

15th Annual Meeting of the Bulgarian Section of SIAM

BGSIAM'20

SCIENTIFIC PROGRAM

Tuesday, December 15

08:30 – 08:45 **Registration**

08:45 – 09:00 **Opening**

Chairperson: N. Kolkovska

09:00 – 09:40 M. Todorov, Vector Schrodinger equation: Nonlinearity, Multidimensionality, Integrability. What to Prefer?

09:40 – 10:00 M. Koleva, L. Vulkov, Fast Positivity Preserving Numerical Method for Time-Fractional Regime-Switching Option Pricing Problem

10:00 – 10:40 **Break**

Chairperson: M. Datcheva

10:40 – 11:00 J. Kandilarov, L. Vulkov, Numerical Determination of Reaction Coefficient in a Degenerate Stationary Problem of Air Pollution

11:00 – 11:20 V. Todorov, I. Dimov, Tz. Ostromsky, S. Poryazov, Sensitivity Analysis of a Large-Scale Air Pollution Model by Using Highly Efficient Stochastic Approaches

11:20 – 11:40 H. Chervenkov, K. Slavov, ETCCDI Precipitation-based Climate Indices in the CMIP5 Future Climate Projections over Southeast Europe

11:40 – 12:00 A. Atanasov, S. Georgiev, Adjoint State Optimization Algorithm for Prediction of Honeybee Population Losses

12:05 – 12:20 BGSIAM business meeting (SIAM members only)

12:20 – 13:30 **Break**

Chairperson: E. Lilkova

13:30 – 13:50 H. Kostadinov, N. Manev, Bounds for BER of Integer Coded Hexagonal QAM in AWGN Channel

13:50 – 14:10 V. Angelova, Sensitivity of the Nonlinear Matrix Equation $X^p = A + M(B + X^{-1})^{-1}M^{\text{ast}}$

14:10 – 14:30 D. Serbezov, E. Nikolova, Shilnikov Chaos in a Dynamical System of Three Competing Economic Sectors

14:30 – 14:50 I. Petrov, Framing the Structural Space in Entropy and Hierarchy

14:50 – 15:10 **Break**

Chairperson: H. Kostadinov

15:10 – 15:30 S. Georgiev, L. Vulkov, Coefficient Identification for SEIR Model and Economic Forecasting in the Propagation of COVID-19

15:30 – 15:50 V. Traneva, S. Tranev, Two-Way Intuitionistic Fuzzy Analysis of Variance for COVID-19 Cases in Europe by Season and Location Factors

15:50 – 16:10 V. Traneva, S. Tranev, Multi-Layered Intuitionistic Fuzzy Intercriteria Analysis on some Key Indicators Determining the Mortality of COVID-19 in European Union

Wednesday, December 16

Chairperson: I. Bazlekov

09:00 – 09:40 G. Nikolov, Markov Type Inequalities and Extreme Zeros of Orthogonal Polynomials

09:40 – 10:00 N. Shegunov, O. Iliev, On to Parallel MLMC for Stationary Single Phase Flow Problem

10:00 – 10:20 S. Harizanov, S. Margenov, P. Marinov, Numerical Solvers Based on Weighted URA-Averages

10:20 – 10:40 **Break**

Chairperson: S. Harizanov

10:40 – 11:00 N. Dimitrova, P. Zlateva, Stability Analysis of a Mathematical Model for Phenol and Cresol Mixture Degradation with Interaction Kinetics

11:00 – 11:20 N. Ilieva, P. Petkov, M. Rangelov, N. Todorova, E. Lilkova, and L. Litov, Suggesting a new approach for management of the cytokine storm using computer modeling and simulations

11:20 – 11:40 E. Lilkova, N. Ilieva, P. Petkov, L. Litov, Computational study of the aggregation behaviour of antimicrobial peptides

11:40 – 12:00 F. Shakola, V. Simeonova, I. Ivanov, Comparison of Four Classification Methods on High-dimensional Small-Sample-Size Synthetic NGS Data

12:00 – 13:30 **Break**

Chairperson: N. Ilieva

13:30 – 13:50 Ts. Ivanova, N. Vitanov, Stationary Flow of a Substance in a Channel with Two Branches

13:50 – 14:10 K. Geogriev, N. Vitanov, M. Stoyanova, Time Series Analysis of Data from the Fluid Glazing Experiment

14:10 – 14:30 S. Georgiev, L. Vulkov, Recovering the Time-Dependent Volatility in European Options from Local and Nonlocal Price Measurements

14:30 – 14:50 G. Kostadinov, P. Tomov, I. Zankinski, Curve Fitting Motivated Differential Evolution Mutation

14:50 – 15:10 **Break**

Chairperson: I. Lirkov

15:10 – 15:30 Tz. Ostromsky, Closing Topographic Survey Polygons with Inexact Angle Measurements

15:30 – 15:50 V. Velichkova, New Software Functions in Microsoft Excel which can Improve and Facilitate the Work of Internal Auditors when Forming Samples

15:50 – 16:10 V. Stoykova, iSybislav - the Bibliographic Database of World Slavic Linguistics Publications: Structure and Functionalities of Bulgarian Language Content

16:10 – 16:30 T. Valchev, On a Nonlinear Evolution Equation of Magnetic Type Related to a Homogeneous Space

Thursday, December 17

Chairperson: S. Margenov

09:00 – 09:40 O. Iliev, T. Prill, P. Toktaliev, P. Gavrilenko, R. Greiner, M. Votsmeier, Pore Scale Simulation of Reactive Flow for Industrial and Environmental Problems

09:40 – 10:00 I. Georgiev, R. Iankov, E. Kolosova, M. Chebakov, M. Datcheva, Computational Homogenization for Determination of Elastic Material Properties of Closed Cell Foams

10:00 – 10:20 I. Hristov, R. Hristova, S. Dimova, P. Armyanov, N. Shegunov, I. Puzynin, T. Puzynina, Z. Sharipov, Z. Tukhliev, Parallelizing Multiple Precision Taylor Series Method for Integrating the Lorenz System

10:20 – 10:40 **Break**

Chairperson: M. Datcheva

10:40 – 11:00 A. Slavova, R. Tetzlaff, Universal In-Memory Computing on the Edge of Chaos

11:00 – 11:20 D. Slavchev, S. Margenov, I. Georgiev, Application of Hierarchical Semi-Separable Compression for Solving 2D Elastodynamic Problem of a Finite-Sized Solid Containing Cavities

11:20 – 11:40 K. Presnakov, S. Harizanov, A Comparative Survey on Neural Rendering

11:40 – 12:00 E. Korovaytseva, S. Pshenichnov, T. Zhelyazov, M. Datcheva, Some Problems of One-Dimensional Non-Stationary Linear-Viscoelastic Wave Propagation

12:00 – 12:10 **Closing**

The event will take place at the ZOOM platform

Topic: BGSIAM'2020

Join Zoom Meeting

<https://us02web.zoom.us/j/9369732759?pwd=L0JFdENNV3UyWUFmUUZGM3JjSEt2UT09>

Meeting ID: 936 973 2759

Passcode: bgsiam2020