
PROGRAM
for
SECOND INTERNATIONAL CONFERENCE
APPLICATION OF MATHEMATICS IN TECHNICAL AND NATURAL
SCIENCES
SOZOPOL
JUNE 21-26, 2010

SUNDAY, JUNE 20, 2010

17:00-19:00 REGISTRATION
Hotel VIP Zone

MONDAY, JUNE 21, 2010

07:30-08:30 REGISTRATION
08:30-09:00 OPENING

09:00-10:00 Room A
Chairs: Christo Christov, Michail Todorov
PLENARY LECTURE: Felix Chernousko
Title: *Modeling and Optimization of Locomotion for Multibody Systems*

10:00-10:15 COFEE BREAK

10:15-16:40 Special Session HPC GRID APPLICATIONS, Room A
Chairs: Todor Gurov, Horst Schwichtenberg

10:15-11:00 KEYNOTE SPEAKER: Horst Schwichtenberg
Title: *HPC Applications from Earth Science on Grid Infrastructures*

11:00-11:45 KEYNOTE SPEAKER: Todor Gurov
Title: *Efficient Gridification of Environmental Protection Applications with QoS*

11:45-12:15 Speaker: Aneta Karaivanova
Title: *Sensitivity Studies of a Large-scale Air Pollution Model*

in Grid Environment

- 10:15-12:15 Minisymposium on SOLITONS, Room B
Chair: Felix Chernousko
- 10:15-11:00 KEYNOTE SPEAKER: Lubomir Kovachev
Title: *Ionization-free Filamentation in Gases*
- 11:00-11:45 KEYNOTE SPEAKER: Vladimir Gerdjikov
Title: *On Soliton Equations and Soliton Interactions*
- 11:45-12:15 Speaker: Marios Christou
Title: *Numerical Investigation of Boussinesq Equations with Saturation*
-

12:15-14:00 **LUNCH**

- 14:00-15:00 Room A
Chais: Michail Todorov
PLENARY LECTURE: Francois Feuillebois
Title: *Methods for the Coupled Stokes-Darcy Problem*
- 15:00-16:00 Special Session HPC GRID APPLICATIONS, Room A
Chair: Todor Gurov
- 15:00-15:30 Speaker: Dimiter Syrakov
Title: *Exploiting GRID for Model Estimates of Regional Climate Changes and Its Impact on the Air Quality of Bulgaria*
- 15:30-16:00 Speaker: Nikolay Manev
Title: *Simulations of Digital Communication Devices on Multicore Systems*
-

- 15:00-16:00 Parallel Session CONTINUUM MECHANICS, Room B
Chair: Vladimir Gerdjikov
- 15:00-15:30 Speaker: Tsvetanka Sendova
Title: *Modeling Interfacial Fracture*
- 15:30-16:00 Speaker: Nikolai Magnitskii
-

Title: *Feigenbaum-Sharkovskii-Magnitskii Scenario of Transition to Turbulence in the Rayleigh-Benard Convection*

16:00-16:15	COFEE BREAK
-------------	-------------

16:15-16:45	Special Session HPC GRID APPLICATIONS, Room A Chair: Svetozar Margenov
16:15-16:45	Speaker: Radoslava Goranova Title: <i>Development of ROOT Services for Grid</i>
16:45-17:15	Parallel Session SCIENTIFIC COMPUTING, Room A Chair: Svetozar Margenov
16:45-17:15	Speaker: Mark Iwen Title: <i>Improved Sparse Fourier Transforms for Sparse Spectral Methods</i>
17:15-17:45	Parallel Session NUMERICAL METHODS, Room A Chair: Svetozar Margenov
17:15-17:45	Speaker: Andrey Andreev Title: <i>Lower Bounds for Eigenvalues by Nonconforming FEM on Convex Domain</i>

16:15-17:15	Parallel Session BIOMATHEMATICS, Room B Chair: Rumen Anguelov
16:15-16:45	Speaker: Piret Avila Title: <i>Stochastic Super-exponential Growth Model Describing Population Dynamics</i>
16:45-17:15	Speaker: Anna Antonova Title: <i>Analysis of Types of Oscillations in Goodwin's Model of Business Cycle</i>

