XXX Enlarged Sessions of the Seminar
of Ilia Vekua Institute of Applied Mathematics (VIAM)
of Ivane Javakhisvili Tbilisi State University (TSU)
April 20–22, 2016

Program

Opening - April 22, Wednesday, 14:00
Ilia Vekua Lecture Hall in VIAM

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Nikoloz Avazashvili (Co-Chair)
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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-file and the corresponding Pdf file of the English version of the talk, not exceeding four A4-format pages should be sent to the editorial board of the Reports of Enlarged Sessions of the Seminar of I. Vekua Institute of Applied Mathematics before May 31 at the following address:

<div align="center">viam.enlarged@gmail.com</div>

Opening of the Seminar will start on April 22, 2015 at 14:00 in 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 planed, where Ilia Vekua is buried.

Wednesday, April 20
Ilia Vekua Lecture Hall (VIAM)

14:00   **Opening**
              Handing Diploma of Doctor Honoris Causa of I.Vekua Institute
              of Applied Mathematics to Professor of Bremen University Reinhold Kienzler

14:15 – 14:45 Reinhold Kienzler (Germany). On Influence Surfaces in Material Space

14:50 – 14:20 Temur Chilachava. Ilia Vekua – from Shesheleti to Mtatsminda

15:25 – 15:55 Sergo Kharibegashvili. Scientific Activities of Academician Andria Bitsadze

Section of Mathematical Logic and Foundations

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

Wednesday, April 20
Room № 254 (VIAM)

10:00 – 10:20	**Roland Omanadze.** Minimal pairs of c.e. sQ- degrees
10:25 – 10:45	**Revaz Grigolia, Antonio Di Nola** (Italy)**, Giacomo Lenzi** (Italy)**.** Subvarieties of perfect monadic MV–algebras
10:50 – 11:10	**Archil Kipiani**. Some combinatorial properties of Hamel's mono-unary algebras
11:15 – 11:35	**Mariam Beriashvili.** Some aspects of measurability of sets in various set-theoretical models
11:40 – 12:00	**Gogi Pantsulaia, Alex Kirtadze, Nino Rusiashvili.** On uniform distribution for invariant extensions of the linear Lebesgue measure
12:05 – 12:25	**Tengiz Tetunashvili.** On constituents of finite families of sets
12:30 – 12:50	**Tamar Kasrashvili.** Some properties of algebraic family of curves
12:55 – 13:15	**Tengiz Kiria, Zurab Zerakidze.** The consistent criteria for checking hypothesis for Gaussian homogeneous field statistical structure

Section of Applied Logics and Programming

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

Wednesday, April 20
Room № 226 (VIAM)

10:00 – 10:20	**Mykola Nikitchenko** (Ukraine), **Stepan Shkilniak** (Ukraine). Program-oriented logics
10:25 – 10:45	**Anriette Bishara** (Egypt). Programming the semantic web
10:50 – 11:10	**Konstantine Pkhakadze, Merab Chikvinidze, Georgi Chichua, David Kurtskhalia**: The first trial versions of theGeorgian smart journal and adapted wikipedia
11:15 – 11:35	**Zurab Kochladze, Lali Beselia**. The use of genetic algorithms in cryptanalysis
11:40 – 12:00	**Khimuri Rukhaia, Lali Tibua, Sopho Pkhakadze. D**escription of unranked formal set theory
12:05 – 12:25	**Lia Kurtanidze.** Unification for fisrt-order unranked logics
12:30 – 12:50	**Mikheil Rukhaia, Gela Chankvetadze**. Proof consturction in first-order unranked logic
12:55 – 13:15	**Besik Dundua**. Pattern calculus with regular types

Section of Number Theory, Algebra and Geometry

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

Wednesday, April 20
Room № 321 (XI Building of TSU)

10:00 – 10:20   **Mikheil Amaglobeli.** Tensor completions in varieties MR-groups
10:25 – 10:45   **Teimuraz Vepkhvadze.** On the number of representations of a positive integer by binary forms belonging to genera consisting of two classes
10:50 – 11:10   **Ketevan Shavgulidze.** On the spaces of spherical polynomials and generalized theta-series
11:15 – 11:35   **Vakhtang Lomadze.** A purely algebraic approach to operational calculus
11:40 – 12:00   **Malkhaz Bakuradze.** Polynomial behavior of the honda formal group law
12:05 – 12:25   **Ruslan Surmanidze.** The dimensions of invariant tensor spaces for one class of Riemaniann homogeneous spaces
12:30 – 12:50   **Ilia Lomidze, Natela Chachava.** On the minimal distance between two roots of a polynomial

