XXVIII Enlarged Sessions of the Seminar of
Ilia Vekua Institute of Applied Mathematics (VIAM) of
Ivane Javakhisvili Tbilisi State University (TSU)
April 22–24, 2014

Program

Opening - April 22, Tuesday, 13:30,
Ilia Vekua Lecture Hall in VIAM

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T. Tadumadze

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M. Svanadze
A. Kipiani
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K. Shavgulidze
J. Sharikadze
A. Kharazishvili
S. Kharibegashvili
G. Khimshiashvili
N. Khomasuridze
T. Jangveladze

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 June 2 at the following address:

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

Opening of the Seminar will start on April 22, 2014 at 13:30 in I. Vekua Institute of Applied Mathematics (University str. 2, 0186 Tbilisi, Georgia).

As usual on April 23 at 16:00 a visit to the grave of Ilia Vekua at the Mtatsminda Pantheon is planned.

Tuesday, April 22
Ilia Vekua Lecture Hall (VIAM)

13:30-13:45   **Opening**

13:45-14:25   <u>**I. Ananiashvili**</u>**, V. Papava.** A nonstandard model of the macroeconomic equilibrium

Section of Foundations of Mathematics and Mathematical Logic

Chairmen – A. Kharazishvili , R. Omanadze

Co-Chairman – A. Kipiani

Wednesday, April 23
Room # 254 (VIAM)

12:00-12:20   **R. Omanadze.** On the bQ-degrees of c.e. sets

12:25-12:45   **R. Grigolia.** On monadic locally finite *MV*-algebras

12:50-13:10   **G. Pantsulaia.** On a certain property of Yamasaki-Kharazishvili measures

13:15-13:35   **T. TetunaShvili.** On a property of Euler-Venn diagram of an independent family of sets

13:40-14:00   **T. Kasrashvili.** Elementary volume and measurability properties of additive functions

14:05–14:25   **M. Beriashvili.** On the relative measurability of Sierpinski sets

14:30–14:50   **N. Rusiashvili.** Logical and set-theoretical foundations of the general theory of systems

14:55–15:15   **A. Kipiani.** On some combinatorial properties of binary relations

Section of Applied Logics and Programming

Chairman – M. Baaz
Co-Chairmen –   J. Antidze, Kh. Rukhaia

Wednesday, April 23
Room # 224 (VIAM)

10:00-10:20   **K. Pkhakadze, G. Chichua, M. Chikvinidze, I. Beriasvili, A.Maskharashvili.** An overview of the already constructed trial version of the Georgian self-developable intellectual corpus as a necessary precondition for constructing Georgian text analyzer, speech processing and automated translator systems

10:25-10:45   **I. Kardava.** Morphological analysis of Georgian words using formal grammar

10:50-11:10   **G. Fedulov, N. Iashvili.** On the technology of evaluating approximate solutions for a class of   combinatorial optimization

11:15-11:35   **Z. Gasitashvili, G. Iashvili.** Processing of the symmetric-key block cipher encryption algorithm by using Hill's method.

11:40-12:00   **G. Iashvili.** Solution of problem of optimal distribution of trucks for transportation of ore using the method of vehicle routing

12:05-12:25   **M. Rukhaia.** On the theorem proving techniques in formula schemata

12:30-12:50   **B. Dundua , T. Kutsia** (Austria). Constraint logic programming for hedges

13:55-13.15   **Kh. Rukhaia, L. Tibua, G. Chankvetadze, S. Pkhakadze, G. Miqanadze.**   Some propertis of unranked operators: $\vee, \wedge, \tau, \exists, \forall, \supset$

13:20-13:40   **O. Dzagnidze.** A short history of formation of the Georgian mathematical, technical and natural science terminology

Section of Algebra end Geometry

Chairmen – M. Amaglobeli, T. Vepkhvadze, G. Khimshiashvili

Co-Chairwoman – K. Shavgulidze

Tuesday, April 22
Room # 203 (XI building of TSU)

