

**40th International Enlarged Sessions of the Seminar
of Ilia Vekua Institute of Applied Mathematics of
Ivane Javakhisvili Tbilisi State University (VIAM TSU)
April 22-24, 2026
Tbilisi**



PROGRAM

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Co-organizers:

Tbilisi International Center of Mathematics and Informatics
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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

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before May 31, 2026.

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

According to tradition, on April 23, 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
- British-Georgian Academy
- Business and Technology University
- European University
- Georgian-American School
- Georgian American University
- Georgian Institute of Public Affairs (GIPA)
- Georgian National University (SEU)
- Georgian Technical University (GTU)
- Gori State University
- Free University of Tbilisi
- 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 (VIAM 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)
- Scientific-Research Institute for Cultural Protection and Technological Development of Georgian State Languages at the Georgian Technical University
- 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)
- Amasya University, Amasya, Turkey
- Augusta University, Augusta, Georgia, USA
- Eindhoven University of Technology, Eindhoven, The Netherlands
- Grenoble University, Grenoble, France
- Joint Institute for Nuclear Research, Dubna Moscow region, Russia
- Indian Statistical Institute, Kolkata, W.B., India
- Middle East Technical University, Ankara, Turkey
- Stevens Institute of Technology, Hoboken, USA
- Université Bourgogne Europe, Dijon, France
- University of Nantes, Jean Leray Laboratory of Mathematics, Nantes, France
- University of Antwerp, Department of Biosciences Engineering, Belgium

Wednesday, April 22

Ilia Vekua Lecture Hall (VIAM TSU)

14:00-14:15 Opening

Plenary Session

14:15 -14:45 George Jaiani (VIAM TSU, Department of Mathematics of TSU)

Life and Activities of Andro Bitsadze

14:45:15:15 Johan Gielis¹, Zehra Özdemir², Diego Caratelli³ (¹Department of Biosciences Engineering, University of Antwerp, Antwerpen, Belgium, ²Amasya University, Amasya, Turkey, ³Eindhoven University of Technology, Eindhoven, The Netherlands)

Unit circles and totally osculating shapes

15:15:15:45 Revaz Kakubava (GTU)

Semi-Markov processes and their applications in queueing and reliability new solutions

Section of Mathematical Logic and Foundations

Chairs: Alexander Kharazishvili, Roland Omanadze

Co-chair: Archil Kipiani

Wednesday, April 22

TSU, XI building, Room № 210

16:00 - 16:20 Irakli Chitaia, Roland Omanadze (Department of Mathematics, Faculty of Exact and Natural Sciences of TSU)

On Q_1 -degrees of nonspeedable sets

16:20 - 16:40 Mariam Beriashvili¹, Marika Khachidze² (¹VIAM TSU, GTU, ²SEU)

On certain properties of Sierpiński–Zygmund functions

16:40 - 17:00 Yohan Fougerolle¹, Joaquin Rodriguez¹, Johan Gielis² (¹Université Bourgogne Europe, Dijon, France, ² Department of Biosciences Engineering, University of Antwerp, Antwerpen, Belgium)

Associative R-functions as directional operators

17:00 - 17:20 Lika Beraia, Tengiz Tetunashvili (VIAM TSU, GTU)

A note on the intersections of Mazurkiewicz type sets with plane algebraic curves

17:20 - 17:40 Mariam Gobronidze¹, Archil Kipiani² (¹The Business and Technology University, ²Department of Mathematics, Faculty of Exact and Natural Sciences of TSU)

Stability of isomorphism of function digraphs under composition and arithmetic operations

17:40 - 18:00 Shalva Beriashvili (Ilia State University)

On combinatorial properties of polyhedrons with triangular faces

Section of Applied Logics and Programming

Dedicated to the 80th Birthday of Professor Khimur Rukhaia

Chair: Matthias Baaz (Austria)

Co-chair: Besik Dundua, Mikheil Rukhaia

Wednesday, April 22

Ilia Vekua Lecture Hall (VIAM TSU)

10:00 - 10:20 Lali Tibua (VIAM TSU)

