

INTERNATIONAL CONFERENCE
"MODERN PROBLEMS IN APPLIED MATHEMATICS"

*Dedicated to the 95th Anniversary of the I. Javakishvili Tbilisi State University
& 45th Anniversary of the I. Vekua Institute of Applied Mathematics of TSU*

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I. Vekua Institute of Applied Mathematics & Faculty of Exact and Natural Sciences
Tbilisi International Centre of Mathematics and Informatics
Georgian National Committee of Theoretical and Applied Mechanics

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**სამართაშორისო კონფერენცია
“გამოყენებითი მათემატიკის თანამედროვე პრობლემები”**

*ეძღვნება ი. ჯავახიშვილის სახელობის თბილისის სახელმწიფო უნივერსიტეტის 95
და ი. ვეკუას სახელობის გამოყენებითი მათემატიკის ინსტიტუტის 45 წლისთავს*

ორგანიზატორები

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- ზუსტ და საბუნებისმეტყველო მეცნიერებათა ფაკულტეტი

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სპონსორი

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ყდის გაფორმება: ნ. ებრაღიძე

SCHEDULE OF THE PROGRAM

Wednesday, September 4th

TIME	
11:00 - 13:00	Opening
13:00 - 14:00	Lunch
14:00 - 15:40	Lectures
15:45 - 16:00	Coffee Break
16:00 - 17:35	Lectures

Thursday, September 5th

TIME	
10:00 - 11:40	Lectures
11:45 - 12:00	Coffee Break
12:00 - 13:40	Lectures
13:45 - 15:00	Lunch
15:00 - 16:40	Lectures in Parallel Sessions (Mathematical problems of mechanics of continua and related problems of analysis & Mathematical modeling and numerical mathematics)
16:40 - 17:00	Coffee Break
17:00 - 19:15	Lectures in Parallel Sessions (Some classes of PDE and systems with applications to mechanics and biology & Mathematical modeling and numerical mathematics)
20:00 – 22:00	Banquet

Friday, September 6th

TIME	
10:00 - 13:25	Lectures in Parallel Sessions (Mathematical problems of mechanics of continua and related problems of analysis; Applied Logics and Programming & Probability theory and mathematical statistics)
13:30 - 13:45	Coffee Break
13:45 - 16:40	Lectures in Parallel Sessions (Mathematical problems of mechanics of continua and related problems of analysis; Mathematical modeling and numerical mathematics & Probability theory and mathematical statistics)

Saturday, September 7th

TIME	
10:00 - 11:40	Lectures
11:45 - 12:00	Coffee Break
12:00 - 13:05	Lectures
13:10 - 14:30	Lunch
14:30 - 16:45	Lectures in Parallel Sessions (Ordinary Differential equations and optimal control & Mathematical problems of mechanics of continua and related problems of analysis)
16:50 - 17:10	Coffee Break
17:10 - 18:40	Lectures in Parallel Sessions (Ordinary Differential equations and optimal control & Mathematical problems of mechanics of continua and related problems of analysis)

PROGRAM

September 4, 2013

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

11⁰⁰ - 13⁰⁰ **Opening**

George Jaiani (Director of I. Vekua Institute of Applied Mathematics).

I. Vekua Institute of Applied Mathematics of TSU – 45

Ramaz Botchorishvili (Dean of the Faculty of Exact and Natural Sciences)

Omar Purtukhia (Head of the Department of Mathematics).

Mathematics in TSU since foundation

Concert

13⁰⁰ – Lunch

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

14⁰⁰ - 14³⁰

Olga Gil-Medrano (Spain). Minimal vector fields on Riemannian manifolds

14³⁵ - 15⁰⁵

David Gordeziani (Georgia). On solution of one nonlocal boundary value contact problem

15¹⁰ - 15⁴⁰

Holm Altenbach (Germany). On some non-standard problems in the theory of thin-walled structures

15⁴⁵ Coffee Break

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

16⁰⁰ - 16³⁰

George Sokhadze, P. Babilua, E. Nadaraya (Georgia). Some limit properties of maximal likelihood estimation in a Hilbert space

16³⁵ - 17⁰⁵

Dietmar Kröner (Germany). Can mathematics help to control and avoid environmental stress

17¹⁰ - 17³⁵

Tamaz Vashakmadze (Georgia). To computation modeling and numerical mechanics of solids.

