

# 10<sup>th</sup> Annual Meeting of the Bulgarian Section of SIAM

## BGSIAM'15

**December 21-22, 2015, Sofia, Bulgaria**

## Scientific program

### Monday, December 21

08:30 – 09:00 **Registration**

09:00 – 09:10 **Opening**

Chairperson: S. Margenov

**09:10** – 09:50 R. Cibulka, A. L. Dontchev, J. Preininger, T. Roubal, V. M. Veliov, On the method of Kantorovich for non-smooth generalized equations

09:50 – 10:30 Q. Hong, J. Kraus, Optimal Multigrid Methods for H(div)-Conforming Discontinuous Galerkin Discretizations of the Brinkman Problem

10:30 – 11:00 **Coffee break** with poster session\* and projects presentation\*\*

Chairperson: N. Kutev

**11:00** – 11:20 A. B. Yanovski, Spectral Theory of  $sl(3, \mathbf{C})$  Auxiliary Linear Problem with  $Z_2 \times Z_2 \times Z_2$  Reduction of Mikhailov Type

11:20 – 11:40 V. S. Gerdjikov, On Generalized Fourier Transforms for Nonlocal Nonlinear Evolution Equation

11:40 – 12:00 R. Hristova, I. Hristov, Standing Waves in Systems of Perturbed Sine-Gordon Equations

12:00 -12:20 A. Balabanov, Resolvent Method Application for Building Special Solutions of Control Theory Problems

12:20-12:30 **Business meeting** of BGSIAM Section (for BGSIAM members only)

12:30 – 13:30 **Lunch time**

Chairperson: K. Georgiev

**13:30** – 14:10 Tz. Kolev, Scalable High-Order Finite Elements for Compressible Hydrodynamics

14:10 – 14:30 S. Tabakova, N. Nikolov, P. Rajnov, S. Radev, Newtonian and Non-Newtonian Pulsatile Blood Flow In Arteries with Model Aneurysms

- 14:30 – 14:50 P. Rashkov, Emergence of Drug Resistance in Cancer from the Perspective of Environmental Competition
- 14:50 – 15:10 S. Kabaivanov, M. Milev, A. Marchev Jr., Efficient Option Valuation of Single and Double Barrier Options
- 15:10 – 15:30 S. Harizanov, I. Georgiev, S. Margenov, Supervised 3D-Surface Fitting
- 15:30 – 16:00 **Coffee break** with poster session\* and projects presentation\*\*

Chairperson: M. Todorov

- 16:00 – 16:20 S. Fidanova, K. Atanasov, Generalized Net Model of Transportation Network
- 16:20 – 16:40 O. Roeva, S. Fidanova, InterCriteria Analysis of Relations between Model Parameters Estimates and ACO Performance
- 16:40 – 17:00 M. Terziyska, Y. Todorov, Reduced Rule Base Fuzzy-Neural Networks
- 17:00 – 17:20 D. S. Brezov, C. D. Mladenova, I. M. Mladenov, On the Use of Split-Quaternion Factorizations in Relativity and Scattering Theory
- 17:20 – 17:40 K. Liolios, V. Tsihrintzis, K. Georgiev, I. Georgiev, Geothermal Effects for BOD Removal in Horizontal Subsurface Flow Constructed Wetlands: A Numerical Approach
- 17:40 – 18:00 N. Dobrinkova, Decision Support Tool in the Project LANDSLIDE
- 18:30 – **Reception, (BAS Hotel)**

\*List of posters:

W. Fenz, I. Georgiev, V. Georgieva, Blood Flow Simulations Based on Medical Image Data

I. Georgiev, S. Harizanov, S Margenov, Y. Vutov, L. Zikatanov, Volume Constraint Segmentation of Porous Media

T. Kovacheva, Hierarchical Clustering of the Simulated Data Paths

T. Partalin, Y. Ivanova, Computer Aided Modeling of Ultrasonic Surface Waves Propagation in Materials with Gradient of the Properties

E. D. Popova, Statics of Particles: Interval Arithmetic Approach

D. Toneva, S. Nikolova, I. Georgiev, A. Tchordadjieff, Accuracy Assessment of Linear Craniometric Measurements on a Laser Scanning Created 3D Model of a Dry Skull

R. Zaharieva, D. Iankov, R. Iankov, M. Datcheva, Numerical Simulation of Nano-Indentation of Systems Containing Piezoelectric Material Layer

\*\*List of projects:

AComIn (7FP), MMAC (H2020), SESAME Net (H2020)

Tuesday, December 22

Chairperson: S. Dimova

- 09:00** – 09:40 M. Neytcheva, Efficient numerical methods for time evolution processes, described by integro-differential equations
- 09:40 – 09:50 D. Aleksov, Spline intersection improvement.
- 09:50 – 10:00 E. Ilieva, Development of mathematical algorithm for direct ascription of missing values in survey research data.
- 10:00 – 10:10 G. Evtimov, Optimal Cutting Problem
- 10:10 – 10:20 St. Harizanov, The 2D/3D Best-Fit Problem.
- 10:20 – 10:30 K. Liolios, Analytical solution for consolidation of a soil layer with finite thickness under cyclic mechanical loading.
- 10:30 – 10:40 Z. Minchev, Cyber Intelligence Decision Support in the Era of Big Data.

10:40 – 11:00 **Coffee break**

Chairperson: K. Georgiev

- 11:00** – 11:20 V. Alexandrov, O. Esquivel-Flores, T. Gurov, A. Karaivanova, On Efficient Monte Carlo and quasi-Monte Carlo Preconditioners and Hybrid Methods for Linear Algebra
- 11:20 – 11:40 E. Atanassov, A. Karaivanova, T. Gurov, On the Security Issues in High Performance Computing
- 11:40 – 12:00 D. Georgiev, T. Gurov, E. Atanassov, Parallel Genetic Algorithms on Intel MIC Architecture
- 12:00 – 12:20 H. Kostadinov, L. Krалева, N. Manev, New Bounds for BER of Integer Coded TQAM in AWGN Channel

12:20 – 13:00 **Lunch time**

Chairperson: S. Fidanova

- 13:00** – 13:20 A. Andreev, H. Hristov, G. Iliev, M. Racheva, Mathematical Model for a Pneumatic Force Actuator System
- 13:20 – 13:40 T. Ivanov, E. Nikolova, Stability Analysis of an Inflated Thin-Walled Hyperelastic Tube with Application to Abdominal Aortic Aneurysms
- 13:40 – 14:00 V. Kudriashov, V. Ivanov, K. Alexiev, P. Koprinkova-Hristova, Microphone Array for Non-Contact Monitoring of Rolling Bearings
- 14:00 – 14:20 L. Markov, Further Results of Mean-value Type in C and R
- 14:20 – 14:40 T. Pencheva, M. Angelova, InterCriteria Analysis of Simple Genetic Algorithms Performance

14:40 – 15:00 **Coffee break**

Chairperson: I. Georgiev

**15:00** – 15:20 D. Vasileva, I. Bazhlekov, E. Bazhlekova, Finite Difference Schemes for Fractional Oldroyd-B Fluids

15:20 – 15:40 M. Veneva, W. Lee, Equivalence of Models of Freeze-Drying

15:40 – 16:00 K. Vlachkova, Comparing Bézier Curves and Surfaces for Coincidence

16:00 – 16:10 **Closing**

**Hosted by**

**Institute of Mathematics and Informatics**

**Bulgarian Academy of Sciences**

**Acad. G. Bonchev Str., Block 8**

**Lecture Hall 055**