Resolution rule to τ -logic formulas

10:20 - 10:40 Besik Dundua¹, Temur Kutsia² (¹VIAM TSU, Scientific-Research Institute for Cultural Protection and Technological Development of Georgian State Languages at the Georgian Technical University, ²Research Institute of Symbolic Computation, Linz, Austria)

A logic programming framework with higher-order pattern unification modulo similarity relations

10:40 - 11:00 Demetre Labadze (VIAM TSU)

Constraint-solving algorithm with proximity relations in commutative theories

11:00 - 11:20 Mariam Katamashvili (VIAM TSU)

Derivatives or regular expressions with similarity relation

11:20 - 11:40 Konstantine Pkhakadze¹, David Gegia¹, Nodar Zaridze¹, Bidzina Lemonjava¹, Shalva Malidze¹, David Kurtskhalia¹, Luka Pkhakadze¹, Rita Margania¹, Aleksandre Maskharashvili^{1,2} (¹Scientific-Research Institute for Cultural Protection and Technological Development of Georgian State Languages at the Georgian Technical University, ²University of Illinois at Urbana-Champaign, Illinois, USA)
Scientific-research institute for cultural protection and technological development of Georgian state languages at the Georgian Technical University: aims, tasks, methods

11:40 – 12:00 Break

12:00 - 12:20 Mikheil Rukhaia (VIAM TSU, Scientific-Research Institute for Cultural Protection and Technological Development of Georgian State Languages at the Georgian Technical University)

Towards cut-elimination in probabilized unranked sequent calculus

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

Electromagnetic field levels in Avlabari (Tbilisi) and fuzzy logic model for risk assesment

12:40 - 13:00 Nino Javashvili¹, Anna Chutkerashvili^{1,2} (¹Eliashvili Institute of GTU, ²TSU)

Georgian denominative verb models and their English equivalents

13:00 – 13:20 Merium Bishara¹, Anriette Bishara² (¹International Black Sea University, ²VIAM TSU)

Unranked probabilistic reasoning: addressing fundamental gaps in uncertainty modeling for artificial intelligence

13:20 – 13:40 Merihan Bishara (International Black Sea University)

Scalability of probabilistic inductive logic programming to real ai systems

Section of Algebra, Geometry and Number Theory

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

Wednesday, April 22

TSU, XI building, Room № 421

10:40 - 11:00 Mikheil Amaglobeli¹, **Tengiz Bokelavadze**², **Alexei Myasnikov**³ (¹Department of Mathematics of TSU, ²A. Tsereteli State University, Department of Mathematics, ³Stevens Institute of Technology, Hoboken, USA)

The structure of the two-generated free 2-nilpotent R -group, where $R = \mathbb{Q}(t)$

11:00 - 11:20 **Teimuraz Vepkhvadze** (Department of Mathematics of TSU)

Generalized theta-functions with characteristics and cusp form corresponding to quadratic forms in ten variables

11:20 - 11:40 **Ketevan Shavgulidze** (Department of Mathematics of TSU)

Generalized theta-series for some six variable quadratic forms

11:40 - 12:00 Ilia Tavkhelidze¹, **Johan Gielis**², **Mamanti Rogava**³ (¹Department of Mathematics of TSU, ²Department of Biosciences Engineering, University of Antwerp, Antwerpen, Belgium, ³University "Geometri")

Möbius phenomenon in GML surfaces and bodies with different radial cross-section

12:00 - 12:20 **Gocha Todua** (European University)

On the integrability of tensor structures of the tangent bundle $T(V^n)$

12:20 - 12:40 Ilia Lomidze, **Natela Chachava** (Free University of Tbilisi)

The Cauchy-Buniakovsky-Schwarz inequality in pseudo-euclidean space

Section of Real Analysis

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

Wednesday, April 22

Room № 133 (VIAM TSU)

11:40 - 12:00 Teimuraz Akhobadze (Department of Mathematics of TSU)

On the uniform convergence of trigonometric Fourier series

12:00 - 12:20 Ana Danelia (Department of Mathematics of TSU)

Moduli of smoothness of conjugate functions

12:20 - 12:40 Ani Eliashvili (GTU)

Summability of the Laplace series by the generalized Cesàro method

12:40 - 13:00 Givi Nadibaidze (Department of Mathematics of TSU)