September 5, 2013

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

- 10⁰⁰ - 10³⁰ **David Natroshvili, O. Chkadua, T. Buchukuri** (Georgia). Regularity of solutions to mixed interface crack problems
- 10³⁵ - 11⁰⁵ **Bert-Wolfgang Schulze** (Germany). Millin-edge quantisation of operators in mixed boundary problems
- 11¹⁰ - 11⁴⁰ **Temur Jangveladze** (Georgia). Difference scheme of variable directions and averaged model of sum approximation for one nonlinear system

11⁴⁵- Coffee Break

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

- 12⁰⁰ - 12³⁰ **Grigor Giorgadze** (Georgia). Regular systems of ODE on Riemann surfaces and Reimann-Hilbert boundary value problem
- 12³⁵ - 13⁰⁵ **Heinrich Begehr, T. Vaitekhovich** (Germany). Green functions for irregular plane domains
- 13¹⁰ - 13⁴⁰ **Ahmet Okey Celebi, U. Aksoy** (Turkey). On a boundary value problem for non-linear elliptic complex partial differential equations in the upper half plane

13⁴⁵ – Lunch

Parallel Sessions

Mathematical problems of mechanics of continua and related problems of analysis

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

- 15⁰⁰ - 15³⁰ **P. E. Ricci, D. Babusci, G. Dattoli, M. Quattromini** (Italy). Extensions of the Dirac factorization and applications
- 15³⁵ - 16⁰⁵ **Ekaterina Pesetskaya, D. Kapanadze** (Georgia), **G. Mishuris** (UK). On improved algorithm for analytical solution of the heat conduction problem in periodic 2D composites
- 16¹⁰ - 16⁴⁰ **Ana Vasilic** (United Arab Emirates). Multiscale acoustic modeling of porous media

Mathematical modeling and numerical mathematics

I. Javakhishvili Lecture hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

- 15⁰⁰ - 15³⁰ **Flavia Lanzara** (Italy). Fast cubature of volume potentials over rectangular domains by approximate approximations
- 15³⁵ - 16⁰⁵ **Zurab Kiguradze** (Georgia). Semi-discrete scheme for one system of nonlinear integro-differential equations
- 16¹⁰ - 16⁴⁰ **Khatuna Chargazia, O. Kharshiladze** (Georgia), **G. Zimbardo** (Italy). Theoretical and experimental detection of nonlinear electromagnetic waves as the elements of turbulence in the geospace environment

16⁴⁵ Coffee Break

Parallel Sessions

Some classes of PDE and systems with applications to mechanics and biology

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

- 17⁰⁰ - 17³⁰ **David Gordeziani** (Georgia). Additive difference schemes for solution of problems of thermo-elasticity in micro temperature field
- 17³⁵ - 18⁰⁵ **Marzio Lembo, G. Formica, P. Podio-Guidugli** (Italy). Second-order internal constraints in theories of shear-deformable beams and plates
- 18¹⁰ - 18⁴⁰ **Giovanni Formica, M. Lembo, P. Podio-Guidugli** (Italy). Modeling laminated plates
- 18⁴⁵ - 19¹⁵ **Natalia Chinchaladze** (Georgia). Hierarchical models for biofilms occupying thin prismatic domains with variable thickness

Mathematical modeling and numerical mathematics

I. Javakhishvili Lecture hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

- 17⁰⁰ - 17³⁰ **Jemal Rogava, N. Dikhaminjia, M. Tsiklauri** (Georgia). Operator splitting for quasi-linear evolution equation with variable operator
- 17³⁵ - 18⁰⁵ **Malkhaz Shashiashvili, K. Shashiashvili, J. Rogava** (Georgia). From the uniform approximation of a solution of the PDE to the L_2 -approximation of the gradient of the solution
- 18¹⁰ - 18⁴⁰ **Nino Khatiashvili, K. Pirumova, V. Akhobadze** (Georgia). On the mathematical model of artificial crystals growth
- 18⁴⁵ - 19¹⁵ **Duglas Ugulava, D. Zarnadze** (Georgia). A linear generalized central spline algorithm of computerized tomography

September 6, 2013

Parallel Sessions

Mathematical problems of mechanics of continua and related problems of analysis

Ilia Vekua Lecture Hall

I.Vekua Institute of Applied Mathematics of TSU, University St. 2

Dedicated to the memory of Professor Levan Magnaradze

- 10⁰⁰ - 10³⁰ **Lamara Bitsadze** (Georgia). On some solutions of equations of the 2D dynamical theory of thermoelasticity with microtemperatures
- 10³⁵ - 11⁰⁵ **Nikoloz Avazashvili** (Georgia). On the main boundary value problems of the theory of elasticity for some non-homogeneous plane bodies
- 11¹⁰ - 11⁴⁰ **Bakur Gulua** (Georgia). On construction of approximate solutions of equations of the non-shallow spherical shell for the geometrically nonlinear theory
- 11⁴⁵ - 12¹⁵ **Kosta Svanadze** (Georgia). Effective solution of the basic mixed boundary value problem of statics of the theory of elastic mixture in a circular domain
- 12²⁰ - 12⁵⁰ **Ivane Tsagareli** (Georgia). The solutions of dynamical problems for elastic bodies with microstructures
- 12⁵⁵ - 13²⁵ **Varden (Badri) Tsutskiridze, L. Jikidze** (Georgia). Some issues of conducting fluid unsteady flows in a circular tube

