

**Georgian Mathematical Union**  
**Batumi Shota Rustaveli State University**  
**Ministry of Education, Culture and Sport of Adjara Autonomous**  
**Republic**

**XIV INTERNATIONAL CONFERENCE**  
**OF THE GEORGIAN MATHEMATICAL UNION**  
**Dedicated to the 100-th Anniversary of the Georgian**  
**Mathematical Union**

# **PROGRAM**

**Batumi, September 2-7**  
**2024**

## **Organizing Committee**

Meskhi Alexander (Chair), Jangveladze Temur (Deputy Chair), Turmanidze Lela (Deputy Chair), Davitashvili Tinatin (Conference Secretary), Baladze Vladimer, Beridze Anzor, Bokelavadze Tengiz, Gagoshidze Mikheil, Natelashvili Lazare, Gogishvili Guram, Kereselidze Nugzar, Makharadze Dali, Rukhaia Mikheil, Shavardenidze Gvantsa, Vashakidze Zurab.

## **Local Organizing Committee**

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## **Scientific Committee**

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## **Conference Thematic Sessions and Organizers**

- Algebra and Number Theory (Khmaladze Emzar, Pirashvili Teimuraz, Shavgulidze Ketevan)
- Differential and Integral Equations, and Their Applications (Chkadua Otar, Duduchava Roland, Shavlakadze Nugzar)
- Geometry and Topology (Bakuradze Malkhaz, Baladze Vladimer, Khimshiashvili George)
- Logic, Language, Artificial Intelligence (Dundua Besik, Pkhakadze Konstantine, Rukhaia Mikheil)
- Mathematical Education and History of Mathematics (Gogishvili Guram, Vepkhvadze Teimuraz)
- Mathematical Logic and Discrete Mathematics (Kharazishvili Alexander, Kirtadze Aleksii, Omanadze Roland)
- Mathematical Modeling and Numerical Analysis (Chilachava Temur, Jangveladze Temur, Meladze Hamlet)
- Theoretical Physics (Kvinikhidze Alexander)
- Probability Theory and Statistics, Financial Mathematics (Kvaratskhelia Vakhtang, Purtukhia Omar, Tarieladze Vaja)
- Real and Complex Analysis (Ephremidze Lasha, Oniani Giorgi, Tephnadze George)

## **Mini Symposia and co-chairs:**

- Emerging Topics in Computer Science (co-chairs: Khachidze Manana and Tsintsadze Magda)

**Editors:** Gogishvili Guram, Davitashvili Tinatin

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## Schedule of the Conference

Section	Room	Mo	Tu	We	Th	Fr
Plenary Session	1	10-14	9-14, 19-21	10-14	10-14, 19-21 <sup>40</sup>	9-9 <sup>50</sup>
Real and Complex Analysis	1					
Geometry and Topology	2					
Algebra and Number Theory	2					
Differential and Integral Equations and their Applications	3					
Logic, Language and Artificial Intelligence	4					
Mathematical Logic and Discrete Mathematics	4					
Mathematical Education and History	5					
Theoretical Physics	6					
Mathematical Modeling and Numerical Analysis	6					
Mathematical Modeling and Numerical Analysis	7					
Probability Theory and Statistics, Financial Mathematics	8					
Mini-Symposium: Emerging Topics in Computer Science	8					

## Plenary Lectures

September 2, Monday

9 <sup>00</sup> : 9 <sup>30</sup>	<b>Registration</b>
9 <sup>30</sup> : 10 <sup>00</sup>	<b>Opening of the Conference</b>
<b>Plenary Room</b>	<b>Chairman: Meskhi Alexander</b>
10 <sup>00</sup> : 10 <sup>50</sup>	<b>Efendiyev Messoud.</b> Frontiers of Biomathematics: The Impact of Biology on Mathematics
10 <sup>50</sup> : 11 <sup>40</sup>	<b>Borodovsky Mark.</b> Mathematical Modeling of Genome Organization and Algorithms of Gene Prediction
11 <sup>40</sup> : 12 <sup>20</sup>	<b>Coffee break</b>
<b>Plenary Room</b>	<b>Chairman: Beridze Anzor</b>
12 <sup>20</sup> : 13 <sup>10</sup>	<b>Iosevich Alexander.</b> Applications of Linear and Multi-linear Restriction to Uncertainty Principles and Exact Signal Recovery
13 <sup>10</sup> : 14 <sup>00</sup>	<b>Burenkov Victor.</b> On the Recent Results in the Theory of Operators in General Morrey-type Spaces
14 <sup>00</sup> : 16 <sup>00</sup>	<b>Lunch break</b>
16 <sup>00</sup> : 17 <sup>15</sup>	Parallel Sessions
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 19 <sup>00</sup>	Parallel Sessions