On the strong $(C,1)$ summability almost everywhere of series with respect to block-orthonormal systems

13:00 - 13:20 Shakro Tetunashvili (Razmadze Institute of TSU, GTU)

On coefficients of universal series

13:20 - 13:40 Vakhtang Tsagareishvili¹, Giorgi Tutberidze^{1,2} (¹TSU, ²The University of Georgia)

The problem of convergence of general Fourier series for functions of class

$Lip\alpha$ ($0 < \alpha < 1$)

Section of Complex Analysis and Applications

Chair: Grigor Giorgadze
Co-chair: George Akhalaia

Wednesday, April 22

Ilia Vekua Lecture Hall (VIAM TSU)

16:00 - 16:20 Gia Giorgadze (VIAM TSU)

On the deformation of complex structures of vector bundles on the Riemann sphere

16:20 - 16:40 Vagner Jikia (Chavchanidze Institute of GTU)

On the Coulomb T matrix in the weak sense

16:40 - 17:00 Giorgi Makatsaria¹, Nino Manjavidze² (¹Chavchanidze Institute of GTU, ²Ilia State University)

Third kind two-dimensional integral equations

17:00 - 17:20 George Bolotashvili (Chavchanidze Institute of GTU)

Special non-integer vertices of the relaxation polytope of the linear ordering polytope and their cutting facets

17:20 - 17:40 Gega Gulagashvili (VIAM TSU)

Unitarity of monodromy matrices and equation parameters

17:40 – 18:00 Irakli Sikharulidze (TSU)

On complex spaces

18:00 - 18:20 Goga Suknidze¹, Kira Chaika² (¹British-Georgian Academy, ²Georgian-American School)

Quantum simulation of the schrödinger equation

18:20 - 18:40 Nugzar Makhaldiani (Joint Institute for Nuclear Research, Russia)

Solvable models for interacting particles with spin and fundamental constants

18:40 - 19:00 Giorgi Kakulashvili (Chavchanidze Institute of GTU)

Combinatorial properties of the partial indices of a matrix function

Section of Ordinary Differential Equations and Optimal Control

Dedicated to the Blessed Memory of Professor Roman Koplatadze

Chairs: Tamaz Tadumadze

Co-chair: Tea Shavadze

Friday, April 24

Room № 110 (VIAM TSU)

- 12:00 - 12:20** **Tamaz Tadumadze¹**, **Nika Gorgodze²**, **Abdeljalil Nachaoui³** (¹VIAM TSU, ²Department of Mathematics of TSU, Department of Mathematics of TSU, ²Department of Mathematics of Akaki Tsereteli State University, ³University of Nantes, Jean Leray Laboratory of Mathematics, Nantes, France)
The global representation formulas of solutions for the nonlinear controlled functional-differential equations with several delays in the phase coordinates and controls considering variation of the initial moment and continuous of the initial condition
- 12:20 - 12:40** **Anamaria Meskhia** (Department of Mathematics of TSU)
Artificial satellites and optimal control
- 12:40 - 13:00** **Ioane Mekvabishvili**, **Nikoloz Lezhava** (Department of Mathematics of TSU)
Application of ordinary differential equations in medicine
- 13:00 - 13:20** **Bezhan Gvaberidze** (Department of Computer Sciences of TSU)
Constructing a knowledge assessment test using multicriteria discrete optimization
- 13:20 - 13:40** **Lela Alkhazishvili¹**, **Medea Iordanisvili¹**, **Ia Ramishvili²** (¹Department of Computer Sciences of TSU, ²GTU)
Sensitivity analysis of a controlled SEIR differential model under perturbations of delays, initial and control functions
- 13:40 - 14:00** **Akaki Gabelaia** (Department of Computational Mathematics of GTU)
RPPI forecasting experience on the example of Georgia and new forecast estimates
- 13:40 - 14:00** **Tea Shavadze** (VIAM TSU)
Modeling GPU cluster dynamics via nonlinear Mackey-Glass type delay differential equations
- 14:20-14:40** **Vladimer Odisharia¹**, **Kakhaber Odisharia²**, **Zviad Kalichava³**, **Nona Janikashvili⁴** (¹Department of Mathematics of TSU, ²EMCoS LLC, ³N. Muskhelishvili Institute of Computational Mathematics of GTU, ⁴Tbilisi State Medical University)
Nonlinear model of immune regulation in rheumatoid arthritis: from dosage to efficacy
- 14:40-15:00** **Phridon Dvalishvili¹**, **Bidzina Midodashvili²**, **Zaza Khechinashvili³**, **Aleksandre Mosidze⁴** (^{1,2}Department of Computer Sciences of TSU, ³Department of Mathematics of TSU, ⁴Department of Mathematics of Tbilisi Free University)
Finding Pareto optimal points for Markowitz mean-variance portfolio optimization model