17:00-17:20   M. Amaglobeli. The variets of the exponential MR-group

Wednesday, April 23
Room # 421 (XI building of TSU)

10:00-10:20   T. Vepkhvadze. Modular forms of half integral weight

10:25-10:45   K. Shavgulidze. The construction of the basis of the space of functions with quadratic forms of five variables

10:50-11:10   V. Lomadze. The Popov-Belevich-Hautus test for linear dynamical systems in several variables

11:15–11:35   J. Gielis (Belgia). A geometrical foundation of fusion in flowers

11:40–12:00   I. Tavkhelidze. A geometric approach to represent a wide class of complex movement as a superposition of elementary displacements and some applications

Section of Real Analysis

Chairmen – U. Goginava, L. Gogoladze
Co-Chairwoman – A. Danelia

Thursday, April 24
Room # 332 (XI building of TSU)

15:00–15:20 <u>**L. Gogoladze**</u>**, V. Tsagareishvili.** On the summability of Fouries series by Cesaro methods with respect to general orthonormal systems

15:25–15:45 **L. Gogoladze,** <u>**V. Tsagareishvili**</u>. On the absolute convergence of multiple Fourier-Haar series

15:50–16:10 **T. Achobadze.** On the asymptotics of Cesáro means of trigonometric Fourier series

16:15–16:35 **A. Danelia.** Characterization of the conjugate functions by moduli of smoothness in the space of continuous functions

16:40–17:00 **G. Chelidze.** The range of critical numbers for Banach spaces

17:05–17:25 **D. Ugulava**. On the Convergence of Fourier integral means of functions defined on locally compact groups

17:30–17:50 <u>**T. Kopaliani**</u>**, A. Gogatishvili.** Maximal multiplier operators in variable Lebesgue spaces

17:55–18:15 **P. Caramuta** (Italy). The Abel summability of conjugate Laplace series on the sphere

18:20–18:40 **A. Aplakov.** On the absolute convergence of the series of Fourier coefficients with respect to the Haar-like sistems

18:45–19:05 **O. Dzagnidze.** Convergence of double trigonometric series obtained by termwise integration

Section of Complex Analysis and Applications

Chairman – G. Giorgadze
Co-Chairman – G. Akhalaia

Dedicated to the Memory of Professor Giorgi Manjavidze

Thursday , April 24
Ilia Vekua Lecture Hall (VIAM)

12:00–12:20 **<u>G. Akhalaia</u>, N. Manjavidze.** Boundary value problems for elliptic systems in domains with angular points

12:25–12:45 **V. Paatashvili.** Variable exponent Smirnov classes in multiply connected domains

12:50–13:10 **G. Makatsaria**. Liouville type theorems for some classes of elliptic systems

13:15–13:35 **V. Jikia.** Liouville type theorems for the Carleman-Vekua system of irregular equations

BREAK

14:00–14:20 **G. Kakulashvili.** Some remarks on bicentral spherical polygons

14:25–14:45 **B. Kotia.** On the kinetics of quantum dissipative system: Quantum Brown particle motion

14:50–15:10 **R. Surmanidze.** On tensor product of irreducible representations of simply Lie algebras

15:15–15.35 **N. Makhaldiani.** Nambu-Poisson Formulation of Dynamics and Renormdynamics

15:40–16:00 **G. Giorgadze.** Relation between conformal mappings and elementary gates

Section of Ordinary Differential Equations and Optimal Control

Chairmen- T. Tadumadze, R. Koplatadze

Dedicated to the Memory of Academician Guram Kharatishvili

Thursday , April 24
Room # 256 (VIAM)

13:00–13:20 **T. Tadumadze.** Variation formulas of solution and necessary optimality conditions of initial data for one class of neutral functional differential equation

13:25–13:45 **N. Gorgodze.** Continuity of solution of the quasi-linear neutral functional differential equation with respect to perturbations of delay functions and right-hand side