Section of Real Analysis

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

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

16:20 – 16:40 **<u>Leri Gogoladze</u>, Vakhtang Tsagareishvili.** On the convergence of general Fourier series

16:45 – 17:05 **Teimuraz Akhobadze.** On the asymphtotic estimation of the generalized Cesáro means of trigonometric Fourier series

17:10 – 17:30 **Rusudan Meskhia**. On the generalized absolute convergence of the trigonometric Fourier series

17:35 – 17:55 **Ushangi Goginava.** Almost everywhere exponential summability of cubic partial sums of D-dimensional Walsh-Fourier series

Section of Complex Analysis and Applications

Chair: Grigor Giorgadze
Co-chair: George Akhalaia

Friday, April 22
Ilia Vekua Lecture Hall (VIAM)

14:00 – 14:20   <u>**Giorgi Akhalaia**</u>**, N. Manjavidze.** Some boundary value problems for generalized analytic vectors

14:25 – 14:45   **Grigori Giorgadze.** Beltrami equations and conformal structures

14:50 – 15:10   <u>**Giorgi Makatsaria**</u>**, Ia Ramishvili, Tamaz Vekua.** "Significant" impact of "insignificant" nonlinearity on the behavior of the solutions of one class of singular elliptic systems in the neighborhood of singularity

15:15 – 15:35   **Nugzar Makhaldiani.** Renormdynamics of coupling constants and masses

15:40 – 16:00   **Vakhtang Paatashvili.** On variable exponent Smirnov classes of the generalized analytic functions

16:05 – 16:25   **Natela Chachava, <u>Ilia Lomidze</u>**.Elaboration of the Arnold theorem on ellipsoids' space codimension

16:30 – 16:50   <u>**Vagner Jikia**</u>**, Ilia Lomidze.** A generalized function defined by the Euler first kind integral and its connection with the dirac delta function

16:55 – 17:15   **Valerian Jikia.** Linear conjugation problem for irregular nonhomogeneous Carleman-Vekua equation

Section of Ordinary Differential Equations and Optimal Control

Chairs: Roman Koplatadze, Tamaz Tadumadze

Wednesday, April 20
Room № 256 (VIAM)

16:20 – 16:40 **Tamaz Tadumadze**. On the well-posedness of the Cauchy problem for a class of functional differential equation with the distributed delay

16:45 – 17:05 **Tea Shavadze**. Variation formulas of solution for one class of controlled functional differential equation

17:10 – 17:30 **Bezhan Ghvaberidze.** On the bicriteria set partitioning problem

17:35 – 17:55 **Phridon Dvalishvili, Ia Ramishvili**. On the well-posedness of one class of optimization problem with the distributed delay

18:00 – 18:20 **Natia Khachidze.** Some properties of monotone sequences and their use for high order differential equations

18:25 – 18:45 **Roman Koplatadze.** Oscillation criteria for higher order functional differential equation

Section of Partial Differential Equations

Dedicated to Centenary of Andria Bitsadze

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

Thursday, April 21
Room № 227 (VIAM)

15:00 – 15:20	**Sergo Kharibegashvili, Otar Jokhadze.** The Cauchy - Darboux problem for the wave equation with a nonlinear dissipative term
15:25 – 15:45	**Ilia Tavkhelidze, Paolo Emilio Ricci** (Italy)**, Mamanti Rogava, Johan Gielis** (Netherlands). Some properties of generalized Möbius-Listing's bodies
15:50 – 16:10	**Nugzar Shavlakadze.** The effective solutions of one class of integro-differential equations
16:15 – 16:35	**Jemal Peradze, Zviad Tsiklauri. A** numerical algorithm for the Woinowsky-Krieger nonlinear static beam equation
16:40 – 17:00	**Tamaz Vekua, Dazmir Shulaia. Green's function for a non-stationary multivelocity Transport equation**
17:05 – 17:25	**Zurab Kiguradze, Maia Kratsashvili.** Finite difference scheme for one nonlinear partial integro-differential equation
17:30 – 17:50	**Mikheil Gagoshidze, Temur Jangveladze.** Hopf bifurcation and its computer simulation for one-dimensional Maxwell's model

