MASTER PROGRAM

for

TENTH INTERNATIONAL CONFERENCE APPLICATION OF MATHEMATICS IN TECHNICAL AND NATURAL SCIENCES ALBENA, JUNE 20-25, 2018

TUESDAY, JUNE 19, 2018

17:00-19:00 REGISTRATION

Flamingo Grand Hotel – 3rd floor

WEDNESDAY, JUNE 20, 2018

07:30-08:30 REGISTRATION

Flamingo Grand Hotel – 3rd floor

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

09:00-10:00 PLENARY LECTURE: Vladimir Shaydurov

Title: The Semi-Lagrangian Approximations of Transfer

Operators in Time-Dependent Equations

(Flamingo Grand Hall) Chair: Vladimir Gerdjikov

10:00-10:30 COFEE BREAK

Parallel Session SCIENTIFIC COMPUTING

(Flamingo Grand Hall)

Chair: Vladimir Shaydurov

10:30-11:00 Speaker: Elena Zemlyanaya

Title: Numerical Simulation of Formation of Hydrated Electron

States

11:00-11:30 Speaker: Nevena Ilieva

Title: Footprint of Point Mutations in Domain Decomposition of

Large Proteins

11:30-12:00 Speaker: Elena Lilkova

Title: Influence of Glycosilation on Human Interferon Gamma –

a Molecular Dynamics Study

Parallel Session APPLIED PHYSICS

(Flamingo Grand Jaco Hall)

Chair: Nevena Ilieva

10:30-11:00 Speaker: Andrei Kolyshkin

Title: Mathematical Model for Eddy Current Testing of

	Electrically Conducting Materials with Cylindrical Flaws
11:00-11:30	Speaker: Natalia Vaganova Title: Simulation of Thermal Interaction of Multiple Wells Open Loop Geothermal System
11:30-12:00	Speaker: Martin Nikolo Title: Induced Voltage, Magnetization Waveforms and the Spectral Response at the Grain Boundaries of YBCO Superconductors and the Critical State Model
12:00-14:00	LUNCH
14:00-15:00	Parallel Session SCIENTIFIC COMPUTING (Flamingo Grand Hall) Chair: Elena Zemlyanaya
14:00-14:30	Speaker: Evgeniya Karepova Title: Statistical Data Analysis to Identification of Operating Modes of Electronic Units
14:30-15:00	Speaker: Tsvetan Ostromsky Title: <i>Evolution of a Performance-Efficient Air Pollution Model</i>
15:00-15:30	Speaker: Teodor Grigorie - non-presented Title: Design and Testing Based Experimental Data of a MEMS-INS/GPS Navigator with ANFIS Data Fusion Algorithm
15:30-16:00	Speaker: Vyara Koleva-Efremova Title: Optimizing Parallelization by the Cluster Platform Avitohol of the CFD Method of a Trimaran
14:00-16:00	Parallel Session MATHEMATICAL PHYSICS AND TRANSPORT PROCESSES (Flamingo Grand Jaco Hall) Chair: Nevena Ilieva

14:00-14:30	Speaker: Georgi Grahovski Title: Integrable Nonlocal Multi-Component Equations with PT and CPT Symmetries
14:30-15:00	Speaker: Yanzhen Hou Title: Study of Histidine in Myoglobin with a Novel 3D Visualization Method
15:00-15:30	Speaker: Galina Lazareva Title: Computational Experiment to Solve the Stefan Problem with Nonlinear Coefficients
15:30-16:00	Speaker: Anna Efimova Title: Simulation of Open Beam-Plasma Systems by the Particle-In-Cell (PIC) Method
16:00-16:30	COFEE BREAK
16:30-17:00	Parallel Session SCIENTIFIC COMPUTING (Flamingo Grand Hall) Chair: Galina Lazareva
16:30-17:00	Speaker: Ekaterina Genrikh Title: 3D-PIC Model of the Electromagnetic Radiation Generation by the Counter-Streaming Electron Beams
17:00-18:30	Parallel Session CONTINUUM MECHANICS (Flamingo Grand Hall) Chair: Galina Lazareva
17:00-17:30	Speaker: Irina Smolekho Title: Parallel Implementation of the Algorithm Describing the Behavior of Liquid Crystals under the Action of Electric Field
17:30-18:00	Speaker: Anna Knyazeva