Applied Logic and Programming

Council Room

I.Vekua Institute of Applied Mathematics of TSU, University St. 2

- 10⁰⁰ - 10³⁰ **Jemal Antidze** (Georgia). Programming means for modeling of natural and formal languages
- 10³⁵ - 11⁰⁵ **Lali Tibua, Kh. Rukhaia** (Georgia). One algorithmic process for deciding validity of some unranked tauSR- logic
- 11¹⁰ - 11⁴⁰ **Sofia Shengelia, R. Megrelishvili** (Georgia). The fractal structures and their properties
- 11⁴⁵ - 12¹⁵ **Irakli Kardava** (Georgia). Morphological analysis of Georgian words using formal grammar
- 12²⁰ - 12⁵⁰ **Konstantine Pkhakadze, G. Chichua, M. Chikvinidze, A. Maskharashvili** (Georgia). The technological alphabet of the Georgian language - aims, methods and results
- 12⁵⁵ - 13²⁵ **Gela Chankvetadze, G. Mikanadze** (Georgia). Implementation of an algorithm for classification of unranked propositional logic formulas

Probability theory and mathematical statistics

Room 116

I.Vekua Institute of Applied Mathematics of TSU, University St. 2

Dedicated to the memory of Professor Gvanji Mania

- 10³⁵ - 11⁰⁵ **Omar Glonti, O. Purtukhia** (Georgia). Clark representations and independence and dependence of Brownian functionals
- 11¹⁰ - 11⁴⁰ **Michael Mania, R. Tevzadze** (Georgia). On the properties of the dynamic value functions in the problem of optimal investing in incomplete markets
- 11⁴⁵ - 12¹⁵ **Vakhtang Kvaratskhelia, V. Tarieladze, N. Vakhania** (Georgia). On exponential integrability of subgaussian series
- 12²⁰ - 12⁵⁰ **Badri Mamporia** (Georgia). New approach in the development of stochastic differential equations in a Banach space
- 12⁵⁵ - 13²⁵ **Kartlos Kachiashvili** (Georgia). The results of investigation of statistical hypotheses testing methods

13³⁰ Coffee Break

Parallel Sessions

Mathematical problems of mechanics of continua and related problems of analysis

Ilia Vekua Lecture Hall

I.Vekua Institute of Applied Mathematics of TSU, University St. 2

Dedicated to the memory of Professor Levan Magnaradze

- 13⁴⁵ - 14¹⁵ **Valerian Jikia** (Georgia). Dolbeault's lemma for the functions of the class $L_p^{loc}(C)$, $p > 2$
- 14²⁰ - 14⁵⁰ **Gaioz Khatiashvili** (Georgia). The solution of three auxiliary problems and Saint-Venant's problems for three-layer confocal elliptic tube for elastic materials with different Poisson ratio
- 14⁵⁵ - 15²⁵ **Larry Gogoladze, R. Meskhia** (Georgia). Absolute convergence of multiple Fourier series
- 15³⁰ - 16⁰⁰ **Vakhtang Tsagareishvili, L. Gogoladze** (Georgia). On partial sums of Fourier series of functions of boundary variation
- 16⁰⁵ - 16³⁵ **Natela Zirakashvili, N. Khomasuridze, R. Janjgava, M. Narmania** (Georgia). Analytical solution of classical and non-classical boundary value contact problems of thermoelasticity for a rectangular parallelepiped consisting of contractible and non-contractible elastic layers and a corresponding program

Mathematical modeling and numerical mathematics

Council Room

I.Vekua Institute of Applied Mathematics of TSU, University St. 2

- 13⁴⁵ - 14¹⁵ **Teimuraz Davitashvili, D. Gordeziani, G. Geladze, G. Gubelidze, A. Papukashvili, M. Sharikadze** (Georgia). Assessment of risk factors of emergency cases at Georgian section of transport corridor Europe-Caucasus-Asia by means of mathematical modeling
- 14²⁰ - 14⁵⁰ **Giorgi Geladze** (Georgia). Numerical simulation of some complex mesometeorological processes
- 14⁵⁵ - 15²⁵ **Archil Papukashvili, D. Gordeziani, T. Davitashvili, M. Sharikadze** (Georgia). On some methods of approximate solution of antiplane problems of elasticity theory for composite bodies weakened by cracks
- 15³⁰ - 16⁰⁰ **Diana Kvaratskhelia, D. Demetrashvili** (Georgia). Numerical investigation of some peculiarities of hydrological mode in the upper layer of the Black Sea for spring season
- 16⁰⁵ - 16³⁵ **Mamuli Zakradze, N. Kobliashvili** (Georgia). On solving the Dirichlet generalized problem for a harmonic function in the case of an infinite plane with holes

