

14th Annual Meeting of the Bulgarian Section of SIAM

BGSIAM'19

SCIENTIFIC PROGRAM

Tuesday, December 17

08:30 – 09:00 **Registration**

09:00 – 09:20 **Opening**

Chairperson: S. Margenov

09:20 – 10:00 Tony Spassov, Nanomaterials for hydrogen production and storage

10:00 – 10:30 **Coffee break**

Chairperson: P. Boyvalenkov

10:30 – 11:10 Peter Dragnev, On the universal optimality of the 600-cell: the Levenshtein framework lifted

11:10 – 11:30 Kristina Kapanova, Velislava Stoykova, Studying the Social Impact of #NAPLeaks Networks
Discussions: Responsive Fusion(s), Diffusion(s), Confusion(s)

11:30 – 11:50 Stefka Fidanova, Krassimir Atanassov, New Ant Colony Optimization Including Weights

11:50 – 12:00 BGSIAM business meeting (SIAM members only)

12:00 – 13:30 **Lunch time**

Chairperson: N. Kolkovska

13:30 – 13:50 K. Georgiev, S. Margenov, Numerical methods for fractional diffusion-reaction problems based on operator splitting and BURA

13:50 – 14:10 Stanislav Harizanov, Svetozar Margenov, Nedyu Popivanov, Analysis of a Space-Fractional Diffusion Problem with a Piecewise Constant Diffusion Coefficient

14:10 – 14:30 Miglena Koleva, Sergey Polyakov, Lubin Vulkov, Exponential difference scheme approximations for Richards' equation with piecewise constant and degenerate absolute permeability

14:30 – 14:50 Nikolay Kutev, Milena Dimova, Natalia Kolkovska, Finite time blow up of the solutions to nonlinear dispersive equations with critical initial energy

14:50 – 15:10 Roumen Borisov, Nikolay Vitanov, Zlatinka Dimitrova, Probability distributions connected to the flows of substance in a channel of a network

15:10 – 15:30 **Coffee break**

Chairperson: S. Harizanov

15:30 – 15:50 Slavi Georgiev, Lubin Vulkov, Reconstruction of Time-Dependent Implied Volatility by Market Observations for European Options in Jump–Diffusion Models

15:50 – 16:10 Vladimir Myasnichenko, Rossen Mikhov, Leoneed Kirilov, Niay Sdobnyakov, Denis Sokolov, Stefka Fidanova, Simulation of Diffusion Process in Bimetallic Nanofilms

16:10 – 16:30 Petia Koprinkova-Hristova, Ivan Georgiev, Image segmentation via Echo state network

16:30 – 16:50 A. Alexandrov, V. Monov, Method for remote continuous Pulse Oximetry for Critical Congenital Heart Disease screening

16:50 – 17:10 Velichka Traneva, Stoyan Tranev, Intuitionistic Fuzzy Anova Approach to the Management of Movie Sales Revenue

17:10 – 17:30 Poster Slam

17:30 – 18:00 Poster session

18:00 – 19:00 Welcome drink

Wednesday, December 18

Chairperson: H. Kostadinov

09:00 – 09:40 Eunji Kim, Ivan Ivanov, Edward Dougherty, Quantifying Important Genes in a Gene Regulatory Network with Applications to Network Compression

09:40 – 10:20 Marcin Paprzycki, Semantic Technologies in a Decision Support System

10:20 – 10:40 **Coffee break**

Chairperson: M. Paprzycki

10:40 – 11:00 Silvia Boumova, Tedis Ramaj, Maya Stoyanova, Computing distance distributions of ternary orthogonal arrays

11:00 – 11:20 Jivko Jeliakov, Hristo Kostadinov, Incentivizing Research Using DLT-based Smart Contract Platforms

11:20 – 11:40 Todorka Alexandrova, Hristo Kostadinov, Nikolai Manev, Watermarking Audio Signals: Analysis of Noise Effect and Error Characteristics

11:40 – 12:00 Rositsa Maksimova, Krassimir Kolev, Live-graphing with LoRaWAN and Python

12:00 – 13:30 **Lunch time**

Chairperson: I. Ivanov

13:30 – 13:50 Milen Borisov, Svetoslav Markov, A Study of Self-catalyzed Exponential Decay Chains with a Fast Rate Parameter

13:50 – 14:10 Peter Rashkov, Dimension reduction in epidemiological models for vector-borne diseases

14:10 – 14:30 Tzvetan Ostrowsky, Venelin Todorov, Ivan Dimov, Stoyan Apostolov, Yuri Dimitrov, Zahari Zlatev, Sensitivity Study of a Large-Scale Air Pollution Model by Using Latin Hypercube Sampling

14:30 – 14:50 Venelin Todorov, Ivan Dimov, Tzvetan Ostrowsky, Stoyan Apostolov, Yuri Dimitrov, Zahari Zlatev, Quasi-Monte Carlo methods based on low discrepancy sequences for sensitivity analysis in air pollution modeling

14:50 – 15:10 N. Shegunov, O. Iliev, P. Armanyan, Comparison Between Different Permeability Field Approximations in MLMC Applications

15:10 – 15:30 M. Terziyska, Zh. Terziyski, Y. Todorov, K. Kolev, Extreme Learning Distributed Adaptive Neuro-Fuzzy Architecture for Chaotic Time Series Prediction

