

**XXXII International Enlarged Sessions of the Seminar  
of Ilia Vekua Institute of Applied Mathematics (VIAM)  
of Ivane Javakhishvili Tbilisi State University (TSU)**

**April 18–20, 2018**

**Dedicated to the**

**Centenary of the Ivane Javakhishvili Tbilisi State University**

**&**

**50th Anniversary of the Ilia Vekua Institute of Applied Mathematics of TSU**



**Program**

**Opening - April 18, Wednesday, 14:00**

**Ilia Vekua Lecture Hall in VIAM**

## Organizing Committee

George Jaiani (Chair)	Leri Gogoladze
Nikoloz Avazashvili (Co-Chair)	Alekhander Kharazishvili
Natalia Chinchaladze (Co-chair)	Sergo Kharibegashvili
Temur Jangveladze (Co-chair)	George Khimshiashvili
Natia Khachidze (Scientific Secretary, Contact Person, email: <a href="mailto:natiaa.xachidze@gmail.com">natiaa.xachidze@gmail.com</a> )	Zurab Kiguradze
Mikheil Rukhaia (Scientific Secretary, Contact Person, email: <a href="mailto:mrukhaia@yahoo.com">mrukhaia@yahoo.com</a> )	Archil Kipiani
Bakur Gulua (Scientific Secretary)	Roman Koplataidze
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Manana Tevdoradze (Technical Secretary)	Elizbar Nadaraia
Mikheil Amaghlobeli	David Natroshvili
Jemal Antidze	Roland Omanadze
George Akhalaia	Archil Papukashvili
Matias Baaz (Austria)	Omar Purtukhia
Ana Danelia	Jemal Rogava
Temur Davitashvili	Khimur Rukhaia
Grigor Giorgadze	Ketevan Shavgulidze
Ushangi Goginava	Tamaz Tadumadze
	Tamaz Vashakmadze
	Teimuraz Vepkhvadze

In the case of co-authors the speaker's name is underlined.

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](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, 2018.

Opening of the Seminar will start on April 18, 2018 at 14:00 at I. Vekua Institute of Applied Mathematics (University str. 2, 0186 Tbilisi, Georgia).

As usual on April 23 at 16:00 a visit to Mtatsminda Pantheon is planned, where Ilia Vekua is buried.

**Wednesday, April 18**  
**Ilya Vekua Lecture Hall (VIAM)**

**14:00 - 14:30**      **Opening**

# Section of Mathematical Logic and Foundations

Chairs: Alexander Kharazishvili, Roland Omanadze

Co-chair: Archil Kipiani

**Friday, April 20**

**Room № 115 (VIAM)**

- 9:00 - 9:20**      **Roland Omanadze.** On the connections between wtt- and Q-reducibilities
- 9:25 - 9:45**      **Mariam Beriashvili.** On Mazurkiewicz type sets
- 9:50 - 10:10**    **Revaz Grigolia.** Decidability of the Logic  $\mathbb{L}_p$  of perfect MV-algebras
- 10:15 - 10:35**   **Archil Kipiani.** On a family of mono-unary algebras
- 10:40 - 11:00**   **Shalva Beriashvili.** Triangulations of polyhedrons and their dual graphs
- 11:05 - 11:25**   **Tengiz Tetunashvili.** On point sets with special combinatorial properties
- 11:30 - 11:50**   **Marika Khachidze.** Almost invariant sets and applications
- 11:55 - 12:15**   **Alex Kirtadze.** Thick homomorphisms and applications

# Section of Applied Logics and Programming

Chair: Matthias Baaz (Austria)

