MASTER PROGRAM

for

SIXTH INTERNATIONAL CONFERENCE
APPLICATION OF MATHEMATICS IN TECHNICAL AND NATURAL
SCIENCES
ALBENA, JUNE 26-JULY 1, 2014

WEDNESDAY, JUNE 25, 2014

17:00-19:00   REGISTRATION
                   Flamingo Grand Hotel – 3rd floor

THURSDAY, JUNE 26, 2014

07:30-08:30   REGISTRATION
Flamingo Grand Hotel – 3rd floor

08:30-09:00   OPENING (Flamingo Grand Hall)

09:00-10:00   PLENARY LECTURE: Blagovest Sendov
(Flamingo Grand Hall)
Chair: Michail Todorov
Title: *Analogue of Gauss-Lucas Theorem for Complex Polynomials*

10:00-10:15 COFEE BREAK

10:15-12:15   Symposium DISCRETE SINGULARITIES METHODS IN
MATHEMATICAL PHYSICS
(Flamingo Grand Hall)
Chair: Michail Todorov

10:15-10:45   Speaker: Kateryna Nesvit
Title: *Mathematical and Computational Modeling of the Diffraction Problems by Discrete Singularities Method*

10:45-11:15   Speaker: Alexei Setukha
Title: *Numerical Simulation of Separated Flow over Three-Dimensional Complex Shape Bodies with Some Vortex Method*

11:15-11:45   Speaker: Gleb Ryzhakov
Title: *On One Numerical Scheme of the Solution of a Three-Dimensional Problem of Diffraction of an Electromagnetic Wave on Thin Ideally Conductive Screens*

11:45-12:15   Speaker: Victor Olevskyi
Title: *Using of 2D Pade Approximations in Shell Mechanics*

12:30-14:00   LUNCH

14:00-14:30   Symposium DISCRETE SINGULARITIES METHODS IN
MATHEMATICAL PHYSICS

(Flamingo Grand Hall)

Chair: Kateryna Nesvit

14:00-14:30	Speaker: Stanislav Zhuchenko Title: *Numerical Simulation of Gas Dynamics and Heat Exchange Tasks in Fuel Assemblies of the Nuclear Reactors*
14:30-14:45	Symposium Discussion
14:45-15:45	Parallel Session NUMERICAL METHODS (Flamingo Grand Hall) Chair: Alexei Setukha
14:45-15:15	Speaker: Volodymyr Kolodyazhny Title: *Structural Methods of Solving Boundary Value Problems on the Basis of the Atomic Functions*
15:15-15:45	Speaker: Ivelin Ivanov **- cancelled** Title: *Iterative Methods for Generalized Riccati Equations on Open Source Software*

15:45-16:00	COFEE BREAK

16:00-17:30	Parallel Session APPLIED PHYSICS (Flamingo Grand Hall) Chair: Michail Todorov
16:00-16:30	Speaker: : Ivailo Mladenov/Danail Brezov Title: *Two-Axes Decompositions of (Pseudo-)Rotations and Some of Their Applications*
16:30-17:00	Speaker: Pavel Selyshchev Title: *Poincare Formalism for Describing of Radiation Damage Evolution*
17:00-17:30	Speaker: Hassan Jolani - **cancelled** Title: *Metaplectic Quantization*

20:00	WELCOME PARTY – Piano bar of Bailando

FRIDAY, JUNE 27, 2014

08:30-09:30	PLENARY LECTURE: Igor Tsukerman
	Title: *The Power of Trefftz Methods: From Finite-Difference to Discontinuous Galerkin Schemes and from Macromolecules to Metamaterials*
	(Flamingo Grand Hall)
	Chair: Michail Todorov