## September 3, Tuesday

<b>Plenary Room</b>	<b>Chairman: Oniani Giorgi</b>
9 <sup>10</sup> : 10 <sup>00</sup>	<b>Xue Qingying.</b> A Class of Multilinear Bounded Oscillation Operators on Measure Spaces and Applications
10 <sup>00</sup> : 10 <sup>50</sup>	<b>Tikhonov Sergey.</b> Uncertainty Principles for Fourier Transform
10 <sup>50</sup> : 11 <sup>40</sup>	<b>Curbera Guillermo.</b> The Finite Hilbert Transform Taking Values in the Zygmund Space $L_{exp}(-1,1)$
11 <sup>40</sup> : 12 <sup>20</sup>	<b>Coffee break</b>
<b>Plenary Room</b>	<b>Chairman: Meskhi Alexander</b>
12 <sup>20</sup> : 13 <sup>10</sup>	<b>Barsegian Grigor.</b> The Idea of Complex Conjugacy (an Analogue of the Idea of Riemann Surfaces in Differential Geometry and Real Analysis)
13 <sup>10</sup> : 14 <sup>00</sup>	<b>Falcone Giovanni.</b> Periodic Functions, Toroidal Groups, Generalized Jacobians and Fractional Ideals of Non-totally Real Number Fields
14 <sup>00</sup> : 16 <sup>00</sup>	<b>Lunch break</b>
16 <sup>00</sup> : 17 <sup>15</sup>	Parallel Sessions
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 19 <sup>00</sup>	Parallel Sessions
Online	<b>Chairman: Ephremidze Lasha</b>
19 <sup>00</sup> : 19 <sup>50</sup>	<b>Biswas Anjan.</b> Quasi-stationary optical gaussons with maximum intensity
20 <sup>00</sup> : 20 <sup>50</sup>	<b>Ullrich Mario.</b> Widths of Convex Sets and the Power of Adaption and Randomization

## September 4, Wednesday

<b>Plenary Room</b>	<b>Chairman: Beridze Anzor</b>
10 <sup>00</sup> : 10 <sup>50</sup>	<b>Mastyło Mieczysław.</b> Projection Constants for the Spaces of Multivariate Polynomials
10 <sup>50</sup> : 11 <sup>40</sup>	<b>Zabka Matthew.</b> Topological Data Analysis with an Example in Social Networks
11 <sup>40</sup> : 12 <sup>20</sup>	<b>Coffee break</b>
<b>Plenary Room</b>	<b>Chairman: Ephremidze Lasha</b>
12 <sup>20</sup> : 13 <sup>10</sup>	<b>Georgiou Dimitrios N.</b> An Introduction to Dimension Theory of Topological Spaces – Zero-dimensional Extensions of Topologies
13 <sup>10</sup> : 14 <sup>00</sup>	<b>Escobar Santiago.</b> Logical Reasoning Capabilities in Maude 3.4
The evening	<b>Banquet</b>

## September 5, Thursday

<b>Plenary Room</b>	<b>Chairman: Duduchava Roland</b>
10 <sup>00</sup> : 10 <sup>50</sup>	<b>Kutsia Temur.</b> Recent Advances in Logic-based Generalization
10 <sup>50</sup> : 11 <sup>40</sup>	<b>Vakhania Nodari.</b> The Domination Problem in Graphs and Solution Methods
11 <sup>40</sup> : 12 <sup>20</sup>	<b>Coffee break</b>
<b>Plenary Room</b>	<b>Chairman: Jangveladze Temur</b>
12 <sup>20</sup> : 13 <sup>10</sup>	<b>Peinador Elena Martin.</b> Angelic Spaces: Eberlein-Šmulyan Type Results for Abelian Topological Groups
13 <sup>10</sup> : 14 <sup>00</sup>	<b>Pappalardi Francesco.</b> Imprimitve Points on Elliptic Curves



14 <sup>00</sup> : 16 <sup>00</sup>	<b>Lunch break</b>
16 <sup>00</sup> : 17 <sup>15</sup>	Parallel Sessions
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 19 <sup>00</sup>	Parallel Sessions
<b>Online</b>	<b>Chairman: Tarieladze Vaja</b>
19 <sup>00</sup> : 19 <sup>50</sup>	<b>Kąkol Jerzy.</b> About the Problem of Banach and Mazur from the 1930s. Classical and New Results
20 <sup>00</sup> : 20 <sup>50</sup>	<b>Kuchment Peter.</b> The Wonderful Wizardry of Tomography
20 <sup>50</sup> : 21 <sup>40</sup>	<b>Eichmann Gernot.</b> From Quarks and Gluons to Exotic Hadrons

### September 6, Friday

<b>Plenary Room</b>	<b>Chairman: Dundua Besik</b>
9 <sup>00</sup> : 9 <sup>50</sup>	<b><u>Gorlatch Sergei</u> and <u>Garanina Natalia.</u></b> Auto-Tuning High-Performance Programs with Model Checking in Promela
9 <sup>50</sup> : 16 <sup>00</sup>	<b>Break</b>
16 <sup>00</sup> : 17 <sup>15</sup>	Parallel Sessions
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 19 <sup>00</sup>	Parallel Sessions

### September 7, Saturday

10 <sup>00</sup> : 12 <sup>00</sup>	Parallel Sessions
<b>Room 1, 12<sup>00</sup></b>	<b>Closing</b>

## Thematic Sessions

### Algebra and Number Theory.

#### September 4, Wednesday

<b>Room 5</b>	<b>Chairman: Khmaladze Emzar</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Lomadze Vakhtang.</b> A note on generalized functions
16 <sup>25</sup> : 16 <sup>50</sup>	<b><u>Nebiyev Celil</u>, Ökten Hasan Hüseyin.</b> On cofinitely $\oplus$ -g-supplemented modules
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Mokhtari Amir Hossein.</b> Proper linear commutant preserving maps
17 <sup>15</sup> : 17 <sup>40</sup>	<b><u>Sampson Marshal</u>, Lipcsey Zsolt.</b> Algorithm for semigroup bases and its implication on the bases of classes of semigroup