Co-chairs: Jemal Antidze, Khimur Rukhaia

**Wednesday, 18 April**

**Room № 226 (VIAM)**

**11:00 - 11:20**    **Anriette Bishara** (Egypt). Fuzzy description logic and its applications

**11:25 - 11:45**    **Mikheil Rukhaia**. Logical methods for protocol analysis

**11:50 - 12:10**    **Besik Dundua**. Logical methods for access control

**12:15 - 12:35**    **Lika Kurtanidze**. Skolemization in unranked logics

**Friday, 20 April**

**Room № 226 (VIAM)**

**16:00 - 16:20**    **Jemal Antidze**. Special approach for some project's computer realisation

**16:25 - 16:45**    **Teimuraz Kutsia** (Austria). Term-graph anti-unification

**16:50 - 17:10**    **K. Pkhakadze, M. Chiqvinidze, G. Chichua, D. Kurtskhalia, Shalva Malidze**. Georgian universal smart corpus and inbuilt in it Abkhazian, Chechen, Kabardian and Lezgian self-developing corpuses - results and perspectives

**17:15 - 17:35**    **Khimur Rukhaia, T. Davitashvili, L. Tibua**. On theorem proving methods in TSR logic and possibility of its usage in weather forecast tasks

## Section of Number Theory, Algebra and Geometry

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

**Wednesday, April, 18**

**Room № 103 (XI Building of TSU)**

- 16:00 - 16:20**    **Mikheil Amaglobeli** . Some results of the theory of exponential MR-groups
- 16:25 - 16:45**    **Teimuraz Vepkhvadze**. The number of representations of some positive integers by positive binary quadratic forms with odd discriminant
- 16:50 - 17:10**    **Ketevan Shavgulidze**. On the number of representations of integers by the quadratic forms of eight variables
- 17:15 - 17:35**    **Ilia Tavkhelidze, J. Gielis**. “m-knife” and the process of cutting  $GML_m^n$  bodies

## Section of Real Analysis

Chairs: Ushangi Goginava, Leri Gogoladze

Co-chair: Ana Danelia

**Wednesday, April 20**

**Room № 334 (XI Building of TSU)**

- 15:00 - 15:20** **Teimuraz Akhobadze.** Approximation of a continuous function by generalized Cesáro means of its Fourier series
- 15:25 - 15:45** **Vakhtang Tsagareishvili, L. Gogoladze.** Functions of bounded variation and unconditional convergence
- 15:50 - 16:10** **Ushangi Goginava.** Convergence in measure of Fejer means of two parameter conjugate Walsh transforms
- 16:15 - 16:35** **Duglas Ugulava, T. Chantladze.** On the summability of Fourier series of almost periodic functions, with values in a Banach space
- 16:40 - 17:00** **Lasha Baramidze.** Summability of logarithmic means of Fourier series
- 17:05 - 17:25** **Gvantsa Shevardenidze.** Bounded variation functions and the convergence of Cesáro means of negative order of Vilenkin-Fourier series
- 17:30 - 17:50** **Giorgi Tutberidze.** Absolutely convergence factors of Lip1 class Fourier coefficients

# Section of Complex Analysis and Applications

Chair: Grigor Giorgadze

Co-chair: George Akhalaia

**Wednesday, April 18**

**Ilia Vekua Lecture Hall (VIAM)**

- 15:00 - 15:20**    **Nugzar Makhaldiani.** Supersymmetric dynamics, statistical sums and Zeta-functions
- 15:25 - 15:45**    **Vagner Jikia.** New properties of the Euler function and applications
- 15:50 - 16:10**    **Giorgi Akhalaia, N. Manjavidze.** Boundary value problems for generalized analytic vectors
- 16:15 - 16:35**    **Ioane Shengelia** The conformal modulus of quadrilaterals
- 16:40 - 17:00**    **Gega Gulagashvili** On the complex structures of vector bundles induced from Fuchsian system
- 17:05 - 17:25**    **Giorgi Makatsaria, Tamaz Vekua.** On asymptotic conditions of uniqueness of the analytic (Generalized Analytic) functions
- 17:30 - 17:50**    **Vallerian Jikia** A Special case of non- homogeneous problem of linear conjugation for the Carleman-Vekua regular equation
- 17:55 - 18:15**    **Gia Giorgadze** Deformation complex structures and boundary value problems with shift