17:15-17:45	Parallel Session CONTINUUM MECHANICS, Room B Chair: Rumen Anguelov
-------------	---

17:15-17:45

Speaker: Sofia Karapetrova

Title: *Hit of a Body into a Plate at a Continuous Action of an Additional Outer Force*

19:30

WELCOME PARTY

THUESDAY, JUNE 22, 2010

08:30-09:30 Room A
Chais: Christo Christov, Michail Todorov

PLENARY LECTURE: Dan Censor
Title: *The Need for a First-order Quasi Lorentz Transformation*

09:30-09:45 COFEE BREAK

09:45-12:15 Parallel Session APPLIED ANALYSIS Room A
Chair: Luis Castro

09:45-10:15 Speaker: Ismail N. Cangul
Title: *A Note on Interpolation Functions of the Frobenious-Euler Numbers*

10:15-10:45 Speaker: Ivan G. Ivanov
Title: *Accelerated Iterations for Finding the Soft-Constrained Stochastic Nash Games Equilibrium*

10:45-11:15 Speaker: Edixon Rojas
Title: *On the Kernel Dimension of Singular Integral Operators with Weighted Shifts*

11:15-11:45 Speaker: Anabela Silva
Title: *Fredholm Characterization of Systems of Equations of Wiener-Hopf and Hankel Type Containing Piecewise Almost Periodic Elements*

11:45-12:15 Speaker: Alberto Simoes
Title: *On the Solvability of a Problem of Wave Diffraction by a Union of a Strip and a Half-Plane*

09:45-12:15 Parallel Session BIOMATHEMATICS
Room B
Chair: Svetoslav Markov

09:45-10:30 KEYNOTE SPEAKER: Ivailo Mladenov
Title: *Some Explicit Solutions of the Shape Equation*

10:30-11:15 KEYNOTE SPEAKER: Rumel Anguelov

11:15-11:45 Title: *A Case of Multi-vector and Multi-host Epidemiological Model: Bartonella Infection*

Speaker: Gaik Ambartsoumian

11:45-12:15 Title: *On Inversion of Radon Transforms from Partial Data*

Speaker: Katrin Laas

Title: *Friction-induced Resonance of a Noisy Fractional Oscillator*

12:15-14:00 **LUNCH**

14:00-15:00 Room A

Chairs: Christo Christov, Michail Todorov

PLENARY LECTURE: Peter Minev

Title: *A New Class of Fractional Step Techniques for the Incompressible Navier-Stokes Equations Using Direction Splitting*

15:00-15:45 Parallel Session APPLIED ANALYSIS

Room A

Chair: Michail Todorov

15:00-15:45 KEYNOTE SPEAKER: Luis Castro

Title: *Electromagnetic Scattering by Orthotropic Waveguides*

15:00-15:45 Parallel Session NUMERICAL METHODS, Room B

Chair: Svetozar Margenov

15:00-15:45 KEYNOTE SPEAKER: Ivan Hristov

Title: *Parametric Investigation of Static and Dynamic Regimes in Stacked Josephson Junctions*

15:45-16:00 COFFEE BREAK

16:00-17:30 Parallel Session APPLIED ANALYSIS, Room A

Chair: Michail Todorov

16:00-16:30 Speaker: Zornitca Petrova

16:30-17:00 Title: *Mathematical Models and Distribution of the Zeros of the Duffing Equation and More General Equations*
Speaker: Beatha Stehlikova

17:00-17:30 Title: *Determining the Form of the Short Rate Volatility Using the Approximate Formula for Pricing Zero-coupon Bonds*
Speaker: Tanya Melton

Title: *Cubic Convergence for Nonlinear Differential Equations with Initial Time Difference*

16:00-17:15 Parallel Session NUMERICAL METHODS, Room B
Chair: Svetozar Margenov

16:00-16:45 KEYNOTE SPEAKER: Norberto Mangiavacchi
Title: *Parallel Numerical Simulations of Water Reservoirs*