#### September 5, Thursday

<b>Room 5</b>	<b>Chairman: Pirashvili Teimuraz</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Mesablihvili Bachuki.</b> On simultaneously reflective and coreflective full subcategories of an (enriched) functor category
16 <sup>25</sup> : 16 <sup>50</sup>	<b>García Martínez Xabier.</b> A characterisation of Lie algebras using ideals and subalgebras
16 <sup>50</sup> : 17 <sup>15</sup>	<b><u>Patchkoria Alex</u>, Martins-Ferreira Nelson, Montoli Andrea, Sobral Manuela.</b> The third cohomology group of a monoid and admissible abstract kernels
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Mesablihvili Tamar.</b> On factorization of monoids

$18^{10} : 18^{35}$	<b><u>Rakviashvili Giorgi, Muladze Vitali, Turmanidze Lela.</u></b> On ptojective class group of crossed products
$18^{35} : 19^{00}$	<b><u>Khmaladze Emzar.</u></b> Crossed modules, cohomology and Wells exact sequence for Leibniz n-algebras

## September 6, Friday

<b>Room 6</b>	<b>Chairman: Mesabliashvili Bachuki</b>
$16^{00} : 16^{25}$	<b><u>Neuhauser Markus, Heim Bernhard, Abdesselam Abdelmalek, Troeger Robert.</u></b> Log-concavity of infinite product generating functions
$16^{25} : 16^{50}$	<b><u>Amaglobeli Mikheil, Miasnikov Alexei.</u></b> On the categories of exponential R-groups
$16^{50} : 17^{15}$	<b><u>Bokelavadze Tengiz.</u></b> On nilpotent power MR-group
$17^{15} : 17^{45}$	<b>Coffee break</b>
$17^{45} : 18^{10}$	<b><u>Kemoklidze Tariel.</u></b> Endomorphisms of a separable primary group
$18^{10} : 18^{35}$	<b>(Online) <u>Goy Taras.</u></b> Connection formulas between Mersenne and Fibonacci numbers using Trudi's formula

## Differential and Integral Equations and their Applications

September 2, Monday

<b>Room 3</b>	<b>Chairman: Gol'dshtein Vladimir</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Duduchava Roland, Tsaava Medea.</b> Transmission problems for a second order differential equation on a hypersurface with Lipschitz boundary in the generic Bessel potential spaces.
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Gol'dshtein Vladimir, Pchelintsev Valery.</b> About Faber-Krahn Inequality for divergence form elliptic operators
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Beznea Lucian.</b> Positive solutions to semilinear Dirichlet problems with general boundary data.
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Ospanov Kordan, Moldagali Erkebulan, Uspanova Zhulduzai.</b> Conditions for the regularity of a solution of one fourth-order differential equation with unbounded coefficients
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Seibel Daniel.</b> Analytical integration in Galerkin boundary element methods
18 <sup>35</sup> : 19 <sup>00</sup>	<b>Ospanov Myrzagali, Merzetkhan Akerke,</b> On the solvability of a system of first-order differential equations in a non-cylindrical domain

September 3, Tuesday

<b>Room 3</b>	<b>Chairman: Duduchava Roland</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Hömberg Dietmar.</b> Two-scale topology optimization - modeling, analysis and numerical results.
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Partsvania Nino.</b> Kneser Problem for Two-Dimensional Nonlinear Singular Differential Systems

16 <sup>50</sup> : 17 <sup>15</sup>	<b>Olgun Cabri, <u>Toprakseven Suayp</u></b> . On q Sturm Liouville Operator with Periodic Boundary Conditions
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Smadiyeva Asselya</b> . Decay estimates for the degenerate differential equations.
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Zholamankyzy Ainur</b> . On the existence of the solution to the Goursat problem for loaded system hyperbolic equations.
18 <sup>35</sup> : 19 <sup>00</sup>	<b>Hamidreza Marasi</b> . Solving fractional models using artificial neural networks

### September 4, Wednesday, **Online**

<b>Room 3</b>	<b>Chairman: Shavlakadze Nugzar</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Kovtunenکو Victor</b> . Well-posedness of the governing equations for nonlinear elastic model in which both stress and strain appear linearly
16 <sup>25</sup> : 16 <sup>50</sup>	<b><u>Ayele Tsegaye</u>, Dagnaw Mulugeta, Monijore Shumatir</b> . Boundary-domain integral equations for Helmholtz BVPs with non-smooth coefficients on Lipschitz domain
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Ayele Tsegaye, <u>Hagos Goitom</u></b> . United boundary-domain integro-differential and integral equations to the Dirichlet problem for a compressible Stokes system with variable viscosity
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>