18:00-18:30	Speaker: Petr Sivtsev Title: Numerical Modeling of Multiphysics Blood Filtration Problem in Liver Lobule
16:30-18:30	Parallel Session APPLIED ANALYSIS (Flamingo Grand Jaco Hall) Chair: TBA
16:30-17:00	Speaker: Marat Khairedtinov - cancelled Title: The Nonlinear Processes in Active Geophysical Monitoring
17:00-17:30	Speaker: Dmytro Bondar - cancelled Title: Fuzzy Method of Identification the Results of Electrolytic Impedance Spectroscopy
17:30-18:00	Speaker: Ridha Horchani - cancelled Title: Ultrafast Laser Excitation of CO/Pd (111) Probed by Sum Frequency Generation: Pump Laser Energy Effect on the Induced CO Photo-desorption
20:00	WELCOME PARTY – the lawn in front of Bailando bar MEETING POINT RECEPTION OF FLAMINGO GRAND HOTEL 19:50

THURSDAY, JUNE 21, 2018

i_{08:30-09:30} PLENARY LECTURE: Thiab Taha

Title: IST Numerical Methods for Solving Nonlinear Evolution

Equations

(Flamingo Grand Hall) Chair: Michail Todorov

09:30-10:00 COFEE BREAK

10:00-12:00 Parallel Session SCIENTIFIC COMPUTING

(Flamingo Grand Hall) Chair: Thiab Taha

10:00-10:30 Speaker: Alexander Matviychuk

Title: Using Cloud Computing for Reachable Sets Calculation

for Control Systems

10:30-11:00 Speaker: Venelin Todorov

Title: Efficient Quasi-Monte Carlo Methods for Multiple

Integrals in Option Pricing

11:00-11:30 Speaker: Irina Tsvetanova/Ivanka Zheleva - poster

Title: Statistical Study of the Influence of the Atmospheric

Characteristics upon the Particle Mater (PM10) Air Pollutant

in the City of Ruse, Bulgaria

11:30-12:00 Speaker: Teodor Simchev

Title: Elastic High-Performance Computing Platform for Real-

Time Data Analysis (Xeon Phi, Kubernetes, Docker, Apache

Kafka)

10:00-12:00 Parallel Session MATHEMATICAL PHYSICS AND TRANSPORT PROCESSES

(Flamingo Grand Jaco Hall) Chair: Georgi Grahovski

10:00-10:30	Speaker: Hidekazu Tsuji Title: Two-Dimensional Interaction of Internal Solitary Waves
10:30-11:00	Speaker: Nicolae Tarfulea Title: Gravitational Waves: Ripples in Spacetime's Geometry
11:00-11:30	Speaker: Andrei Tarfulea Title: Homogenization for Nonlocal KPP Reaction-Diffusion Equations in Periodic Media
11:30-12:00	Speaker: Lyubov Toropova - cancelled Title: Stable Mode of Dendritic Growth with Allowance for the Convective Heat Transport near the Solid/Liquid Phase Transition Interface
12:00-14:00 LUN	NCH
	Flamingo Grand Hall Chair: Michail Todorov
14:00-14:45	KEYNOTE LECTURE: Boris Ananyev Title: Estimation Problems for Impulsive Systems
15:00-16:00	Parallel Session CONTINUUM MECHANICS (Flamingo Grand Hall) Chair: Boris Ananyev
15:00-15:30	Speaker: Victor Olevsky Title: Estimation of Parameter-Dependent Plates Vibrations on the Basis of the Asymptotic Method
15:30-16:00	Speaker: Maria Varygina Title: Numerical Modeling of Seismic Wave Propagation under the Action of Electromagnetic Pulse Source
15:00-16:00	Parallel Session MATHEMATICAL PHYSICS AND TRANSPORT PROCESSES