Section of Theory of Probability and Mathematical Statistics

Chairs: Elizbar Nadaraia, Omar Purtukhia

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

13:00 – 13:20	**Petre Babilua, Elyzbar Nadaraya, Grigol Sokhadze. O**n the testing hypothesis of equality distribution densities
13:25 – 13:45	**Grigol Sokhadze, Aleksander Tkeshelashvili.** On estimation of integral functional of distribution density
13:50 – 14:10	**Besarion Dochviri, Mzevinar Patsatsia, Vakhtang Jaoshvili.** About financial market with three assets
14:15 – 14:35	**Malkhaz Shashiashvili, Besarion Dochviri, Petre Babilua.** On the nonlinear Volterra integral equation of second kind arising in problems of mathematical finance
14:40 – 15:00	Break
15:00 – 15:20	**Omar Purtukhia.** On the smoothness of conditional mean of some stochastically nonsmooth functionals
15:25 – 15:45	**Simon Eloshvili.** Probability theory is a measure theory with the "soul"
15:50 – 16:10	**Zaza Khechinashvili.** Optimal hedging in the financial model with disorder
16:15 – 16:35	**Zurab Kvatadze, Tengiz Shervashidze.** Limiting properties of a density ninparametric estimator and consistent demixinf for a Keilson-Wishart klass of conditionally independence observations

Friday, April 22
Room № 335 (XI Building of TSU)

14:00 – 14:20	**Kartlos Kachiashvili.** Biometric verification on the basis of measurement information of a fingerprint reader
14:25 – 14:45	**Besik Chikvinidze.** New sufficient condition for uniform integrability of stochastic exponential
14:50 – 15:10	**David Gogolashvili.** On estimation of the two dimensional regression function
15:15 – 15:35	**<u>Tengiz Kiria</u>, Zurab Zerakidze.** The consistent criteria for checking hypothesis for Gaussian homogeneous field statistical structure
15:40 – 16:00	Break
16:00 – 16:20	**Nino Makatsaria.** Times series flows of Bernoulli type asymptotic properties
16:25 – 16:45	**Levan Labadze.** On estimation of parameters of Ornstein-Uhlenbeck process
16:50 – 17:10	**Aleksander Sborshchikov.** On estimation of parameters of beta distributions by grouped observations with censoring

Section of Mechanics of Continua

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

Thursday, April 21
Room # 115 (VIAM)

12:00 – 12:20   <u>**Gia Avalishvili, Mariam Avalishvili**</u>. On nonclassical one-dimensional models for thermoelastic bars

12:25 – 12:45   **George Kapanadze.** A problem of plane elasticity for a rectangular domain with a curvilinear quadrangular hole

12:50 – 13:10   **Lamara Bitsadze.** On some solutions in the plane equilibrium theory for triple-porosity solids

13:15 – 13:25   **Bakur Gulua.** On a boundary value problem for the nonlinear non-shallow spherical shell

13:30 – 13:50   **Natela Zirakashvili**. Analytical solution of interior boundary value problems of elasticity for the domain bounded by the parabola with the normal or tangential loads

13:55 – 14:15   **Tengiz Meunargia.** The problem of existence of the neutral surface for the elastic shell

14:20 – 14:40   **Kosta Svanadze.** On the solution of one non-classical problem of statics of the theory of elastic mixture in a circular domain

14:45 – 15:15   Break

15:15 – 15:35   **Roman Janjgava.** On the plane theory of poroelasticity for the binary mixture with double porosity

15:40 – 16:00   **Nana Odishelidze.** On a contact problem for a piecewise-homogeneous orthotropic plate

16:05 – 16:25   <u>**David Pataraia**</u>, **N. Tsverikmazashvili., E.Tsotseria, A. Kartvelishvili, R. Maisuradze.** On calculation of some nonstandard structures by discrete model of solid deformable bodies and algorithm of successive approximations

16:30 – 16:50   **Natalia Chinchaladze.** On a dynamical problem of the antiplane strain (shear)

16:55 – 17:15   **Ivane Tsagareli.** Solution of the problems of thermoelastostatics for circle with double porosity

17:20 – 17:40   **George Jaiani.** Influence of different physical fields on setting boundary conditions for cusped prismatic bodies