## September 5, Thursday

<b>Room 3</b>	<b>Chairman: Jokhadze Otar</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Gachechiladze Roland, <u>Gachechiladze Avtandil</u>.</b> Boundary contact problems with regard to friction of couple-stress viscoelasticity for inhomogeneous anisotropic bodies (non-coercive, quasi-static cases)
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Abylayeva Akbota,</b> Two-sided estimates of Weyl type operator
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Rupp Florian.</b> Modeling and Simulating the Stochastic Dynamics of Games with Three Pure Strategies
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b><u>Muratbekov Madi</u>, <u>Muratbekov Mussakan</u>.</b> Estimates of approximation numbers and completeness of root vectors of a singular operator generated by the linear part of the Korteweg-de Vries operator
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Dauren Matin, <u>Bokayev Nurzhan</u>, <u>Akhazhanov Talgat</u>.</b> Compactness of the commutator of the multilinear Calderon–Zygmund singular integral operator in global Morrey-type spaces

## September 6, Friday

<b>Room 3</b>	<b>Chairman: Chkadua Otar</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b><u>Jokhadze Otar</u>, <u>Kharibegashvili Sergo</u>.</b> On some boundary value problems for the equation of string oscillation.
16 <sup>25</sup> : 16 <sup>50</sup>	<b><u>Shavlakadze Nugzar</u>, <u>Pachulia Bachuki</u>,</b> The contact problem for piecewise-homogeneous viscoelastic plate with elastic patch
16 <sup>50</sup> : 17 <sup>15</sup>	<b><u>Shalamberidze Merab</u>, <u>Sokhadze Zaza</u>.</b> Basics of designing individual orthopedic Boot-Tree by for children with cerebral palsy

17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Giorgashvili Levan, Zazashvili Shota</b> , Boundary Value Problem of statics of the Second Gradient Theory of Thermoelasticity for a Ball
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Ashordia Malkhaz, Kekelia Nestan</b> , On the existence of bounded solutions for systems of linear impulsive equations
18 <sup>35</sup> : 19 <sup>00</sup>	<b>Toloraia Anika</b> . The solvability and regularity results of dynamical mixed type boundary-transmission problems with interior cracks of the thermo-electro-elasticity theory without energy dissipation

## Geometry and Topology

September 2, Monday

<b>Room 2</b>	<b>Chairman: Bakuradze Malkhaz</b>
15 <sup>00</sup> : 15 <sup>50</sup>	<b>Saneblidze Samson</b> . The secondary cohomology operations and loop space cohomology
15 <sup>50</sup> : 16 <sup>00</sup>	<b>Coffee break</b>
16 <sup>00</sup> : 16 <sup>50</sup>	<b>Patchkoria Irakli</b> . Chromatic congruences and Bernoulli numbers
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Aliashvili Teimuraz, Kapanadze Gvantsa</b> . On the topology of an intersection of quadric
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Kuznetsov Evgeny</b> . On Boolean Topos Constructions by Freyd and Patariaia and their generalizations
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Baladze Vladimer, Dumbadze Fridon</b> . An inverse system approach of map and its application in (co)homology theory

## September 3, Tuesday

<b>Room 2</b>	<b>Chairman: Saneblidze Samson</b>
15 <sup>00</sup> : 15 <sup>50</sup>	<b>Pirashvili Mariam.</b> The Drinfeld centre and Gottlieb group of a crossed module
15 <sup>50</sup> : 16 <sup>00</sup>	<b>Coffee break</b>
16 <sup>00</sup> : 16 <sup>50</sup>	<b>Bakuradze Malkhaz.</b> Complex cobordism modulo spherical cobordism
17 <sup>50</sup> : 17 <sup>15</sup>	<b>Latifinavid Sousan, Abazari Nemat, Yayli Yusuf.</b> A characterization of dual catenaries problem in dual spaces
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>35</sup>	<b>Beridze Anzor, Traczyk Pawel.</b> On the homological approach in Buraou representation theory
18 <sup>35</sup> : 19 <sup>00</sup>	<b>Bayramov Sadi, Velieva Kamale.</b> Neutrosophic topology on soft sets

## Logic, Language and Artificial Intelligence

*Dedicated to the 105th Anniversary of founder of Georgian School of the Classical Mathematical Logic, Honored Scientist of Georgia, Shalva Pkhakadze*

## September 2, Monday

<b>Room 4</b>	<b>Chairman: Rukhaia Mikheil</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Bishara Merium.</b> Some properties of Unranked Probabilistic Logic
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Bishara Merihan.</b> Probabilistic Inductive Logic Programming Techniques
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Dundua Besik.</b> Fuzzy Extension of Lambda Calculus



17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b><u>Abuladze Inga</u>, <u>Siradze Saba</u>, <u>Tsertsvadze Giorgi</u>.</b> Development of an electronic library for mobile applications using AI functions
18 <sup>10</sup> : 18 <sup>35</sup>	<b><u>Jintcharadze Elza</u>, <u>Khinkiladze Lika</u>.</b> Performance analysis for homomorphic encryption techniques based on Paillier Encryption
18 <sup>35</sup> : 19 <sup>00</sup>	<b><u>Saghinadze Teimuraz</u>.</b> LoRA-like parameter-efficient transfer learning for CNNs