16:45-17:15 Speaker: Mohammed Louaked
Title: *Well-balanced Component-wise Scheme for Shallow Water System*

17:15-17:45 Parallel Session CONTINUUM MECHANICS, Room B
Chair: Svetozar Margenov

17:15-17:45 Speaker: Goodarz Ahmadi
Title: *Postbuckling Behavior and Imperfection Sensitivity of an Elastic Compressible Rod whose Flexural Resistance Changes with Load*

WEDNESDAY, JUNE 23, 2010

08:30-09:30 Room A
Chairs: Michail Todorov
PLENARY LECTURE: Christo I. Christov
Title: *Continuum Mechanics of Space and Unification*

09:30-09:45 COFFEE BREAK

09:45-12:30 Parallel Session CONTINUUM MECHANICS, Room A
Chair: Lubomir Kovachev

09:45-10:30 KEYNOTE SPEAKER: Vladimir Ostapenko
Title: *Shallow Water Model Which Admits the Propagation of Shocks over a Dry Bed*

10:30-11:15 KEYNOTE SPEAKER: Joachim Gwinner
Title: *Unilateral Contact Problems for Hemitropic Solids – A Boundary Variational Inequality Approach*

11:15-12:00 KEYNOTE SPEAKER: Ardeshir Guran
Title: *Recent Developments in Stability, Vibration and Control of Mechanical Structures*

12:00-12:30 Speaker: Dmitry Zavalishchin
Title: *Optimal Flow over Body at Reynolds Great Numbers*

09:45-12:00 Parallel Session APPLIED PHYSICS, Room B
Chair: Stoytcho Yazadjiev

09:45-10:30 KEYNOTE SPEAKER: Sanichiro Yoshida
Title: *Physical Mesomechanics; Its Theoretical Basis and Applications*

10:30-11:00 Speaker: Magdalena Christova
Title: *Modeling of Line Shapes Using Stochastic Processes*

11:00-11:30 Speaker: Olga Zeynalova
Title: *A New Method of Prompt Fission Neutron Energy Spectrum Unfolding*

11:30-12:00	Speaker: Iliycho Iliev Title: <i>Temperature Model of a New High-powered SrBr₂ Laser</i>
12:00-12:30	Parallel Session NUMERICAL METHODS, Room B Chair: Stoytcho Yazadjiev
12:00-12:30	Speaker: Abdelkader Saidi Title: <i>2D Control Problem and TVD-Particle Method for Water Treatment System</i>
<hr/>	
12:30-14:00	LUNCH
<hr/>	
14:00-18:00	EXCURSION AND SOCIAL ACTIVITIES
18:00-23:30	BANQUET

THURSDAY, JUNE 24, 2010

- 08:30-09:30 Room A
Chairs: Christo Christov, Michail Todorov
- PLENARY LECTURE: Anastasis Polycarpou
Title: *Use of the Vector Finite Element Method for the Solution of Electromagnetic Problems*
-
- 09:30-09:45 COFFEE BREAK
-
- 09:45-12:00 Parallel Session SCIENTIFIC COMPUTING, Room A
Chair: Anastasis Polycarpou
- 09:45-10:30 KEYNOTE SPEAKER: Svetozar Margenov
Title: *Total Robustness of Nonconforming Finite Element Methods*
- 10:30-11:00 Speaker: Krassimir Georgiev
Title: *Studying an Eulerian Computer Model Performance on Different High-performance Computer Platforms*
- 11:00-11:30 Speaker: Nikola Kosturski
Title: *Supercomputer Simulation of Radio-Frequency Hepatic Tumor Ablation*
- 11:30-12:00 Speaker: Vladimir Lukin
Title: *Mathematical Modeling of Magnetic Jets Acceleration Processes*
- 12:00-12:30 Minisymposium on SOLITONS, Room A
Chair: Anastasis Polycarpou
- 12:00-12:30 Speaker: Todor Todorov
Title: *Generation of Stable (3+1)-dimensional High-intensity Ultrashort Pulses*
-
- 09:45-12:30 Parallel Session MATHEMATICAL PHYSICS, Room B
Chair: Dan Censor