Section of Mathematical Modeling and Numerical Analysis

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

Wednesday, April 20
Room # 115 (VIAM)

16:30 – 16:50	**Tamaz Vashakmadze, Unver Kaynak** (Turkey). To design and analysis of some thin-walled structures
16:55 – 17:15	**Guram Gabrichidze.** Mathematical matrixes, good and evil
17:20 – 17:40	**Amiran Aptsiauri**. The new averaged system of equations for turbulent flows
17:45 – 18:05	**Khatuna Chargazia, Oleg Kharshiadze.** Zonal flow generation in nonuniform ionospheric flows
18:10 – 18:30	**Givi Berikelashvili, Bidzina Midodashvili.** Method of refinement by higher order differences for elliptic equations with Bitsadze - Samarskii type nonlocal boundary conditions
18:35 – 18:55	**Vladimer Odisharia.** The generalized solution for the nonlinear Timoshenko system and it's implementation
19:00 – 19:20	**Archil Papukashvili, Beka Tezelishvili, Zurab Vashakidze.** The numerical solution of a two-point boundary value problem with a non-constant coefficient by means of operator interpolation method

Friday, April 22
Room # 115 (VIAM)

14:30 – 14:50	**Jemal Rogava.** On the stability of the three-layer semi-discrete scheme for an abstract hyperbolic equation with variable operator
14:55 – 15:15	**David Gulua.** Splitting of the multi-layer semi-discrete scheme for an evolutionary equation on two-layer schemes and error estimation for approximate solution using the associated polynomials
15:20 – 15:40	**Givi Lemonjava.** Currency exchange rate volatility modeling
15:45 – 16:05	**Geladze Giorgi.** Numerical modelling of some Foehn processes
16:10 – 16:30	**Jemal Peradze.** The convergence of an iteration method for the plate under the action of an symmetric load
16:35 – 16:55	**Giorgi Papukashvili.** On the approximate solution of the J. Baal nonlinear dynamic beam equation
17:00 – 17:20	**David Gordeziani, Tinatin Davitashvili, Teimuraz Davitashvili, Meri Sharikadze.** Mathematical modeling of filtration problem for the multilayer liquid-permeable horizons

Section of Modeling of Physical and Biological Problems

Chairs: Tamaz Kaladze, Nino Khatiashvili

Wednesday, April 20
Ilia Vekua Lecture Hall (VIAM)

16:30 – 16:50	**Khatuna Chargazia**, <u>**Oleg Kharshiladze.**</u> Seismic oscillations in the simple models of the earthquakes
16:55 – 17:15	<u>**Tamaz Kaladze,**</u> **Oleg Kharshiladze, Khatuna Chargazia.**Transient growth of ULF electromagnetic structures in the shear flow driven ionosphere
17:20 – 17:40	<u>**Luba Tsamalashvili.**</u> Special exp-function method fortravelling wave solutions of Burgers equation
17:45 – 18:05	<u>**Anzor Khelashvili.**</u> N=2 superalgebra and dynamical symmetries

Thursday, April 21
Ilia Vekua Lecture Hall (VIAM)

15:00 – 15:20	<u>**Ivan Petoev**</u>**, V. Tabatadze, R. Zaridze.** Eigen field and eigen frequencies calculation based on the method of auxiliary sources
15:25 – 15:45	<u>**Tamar Nozadze**</u>**, Veriko Jeladze, Vasil Tabatadze, Mariam Tsverava, Ivane Petoev, Mikheil Prishvin, Revaz Zaridze.** Human emexposure modeling using fdtd and method of auxiliary sources
15:50 – 16:10	<u>**David Jishiashvili**</u>, **Zeinab Shiolashvili, Nino Makhatadze, Archil Chirakadze, Aleksandre Jishiashvili.** Evaluation of thermochemical data for the growth of LnP -based core-shell nanostructure
16:15 – 16:35	**Nino Khatiashvili.** On some aspects of the crystal growth
16:40 – 17:00	Break
17:00 – 17:20	<u>**Irene Khatiashvili,**</u> **Nino Khatiashvili.** On the model of capillary network at the human brain
17:25 – 17:45	<u>**Revaz Shanidze**</u>**, Lia Chelidze.** Perspectives of nuclear physics medicine
17:50 – 18:10	<u>**David Gamrekeli**</u>**, Vladimer Akhobadze.** The effect of free radical oxidation on the lipids and membranes