15:30 – 16:00 **Coffee break**

Chairperson: M. Datcheva

- 16:00 – 16:20 Nikolay Kutev, Sonia Tabakova and Stefan Radev, Axisymmetric oscillatory flow of Carreau fluid in tube
- 16:20 – 16:40 Ludmila Parashkevova, Characterization of porous materials by homogenization models based on a generalized mixture rule
- 16:40 – 17:00 Svilen Popov, Vassil Vassilev, Some sufficient conditions for the well-posedness of a clamped Timoshenko beam type system
- 17:00 – 17:20 Marek Pecha, Stanislav Harizanov, Comparison analysis of graph-Laplacian-based methods for image segmentation
- 17:20 – 17:40 Krassimira Vlachkova, Krum Radev, Interpolation of data in R^3 using quartic triangular B´ezier surfaces
- 17:40 – 18:00 Lubomir Markov, Two series which generalize certain sums expressed in terms of zeta values

18:30 Dinner

Thursday, December 19

Chairperson: Kr. Georgiev

- 09:00 – 09:20 Dimiter Syrakov, Emilia Georgieva, Maria Prodanova, Maria Dimitrova, Damyan Barantiev, Effects of satellite data assimilation on air quality parameters simulated by the Bulgarian Chemical Weather Forecast System (BgCWFS)
- 09:20 – 09:40 Hristo Chervenkov and Kiril Slavov, ETCCDI Thermal Climate Indices in the CMIP5 Future Climate Projections over Southeast Europe
- 09:40 – 10:00 Hristo Chervenkov and Kiril Slavov, Solar Radiation Modelling for Bulgaria Based on Assimilated Surface Data
- 10:00 – 10:20 Y. Boneva, V. Ivanov, Improvement of air pollution caused by traffic through different signal timing policies case study of Sofia
- 10:20 – 10:40 **Coffee break**

Chairperson: N. Ilieva

- 10:40 – 11:00 V. Gerdjikov, On mKdV equations and 2-dimensional Toda field theories: algebraic structures and Hamiltonian properties
- 11:00 – 11:20 B. Batgerel, I. Puzynin, T. Puzynina, I. Hristov, R. Hristova, Z. Tuxhliev, Z. Sharipov Modeling the Long-Range Effect of Copper Nanoclusters Irradiating a Copper Target
- 11:20 – 11:40 Radoslava Hristova, Ivan Hristov, Computing reliable solutions of chaotic dynamical systems using multiple-precision arithmetic
- 11:40 – 12:00 Iliyan Petrov, Information theory with new vision on hierarchy and evolution in dynamic
- 12:00 – 12:20 A. Danilchenko, A. Nasedkin, A. Nasedkina, Finite Element Modeling of Effective Properties of Nanostructured Poroelastic Composites with Surface Effects
- 12:20 – 12:30 **Closing**

List of posters:

1. Vera Angelova, *Perturbation analysis of the matrix equation ${}^{2^m}\sqrt{X^{-1}}A=I$*
2. Krasimir Angelow, Natalia Kolkovska, *Numerical Study of Soliton Solutions to the Two Dimensional Boussinesq Equation*
3. Atanas Atanasov, Ivan Georgiev, Milen Petrov, *Application of the mixed integer programming in determining the optimal honeybee colony's location based on the productive potential of the bee forage species*
4. Stefan Bushev, *Key Results on 3D Printing Technology*
5. Ivan Georgiev, Roumen Iankov, Maria Datcheva, *Numerical determination of elastic material properties of closed cell aluminum foam*
6. Raoul Hoelter, Elham Mahmoudi, Markus Koenig, Chenyang Zhao, Maria Datcheva, *System and Parameter Identification Methods for GroundModels in Mechanized Tunneling*
7. Ivan Jordanov, Nikolay Vitanov, Elena Nikolova, *Nonlinear waves in a generalized model of interacting high density populations*
8. David Kamenov, Stanislav Harizanov, Silviya Nikolova, Diana Toneva, *Increasing the Resolution and Readability of Digital Images*
9. Juri Kandilarov, Lubin Vulkov, *Numerical Study of an Initial Concentration Identification Problem in Porous Media*
10. Ivaylo Katsarov, Nevena Ilieva, Ludmil Drenchev, *Quantum effects on dislocation motion in pure and hydrogen charged Fe from ring-polymer molecular dynamics*
11. Tsveta Lazarova, Peicho Petkov, Nevena Ilieva, Elena Lilkova, Leandar Litov, *In silico study of the self-organisation process in mono-component solutions of antimicrobial peptides*
12. Konstantinos Liolios, Georgios Skodras, Krassimir Georgiev, Ivan Georgiev, *Analysis of contaminant removal in constructed wetlands under step-feeding: A Monte Carlo based stochastic treatment accounting for uncertainty*
13. Elena Nikolova, Denislav Serbezov, *Chaotic behaviour in a generalized model of three interacting economic sectors*
14. Evgenija Popova, *Parameterized Solutions to a Class of Interval Parametric Linear Systems*
15. Dimitar Slavchev, Svetozar Margenov, *Performance analysis of a Parallel Hierarchical Semi-Separable compression solver in shared and distributed memory environment for BEM discretization of Flow around Airfoils*
16. Petar Tomov, Iliyan Zankinski, Todor Balabanov, *Genetic Algorithm Selection Operator Based on Recursion and Brute-Force*

**The event will take place at the Joint Innovation Centre of the Bulgarian Academy of Sciences
Sofia, Acad. Geogri Bonchev Str., Bl. 26B**

