XXXI International Enlarged Sessions of the Seminar of Ilia Vekua Institute of Applied Mathematics (VIAM) of Ivane Javakhisvili Tbilisi State University (TSU) Dedicated to the 110th Birthday Anniversary of Academician Ilia Vekua

April 19–21, 2017

Program

Opening - April 19, Wednesday, 14:00
Ilia Vekua Lecture Hall in VIAM
Organizing Committee

George Jaiani (Chair)
Nikoloz Avazashvili (Co-Chair)
Temur Jangveladze (Co-Chair)
Mikheil Rukhaia (Scientific Secretary)
Zurab Kiguradze (Contact Person, email: zkigur@yahoo.com)
Mariam Beriashvili
Natalia Chinchaladze
Besik Dundua
Miranda Gabelaia
Bakur Gulua
Zurab Vashakidze

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) and not exceeding four A4-format pages should be uploaded in the system

http://www.viam.science.tsu.ge/userspace/login


Opening of the Seminar will start on April 19, 2017 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 19
Ilia Vekua Lecture Hall (VIAM)

14:00
Opening
Professor George Sharvashidze (Rector of Ivane Javakhishvili Tbilisi State University)
Professor Mikhail Chkhenkeli (Vice-Rector of Ivane Javakhishvili Tbilisi State University)

14:20 – 14:40
George Jaiani. Life and Activities of Ilia Vekua

14:45 – 15:00
Coffee Break

Section of Students Applying for TICMI Prize

15:00 – 15:20
Lasha Baramidze. Uniform convergence of double Vilenkin-Fourier series

15:25 – 15:45
Giorgi Kupunia. About asymptotic behavior of solutions of second order nonlinear difference equation

15:50 – 16:10
Tea Shavadze. Variation formulas of solutions for controlled functional-differential equations with several delays and the continuous initial condition
Section of Mathematical Logic and Foundations

Dedicated to the Memory of Professor Gogi Pantsulaia

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

Wednesday, April 19
Room № 115 (VIAM)

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<td>10:00 – 10:20</td>
<td>Archil Kipiani. Universal graph for some class of groups</td>
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<td>10:25 – 10:45</td>
<td>Revaz Grigolia, Antonio Di Nola (Italy), Giacomo Lenzi (Italy). Duality, projectivity and unification in locally finite varieties of monadic MV-algebras</td>
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<td>10:50 – 11:10</td>
<td>Ryszard Frankiewicz (Poland), Joanna Jureczko (Poland). On solutions of Kuratowski problem 1</td>
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<tr>
<td>11:15 – 11:35</td>
<td>Ryszard Frankiewicz (Poland), Joanna Jureczko (Poland). On solutions of Kuratowski problem 2</td>
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<td>11:40 – 12:00</td>
<td>Tengiz Tetunashvili. On finite independent families of convex bodies in R2 and R3 spaces.</td>
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<td>12:05 – 12:25</td>
<td>Tamar Kasrashvili, Aleksi Kirtadze. On some estimates of topological weights of left-invariant measures on uncountable solvable groups</td>
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<td>12:30 – 12:50</td>
<td>Mariam Beriashvili. Projective nonmeasurable sets</td>
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Section of Applied Logics and Programming

Chair: Matthias Baaz (Austria)
Co-chairs: Jemal Antidze, Khimur Rukhaia

Wednesday, April 19
Room № 226 (VIAM)

10:00 – 10:20 Mikheil Rukhaia. Cut-elimination in calculus of structures
10:25 – 10:45 Anriette Bishara (Egypt). Description logic and its species
10:50 – 11:10 Nodar Momtselidze. Spark - big data analytics
11:15 – 11:35 Besik Dundua. Higher order term rewriting with regular types
11:40 – 12:00 Lia Kurtanidze. The using of information technology in the teaching process
12:05 – 12:25 Nugzar Iashvili. Construction issues of mathematical model of analytical measuring device
12:30 – 12:50 Khimuri Rukhaia, Lali Tibua, Sopho Pkhakadze. Invariance and monotonicity property of unranked operators
Section of Number Theory, Algebra and Geometry

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

Wednesday, April 19
Room № 108 (XI Building of TSU)