Probability theory and mathematical statistics

Room 116

I.Vekua Institute of Applied Mathematics of TSU, University St. 2

Dedicated to the memory of Professor Gvanji Mania

- 13⁴⁵ - 14¹⁵ **Besarion Dochviri, P. Babilua, O. Purtukhia, G. Sokhadze** (Georgia). On the problem of optimal stopping with incomplete data
- 14²⁰ - 14⁵⁰ **Elizbar Nadaraya, G. Sokhadze, A. Tkeshelashvili** (Georgia). On functionals from Gasser-Müller estimators
- 14⁵⁵ - 15²⁵ **Gogi Pantsulaia** (Georgia). On a certain problem of H. Shi in Solovay's model
- 15³⁰ - 16⁰⁰ **George Sokhadze, Z. Zerakidze** (Georgia). On statistical estimation in infinite dimensional spaces

September 7, 2013

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

- 10⁰⁰ - 10³⁰ **Sergo Kharibegashvili, O. Jokhadze** (Georgia). On one boundary value problem for a wave equation with power nonlinearity
- 10³⁵ - 11⁰⁵ **Alberto Cialdea** (Italy). L^p -dissipativity of the Lamé' operator

11¹⁰ - 11⁴⁰ **Ardeshir Guran** (Canada), **T. Frantik** (Czech Republic). Stability, bifurcation and post-critical behavior of a flexible missile under an end thrust

11⁴⁵ - Coffee Break

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

12⁰⁰ - 12³⁰ **Tamaz Tadumadze** (Georgia). Variation formulas of solution for a class of neutral functional differential equation taking into account delay function perturbation and the continuous initial condition

12³⁵ - 13⁰⁵ **Roman Koplataдзе** (Georgia). Oscillation criteria for differential equations with several delays

13¹⁰ – Lunch

Parallel Sessions

Ordinary differential equations and optimal control

I. Javakhishvili Lecture hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

14³⁰ - 15⁰⁰ **Phridon Dvalishvili, B. Midodashvili** (Georgia). On one method of constructing optimal mixed strategies in fuzzy antagonistic matrix games

15⁰⁵ - 15³⁵ **Akaki Gabelaia** (Georgia). Samuelson's model realization problem for Georgia

15⁴⁰ - 16¹⁰ **Lela Alkhazishvili** (Georgia). About genetic algorithm approach for one dynamic model of communication market

16¹⁵ - 16⁴⁵ **Nika Gorgodze** (Georgia). Well-posedness of the Cauchy problem for one class of neutral functional differential equation taking into account delay perturbation

Mathematical problems of mechanics of continua and related problems of analysis

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

14³⁰ - 15⁰⁰ **Nino Manjavidze, G. Akhalaia** (Georgia). Functional classes of the solutions of elliptic systems on the plane

15⁰⁵ - 15³⁵ **Liparit Tepoyan** (Armenia). Nonself-adjoint degenerate differential-operator equations of higher order

15⁴⁰ - 16¹⁰ **Umit Aksoy** (Turkey). Neumann-type boundary value problem for second order partial differential equations on the unit ball in Clifford analysis

16¹⁵ - 16⁴⁵ **Pietro Caramuta, A. Cialdea** (Italy). An application of theory of self-conjugate differential forms to the Dirichlet problem for Cimmino system

16⁵⁰ Coffee Break

Ordinary differential equations and optimal control

I. Javakhishvili Lecture hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

17¹⁰ - 17⁴⁰ **Zurab Isakadze, B. Ghvaberidze (Georgia)**. On some bicriterial problems of the discrete optimization

17⁴⁵ - 18¹⁵ **Nugzar Khvedelidze (Georgia)**. On the existence of bounded and vanishing at infinity solutions of linear ordinary differential equations of third order

18²⁰ - 18⁴⁰ **Nana Odishelidze, K. Kuthkhashvili (Georgia)**. On multi-criteria algorithms and the analysis for some discrete optimization problems

Mathematical problems of mechanics of continua and related problems of analysis

Assembly Hall

I. Javakhishvili Tbilisi State University, Main Building, I. Chavchavadze Ave. 1

17¹⁰ - 17⁴⁰ **Tengiz Meunargia (Georgia)**. On one method of construction the nonlinear theory of non-shallow shells

17⁴⁵ - 18¹⁵ **Emanuela Dolce, A. Cialdea, A. Malaspina (Italy)**. On the potential theory in Cosserat elasticity

18²⁰ - 18⁴⁰ **Maia Svanadze (Georgia)**. Boundary value problems of the linear theory of viscoelasticity for Kelvin-Voigt materials with voids