13:50–14:10 **P. Dvalishvili .** On the continuity of minimum of the integral functional in quasi-linear optimal control problems with distributed delay

14:15–14:35 **B. Ghvaberidze.** Bi-criteria fuzzy vehicle routing problem for extreme environment

14:40–15:00 **R. Koplatadze.** Comparison theorems for second order linear singular differential equations

Section of Partial Differential Equations

Chairmen – D. Natroshvili, S. Kharibegashvili, T. Jangveladze

Co-Chairman – Z. Kiguradze

Tuesday, April 22
Room # 227 (VIAM)

15:00–15:20 **Z. Kiguraze, A. Kratsashvili.** Semi-discrete scheme for one system of nonlinear integro-differential equations with source terms

15:25–15:45 **T. Jangveladze, M. Kratsashvili.** Asymptotic behavior of solution and semi-discrete difference scheme for one nonlinear integro-differential equation with source term

15:50–16:10 **M. Nikolishvili, B. Tabatadze.** Some properties of solution and variable directions difference scheme for one system of nonlinear three-dimensional partial differential equations

16:15–16:35 **M. Aptsiauri, M. Gagoshidze.** On one nonlinear averaged integro-differential system with source terms

16:40–17:00 **D. Shulaia.** On one integral equation with coefficient having zeros

17:05–17:25 **D. Ivanidze.** Dirichlet boundary-transmission problem of thermoelasto-statics for hemitropic composite structures

17:30–17:50 **M. Ivanidze.** Dirichlet boundary-transmission problem of thermoelasto-statics for anisotropic composite structures

Section of Probability Theory and Mathematical Statistics

Chair – E. Nadaraya

Co-Chairman – O. Purtukhia

Wednesday, April 23
G. Mania Lecture Room (XI building of TSU)

14:00-14:20 **E. Nadaraya, <u>P. Babilua</u>, G. Sokhadze.** On the integral square measure of deviation of two kernel estimators of Bernoulli regression function

14:25-14:45 **S.Eloshvili.** Probability Geometry. Hypothesis testing problem

14:50-15:10 **O. Glonti, <u>O. Purtukhia.</u>** On the differentiability of integral type functionals in Malliavin sense

15:15-15:35 **A. Tkeshelashvili.** Statistical estimation of the density of initial distribution in an adiabatic process

15:40-16:00 **B. Chikvinidze.** New proof of the Novikov theorem using BSDEs

16:05–16:25 **M. Kintsurashvili.** Classification of infinite sample consistent estimators of a useful signal in one-dimensional stochastic model in terms of Haar null sets and "prevalence"

Thursday, April 24
G. Mania Lecture Room (XI building of TSU)

14:00-14:20 **R. Kakubava, <u>G. Sokhadze</u>.** On a Queuing System in Random Environment

14:25-14:45 **<u>O. Glonti,</u> Z.Khechinashvili.** On the model of stock price evolution described by Gaussian martingales with disorder

14:50-15:10 **P. Babilua, <u>B. Dochviri</u>, V. Jaoshvili.** On one problem of convergence of payoffs

15:15-15:35 **T. Buadze, <u>Z. Khechinashvili,</u> G. Sokhadze.** On Estimation of Unbounded Functionals from Probability Distribution Density

15:40-16:00 **D. Arabidze.** On Integral Functionals of Priestley-Chao's Regression Function

16:05-16:25 **<u>Z. Zerakidze</u>, G. Sokhadze.** On the construction of statistical structure

Section of Mechanics of Continua

Chairmen – T. Meunargia, J. Sharikadze, N. Khomasuridze, G. Jaiani

Co-Chairwoman – N. Chinchaladze

Dedicated to the Memory of Corresponding Member of the Georgian Academy of Sciences Revaz Bantsuri

Thursday, April 24
Room # 115 (VIAM)

13:00–13:20 B. Gulua. Some basic boundary value problems for the hierarchical models

