

# 12<sup>th</sup> Annual Meeting of the Bulgarian Section of SIAM BGSIAM'17

## SCIENTIFIC PROGRAM

Wednesday, December 20

08:30 – 09:00 **Registration**

09:00 – 09:20 **Opening**

09:20 – 09:30 **BGSIAM in 2017**

Chairperson: S. Margenov

09:30 – 10:10 Z. Zlatev, I. Dimov, I. Farago, K. Georgiev, A. Havasi, Stability properties of the repeated Richardson extrapolation combined with some explicit Runge-Kutta methods

10:10 – 10:30 **Coffee break**

Chairperson: S. Fidanova

10:30 – 11:10 K. Atanasov, Generalized nets: theory and applications

11:10 – 11:30 M. Angelova, T. Pencheva, How to assess multi-population genetic algorithms performance using intuitionistic fuzzy logic

11:30 – 11:50 V. Angelova, Perturbation analysis for a nonlinear matrix equation arising in tree-like stochastic processes

11:50 – 12:10 H. Kostadinov, N. Manev, On Digital Watermarking for Audio Signals

12:10 – 13:30 **Lunch time**

Chairperson: K. Georgiev

13:30 – 14:10 O. Axelsson, M. Neytcheva, Z. Liang, Enhanced degree of parallelism when solving optimal control problems constrained by evolution equations

14:10 – 14:30 S. Becher, G. Matthies, D. Wenzel, Variational methods for stable time discretization of linear differential equations

14:30 – 14:50 M. Lachaab, P. Turner, A. Fokas, Efficient numerical evaluation of Fokas' transform solution of the heat equation on the half-line

14:50 – 15:10 L. Parashkevova, P. Egizabal, Investigation of as-cast light alloys by selected homogenization techniques with microstructure effects

15:10 – 15:30 **Coffee break**

Chairperson: M. Todorov

15:30 – 15:50 S. Fidanova, O. Roeva, Ant colony optimization algorithm for workforce planning, influence of the algorithm parameters

15:50 – 16:10 V. Myasnichenko, N. Sdobnyakov, L. Kirilov, R. Mikhov, S. Fidanova, Simulated annealing method for metal nanoparticle structures optimization

16:10 – 16:30 P. Balazs, S. Harizanov, 2D CT data reconstruction from radiographic images, generated by scanners with static 1D detectors

**16:30 – 19:00 Poster session & Welcome drink**

## Thursday, December 21

Chairperson: M. Neytcheva

09:00 – 09:40 J.-L. Guermond, P. Minev, High-order artificial compressibility for the Navier-Stokes equations

09:40 – 10:10 A. Kurganov, Adaptive moving mesh central-upwind schemes for the Saint-Venant systems of shallow water equations

10:10 – 10:30 **Coffee break**

Chairperson: N. Kutev

10:30 – 10:50 V. Gerdjikov, Riemann-Hilbert problems, reduction groups, and spectral properties of Lax operators

10:50 – 11:10 A. Yanovski, T. Valchev, Hermitian and Pseudo-Hermitian reduction of the GMV auxiliary system. Spectral properties of the recursion operators

11:10 – 11:30 N. Popivanov, Pohodhaev identities as conservation laws for semi-linear elliptic-hyperbolic equations

11:30 – 11:50 A. Slavova, R. Tetzlaff, Memristor computing

11:50 – 12:10 M. Todorov, V. Gerdjikov, Multisoliton interactions in Schrödinger and Manakov dynamical systems with nonlinear gain/loss and external potentials

12:10 – 13:30 **Lunch time**

Chairperson: N. Popivanov

13:30 – 13:50 W. Schilders, A European technology platform for MSO

13:50 – 14:10 R. Borisov, K. Vitanov, N. Vitanov, Statistical characteristics of a flow of substance in a network channel containing two arms

14:10 – 14:30 N. Nikolov, S. Tabakova, St. Radev, Gaussian model deformation of an abdominal aortic aneurysm caused by the interaction between the wall elasticity and the average blood pressure

14:30 – 14:50 E. Nikolova, Evolution equation for propagation of blood pressure waves in an artery with an aneurysm: exact solution obtained by the modified method of simplest equation

14:50 – 15:10 S. Nedelcheva, P. Koprinkova-Hristova, Orientation selectivity tuning of a spike timing neural network model of the first layer of the human visual cortex

15:10 – 15:30 **Coffee break**

Chairperson: S. Dimova

15:30 – 15:50 A. Angov, S. Stefanov, N. Dobrinkova, Decision support system in cases of wildland fire

15:50 – 16:10 A. Tchordadjieff, I. Angelov, Change-point analysis as a tool to detect abrupt Cosmic ray muons variations

16:10 – 16:30 G. Lyutskanova-Zhekova, T. Ivanov, S. Nonev, Initial calibration of MEMS accelerometers, used for measuring

16:30 – 16:40 P. Dojnow, Modelling for price accuracy in the airline tickets domain

16:40 – 16:50 I. Ivanov, Machine learning approach for classification task

16:50 – 17:10 T. Balabanov, S. Darachev, I. Jordanov, A. Karakushev, N. Kitanov, A. Manov, G. Nikolov, S. Nonev, Z. Nedyalkova, E. Rogachev, N. Stojkovikj, P. Tomov, I. Zankinski, Geometric visualization of a polygon area partitioning