# Section of Ordinary Differential Equations and Optimal Control

Chairs: Roman Koplataдзе, Tamaz Tadumadze

**Friday, April 20**

**Room № 256 (VIAM)**

- 12:00 - 12:20**    **Tamaz Tadumadze.** On sensitivity of the minimum of functional for one optimization problem with delay
- 12:25 - 12:45**    **K. Odisharia, Vladimer Odisharia, P. Tsereteli.** About the mathematical model of autoimmune diseases
- 12:50 - 13:10**    **G. Adeishvili, Mariam Khechikashvili.** Well-posedness of the Cauchy problem for some classes of controlled functional-differential equations uniformly with respect to control
- 13:15 - 13:35**    **Tea Shavadze.** Local variation formulas of solution for the controlled delay functional differential equation with the discontinuous initial condition
- 13:40 - 14:00**    **Akaki Gabelaia .** For Arrow–Hurwitz model’s adjustment, in the frame of Walras general equilibrium theory
- 14:05 - 14:25**    Break
- 14:25 - 14:45**    **Roman Koplataдзе.** Oscillation criteria for second order nonlinear difference equations
- 14:50 - 14:10**    **Natia Khachidze.** Higher order Emden-Fowler type difference equation with the deviated argument
- 14:15 - 14:35**    **Nika Gorgodze, I. Ramishvili.** Well-posedness of the Cauchy problem for one class of neutral quasi-linear differential equations with distributed delay
- 15:40 - 16:00**    **Bezhan Gvaberidze.** Some applications of multicriteria partitioning and covering problem
- 16:05 - 16:25**    **Phridon Dvalishvili .** Sensitivity analysis for one delay optimization problem

## Section of Partial Differential Equations

Chairs: Temur Jangveladze, Sergo Kharibegashvili, David Natroshvili

Co-chair: Zurab Kiguradze

**Wednesday, April 18**

**Room № 227 (VIAM)**

- 15:00 - 15:20**     **Giorgi Dekanoidze.** The Darboux type problems for one class of nonlinear second order hyperbolic systems
- 15:25 - 15:45**     **J. Peradze, Zviad Tsiklauri.** On a method of solution of a system of differential equations for a dynamical beam
- 15:50 - 16:10**     **S. Akbarova, Marguba Akbarova (Uzbekistan).** Boundary value problem with integral conditions for the elliptic-parabolic equation with inner two lines of degeneration
- 16:15 - 16:35**     **Valery V. Volchkov, Vit.V.Volchkov (Ukraine).** A uniqueness theorem for the Darboux equation on the hyperbolic space

# Section of Theory of Probability and Mathematical Statistics

Dedicated to Centenary of Professor Gvanji Mania

Chairs: Elizbar Nadaraia, Omar Purtukhia

**Wednesday, April 18**

**Auditorium № 335 (TSU XI)**

- 15:00 - 15:20**     **Petre Babilua, E. Nadaraya.** On the nonparametric estimation of the Bernoulli regression Function
- 15:25 - 15:45**     **P. Babilua, Besarion Dochviri, V. Jaoshvili.** On the statistical estimation of the life time of the multimolecular chemical reaction
- 15:50 - 16:10**     **Revaz Tevzadze.** Robust stochastic control of the exchange rate using interest rates
- 16:15 - 16:35**     **Besik Chikvinidze.** An extension of the mixed Novikov-Kazamaki condition
- 16:40 - 17:00**     **Aleksander Tkeshelashvili.** One type of generalized stochastic integral in a Hilbert Space

**Thursday, April 19**

**Auditorium № 335 (TSU XI)**

- 15:00 - 15:20**     **Kartlos Kachiashvili.** On one aspect of constrained Bayesian method for testing directional hypotheses
- 15:25 - 15:45**     **B. Mamporia, Omar Purtukhia.** About one method of stochastic integral representation of Brownian functional
- 15:50 - 16:10**     **Zaza Khechinashvili.** Optimal forecasting in the financial schemes with disorder moment
- 16:15 - 16:35**     **Benku Farjani, Z. Kvatadze.** The kernel estimation of the density and its precision in the case of chain dependent sequences
- 16:40 - 17:00**     **M. Mumladze, Zurab Zerakidze.** The consistent criteria for testing hypotheses