09:30-09:45 COFEE BREAK

09:45-12:15	Special Session THEORETICAL AND NUMERICAL ANALYSIS OF GENERALIZED WAVE EQUATIONS
	(Flamingo Grand Hall)
	Chair: Vladimir Gerdjikov
09:45-10:15	Speaker: Nikolay Kutev
	Title: *Global Behavior of the Solutions to Boussinesq Type Equation with a Linear Restoring Force*
10:15-10:45	Speaker: Elena Zemlyanaya
	Title: *Ac-Driven Nonlinear Schroedinger Equation and Double Sine-Gordon Equation: Numerical Study of Complexes of Localized States*
10:45-11:15	Speaker: Ivan Hristov
	Title: *The In-phase States of Josephson Junctions Stacks as Attractors*
11:15-11:45	Speaker: Daniela Vasileva
	Title: *A Numerical Investigation of Stability of 1D Soliton Solutions of Boussinesq Paradigm Equation in the 2D Case*
09:45-12:15	Symposium DISCRETE SINGULARITIES METHODS IN MATHEMATICAL PHYSICS
	(Flamingo Grand Jaco Hall)
	Chair: Volodymyr Kolodyazhny
09:45-10:15	Speaker: Tetiana Hryhorova/Viktor Lyashenko
	Title: *Computer Modeling of High-Temperature Diffusion Processes*

10:15-10:45	Speaker: Viktor Lyashenko/Elena Kobilskaya

10:15-10:45   Speaker: Viktor Lyashenko/Elena Kobilskaya
Title: *Control of Heat Source in a Heat Conduction Problem*

10:45-11:15   Speaker: Yevgenii Donchik
Title: *Controllability Problem for the Solution of the String Equation with an External Load with Fixed Ends on a Rectangular*

11:15-12:15   Parallel Session SCIENTIFIC COMPUTING
(Flamingo Grand Jaco Hall)
Chair: Petr Vabishchevich

11:15-11:45   Speaker: V. Vasilyev/Maria Vasilyeva
Title: *Mathematical Modeling of Heat Transfer Problems in the Permafrost*

11:45-12:15   Speaker: M.Todorov/A.Bowden/N.M. Sirakov
Title: *Euler-Lagrange Active Contour Evolving in a Poisson Vector Field of an Image*

12:30-14:00 LUNCH

14:00-15:00   Flamingo Grand Hall
Chair: Michail Todorov

PLENARY LECTURE: Ivan Dimov
Title: *A New Walk on Equations Monte Carlo Method for Linear Algebraic Problems*

15:00-15:45   KEYNOTE LECTURE: Marcin Paprzycki/Maria Ganzha
Title: *Multicriteria Analysis of Ontologically Represented Information*
(Flamingo Grand Hall)
Chair: Ivan Dimov

15:45-16:00   COFEE BREAK

16:00-17:30   Parallel Session SCIENTIFIC COMPUTING
(Flamingo Grand Hall)

Chair: Ivan Dimov

16:00-16:30	Speaker: Peter Bogatencov/Gregore Secrieru
	Title: *Numerical Investigation of the Impact of Seismic Waves on the Elastic-Plastic Structures Buried in the Ground*
16:30-17:00	Speaker: Damian Slota
	Title: *Application of the Homotopy Analysis Method for Solving the Two-Dimensional Steady-State Heat Conduction Problem*
17:00-17:30	Speaker: Kostadin Ganev
	Title: *Renewable Energy Potential in Bulgaria- Some Computer Simulations Results*

08:30-09:30   Flamingo Grand Hall
                     Chair: Michail Todorov

                     PLENARY LECTURE: Alex Freundlich
                     Title: *Ultra-Efficient Solar-Energy-Conversion Pathway with
                     Dilute Nitride Quantum-Enhanced Photovoltaics*

09:30-09:45 COFEE BREAK

09:45-11:45   Parallel Session CONTINUUM MECHANICS
                     Flamingo Grand Hall
                     Chair: Alex Freundlich

09:45-10:15   Speaker: Vladimir Sadovskii
                     Title: *Equations of the Dynamics of a Liquid Crystal under the
                     Influence of Weak Mechanical and Thermal Perturbations*
 10:15-10:45   Speaker: Sonya Tabakova
                     Title: *Carreau Model for Oscillatory Blood Flow in a Tube*
10:45-11:15   Speaker: Oxana Sadovskaya
                     Title: *Numerical Simulation of the Dynamics of a Liquid
                      Crystal in the Case of Plane Strain using GPUs*
 11:15-11:45   Speaker: Yonko Stoynov
                     Title: *Dynamic Fracture of Functionally Graded
                     Magnetoelectroelastic Composite Materials*

                     Parallel Session SCIENTIFIC COMPUTING
 10:45-11:15   Speaker: Massoud Allame
                     Title: *Solution of Falkner-Skan Equation with Heat Transfer*