Joint Section of Partial Differential Equations and Mechanics of Continua

Dedicated to the 110th Birthday of Professor Andro Bitsadze

Chairs: George Jaiani, Temur Jangveladze, Sergo Kharibegashvili, David Natroshvili

Co-chair: Natalia Chinchaladze, Zurab Kiguradze

Wednesday, April 22

Room № 110 (VIAM TSU)

- 12:00 - 12:20** **Levan Giorgashvili, Shota Zazashvili** (GTU)
Some boundary value problems of the theory of consolidation with double porosity
- 12:20 - 12:40** **Irine Sigua, Markoz Chanturia** (GTU)
On the solvability of a mixed problem for one class of second-order non-strictly hyperbolic systems
- 12:40 - 13:00** **Natela Zirkashvili** (VIAM TSU)
Investigation of stress-strain state of an infinite elastic plane containing a symmetric circular moon-shaped hole
- 13:00 - 13:20** **Teona Bibilashvili¹, Sergo Kharibegashvili²** (Department of mathematics of GTU)
On the solvability of the characteristic problem for one high-order nonlinear equation of composite type
- 13:20 - 13:40** **Roman Janjgava** (VIAM TSU)
On a general papkovitch–neuber-type representation for thermoelastic bodies with voids incorporating microtemperature effects
- 16:00 - 16:20** **Gia Avalishvili¹, Mariam Avalishvili²** (¹TSU, ²University of Georgia)
Investigation of high-order approximations of three- phase-lag model of thermoelastic solids
- 16:20 - 16:40** **Guranda Charkseliani², Bakur Gulua^{1,2}, Tamar Kasrashvili^{1,3}** (¹VIAM TSU, ²Sokhumi State University, ³GTU)
A boundary value problem of the coupled theory of plane elasticity for the circular ring with double-porosity
- 16:40 - 17:00** **Jemal Peradze¹, Nikoloz Kachakhidze²** (¹TSU, ²GTU)
A numerical method for solving the two-dimensional Kirchhoff-type equation
- 17:00 - 17:20** **Badri Tsutskiridze¹, M. Tsutskiridze²** (¹Department of Mathematics of GTU, ²Grenoble University, Grenoble, France)
The nonstationary flow of incompressible electrically conducting fluid in between two planar parallel plates
- 17:20 - 17:40** **Temur Jangveladze** (VIAM TSU, GTU)
On one system of nonlinear two-dimensional partial differential equations

Section of Probability Theory and Mathematical Statistics

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

Wednesday, April 22

Gvanji Mania's Cabinet (TSU, XI building, Auditorium № 335)