	(Flamingo Grand Jaco Hall) Chair: Vladimir Gerdjikov
15:00-15:30	Speaker: Volodymyr Kiosak – non presented Title: <i>Holomorphically Projective Mappings of Special Kahler Manifolds</i>
15:30-16:00	Speaker: Mikhail Filimonov Title: Representation of Solutions of Initial Boundary Value Problems for Nonlinear Equations of Mathematical Physics by Special Series
16:00-16:30	COFEE BREAK
16:30-17:00	Parallel Session CONTINUUM MECHANICS (Flamingo Grand Hall) Chair: Boris Ananyev
16:30-17:00	Speaker: Vladimir and Oxana Sadovskie/Irina Smolekho – poster Title: Modeling of Fan Waves Taking into Account the Resistance to Separation of Domino-Slabs in a Fan-Shaped System
17:00-18:30	Parallel Session APPLIED ANALYSIS (Flamingo Grand Hall) Chair: Boris Ananyev
17:00-17:30	Speaker: Lev Ryashko Title: <i>Noise-Induced Excitability in the Hodgkin-Huxley Neuron Model</i>
17:30-18:00	Speaker: Irina Bashkirtseva Title: Stochastic Dynamics in the Bistable Goldbeter Model
18:00-18:30	Speaker: Iryna Hvozdeva Title: Some Interval and Trend Statistics with Non-Gaussian Initial Data Distribution

16:30-17:30	Parallel Session MATHEMATICAL PHYSICS AND TRANSPORT PROCESSES
	(Flamingo Grand Jaco Hall) Chair: Sanichiro Yoshida
16:30-17:00	Speaker: Sander Paekivi Title: Interspike Interval Distribution for a Continous-Time Random Walk Model of Neurons in the Diffusion Limit
17:00-17:30	Speaker: Tetiana Hryhorfova/Viktor Lyashenko Title: <i>Mathematical Model of heat Transfer in an Electric Machine</i>
17:30-18:30	Parallel Session NUMERICAL METHODS (Flamingo Grand Jaco Hall) Chair: Sanichiro Yoshida
17:30-18:00	Speaker: Linda Smail Title: Junction Trees Construction: Application to Bayesian Networks
18:00-18:30	Speaker: Valentin Alekseev Title: Numerical Simulation of the Transport and Flow Problems in Perforated Domains Using Generalized Multiscale Finite Element Method

FRIDAY, JUNE 22, 2018

08:30-09:30 Flamingo Grand Hall

Chair: Michail Todorov

PLENARY LECTURE: Roumen Anguelov

Title: Estimation Problems for Impulsive Systems

09:30-10:00 CC	DFEE BREAK
10:00-12:00	Parallel Session BIOMATHEMATICS Flamingo Grand Hall Chair: Roumen Anguelov
10:00-10:30	Speaker: Gabriel Dimitriu Title: Application of the Dynamic Mode Decomposition Method in Epidemiology for Malaria Disease
10:30-11:00	Speaker: Nicoleta Tarfulea Title: Mathematical Modeling of HIV Dynamics with Virus-to- Cell and Cell-to-Cell Transmissions
11:00-11:30	Speaker: Yulia Olevska Title: Using of Fuzzy Mathematical Models in Automated Systems for Recognition of High Molecular Substances
11:30-12:00	Speaker: Gergana Nikolova - poster Title: 3D Mathematical Model for Evaluation of the Mass- Inertial Characteristics of the Upper Limb: Analytical Results
10:00-11:00	Parallel Session MATHEMATICAL PHYSICS AND TRANSPORT PROCESSES (Flamingo Grand Jaco Hall) Chair: Vladimir Gerdjikov
10:00-10:30	Speaker: Iryna Shapka