10:00 – 10:20 Mikheil Amaglobeli. Basic groups operations on exponential MR-groups
10:25 – 10:45 Teimuraz Vepkhvadze. The number of representation of numbers by positive binary quadratic forms with even discriminant
10:50 – 11:10 Ketevan Shavgulidze. On the spaces of spherical polynomials and generalized theta-series with quadratic forms of five variables
11:15 – 11:35 Ilia Tavkhelidze. One method of analytic representation and classification of a wide set of geometric figures with "complex" configuration and their movements
11:40 – 12:00 Vakhtang Lomadze. Converting high order linear partial differential equations to first order
12:05 – 12:25 Tengiz Bokelavadze. The W-completion of a torsion-free group
Section of Real Analysis

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

Thursday, April 20
Room № 332 (XI Building of TSU)

15:00 – 15:20 Larry Gogoladze. On the unconditional convergence of general Fourier series
15:25 – 15:45 Shakro Tetunashvili. On universal function series
15:50 – 16:10 Vakhtang Tsagareishvili. General orthonormal system and absolute convergence of Fourier series
16:15 – 16:35 Teimuraz Akhobadze, Shalva Zviadadze. A generalized Salem test for multivariable functions
16:40 – 17:00 Omar Dzagnidze. One dimensional Fourier series of functions of many variables
17:05 – 17:25 Ushangi Goginava. Norm convergence of logarithmic means on unbounded Vilenkin group
17:30 – 17:50 George Chelidze, George Giorgobiani, Vaja Tarieladze. Rearrangement theorem for the weak topology
17:55 – 18:15 Rusudan Meskhia. Generalized absolute convergence of Fourier series
18:45 – 19:05 Ekaterine Vekua. The analogue of Paley theorem for multiple trigonometric Fourier series
19:10 – 19:30 Givi Nadibaidze. Cesaro strong summability of series with respect to block-orthonormal system
# Section of Complex Analysis and Applications

Chair: Grigor Giorgadze  
Co-chair: George Akhalaia

**Thursday, April 20**  
Ilia Vekua Lecture Hall (VIAM)

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<td>11:00 – 11:20</td>
<td><strong>George Akhalaia, Nino Manjavidze</strong></td>
<td>Differential boundary value problem for the second order linear elliptic system of differential equations on the plane</td>
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<td>11:25 – 11:45</td>
<td><strong>Valerian Jikia</strong></td>
<td>Unusual cases of linear conjugation problem for the Carleman-Vekua equation</td>
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<td>11:50 – 12:10</td>
<td><strong>George Makatsaria, Ia Ramishvili, Tamaz Vekua</strong></td>
<td>The Liouville type theorems for the first order two-dimensional singular differential systems</td>
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<td>12:15 – 12:35</td>
<td><strong>Nugzar Makhaldiani</strong></td>
<td>Supersymmetric dynamics and quanputers</td>
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<td>12:40 – 13:00</td>
<td><strong>Vakhtang Paatashvili</strong></td>
<td>Dirichlet problem in Smyrnov classes of harmonic functions</td>
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<td>13:00 – 13:15</td>
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<td>Coffee Break</td>
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<td>14:00 – 14:20</td>
<td><strong>Tinatin Supatashvili</strong></td>
<td>Super symmetry and pseudoanalytic functions</td>
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<td>14:25 – 14:45</td>
<td><strong>Nika Kochkiani</strong></td>
<td>Super symmetric Jaynes-Cummings Hamiltonian</td>
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<td>14:50 – 15:10</td>
<td><strong>Goga Suknidze</strong></td>
<td>Factorization of the two dimensional Schrödinger equations and Darboux transformation</td>
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<td>15:15 – 15:35</td>
<td><strong>Gega Gulagashvili</strong></td>
<td>On the splitting type of the two rank vector bundles on the Riemann sphere</td>
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<td>15:40 – 16:00</td>
<td><strong>Grigor Giorgadze</strong></td>
<td>Quasiconformal instanton and vortex equations on the Riemann sphere</td>
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<td>16:05 – 16:25</td>
<td><strong>Ilia Lomidze</strong></td>
<td>The Legendre function of the second kind. New relation</td>
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<td>16:30 – 16:50</td>
<td><strong>Natela Chachava</strong></td>
<td>Symbolic estimation of distances between real and imaginary parts of the polynomial's roots</td>
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<td>16:55 – 17:15</td>
<td><strong>Vagner Sh. Jikia</strong></td>
<td>New properties of the Euler function and applications</td>
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Section of Ordinary Differential Equations and Optimal Control