09:45-10:30 KEYNOTE SPEAKER: Kamel Al-Khaled
Title: *A Sinc-Galerkin Approach for Systems of Conservation Laws of Mixed Hyperbolic-Elliptic Type*

10:30-11:15 KEYNOTE SPEAKER: Burat Polat
Title: *A Distributional Investigation of Progressive Differential Operators*

11:15-12:00 KEYNOTE SPEAKER: Stoytcho Yazadjiev
Title: *Uniqueness Theorem for Einstein-Maxwell Black Holes with Kaluza-Klein Asymptotic*

12:00-12:30 KEYNOTE SPEAKER: Claudia Timofte
Title: *On the Homogenization of a Damped Wave Equation*

12:30-14:00 **LUNCH**

14:00-15:00 Room A
Chair: Christo Christov, Michail Todorov

PLENARY LECTURE: Svetoslav Markov
Title: *Biomathematics and Interval Analysis: A Prosperous Marriage*

15:00-15:45 Parallel Session NUMERICAL METHODS, Room A
Chair: Norberto Mangiavacchi

15:00-15:45 KEYNOTE SPEAKER: Stefan Stefanov
Title: *Direct Simulation Monte Carlo Algorithms for Simulation of Non-equilibrium Gas Flows*

15:00-15:45 Parallel Session MATHEMATICAL PHYSICS, Room B
Chair: Francois Feuillebois

15:00-15:45 KEYNOTE SPEAKER: Ivan Koprinkov
Title: *Material Phase Causality or a Dynamics-statistical Interpretation of Quantum Mechanics*

15:45-16:00 COFEE BREAK

- 16:00-17:00 Parallel Session NUMERICAL METHODS, Room A
Chair: Norberto Magniavacchi
- 16:00-16:30 Speaker: Andreas Savva
Title: *Surface Generation from a Non-structured Set of Vertices*
- 16:30-17:00 Speaker: Leonid Prigozhin
Title: *Partial L^1 Monge-Kantorovich Problem*
- 17:00-17:30 Parallel Session TRANSPORT PROCESSES, Room A
Chair: Norberto Magniavacchi
- 17:00-17:30 Speaker: Galina Timofeeva
Title: *Queuing Models for Vehicle Flow on Crossroads*
-
- 16:00-17:30 Parallel Session MATHEMATICAL PHYSICS, Room B
Chair: Francois Feuillebois
- 16:00-16:30 Speaker: Peter Slavov
Title: *3+1 Representation of Maxwell Equation on Riemannian Manifold*
- 16:30-17:00 Speaker: Dimiter Mladenov
Title: *Gauge and Rigid Symmetries of Light-cone Yang-Mills Classical Mechanics*
- 17:00-17:30 Speaker: Petya Nedkova
Title: *Rotating Black Ring on Kaluza-Klein Bubbles*

FRIDAY, JUNE 25, 2010

08:30-10:00 Special Session INTEGRAL TRANSFORM METHODS AND SPECIAL FUNCTIONS IN APPLIED ANALYSIS within section APPLIED ANALYSIS
Room A
Chair: Virginia Kiryakova

08:30-9:15 KEYNOTE SPEAKER: Virginiya Kiryakova
Title: *The Multi-index Mittag-Leffler Functions and Their Applications for Solving Fractional Order Problems in Applied Analysis*

9:15-10:00 KEYNOTE SPEAKER: Yuri Luchko
Title: *Fractional Calculus Models for the Anomalous Diffusion Processes and Their Analysis*

10:00-10:15 COFEE BREAK

10:15-11:45 Parallel Session CONTINUUM MECHANICS, Room A
Chair: Sonya Tabakova

10:15-10:45 Speaker: Tatyana Pukhnacheva
Title: *Mathematical Models in Dynamics of Incompressible Viscoelastic Media*

10:45-11:15 Speaker: Michail Todorov
Title: *Polarization Dynamics in System of Coupled Nonlinear Schrodinger Equations*