	Title: Methods of Pade-Type Multidimensional Approximations Application for Solving Boundary Value Problems
10:30-11:00	Speaker: Anna Chugaynova Title: Special Discontinuities in Models of Continuum Mechanics
11:00-12:00	POSTER SESSION (Flamingo Grand Jaco Hall)
11:00-11:30	Speaker: Michail Todorov Title: The Dynamics of Two Linearly Coupled Goodwin Oscillators with Fixed Delay
11:30-12:00	Speaker: Nevena Ilieva Title: Coarse Graining in MD Structure Studies: Cluster Formation from Peptides in Water Solution

12:00-12:30 LUNCH	
12:30-19:30	EXCURSION TO THE MUSEUM OF ROMAN MOSAICS IN DEVNYA AND GREAT PRESLAV - THE CAPITAL OF THE FIRST BULGARIAN STATE (8-9 CENTURY AD)
20:00	BANQUET DINNER RESTAURANT "GREEN FOREST", MEETING POINT RECEPTION OF FLAMINGO GRAND HOTEL

SATURDAY, JUNE 23, 2018

08:30-09:30	PLENARY LECTURE: Vladimir Gerdjikov Title: On N-soliton Interactions of Manakov Model with Gain/Loss Terms
	(Flamingo Grand Hall) Chair: Michail Todorov
09:30-10:00	COFEE BREAK
10:00-12:00	Special Session APPLIED ANALYSIS (Flamingo Grand Hall) Chair: Vladimir Gerdjikov
10:00-10:30	Speaker: Constance Schober Title: Linear Instability of the Peregrine Breather: Numerical and Analytical Investigations
10:30-11:00	Speaker: Mukhit Onalbekov Title: Parametric Control of the Processes of Making Recommendations in Economic Policy
11:00-11:30	Speaker: Gyulnara Voskoboynikova Title: Mathematical Simulation of the Acoustic Wave Propagation through Absorbing Layers on the Ground
11:30-12:00	Speaker: Dmitry Zavalishchin Title: Nonstationary Boussinesq Viscous Medium Flow for a Solid
10:00-12:00	Parallel Session NUMERICAL METHODS (Flamingo Grand Jaco Hall) Chair: Anatoly Kardashevsky
10:00-12:00	Speaker: Aleksandr Vasilev

16:30-18:00	Special Session "STATISTICS AND MODELING"
16:00-16:30	COFEE BREAK
15:30-16:00	Speaker: Velizar Pavlov Title: <i>An Application of Survival Model in Insurance</i>
15:00-15:30	Speaker: Pavlina Jordanova Title: Tails and Probabilities for Extreme Outliers
15:00-15:30	Special Session "STATISTICS AND MODELING" (Flamingo Grand Hall) Chair: Milan Stehlik
14:00-14:45	KENOTE LECTURE: Milan Stehlik Title: On Statistical Invariants, Groups and Broken Symmetries for Algebraic Confidence Covers
	Session BIOMATHEMATICS (Flamingo Grand Hall) Chair: Michail Todorov
12:00-14:00 LU	NCH
11:30-12:00	Speaker: Maria Anisimova/Anna Knyazeva - cancelled Title: Model of the Formation of the Multiphase Zone between the Inclusion and the Matrix during the Composite Synthesis
11:00-11:30	Speaker: Linda Smail Title: Bayesian Network Model for Temperature Forecasting in Dubai
10:30-11:00	Speaker: Natalia Yaparova Title: Method for Solving an Inverse Problem of Heat Transfer Based on the Integral Equation
	Title: Algorithm of Time Step Selection for Numerical Solution of Boundary Value Problem for Parabolic Equations