- 16:00 - 16:20** **Petre Babilua¹, Elizbar Nadaraya^{1,2}, Mzevinar Patsatsia³** (¹Department of Mathematics of TSU, ²VIAM TSU, ³Sukhumi State University)
On testing hypothesis of equality two Poisson regression functions
- 16:20 - 16:40** **Kartlos I. Kachiashvili¹, Ashis SenGupta²** (¹Faculty of Informatics and Control Systems of GTU, VIAM TSU, Muskhelishvili Institute of GTU, ² Indian Statistical Institute, Kolkata, W.B., India; Augusta University, Augusta, Georgia, USA; Middle East Technical University, Ankara, Turkey)
Constrained Bayesian method for testing equi-correlation coefficient of a standard symmetric multivariate normal distribution
- 16:40 - 17:00** **George Giorgobiani, Vakhtang Kvaratskhelia, Vaja Tarieladze** (Muskhelishvili Institute of GTU)
On a notion of a subgaussian random sequence
- 17:00 - 17:20** **Michael Mania¹, Besik Chikvinidze²** (¹Georgian American University, Razmadze Institute of TSU, ²Department of Mathematics of TSU)
On the convergence of exponential martingales
- 17:20 - 17:40** **Tsotne Kutalia, Revaz Tevzadze** (Georgian American University)
A method of pricing for spread options
- 17:40 - 18:00** **Ekaterine Namgalauri¹, Omar Purtukhia^{1,2}** (¹Department of Mathematics of TSU, ²Razmadz Institute of TSU)
Integral representation of stochastically non-smooth functional of the running maximum of Brownian motion
- 18:00 - 18:20** **Zurab Kvatadze¹, Beqnu Parjiani¹, Tsiala Kvatadze²** (¹Department of Mathematics of GTU, ²Black Sea University)
On the strong law of large numbers for a sequence with chain dependence
- 18:20 - 18:40** **Nani Salia** (GTU)
The M/G/1 queueing system with an unreliable server a new solution
- 18:40 - 19:00** **Zaza Khechinashvili¹, Giorgi Lominashvili²** (¹Department of Mathematics of TSU, ²Akaki Tsereteli State University)
Minimum entropy martingale measure in a two-dimensional financial scheme
- 19:00 - 19:20** **Zurab Zerakidze** (Gori State University)
On Gaussian statistical structures

Section of Mathematical Modeling and Numerical Analysis

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

Wednesday, April 22

Room № 133 (VIAM TSU)

- 16:00 - 16:20 Tamaz Vashakmadze** (VIAM TSU, Department of Mathematics of TSU)
On the construction and foundation of refined theories and hierarchical models for thin-walled structures
- 16:20 - 16:40 Giorgi Buzhghulashvili, Tamaz Vashakmadze** (VIAM TSU, Department of Mathematics of TSU)
Approximate solution of screened Laplace equation with Green-Lagrange coefficient method under mixed boundary conditions
- 16:40 - 17:00 Jemal Rogava^{1,2}, Zurab Vashakidze^{2,3}** (¹Faculty of Exact and Natural Sciences of TSU, ²VIAM TSU, ³The University of Georgia)
A combined numerical approach for solving a nonlinear dynamic Timoshenko beam system
- 17:00 - 17:20 Giorgi Geladze¹, Archil Papukashvili^{1,2}, Meri Sharikadze¹, Manana Tevdoradze¹** (¹VIAM TSU, ²School of Science and Technology of the University of Georgia)
The influence of various meteorological parameters on MBLA through its numerical model
- 17:20 - 17:40 Khatuna Elbakidze¹, Oleg Kharshiladze²** (¹VIAM TSU, ²Physics Department of of TSU)
Review of the link between the space weather and the earth's atmospheric winds

Thursday, April 23

Ilia Vekua Lecture Hall

- 11:00 - 11:20 Nikoloz Kachakhidze¹, Jemal Peradze²** (¹GTU, ²TSU)
On a method for solving the generalized Kirchhoff equation describing the static state of a beam
- 11:20 – 11:40 Temur Chilachava, Gia Kvashilava, George Pochkhua** (Sokhumi State University)
Computer modeling of the process of interaction amonggeorgian, Laz, Mingrelian, and Svan populations
- 11:40 - 12:00 Archil Papukashvili^{1,2}, Giorgi Geladze¹, Meri Sharikadze¹** (¹VIAM TSU, ²School of Science and Technology of the University of Georgia)
On the approximate solution of the J. Ball's beam equation in the case of external damping
- 12:00 - 12:20 Nino Khatiashvili, David Kaladze** (VIAM TSU)
On the Stokes axi-symmetric flow in the infinite areas
- 13:00 - 13:20 Teimuraz Davitashvili, Giorgi Rukhaia, Giorgi Geladze, Meri Sharikadze** (VIAM TSU)
Study of the transport pathways of aeolian dust aerosols over the Caucasus (Georgia) using an ensemble of modern numerical models