### September 3, Tuesday

<b>Room 4</b>	<b>Chairman: Dundua Besik</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b><u>Nadiradze Luka</u>.</b> Cross-Disciplinary Insights in AI and Neuroscience
16 <sup>25</sup> : 16 <sup>50</sup>	<b><u>Kalandadze Raphael</u>, <u>Katamadze Sofio</u>, <u>Ferrari Laura</u>, <u>Tsmindashvili Tatia</u>, <u>Mueller Philipp</u>, <u>Kukhilava Natia</u>, <u>Wirth Benedikt Emanuel</u>.</b> Evaluation in EEG emotion recognition: state-of-the-art review and unified framework
16 <sup>50</sup> : 17 <sup>15</sup>	<b><u>Kachiashvili Soso</u>, <u>Tabagari Luka</u>, <u>Karapetian David</u>, <u>Müller Philipp</u>, <u>Wirth Benedikt Emanuel</u>, <u>Balazia Michal</u>.</b> Emotion recognition on the basis of human body movements using artificial intelligence methods
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b><u>Rukhaia Mikheil</u>.</b> Rewriting logic with quantitative relations
18 <sup>10</sup> : 18 <sup>35</sup>	<b><u>Kurtanidze Lia</u>.</b> Exploring some applications of probability logics
18 <sup>35</sup> : 19 <sup>00</sup>	<b><u>Tibua Lali</u>.</b> Extension of $\tau$ logic with probabilistic operators

## Mathematical Education and History of Mathematics

September 2, Monday

Room 5	Chairman: Gogishvili Guram
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Gogishvili Guram.</b> On the precision of mathematical concepts' defining.
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Chelidze George, Nikoleishvili Mikheil, <u>Tarieladze Vaja</u>.</b> On a sufficient condition of solvability of a Diophantine equation.
16 <sup>50</sup> : 17 <sup>15</sup>	<b><u>Kutkhashvili Ketevan</u>, Sulaqvelidze Levan, Kupertadze Kote.</b> School and university - one unit, one goal.
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b><u>Pkhovelishvili Merab</u>, Archvadze Natela, Gogichaishvili Kakha, Zandarashvili Zurab.</b> Modern Confirmation Theory.
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Zarnadze David.</b> On the Representation of the "either ..., or ..." Conjunction in School Mathematics Textbooks and National Examination Tests.

September 3, Tuesday

Room 5	Chairman: Vepkhvadze Teimuraz
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Vepkhvadze Teimuraz.</b> On the importance of teaching the elements of number theory in middle and high school
16 <sup>25</sup> : 16 <sup>50</sup>	<b><u>Manukyan Vardan</u>, Nikoghosyan Gagik.</b> Some kinematic approaches to solving geometric problems.
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Mebonia Ia.</b> About the specifics of using the open book method at school.
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>

17 <sup>45</sup> : 18 <sup>10</sup>	<b>Samsonadze Guram.</b> About the ABET-Program in Linear Algebra.
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Mahagna Ahlam.</b> Pines and Future.

## September 5, Thursday

<b>Room 5</b>	<b>Chairman: Sulakvelidze Levan</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b><u>Tsamalashvili Davit</u>, Kurchishvili Lamara.</b> One approach to solve probability problems
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Macharashvili Giorgi.</b> Data analysis
16 <sup>50</sup> : 17 <sup>15</sup>	<b><u>Deisadze Manana</u>, Kirtadze Shalva.</b> A Universal design of teaching and differentiated approach
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Adeishvili Vladimer, <u>Gokadze Ivane</u>.</b> Ptolemy's theorem for cyclic quadrilaterals and its consequences
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Butchukhishvili Mamuli.</b> On the issue of teaching irrational equations.
18 <sup>35</sup> : 19 <sup>00</sup>	<b>Giorgadze Teimuraz.</b> From the history of trigonometric functions.

## Mathematical Logic and Discrete Mathematics

### September 4, Wednesday

<b>Room 4</b>	<b>Chairman: Kirtadze Aleks</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b><u>Altayeva Aizhan</u>, Kulpeshov Beibut.</b> Almost omega-categoricity in weakly o-minimal theories
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Beriashvili Mariam.</b> On some topological properties of Luzin set
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Ahmed Mamoon.</b> The Graded Graph for Submodules

## September 5, Thursday

<b>Room 4</b>	<b>Chairman: Beriashvili Mariam</b>
$16^{00} : 16^{25}$	<b>Grigolia Revaz, Liparteliani Ramaz.</b> Decidability of Generalized 3-valued Post algebras
$16^{25} : 16^{50}$	<b>Yershigeshova Aisha, Verbovskiy Viktor,</b> On pure linear orderings of Morley o-rank 1
$16^{50} : 17^{15}$	<b>Zambarnaya Tatyana, Baizhanov Bektur.</b> Observations on the number of countable models of ordered theories
$17^{15} : 17^{45}$	<b>Coffee break</b>
$17^{45} : 18^{10}$	<b>Tazabekova Nargiza, Baizhanov Bektur.</b> V-independent sequences
$18^{10} : 18^{35}$	<b>Zarnadze David, Tsozniashvili Soso.</b> Boolean algebras with exclusive disjunction and symmetric difference

## September 6, Friday

<b>Room 4</b>	<b>Chairman: Grigolia Revaz</b>
$16^{00} : 16^{25}$	<b>Kirtadze Aleks,</b> On some properties of small sets
$16^{25} : 16^{50}$	<b>Khachidze Marika.</b> On almost invariant Bernstein type sets
$16^{50} : 17^{15}$	<b>Beriashvili Shalva, Kasrashvili Tamar, Tetunashvili Tengiz.</b> On estimation of sums of certain finite systems of vectors with applications
$17^{15} : 17^{45}$	<b>Coffee break</b>
$17^{45} : 18^{10}$	<b>Beraia Lika.</b> On Mazurkiewicz type sets