11:15-11:45 Speaker: Nectarios Papanicolaou
Title: *2D Regimes of Non-Fourier Convection in a Rectangular Cavity*

11:45-12:15 Parallel Session APPLIED ANALYSIS, Room A
Chair: Sonya Tabakova

11:45-12:15 Speaker: Speaker: Predrag Rajkovic
Title: *The Concepts of Polynomial Orthogonality and Their Applications*

12:15-14:00 **LUNCH**

14:00-15:40 Special Session INTEGRAL TRANSFORM METHODS AND SPECIAL FUNCTIONS IN APPLIED ANALYSIS within section APPLIED ANALYSIS
Room A
Chair: Yuri Luchko

14:00-14:30 Speaker: Vera Lipnevich
Title: *The Wright Function: Its Properties, Applications, and Numerical Evaluation*

14:30-15:00 Speaker: Jordanka Paneva-Konovska
Title: *Convergence of Series in Mittag-Leffler Type Functions*

15:00-15:30 Speaker: Ivan Stefanov
Title: *Relation between the Parameters of a Gravitational Lens and the Frequencies of Black-hole Quasi-normal Modes*

15:30-16:00 Speaker: Daniela Doneva
Title: *Thermodynamics of Scalar-Tensor AdS Black Holes Coupled to Nonlinear Electrodynamics*

16:00-16:15 COFEE BREAK

08:30-10:00 Parallel Session NUMERICAL METHODS, Room B
Chair: Peter Minev

08:30-09:00 Speaker: Luben Vulkov
Title: *Richardson Extrapolation in Spectral Problems with Eigenvalues in Boundary and Conjugation Conditions*

09:00-09:30 Speaker: Miglena Koleva
Title: *Numerical Solution of Black-Scholes Equations with Non-differentiable Nonlinearities*

09:30-10:00 Speaker: Radoslav Vulkov
Title: *A Computational Scheme in the Zero Bond Pricing*

10:00-10:15 COFEE BREAK

10:15-12:15 Parallel Session NUMERICAL METHODS, Room B
Chair: Peter Minev

10:15-10:45 Speaker: Natalia Kolkovska
Title: *Finite Difference Schemes for Multidimensional*

10:45-11:15	<i>Boussinesq Equation</i> Speaker: Jose Pontes Title: <i>A Splitting Scheme for Solving Reaction-Diffusion Equations Modeling Dislocation Dynamics in Materials Subjected to Cyclic Loading</i>
11:15-11:45	Speaker: Dobri Dankov Title: <i>Cylindrical Couette Flow of Rarefied Gas between Two Cylinders Rotating with Different Velocities</i>
11:45-12:15	Speaker: Kiril Shterev Title: <i>Some Spectral Problems of Porous Media Acoustics</i>
12:15-14:00	LUNCH
14:00-15:30	Parallel Session TRANSPORT PROCESSES, Room B Chair: Ardeshir Guran
14:00-14:45	KEYNOTE SPEAKER: Sonya Tabakova Title: <i>Dynamics and Stability of Free Thin Films</i>
14:45-15:30	KEYNOTE SPEAKER: Lubomir Dechevsky Title: <i>Matrix-valued Polynomial Hermite Interpolation and the Cauchy-Riesz-Dunford Operator Integral in the Finite-dimensional Case</i>
15:30-16:00	Speaker: Ivan Altaparmakov Title: <i>Modeling of an Elastic Sphere Hit on an Elastic-plastic Plate under a Continuing Action of an Outer Force</i>
16:00-16:15	COFEE BREAK

POSTER PRESENTATIONS

Room A

Daniela Georgieva

Title: *Phases of Soliton-like Solutions in the Scalar-tensor Theories of Gravity*

Galin Gyulchev

Title: *Analytical Kerr-Sen Dilaton-axion Black Hole Lensing in the Weak Deflection Limit*

Ivan Georgiev

Title: *An Immersed Interface FEM for 1D Elastic Continuum Vibrations Under a Traveling Load*

16:15

CLOSING THE CONFERENCE