13:25–13:45 E. Dolce (Italy). New integral representations in the linear theory of viscoelastic materials with voids

13:50–14:10 N. Zirakashvili. Control of the stress-strain state of elastic infinite bodies with an elliptic hole and cracks by means of variation of boundary conditions

14:15–14:35 T. Meunargia. On a system of 2D nonlinear equations for non-shallow shells

14:40–15:00 N. Odishelidze, Z. Vashakidze, F. Criado-Aldeanueva, Francisco Criado (Spain). Partially Unknown BoundaryAxis Symmetric Problem of Plane Elasticity Theory

15:05–15:25 K. Svanadze. Solution of some boundary value problems of statics of the theory of elastic mixtures for a circle

BREAK

15:50–16:10 N. Shavlakadze. A boundary value problem of electroelasticity for the piezoelectric half-space with a cut

16:15–16:35 R. Jainjgava. Construction of approximate solutions of some plane problems of thermoelasticity for transversal isotropic bodies

16:40–17:00 I. Tsagareli, L. Bitsadze. Explicit solutions of boundary value problems of statics for an elastic circle with double porosity

17:05-17:25 N. Khomasuridze. Repesentation of solutions of some boundary value problems of the theory of elasticity as a sum of the solutions of some other boundary value problems of the theory of elasticity

17:30–17:50 G. Kapanadze. The plane problem of elasticity for a polygonal region with a rectilinear cut

17:55–18:15 G. Jaiani, N. Chinchaladze. A boundary-transmission problem for two rectangularly leant elastic bars

Section of Mathematical Modeling and Numerical Analysis

Chairmen – D. Gordeziani, T. Vashakmadze , J. Rogava
Co-Chairman – T. Davitashvili

Tuesday, April 22
Ilia Vekua Lecture Hall (VIAM)

14:30–14:50 **A. Rukhadze, N. Bogachev, I. Bogdankevich, N.Gusein-Zade** (Russia). Numerical modeling of the plasma vibration antenna

14:55 –15:15 **T. Vashakmadze.** On thermal waves

15:20–15:40 **A. Gvelesiani.** On the spectral function modification in the light ionized turbulent ionosphere

15:45–16:05 **D. Tvaltchrelidze.** Modern challenges in software engineering

16:10–16:30 **G. Avalishvili, M. Avalishvili.** On two-dimensional models of prismatic shells with microtemperatures

16:35 –16:55 **N. Dikhaminjia, J. Rogava, M. Tsiklauri.** Fourth order accuracy decomposition scheme for a multi-dimensional quasi-linear hyperbolic equation

17:00–17:20 **A. Papukashvil, Y.F. Gulver** (Turkey)**, Z. Vashakidze.** On the numerical realizations and stability of calculating processes of some problems of the theory of elasticity for cross-shaped regions

17:25–17:45 **V. Odisharia.** A numerical method of the one-dimensional nonlinear Reissner system

Thursday, April 24
Room # 118 (VIAM)

14:00–14:20 <u>**G. Berikelashvili**</u>**, B. Midodashvili.** Method of corrections by higher order differences for elliptic equations with variable coefficients

14:25–14:45 **J. Peradze.** An approximate method for the plate under the action of symmetric load

14:50–15:10 <u>**D. Gordeziani**</u>**, I. Meladze.** On a nonlocal contact problem for two-dimensional linear elliptic equations

15:15–15:35 **D. Gulua.** Reduction of a four-layer semi-discrete scheme for an abstract evolutionary equation to two-layer schemes

15:40–16:00 **K. Kachiashvili.** Investigation of the probabilities of errors in the sequential method of Bayesian type

16:05–16:25 **N. Khatiashvili.** On the hexagonal quantum billiard

16:30–16:50 **G. Geladze.** Classification of the foehns and their numerical simulation

16:55–17:15 <u>**T. Davitashvili**</u>**, M. Sharikadze.** On modeling of liquid infiltration into nonhomogeneous soils