## Mathematical Modeling and Numerical Analysis

September 2, Monday

<b>Room 6</b>	<b>Chairman: Meladze Hamlet</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b><u>Kublashvili Murman, Sanikidze Zaza, Saghinadze Teimuraz, Macharashvili Gela.</u></b> Approximate calculations of singular integrals with piecewise differentiating density
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Ugulava Duglas, <u>Zarnadze David.</u></b> On a central algorithm for calculation of the inverse of the multidimensional harmonic oscillator in the spaces of orbits
16 <sup>50</sup> : 17 <sup>15</sup>	<b><u>Zakradze Mamuli, Tabagari Zaza, Koblishvili Nana, Davitashvili Tinatin.</u></b> The numerical solution of the Dirichlet generalized and classical harmonic problems for irregular n-sided pyramidal domains by the MPS
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Baghaturia Giorgi, <u>Menteshashvili Marine.</u></b> Application of grid-characteristic method to characteristic problems for one class of quasi-linear equations
18 <sup>10</sup> : 18 <sup>35</sup>	<b><u>Tsiramua Sergo, Davitashvili Tinatin, Meladze Hamlet.</u></b> Logical-probabilistic modeling of risks and quantitative assessment of safety
18 <sup>35</sup> : 19 <sup>00</sup>	<b>Vashakmadze Tamaz.</b> To the reduction, spread and perspective of nonlinear complex analysis for some problems of theoretical physics

September 2, Monday

<b>Room 7</b>	<b>Chairman: Tsiramua Sergo</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b><u>Odisharia Vladimer, Odisharia Kakhaber, Janikashvili Nona, Kalichava Zviad.</u></b> Mathematical model of combined treatment of rheumatoid arthritis considering IL6

16 <sup>25</sup> : 16 <sup>50</sup>	<b>Kalichava Zviad, Odisharia Vladimer, Odisharia Kakhaber, Janikashvili Nona.</b> Nonlinear mathematical model of immunopathogenesis of rheumatoid arthritis considering the role of mediator of inflammation
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Meladze Hamlet, Davitashvili Tinatin, Tchelidze Tamar, Basharuli Nika, Burdiladze Luka.</b> About one method of solving the Schrödinger equation and its application in modeling the electronic properties of quantum nanostructures
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>(Online) Slabospitsky Alexander.</b> Least squares time-varying parameter estimation with least deviations from attraction points and its recurrent representation for some classes of systems under non-classical assumptions
18 <sup>10</sup> : 18 <sup>35</sup>	<b>(Online) Khatiashvili Nino.</b> On the Novel Solutions of 2D Navier-Stokes Equation
18 <sup>35</sup> : 19 <sup>00</sup>	<b>(Online) Peradze Jemal.</b> A numerical algorithm of solving a nonlinear integro-differential string equation and its error

### September 3, Tuesday

<b>Room 6</b>	<b>Chairman: Chilachava Temur</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b><u>Chilachava Temur</u>, Pochkhua George.</b> Mathematical models of the propagation of world religions
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Chilachava Temur, <u>Zedashidze Rusudan.</u></b> Mathematical model of detonation wave propagation in a nonhomogeneous gravitational gas sphere
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Kereselidze Nugzar.</b> Information security model in the case of two sources of misinformation
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
	<b>Chairman: Jangveladze Temur</b>

17 <sup>45</sup> : 18 <sup>10</sup>	<b>Akhobadze Merab, <u>Kurtskhalia Elguja</u>.</b> <i>Q</i> -analysis of connections of hierarchical systems using fuzzy sets
18 <sup>10</sup> : 18 <sup>35</sup>	<b><u>Chkhikvadze Teimuraz, Jangveladze Temur, Kiguradze Zurab</u>.</b> On one nonlinear fourth-order integro-differential parabolic equation
18 <sup>35</sup> : 19 <sup>00</sup>	<b><u>Gagoshidze Mikheil, Jangveladze Temur, Kiguradze Zurab</u>.</b> On approximate solution of one two-dimensional system of nonlinear partial differential equations

### September 3, Tuesday

<b>Room 7</b>	<b>Chairman: Davitashvili Tinatin</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b><u>Elbakidze Khatuna, Kharshiladze Oleg, Kutalia Konstantine</u>.</b> The solar wind - earth magnetic field interactions and its effect on the climate change
16 <sup>25</sup> : 16 <sup>50</sup>	<b><u>Martínez-Aroza José A., Gómez-Lopera Juan F.</u></b> Histogram clustering and edge detection in grayscale digital images
16 <sup>50</sup> : 17 <sup>15</sup>	<b><u>Mdzinarishvili Tengiz, Shanidze Revaz, Osepashvili Mariam</u>.</b> Mathematical modeling of carcinogenesis
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Alizadeh Abdollah.</b> Numerical Simulation of generated heat in Metal plate placed upon the optical waveguide using the 1D simulation and extending to 3D
18 <sup>10</sup> : 18 <sup>35</sup>	<b><u>Kumar Sanjeev, Gautam Diksha, Sharma Rashmi</u>.</b> A rigorous mathematical analysis to explore the density of tumour cells and immune response (TNF)
18 <sup>35</sup> : 19 <sup>00</sup>	<b><u>Vadher Pragna A., Deheri Gunamani B., Kumar Sanjeev, Valani Bharatkumar N., Patel Rakesh M.</u></b> The combined effect of elastic deformation and viscosity variation on a ferrofluid based rough short bearing: A comparison of porous structures