17:10 – 17:30 A. Avdzhieva, S. Dimova, S. Gurova, T. Ivanov, G. Lyutskanova-Zhekova, S. Nonev, S. Slavchev, V. Souvandjieva, Parametric study of a classifying rotor

**18:00 Reception**

## Friday, December 22

Chairperson: S. Harizanov

09:00 – 09:20 K. Kapanova, S. Fidanova, Generalized nets: a new approach to model a hashtag linguistic network on Twitter

09:20 – 09:40 G. Evtimov, S. Fidanova, Analyses and boolean operation for 2D cutting stock problem

09:40 – 10:00 Y. Dimitrov, I. Dimov, V. Todorov, A novel method for improving the numerical solutions of fractional differential equations

10:00 – 10:20 Z. Minchev, Digital security future objectives foresight modelling & analytical assessment

10:20 – 10:40 **Coffee break**

Chairperson: Z. Minchev

10:40 – 11:00 K. Liolios, K. Georgiev, I. Georgiev, A mathematical analysis concerning the effect of step-feeding on performance of constructed wetlands

11:00 – 11:20 L. Markov, A functional expansion and a new set of rapidly convergent series involving zeta values

11:20 – 11:40 I. Nikolova, The derivatives of any polynomial as a linear combination of finite differences with step one

11:40 – 12:00 J. Genoff, Trajectory divergence measures

12:00 – 12:10 **Closing**

### List of posters:

1. A. Alexandrov, V. Monov, Method for indoor localization optimization of AoA based mobile devices
2. S. Angelov, E. Stoimenova, Cross-validated sequentially constructed multiple regression
3. S. Bouyuklieva, S. Kapralov, The 6-th CompMath competition
4. S. Bushev, Material science theory in Industry 4.0 for phase transition technologies
5. M. Datcheva, S. Cherneva, D. Iankov, V. Kyrychok, D. Stoychev, Mechanical characterization of multilayer thin film system via nanoindentation and numerical simulations
6. P. Dojnow, Preliminary analysis of the dynamics of multifractal parameters of the Dow Jones Industrial Average
7. V. Dragieva, A single server retrial queue with finite population and two types of customers
8. A. Georgieva, A. Pavlova, S. Enkov, Iterative method for numerical solution of two-dimensional nonlinear Urysohn fuzzy integral equations
9. A. Georgieva, A. Alidema, Convergence of homotopy perturbation method for solving of two-dimensional fuzzy Volterra functional integral equations
10. I. Georgieva, C. Hofreither, Greedy low-rank approximation in Tucker tensor format
11. S. Harizanov, S. Margenov, Comparison analysis on two numerical solvers for fractional Laplace problems
12. S. Harizanov, S. Nikolova, D. Toneva, I. Georgiev, Improved cranial sutures visualization via digital image processing
13. I. Hristov, R. Hristova, S. Dimova, Parallelization of a finite difference algorithm for solving systems of 2D Sine-Gordon equations
14. N. Ilieva, P. Petkov, E. Lilkova, R. Marinova, A. Niemi, J. He, L. Litov, Biomolecular studies in coarse-grain approaches: the good, the bad, and the beautiful
15. V. Ivanov, T. Stoilov, Performing a moving average operation with an FPGA device
16. I. Jordanov, N. Vitanov, Exact traveling wave solutions of a class of reaction-diffusion equations
17. G. Kostadinov, H. Melemov, On the group analysis of differential equations on the group  $SL(2;R)$

18. V. Koleva-Efremova, Testing performance and scalability of the hybrid MPI-2/OpenMP model on the heterogeneous supercomputer "Avitohol"
19. T. Kovacheva, Methods of analysis of the life expectancy of the population in Bulgaria in the period 2001-2015
20. E. Lilkova, N. Ilieva, P. Petkov, L. Litov, Influence of glycosylation on human interferon gamma dynamics - setting up the stage
21. R. Marinova, P. Petkov, N. Ilieva, E. Lilkova, L. Litov, Cluster formation from disordered peptides in water solution: a coarse-grain molecular dynamics approach
22. N. Nikolov, E. Stoimenova, EM estimation of the parameters in latent Mallows' models
23. E. Nikolova, Z. Dimitrova, Exact traveling wave solutions of a generalized Kawahara equation
24. P. Petrova, B. Petrova, S. Chaoushev, Experimental investigation of the influence of the non-condensable gas on the heat transfer during the condensation of different tubular structures
25. P. Rashkov, Sparse time-frequency representations and uncertainty on finite Abelian groups
26. D. Slavchev, S. Margenov, Comparative study of hierarchical and traditional solvers for dense systems of linear equations on Xeon Phi processors
27. P. Tomov, I. Zankinski, T. Balabanov, Slot machine reels reconstruction with genetic algorithms
28. P. Tomov, I. Zankinski, T. Balabanov, Sound vectorization with genetic algorithms
29. M. Veneva, A. Ayriyan, Performance analysis of effective methods for solving band matrix SLEs after parabolic nonlinear PDEs

**The event will take place at the Institute of Mechanics, Bulgarian Academy of Sciences**

**Acad. Georgi Bonchev Str., Bl. 4, Room 510**