Dedicated to the 90th Birthday of Academician Revaz Gamkrelidze

Chairs: Roman Koplatadze, Tamaz Tadumadze

Friday, April 21
Room № 256 (VIAM)

09:00 – 09:20 Tamaz Tadumadze. Variation formulas of solutions for functional differential equations considering perturbations of several delays and the discontinuous initial condition and their applications in optimal control problems

09:25 – 09:45 Phridon Dvalishvili, Lela Alkhazishvili, Medea Iordanishvili. On the well-posedness of the Cauchy problem for nonlinear functional differential equations with concentrated and distributed variable delays

09:50 – 10:10 Bezhan Gvaberidze, Bidzina Matsaberidze. On a method of solving b-criteria partitioning and covering problems

10:15 – 10:35 Akaki Gabelaia. Linear autonomous systems stabilization with incomplete information on the bases of MatLab

10:40 – 11:00 Tea Shavadze. On estimation of the increment of solution for one class of controlled functional differential equation with several delays and the discontinuous initial condition

11:05 – 11:25 Natia Khachidze. Asymptotic behavior of solutions of high order difference equation with deviated argument

11:30 – 11:50 Nika Gorgodze, Ia Ramishvili. On the well-posedness of the Cauchy problem for one class of neutral quasi-linear functional differential equation

11:55 – 12:15 Roman Koplatadze. On asymptotic behavior of solutions of first order difference equation
Section of Partial Differential Equations

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

Wednesday, April 19
Room № 227 (VIAM)

10:00 – 10:20 Zurab Kiguradze, Maia Kratsashvili. Finite difference scheme for one system of nonlinear partial integro-differential equations with source terms

10:25 – 10:45 Mikheil Gagoshidze. On the numerical solution of one nonlinear integro-differential system with source terms

10:50 – 11:10 Ciala Kacadze. On the numerical solution of one-dimensional analog of Mitchison nonlinear partial differential system


11:40 – 12:00 Giorgi Tsulaia. On the stationary solution and numerical approximation for one-dimensional Maxwell system

12:05 – 12:25 Temur Jangveladze. Well-posedness and approximate solution of the initial-boundary value problem for nonlinear integro-differential equation obtained by the reduction of Maxwell system

Thursday, April 20
Room № 227 (VIAM)

10:00 – 10:20 Dazmir Shulaia, Tamaz Vekua. Solution of one integral equation from multivelocity transport theory

10:25 – 10:45 Giorgi Devdariani. On a cusped shell

10:50 – 11:10 Diana Ivanidze, Marekh Ivanidze. The basic transmission problem of statics

11:15 – 11:35 Solomon Kurtanidze. On one redundant system and its numerical solution

11:40 – 12:00 Giorgi Dekanoidze. On the global solvability of the first Darboux problem for one class of nonlinear second order hyperbolic systems

Friday, April 21
Ilia Vekua Lecture Hall (VIAM)

10:00 – 10:20 Seyran Abelyan, Armenak Babayan (Armenia). On a Dirichlet problem for one sixth order elliptic equation

10:25 – 10:45 Alexander Kozhanov (Russia). Conjugate problems for some classes of non-stationary differential equations with a variable direction of evolution

10:50 – 11:10 Ludmila Pulkina (Russia). Nonlocal problems with integral conditions

11:15 – 11:35 Otar Jokhadze, Sergo Kharibegashvili. Mixed problem with nonlinear boundary conditions for semi-linear wave equation

11:40 – 12:00 Maksim Kukushkin (Russia). Properties of strong accretively operators of fractional differentiation

12:05 – 12:25 David Natroshvili. Method of fundamental solutions for mixed and crack type problems in the classical theory of elasticity
Section of Theory of Probability and Mathematical Statistics

Chairs: Elizbar Nadaraia, Omar Purtukhia

Thursday, April 20
Room № 335 (XI Building of TSU)