## September 5, Thursday

<b>Room 7</b>	<b>Chairman: Jangveladze Temur</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Bulut Sadullah, Yiğider Muhammed.</b> Numerical solution and applicability of $\beta$ -conformable time fractional derivative equations with artificial neural networks
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Jafarzadeh Yousef.</b> Dual integral transform in the class of laplace
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Jafarzadeh Yousef.</b> Some theorems and new result related to the triple laplace transform
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Oleinikov Alexander.</b> Fracture criteria for matrix and fibers in unidirectional polymeric composites
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Yousefikhoshbakht Majid, Dolatnezhadsomarin Azam.</b> A combination of ant colony optimization and simulated annealing for solving the multiple traveling salesman problem
18 <sup>35</sup> : 19 <sup>00</sup>	<b>(Online) Kechiche Dounya.</b> A litterature survey on the effect of scanning strategy on temperature gradients in SLM



## Probability Theory and Statistics, Financial Mathematics

September 2, Monday

Room 8	Chairman: Kachiashvili Kartlos
16 <sup>00</sup> : 16 <sup>25</sup>	<b><u>Kachiashvili Kartlos</u>, Kachiashvili Joseph, SenGupta Ashis.</b> Quasi-optimal rule of testing directional hypotheses and its application to big data
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Sági Judit.</b> Measurement of the excess inflation in the Balassa Samuelson model in the countries of the South Caucasus
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Udvaros József.</b> Econometric forecasting during crisis periods, using unrestricted mixed-data sampling regression
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Namgalauri Ekaterine, Jaoshvili Vakhtang, Purtukhia Omar.</b> Clark-Ocone type formulas for some past-dependent Brownian functionals
18 <sup>10</sup> : 18 <sup>35</sup>	<b>George Giorgobiani, <u>Kvaratskhelia Vakhtang</u>, Tarieladze Vaja.</b> On sub-gaussianity in finite and infinite-dimensions
18 <sup>35</sup> : 19 <sup>00</sup>	<b><u>Kvatadze Zurab</u>, Parjiani Beqnu, Kvatadze Tsiala.</b> Chebyshev's theorem for sequences with chain dependence

September 3, Tuesday

Room 8 Online	Chairman: Kvaratskhelia Vakhtang
16 <sup>00</sup> : 16 <sup>25</sup>	<b><u>Tkach Mariia</u>, Livinska Hanna.</b> Evaluation of some optimal characteristics of a metro station by queueing modelling
16 <sup>25</sup> : 16 <sup>50</sup>	<b><u>Salia Nani</u>, Kakubava Revaz.</b> Queue length's analysis for an M/G/1 system in random environment

16 <sup>50</sup> : 17 <sup>15</sup>	<b><u>Zerakidze Zurab</u>, Aleksidze Lela, Eliauri Laura.</b> The "Z-Criteria" of hypotheses testing for statistical structure in Banach Space of measures
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b><u>Babilua Petre</u>, Nadaraya Elizbar.</b> On the estimating Poisson regression function using Bernstein polynomials
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Mnatsakanov Robert.</b> Nonparametric estimation in random coefficient regression model
18 <sup>35</sup> : 19 <sup>00</sup>	<b>Magrakvelidze Dali.</b> Fuzzy probability - one of the ways to remove uncertainty

## Real and Complex Analysis

*Dedicated to the 100th Anniversary of Honored Scientist of Georgia,  
Professor Gogi Manjavidze*

### September 2, Monday

<b>Room 1</b>	<b>Chairman: Meskhi Alexander</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Meskhi Alexander.</b> Rubio de Francia's extrapolation in grand Banach function spaces
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Oniani Giorgi.</b> Approximation and transfer of properties between translation invariant convex differentiation bases
16 <sup>50</sup> : 17 <sup>15</sup>	<b><u>Makharadze Dali</u>, Meskhi Alexander.</b> Commutators of sublinear operators in Grand variable exponent Morrey spaces and applications to PDEs
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Chelidze George, <u>Giorgobiani George</u>, Tarieladze Vaja.</b> Rearrangement universality of the Dirichlet type series
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Qin Moyan.</b> Limiting weak type behaviors for rough operators, and characterizations

18 <sup>35</sup> : 19 <sup>00</sup>	<b>Zhang Juan.</b> Riesz transforms associated with the Neumann Laplacian
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### September 3, Tuesday

<b>Room 1</b>	<b>Chairman: Oniani Giorgi</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Bokayev Nurzhan, Gogatishvili Amiran, <u>Matin Dauren</u>, Abek Azhar.</b> On optimal embedding of the space of generalized fractional-maximal functions in rearrangement-invariant spaces
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Giorgadze Grigor, Makatsaria Giorgi, <u>Manjavidze Nino</u>.</b> Some functional properties of generalized solutions of two-dimensional elliptic system
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Bakuridze Mzevinar, <u>Tarieladze Vaja</u>.</b> On Khavin subsets of complex plane
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Khanna Nikhil.</b> A note on scalable $K$ - $g$ -frames
18 <sup>10</sup> : 18 <sup>35</sup>	<b>Sharma Nitin, <u>Sharma Sumit Kumar</u>.</b> On Hilbert-Schmidt frames in quaternionic Hilbert spaces