## Section of Mechanics of Continua

Chairs: Tengiz Meunargia, George Jaiani

Co-chair: Natalia Chinchaladze

**Wednesday, April 18**

**Room № 115 (VIAM)**

- 15:00 - 15:20**    **Edison Abramidze, El. Abramidze.** Numerical solution of a problem of nonlinear deformation of a layered cylindrical shell under local axially symmetric loading
- 15:25 - 15:45**    **Roman Janjgava.** Strongly shallow spherical shell with double porosity
- 15:50 - 16:10**    **Giorgi Kapanadze, B. Gulua.** The problem of finding an equally strong contour for a rectangular plate weakened by a hole and the notches at the vertices
- 16:15 - 16:35**    **Tengiz Meunargia.** On the Muskhelishvili-Vekua methods for 3D shell-like elastic bodies
- 16:40 - 17:00**    **Tamaz Vashakmadze.** On the justification and stability of the refined and hierarchical theories for thin walled structures

**Friday, April 20**

**Room № 115 (VIAM)**

- 15:00 - 15:20**    **George Jaiani.** Hierarchical models for piezoelectric nonhomogeneous viscoelastic Kelvin-Voigt prismatic shells with voids
- 15:25 - 15:45**    **Natalia Chinchaladze.** On a vibration problem of porous elastic prismatic shells
- 15:50 - 16:10**    **Natela Zirakashvili.** Exact solution of some interior boundary value problems of elasticity for the domain, bounded by hyperbola
- 16:15 - 16:35**    **Ivane Tsagareli.** Solution of a boundary value problem of elastostatics for an elastic porous circular ring with voids
- 16:40 - 17:00**    **Lamara Bitsadze.** Basic problems of steady vibration in the fully coupled theory of elasticity for a half-space with double porosity

# Section of Mathematical Modeling and Numerical Analysis

Chairs: Teimuraz Davitashvili, Jemal Rogava, Tamaz Vashakmadze

Co-chair: Archil Papukashvili

**Wednesday, April 18**

**Room № 115 (VIAM)**

- 11:00 - 11:20** **Tamaz Vashakmadze.** On the creation of initial data by Gauss-Hermite approximate method for the Cauchy problem
- 11:25 - 11:45** **D. Ugulava, David Zarnadze.** On ill-posed problems and associated with them orbital operators
- 11:50 - 12:10** **Ramaz Botchorishvili.** Upwind Schemes for Helmholtz Equation
- 12:15 - 12:35** **Archil Papukashvili, G. Papukashvili, M. Sharikadze.** Numerical calculations of the J.Ball nonlinear dynamic beam
- 12:40 - 13:00** **Kakhaber Odisharia, V. Odisharia, P. Tsereteli.** About the computer model of rheumatoid arthritis treatment
- 13:05 - 13:25** **Giorgi Geladze.** Accounting of the latent heat of condensation in some numerical models of mesometeorology
- 13:30 - 13:50** **Jemal Rogava.** Approximate solution of Cauchy problem for abstract non-homogeneous hyperbolic equation using Pade approximation

**Thursday, April 19**

**Room № 115 (VIAM)**

- 15:00 - 15:20** **Tinatin Davitashvili, Hamlet Meladze.** Method of separation of variables for non-local contact problem for one dimensional parabolic equation
- 15:25 - 15:45** **Khatuna Chargazia, O. Kharshiladze.** Theoretical and experimental investigation of the features of internal gravity waves in the shear flow driven ionosphere
- 15:50 - 16:10** **Nino Khatiashvili.** On one elliptic equation connected with the nonlinear waves
- 16:15 - 16:35** **J. Peradze, Zviad Kalichava.** Newton iteration for Timoshenko type dynamic beam equation
- 16:40 - 17:00** **Teimuraz Davitashvili.** On liquid phase formation in pipes for gas non-stationary flow