09:45-12:00   Poster Session
                     (Flamingo Grand Jaco Hall)

                     Borislav Stoyanov
                          Using Circle Map in Pseudorandom Bit Generation
                     Krasimir Kordov

Modified Chebyshev Maps Based Pseudorandom Bit Generator

Renna Djulgerova **- cancelled**

Evaluation of Collisional Ionization Rate Constants in Discharge Plasma by the Optogalvanic Effect

Todor Todorov

Numerical Solutions of Physical Models for Propagation of Ultrashort Light Pulses

Benedict Ita **- cancelled**

Solutions of the Schrödinger Equation with Inversely Quadratic Hellmann Plus Inversely Quadratic Potential Using Nikiforov-Uvarov Method

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12:00-14:00 LUNCH

14:00-18:00   EXCURSION AND SOCIAL ACTIVITIES
(The panorama road alongside the Black-Sea shore to Kavarna, Kamen Bryag, Shabla and Balchik visiting the Botanical Garden and the palace)

19:30-23:30   BANQUET DINNER
(restaurant of Bulgarian Fiesta)

SUNDAY, JUNE 29, 2013

08:30-09:30	Flamingo Grand Hall Chair: Michail Todorov
	PLENARY LECTURE: Petr Vabishchevich Title: *Numerical Simulation of the Aluminum Production*

09:30-09:45	COFEE BREAK

09:45-12:00	Parallel Session MATHEMATICAL PHYSICS & APPLIED ANALYSIS (Flamingo Grand Hall) Chair: Volodymyr Kolodyazhny
09:45-10:30	KEYNOTE LECTURE: Vladimir Gerdjikov Title: *Integrability, Solitons & Their Interaction*
10:30-11:00	Speaker: Edyta Hetmaniok Title: *Generalization of Eulerian Numbers and Their Application*
11:00-11:30	Speaker: Roman Witula Title: *On Certain Approximation Problem in Normed Spaces*
11:30-12:00	Speaker: Mariusz Pleszczynski Title: *Transformations Preserving Nonsingularity, Trace and Spectrum of Matrices*

09:45-10:45	Parallel Session CONTINUUM MECHANICS Flamingo Grand Jaco Hall Chair: Nikolay Kutev
09:45-10:15	Speaker: Kiril Shterev Title: *Strouhal Number Analysis for a Karman Vortex Gas Flow past a Square in a Microchannel at Low Mach Number*
10:15-10:45	Speaker: Dobri Dankov – **poster, non-available**? Title: *Thermoacoustic Waves in a Cylindrical Couette Rarefied Gas Flow*

10:45-12:00	Parallel Session NUMERICAL METHODS Flamingo Grand Hall Chair: Nikolay Kutev
10:45-11:30	KEYNOTE LECTURE: Raytcho Lazarov Title: *Finite Element Method for Fractional-Order Differential Equations*
11:30-12:00	Speaker: Evgeniya Karepova Title: *The Parallel Implementation of the Numerical Solution of the Inverse Problem of Boundary Function Recovery for the Tidal Models*

12:00-14:00 LUNCH

14:00-15:45	Parallel Session SCIENTIFIC COMPUTING (Flamingo Grand Hall) Chairs: Stefka Dimova
14:00-14:45	KENOTE LECTURE: Wil Schilders Title: *Mathematics for Industry and Innovation in Europe*
14:45-15:15	Speaker: Dimiter Syrakov Title: *Influence of NO_x Emission on WRF-CMAQ Regional Modeling System Results*
15:15-15:45	Speaker: Nectarios Papanicolaou Title: *Numerical Analysis of Nematic Liquid Crystals as Applied to Tunable Antennas*

14:00-15:30	Parallel Session NUMERICAL METHODS (Flamingo Grand Jaco Hall) Chairs: Petr Vabishchevich
14:00-14:30	Speaker: M. Kajani Title: *A Numerical Solution of Falkner-Skan Equation via a Shifted Chebyshev Collocation Method*
14:30-15:00	Speaker: M. Tirani

Title: *A Nonclassical Radau Collocation Method for Solving the Lane-Emden Equations of the Polytropic Index $4.75 \leq a \leq 5$*

15:00-15:30	Parallel Session MATHEMATICAL PHYSICS & APPLIED ANALYSIS (Flamingo Grand Jaco Hall) Chairs: Petr Vabishchevich
15:00-15:30	Speaker: Todor Stoyanov Title: *Some Estimates Bellow the Modulus of Some Integrals of the Unit Circle*