### September 5, Thursday

<b>Room 1</b>	<b>Chairman: Ephremidze Lasha</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Ephremidze Lasha.</b> Algorithm for Wiener-Hopf factorization of polynomial matrices with monomial determinant
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Tepnadze George.</b> Almost everywhere convergence of subsequences of partial sums of Fourier series with respect to Vilenkin systems
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Almohammedali Fadelah, <u>Chan Kit</u>.</b> Conditions for automorphic compositions on the upper half-plane to be universal
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>

$17^{45} : 18^{10}$	<b><u>Akhazhanov Talgat, Bokayev Nurzhan, Matin Dauren.</u></b> Compactness of the commutator of the multilinear Calderon–Zygmund singular integral operator in global Morrey-type spaces.
$18^{10} : 18^{35}$	<b><u>Meskhi Alexander, Natelashvili Lazare.</u></b> Boundedness criteria for the multilinear Riemann-Liouville operators

### September 6, Friday

<b>Room 1</b>	<b>Chairman: Tutberidze Giorgi</b>
$16^{00} : 16^{25}$	<b><u>Cagareishvili Giorgi, Tsagareishvili Vakhtang, Tutberidze Giorgi.</u></b> Unconditional convergence of general Fourier series
$16^{25} : 16^{50}$	<b><u>Poumai Khole Timothy.</u></b> Short-Time Gabor transform in graph signal processing
$16^{50} : 17^{15}$	<b><u>Tetvadze Giorgi, Tetvadze Lili, Tsibadze Lamara, Tvalodze Iuri.</u></b> On the boundary behaviour of Blaschke-Djrbashyan canonical product in the unit disk
$17^{15} : 17^{45}$	<b>Coffee break</b>
$17^{45} : 18^{10}$	<b><u>Mukhambetzhan Manshuk, Turgumbaev Mendybai.</u></b> On the weighted integrability of the series with monotonic coefficients with respect to the multiplicative systems

### September 7, Saturday (Online)

<b>Room 1</b>	<b>Chairman: Lasha Ephremidze</b>
$10^{00} : 10^{25}$	<b><u>Asad Zaighum Muhammad.</u></b> Sublinear operators on Grand Herz Hardy spaces
$10^{25} : 10^{50}$	<b><u>Mathi Manivannan.</u></b> Radius properties of harmonic mappings fixing with the analytic part as convex

## Theoretical Physics

### September 5, Thursday

<b>Room 6</b>	<b>Chairman: Gevorkyan Ashot</b>
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Devidze Gela.</b> Top quark rare decays in the BSM scenarios
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Gevorkyan Ashot.</b> Quantum chromodynamics of nucleons in the representation of complex probabilistic processes
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b><u>Katchiuri Irine</u>, Kipiani Gela.</b> Dynamic Study of Overhead crane
18 <sup>10</sup> : 18 <sup>35</sup>	<b><u>Khunjua Tamaz</u>, Klimenko Konstantin , Zhokhov Roman.</b> Dual symmetries of dense three and two-color QCD and some QCD-like NJL models
18 <sup>35</sup> : 19 <sup>00</sup>	<b><u>Özçağ Emin</u>.</b> On compositions of some singular distributions

### September 6, Friday

<b>Room 6</b>	<b>Chairman: Khunjua Tamaz</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Kvinikhidze Alexander.</b> Boosting bound state wave functions for the Chiral EFT
16 <sup>25</sup> : 16 <sup>50</sup>	<b><u>Tchelidze Tamar</u>, Meladze Hamlet, Davitashvili Tinatin, Machavariani Zaal, Basharuli Nika, Burdiladze Luka.</b> Coulomb interaction in semiconductor quantum wells
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Tediashvili Zurab.</b> On the uniqueness in the inverse problems of potential theory
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b><u>Tsutskiridze Badri</u>, Tsutskiridze Mari.</b> The flow between two co-axial tube

## Mini-Symposium: Emerging Topics in Computer Science

September 5, Thursday

<b>Room 8</b>	<b>Chairman: Archuadze Maia</b>
16 <sup>00</sup> : 16 <sup>25</sup>	<b>Archuadze Maia, Tsintsadze Magda, Khachidze Manana.</b> Gender challenges in computer science and STEM
16 <sup>25</sup> : 16 <sup>50</sup>	<b>Archvadze Natela, Pkhovelishvili Merab, Shetsiruli Lia.</b> The prediction model of parallel data
16 <sup>50</sup> : 17 <sup>15</sup>	<b>Asabashvili Elisabed.</b> Identifying key relationships in a data set
17 <sup>15</sup> : 17 <sup>45</sup>	<b>Coffee break</b>
17 <sup>45</sup> : 18 <sup>10</sup>	<b>Gagloshvili Julieta.</b> The best intelligent systems for idea management and their practical integration
18 <sup>10</sup> : 18 <sup>35</sup>	<b>(Online) Tsintsadze Magda, Archuadze Maia, Khachidze Manana.</b> The role of patterns in improving performance in the .NET environment.
18 <sup>35</sup> : 19 <sup>00</sup>	<b>(Online) Khachidze Manana, Kobrava Davit, Archuadze Maia, Tsintsadze Magda.</b> Using reverse Monte Carlo to populate data lakes and marts

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