	(Flamingo Grand Hall) Chair: Milan Stehlik
16:30-17:00	Speaker: Vesela Mihova Title: Customer Segmentation Approach in Commercial Banks
17:00-17:30	Speaker: Atanas Ivanov Title: Random Forests Models of Particulate Matter PM10: A Case Study
17:30-18:00	Speaker: Elitsa Raeva Title: Fourier Approximation for Modeling Limit of Insurance Liability
15:00-16:00	Parallel Session APPLIED ANALYSIS (Flamingo Grand Jaco Hall) Chair: Gabriel Dimitriu
15:00-15:30	Speaker: Evelina Veleva Title: GARCH Models for Particle Mater Air Pollutants in the City of Ruse, Bulgaria
15:30-16:00	Speaker: Naziya Suleimanova/Margarita Filipova - poster Title: Analysis of the Implementation of Resource-Saving Technologies for Rapeseed Production in Southeastern Kazakhstan
16:00-16:30	COFEE BREAK
16:30-17:00	Parallel Session APPLIED ANALYSIS (Flamingo Grand Jaco Hall) Chair: Gabriel Dimitriu
16:30-17:00	Speaker: Antoaneta Stefanova/Ivanka Zheleva - poster Title: Deviation Analysis using Applicable Methodologies for Impact Assessment on the Ambient Air Component from Industrial Sites

17:00-17:30 Parallel Session CONTINUUM MECHANICS (Flamingo Grand Jaco Hall) Chair: Gabriel Dimitriu 17:00-17:30 Speaker: Dobri Dankov Title: Thermoacoustic Waves in Pulsed Pirani Gauge MEMS. Frequency Analysis 17:30-18:00 Parallel Session MATHEMATICAL PHYSICS AND TRANSPORT PROCESSES (Flamingo Grand Jaco Hall) Chair: Gabriel Dimitriu Speaker: Makrina Agaoglou - cancelled 17:30-18:00 Title: The Dynamics in the In-Plane Oscillations of a Geometrically Nonlinear Lattice

SUNDAY, JUNE 24, 2018

08:30-09:30	PLENARY LECTURE: Alexey Kostenko Title: Infinite Quantum Graphs	
	(Flamingo Grand Hall) Chair: Michail Todorov	
09:30-10:00	COFEE BREAK	
10:00-12:00	Special Session NEW TRENDS IN INFORMATION TECHNOLOGY (Flamingo Grand Hall) Chair: Michail Todorov	
10:00-10:30	Speaker: Marcin Paprzycki Title: Mining Smartphone Generated Data for "User Action Recognition" - Preliminary Assessment	
10:30-11:00	Speaker: Maria Ganzha Title: Applying Semantic Technologies within a Port Internet of Things Ecosystem - Case Study	
11:00-12:00	Parallel Session NUMERICAL METHODS (Flamingo Grand Hall) Chair: Alexey Kostenko	
11:00-11:30	Speaker: Eugeniya Zhabitskaya Title: Parallel Implementation of the SANS Analysis of the PTNS-Based Vesicles Structure	
11:30-12:00	Speaker: Uigulaana Gavrileva Title: Numerical Homogenization for Wave Propagation in Fractured Porous Media	
11:00-11:30	Parallel Session NEW TRENDS IN INFORMATION TECHNOLOGY (Flamingo Grand Jaco Hall)	

Chair: Maria Ganzha

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11:00-11:30	Speaker: Marcin Paprzycky/Robert Adamski Title: Studying Performance of Distributed Batch Asynchronous Advantage Actor-Critic Algorithm	
11:30-12:00	Parallel Session APPLIED ANALYSIS (Flamingo Grand Jaco Hall) Chair: Maria Ganzha	
11:30-12:00	Speaker: Galina Timofeeva Title: Loan Portfolio Payment Flows Management Considering Macroeconomic Parameters Forecast	
12:00-14:00 LUNCH		
14:00-14:30	Parallel Session MATHEMATICAL PHYSICS AND TRANSPORT PROCESSES (Flamingo Grand Hall) Chair: Georgi Grahovski	
14:00-14:30	Speaker: Alexey Sukhinin Title: Two-Color Self-Focusing of Optical Beams	
14:30-16:00	Parallel Session NUMERICAL METHODS (Flamingo Grand Hall) Chair: Georgi Grahovski	
14:30-15:00	Speaker: Denis Spiridonov Title: Multiscale Model Reduction of the Flow Problem in Fractured Porous Media Using Mixed Generalized Multiscale Finite Element Method	
15:00-15:30	Speaker: Anatoly Kardashevsky Title: Numerical Reconstruction of the Right-Hand Side with Separable Variables of the Parabolic Equation	
15:30-16:00	Speaker: Vesselina Vucheva Title: Symplectic Numerical Method for Boussinesq Equation	