14:20 – 14:40  Malkhaz Shashiashvili. Mathematical analysis of the optimal exercise boundary for the American option with time and level dependent volatility
14:45 – 15:05  Badri Mamporia. Stochastic differential equations in a Banach space, main directions and new method of development
15:10 – 15:30  Vakhtang Kvatsrachtskeli, Kote Ninidze, George Chelidze. On an algorithm of finding sign-invariant pairs of elements in normed spaces
16:00 – 16:15  Break
16:20 – 16:40  Kartlos Kachiachvili. Estimators of the parameters of beta distribution
16:45 – 17:05  Omar Purtukhia, Vakhtang Jaoshvili. Hedging of one European option of barrier type
17:10 – 17:30  Besarion Dochviri, Zaza Khechinashvili. On the multidimensional financial (\(B,S\)) market
17:35 – 17:55  Luka Tikanadze. About one construction of stochastic integral

Friday, April 21
Room № 335 (XI Building of TSU)

11:20 – 11:40  Revaz Tevzadze, Mikheil Mania. A system of forward-backward SDEs related to utility maximization problem
11:45 – 12:05  Zurab Zerekidze, Omar Purtukhia. The weakly consistent, strongly consistent and consistent estimates of the parameters
12:10 – 12:30  Aleksandre Tkeshelashvili. On weak distributions of measures in the infinite dimensional Hilbert space
12:35 – 12:55  Petre Babilua, Elizbar Nadaraia. On deviations between kernel type estimators of a distribution density in \(p \geq 2\) independent samples
Section of Mechanics of Continua

Dedicated to the 80th Birthday of Professor Tengiz Meunargia

Chairs: Tengiz Meunargia, George Jaiani
Co-chair: Natalia Chinchaladze

Thursday, April 20
Room № 118 (VIAM)

13:20 – 13:40  **David Pataraiia, Edisher Tsotseria, Rusudan Maisuradze.** analysis and design of having extreme parameters rope lowering system (ZIPLINE) with application of rope discrete model

13:45 – 14:05  **Bakur Gulua.** Basic boundary value problems for a circle with double porosity

14:10 – 14:30  **Roman Janjgava.** On a plane boundary value problem of the Cosserat theory for a perforated domain

14:35 – 14:55  **Nino Gulua.** Thermoelastic equilibrium of a cylinder in the elliptic cylindrical coordinate system

Friday, April 21
Room № 115 (VIAM)

11:00 – 11:20  **Tengiz Meunargia.** Closed convex shells

11:25 – 11:45  **Lamara Bitsadze.** Effective solution of some BVP of the linear theory of thermoelasticity with microtemperatures

11:50 – 12:10  **Giorgi Kapanadze.** The problem of finding an equally strong contour for a rectangular plate weakened by a rectilinear cut, whose ends are cut out by convex smooth arcs

12:15 – 12:35  **Ivane Tsagareli.** Solving boundary problems of elastostatics for a porous circle

12:40 – 13:00  **Natela Zirakashvili.** Obtaining numerical-analytical solutions of the contact problems of elasticity for some distributed loads

13:05-13:25  **Gia Avalishvili, Mariam Avalishvili.** On investigation of static three-dimensional model of thermoelastic piezoelectric bodies
# Section of Mathematical Modelling and Numerical Analysis

Dedicated to the 80th Birthday of Professor Tamaz Vashakmadze

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

**Thursday, April 20**  
**Room № 115 (VIAM)**

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<th>Title and Details</th>
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<td>11:00-11:20</td>
<td>Tamaz Vashakmadze. From Chladni to Gödel or on the example of realizing the laws of the unity and conflict of opposites and of the negation of the negation.</td>
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<td>11:50-12:10</td>
<td>Ramaz Botchorishvili, Nino Bukuri. Adaptive multischeme refinement for linear advection equation on Cartesian meshes in two space dimensions.</td>
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<td>13:00-13:15</td>
<td>Coffee Break.</td>
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<td>14:10-14:30</td>
<td>Jemal Rogava, Nana Dikhaminjia, Mikheil Tsiklauri. High order accuracy decomposition scheme for abstract hyperbolic equation.</td>
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<td>15:25-15:45</td>
<td>Khatuna Chargazia. The large-scale ULF electromagnetic structures in the ionosphere with shear flow.</td>
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<td>16:40-17:00</td>
<td>Nino Khatiashvili. On the gravity waves in incompressible fluid.</td>
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<td>17:05–17:25</td>
<td>Zviad Kalichava, Jemal Peradze. Approximation with respect to the spatial variable of the solution of a nonlinear beam equation.</td>
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