>1</sup>, Dimitri Amilakhvari<sup>2</sup>, Oleg Kharshiladze<sup>3</sup>, Giorgi Rukhaia<sup>1</sup>, Meri Sharikadze<sup>1</sup> (<sup>1</sup>Vekua Institute of TSU, <sup>2</sup>Nodia Institute of TSU, <sup>3</sup>TSU) Application of nonlinear soil thermal conductivity theory to study processes occurring during drought