14:00-16:00	Parallel Session APPLIED ANALYSIS (Flamingo Grand Jaco Hall) Chair: Sanichiro Yoshida
14:00-14:30	Speaker: Nadezhda Gredasova/Boris Ananyev Title: About Nonlinear Guaranteed Estimation
14:30-15:00	Speaker: Mikhail Gusev Title: Computing the Reachable Set Boundary for an Abstract Control Problem
15:00-15:30	Speaker: Lev Ryashko Title: Analysis of Stochastic Cycles Induced by Periodic Forcing
15:30-16:00	Speaker: Irina Bashkirtseva Title: Impact of the Parametric Noise on Map-Based Dynamic Systems
16:00-16:30	COFEE BREAK
16:30-18:30	Parallel Session NUMERICAL METHODS (Flamingo Grand Hall) Chair: Alexey Sukhinin
16:30-17:00	Speaker: Igor Zykov Title: An Algorithm for Computing Reachable Sets of Control Systems under Isoperimetric Constraints
17:00-17:30	Speaker: Aleksei Tyrylgin Title: Mathematical Modeling of the Fluid Flow and Geomechanics in the Fractured Porous Media using Generalized Multiscale Finite Element Method
17:30-18:00	Speaker: Oxana Matviychuk Title: Estimates of the Reachable Set of the Lotka-Volterra

System under Uncertainty

17:00-17:30	Speaker: Fadi Awawdeh - cancelled Title: Inverse Problems in Industry: Theory and Methods
16:30-17:30	Parallel Session APPLIED ANALYSIS (Flamingo Grand Jaco Hall) Chair: Ivanka Zheleva
16:30-17:00	Speaker: Olexander Olevsky Title: Verification of Applicability in Space Domain of the Inverse Filtering with Evolution Control for Reconstruction of Images Obtained by Radar Scanning
17:00-17:30	Speaker: Petras Rupsys Title: A 4-Variate Gompertz Type Diffusion Model: Computational Aspects and Applications
17:30-18:00	Parallel Session CONTINUUM MECHANICS (Flamingo Grand Jaco Hall) Chair: Ivanka Zheleva
17:30-18:00	Speaker: Sanichiro Yoshida Title: Deformation and Fracture Based on Wave Dynamics

MONDAY JUNE 25, 2018

08:30-09:30	PLENARY LECTURE: Valentin Gushchin Title: On Some Approaches for a Free Surface Fluid Flows Modeling
	(Flamingo Grand Hall) Chair: Michail Todorov
09:30-10:00	COFEE BREAK
10:00-12:00	Session NUMERICAL METHODS (Flamingo Grand Hall) Chair: Valentin Gushchin
10:00-10:30	Speaker: Svetlana Tikhovskaya Title: Solving a Singularly Perturbed Elliptic Problem by a Cascadic Multigrid Algorithm on the Shishkin Mesh
10:30-11:00	Speaker: Alexander Matviychuk Title: A Method of Approximate Reachable Set Construction on the Plane for a Linear Control System with Uncertainty
11:00-11:30	Speaker: Elena Parfenova/Anna Knyazeva Title: The Non-Isothermal Mathematical Model of Particle Beam Action on the Target with Coating
11:30-12:00	Speaker: Marina Boronina Title: Parallel Algorithm for Numerical Modeling of Colliding Ultrarelativistic Beams with Crossing Angle
12:00-12:30	Speaker: Michail Todorov Title: A Note about the Applicability of Numerical Approach to Nonintegrable Dynamical Systems
12:30	RECAPITULATION AND OFFICIAL CLOSING SESSION OF THE CONFERENCE (Falmingo Grand Hall)

12:30	GOOD-BYE COFEE BREAK
13:30	EXCURSION TO VILLAGE OF TYULENOVO. MEETING POINT IN THE FRONT OF RECEPTION FLAMINGO GRAND