15:45-16:00	COFEE BREAK

16:00-17:30	Parallel Session SCIENTIFIC COMPUTING (Flamingo Grand Hall) Chair: Marcin Paprzycki
16:00-16:30	Speaker: Andreas Savva Title: *Patch-Fitting on Surface Holes*
16:30-17:30	Speaker: Alexandre Fedoseyev Title: *Improved Boundary Condition Approximation for Accurate Numerical Solution of PDEs*
17:00-17:30	Speaker: Ivailo Mladenov/Mariana Hadzhilazova *Elastic Spirals*

16:00-17:00	Parallel Session MATHEMATICAL PHYSICS & APPLIED ANALYSIS (Flamingo Grand Jaco Hall) Chair: Elena Zemlyanaya
16:00-16:30	Speaker: Abdullah Hadi-Vencheh Title: *A Non-Radial Model for Evaluating Multiperiod Aggregative Efficiency*
16:30-17:00	Speaker: Charalambos Christou Title: *Frequency-Dependent Performance Analysis of a Parallel DSP-Based Computer System*

MONDAY, JUNE 30, 2014

08:30-09:30	PLENARY LECTURE: Vladimir Shaydurov
	Title: *Semi-Lagrangian Approach in Finite Element Method for Navier-Stokes Equations of Viscous Heat-Conducting Gas*
	(Flamingo Grand Hall)
	Chair: Michail Todorov

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09:30-09:45	COFEE BREAK

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09:45-10:15	Special Session THEORETICAL AND NUMERICAL ANALYSIS OF GENERALIZED WAVE EQUATIONS
	(Flamingo Grand Hall)
	Chair: Vladimir Shaydurov
09:45-10:15	Speaker: Benedict Ita
	Title: *Solutions of the Klein-Gordon Equation with Equal Scalar and Vector Harmonic Oscillator Plus Inversely Quadratic Potential*
10:15-11:15	Nicoleta-Corina Babalic
	Soliton Solutions for Tzitzeica II Equation
10:15-10:45	Speaker: Lubomir Kovachev **- cancelled**
	Title: *Long Range Filament as Vector Solitary Wave*
10:45-11:45	Speaker: Vladimir Gerdjikov
	Title: *Modeling Interactions of Soliton Trains. Effects of External Potentials. Part I*
11:15-11:45	Speaker: Michail Todorov
	Title: *Modeling Interactions of Soliton Trains. Effects of External Potentials. Part II*

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12:30-14:00 LUNCH

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14:00-15:30	Parallel Session BIOMATHEMATICS
	(Flamingo Grand Hall)
	Chair: Michail Todorov
14:00-14:30	Speaker: Anna Antonova

14:30-15:00	Title: *On the Excitation of Goodwin's Oscillation* Astrid Rekker *Sensitive Response of a Model of Symbiotic Ecosystem to Seasonal Periodic Drive*
15:00-15:30	Speaker: Gabriel Dimitriu Title: *Numerical Approach for an Optimal Harvesting Policy in a Diffusive Predator-Prey System*

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15:45-16:00	COFEE BREAK

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16:00-16:30	Parallel Session BIOMATHEMATICS (Flamingo Grand Hall) Chair: Nikolay Kutev Speaker: Neemi Lumi Title: *Stochastic Resonance in a Generalized von Foerster Population Growth Model*
16:30-17:30	Special Session THEORETICAL AND NUMERICAL ANALYSIS OF GENERALIZED WAVE EQUATIONS (Flamingo Grand Hall) Chair: Nikolay Kutev
16:30-17:00	Speaker: Daniela Georgieva -**cancelled** Title: *Energy Transfer between Two Filaments Due to Degenerate Four-Photon Parametric Process*
17:00-17:30	Speaker: Ivailo Mladenov/Vasil Vasilev Title: *Explicit Parameterization of Wilmore Surfaces*
17:30	RECAPITULATION AND FORMAL CLOSING OF THE CONFERENCE (PART 1)

TUESDAY JULY 1, 2014

5:30   MEETING THE JULY MORNING AND INFORMAL
                       CLOSING THE CONFERENCE – Black-Sea beach (PART 2)