

**18<sup>th</sup> Annual Meeting of the Bulgarian Section of SIAM  
BGSIAM'23**

*in memory of Professor Krassimir Georgiev*

TIMETABLE

11.12.2023 г.

12.12.2023 г.

13.12.2023 г.

09:00-09:30	<i>Registration</i>				
09:30-10:00	N. Vitanov	09:30-09:55	A. Slavova	09:30-09:55	S. Fidanova
10:00-10:20	S. Georgiev	09:55-10:20	T. Gyulov	09:55-10:20	E. Atanassov
10:20-10:40	T. Hristov	10:20-10:45	N. Popivanov	10:20-10:45	V. Kotev
10:40-11:00	<i>Coffee break</i>	10:45-11:00	<i>Coffee break</i>	10:45-11:00	<i>Coffee break</i>
11:00-12:00	<b>D. Dantchev</b>	11:00-12:00	<b>R. Stoyanova</b>	11:00-12:00	<b>D. Doneva</b>
12:00-14:00	<i>Lunch</i>	12:00-14:00	<i>Lunch</i>	12:00-14:00	<i>Lunch</i>
14:00-14:15	I. Georgiev	14:00-14:25	K. Vlachkova	14:00-14:30	T. Popov
14:15-14:45	S. Margenov	14:25-14:50	P. Petkov	14:30-14:50	M. Rashevski
14:45-15:15	M. Neytcheva	14:50-15:10	S. Georgiev	14:50-15:10	P. Iliev
15:15-15:45	Z. Zlatev	15:10-15:30	H. Bansu	15:10-15:30	Z. Zhelev
		15:30-15:50	S. Zhelezova	15:30-15:50	V. Vassilev
15:45-16:15	I. Farago	15:50-16:10	<i>Coffee break</i>	15:50-16:10	R. Menda-Shabat-More
16:16-16:30	<i>Coffee break</i>	16:10-16:35	N. Ilieva		
16:30-17:00	O. Iliev	16:35-17:00	N. Todorova		
17:00-17:30	V. Vassilev	17:00-17:20	E. Lilkova		
		17:20-17:40	P. Sirakova		
17:30-18:00	K. Ganev	17:40-18:00	M. Ilieva		
18:00-18:30	H. Chervenkov	18:00	<i>Poster session and reception</i>		

# SCIENTIFIC PROGRAM

***Monday, December 11***

09:00 – 09:30 **Registration**

*Chairperson:* M. Datcheva

09:30 – 10:00 Y. Chorbadzhiyska - Stamenova, **N. K. Vitanov**, Z. I. Dimitrova, On the flow of substance in a channel of network for the case of time dependent parameters of the flow

10:00 – 10:20 **S. Georgiev**, L. Vulkov, Numerical Analysis and Model Calibration for COVID-19 Epidemic Spread

10:20 – 10:40 **T. Hristov**, Mathematical Modeling of the Epidemic Dynamics of COVID-19 in Bulgaria by SEIRS Model with Vaccination

10:40 – 11:00 **Coffee break**

*Chairperson:* M. Datcheva

11:00 – 12:00 *Invited talk:* **D. Dantchev**, Fluctuation-induced Interactions in Micro- and Nano-systems: Survey of Some Basic Results

12:00 – 14:00 **Lunch break**

*Chairperson:* E. Lilkova

14:00 – 14:15 **I. Georgiev**, Remembering Krassi Georgiev

14:15 – 14:45 **S. Margenov**, Strang splitting for fractional-in-space diffusion-reaction equations

14:45 – 15:15 **M. Neytcheva**, The convection-diffusion problem as remembrance of working with Krassimir Georgiev

15:15 – 15:45 **Tz. Ostromsky, Z. Zlatev**, The supercomputer implementation of the Danish Eulerian Model - from CRAY 92 to the machines of the present days

15:45 – 16:15 **I. Faragó**, Analysis of Richardson's Extrapolation

16:15 – 16:30 **Coffee break**

*Chairperson:* S. Harizanov

- 16:30 – 17:00 **O. Iliev**, D. Fokina, P. Toktaliev, I. Oseledets, V. Grigoriev, Pore scale reactive flow related to exhaust gases purification: full and machine learning models and simulation
- 17:00 – 17:30 **V. M. Vassilev**, Exact solutions to a class of complex Ginzburg-Landau equations.
- 17:30 – 18:00 **K. Ganev**, N. Miloshev, G. Gadzhev, I. Georgieva, V. Ivanov, Atmospheric composition climate in Bulgaria
- 18:00 – 18:30 **H. Chervenkov**, Assessment of the Drought and Wetness Characteristics over Bulgaria by Means of the Standardized Precipitation Index

***Tuesday, December 12***

*Chairperson:* T. Alexandrova

- 09:30 – 09:55 **A. Slavova**, V. Ignatov, Edge of chaos in integro-differential model of nerve conduction
- 09:55 – 10:20 **T. B. Gyulov**, J. D. Kandilarov, Numerical Solution of a Free Boundary Problem for a Saturated-Unsaturated Water Flow Absorption in Soil
- 10:20 – 10:45 **N. Popivanov**, Pohozaev Type Identity for a Nonlinear Mixed Type Equation and Applications
- 10:45 – 11:00 **Coffee break**

*Chairperson:* T. Alexandrova

- 11:00 – 12:00 *Invited talk:* **R. Stoyanova**, Radiogenomic Characterization of MRI Habitats for Effective Management of Prostate Cancer
- 12:00 – 14:00 **Lunch break**

*Chairperson:* N. Ilieva

- 14:00 – 14:25 **K. Vlachkova**, Formulae in Closed Form for Subdivision of Bézier Surfaces using the Blossoming Principle
- 14:25 – 14:50 **P. Petkov**, V. Pavlov, L. Nista, T. Grenga, H. Pitsch, S. Markov, Deploying data-driven models for turbulence closure modeling in computational fluid dynamics numerical solvers
- 14:50 – 15:10 V. Todorov, **S. Georgiev**, Sensitivity Analysis of a Large-Scale Air Pollution Model by Highly Efficient Lattice Generating Vectors
- 15:10 – 15:30 **H. Bansu**, S. Margenov, Numerical solution of space fractional diffusion equation using collocation method
- 15:30 – 15:50 S. Topalova, **S. Zhelezova**, Point-cyclic KTS(45)

15:50 – 16:10 **Coffee break**

Chairperson: P. Petkov

16:10 – 16:35 **N. Ilieva**, E. Lilkova, P. Petkov, L. Litov, Perspectives from large-scale in silico studies of multicomponent solutions of putative antimicrobial peptides

16:35 – 17:00 **N. Todorova**, M. Rangelov, P. Petkov, C. Nedeva, E. Lilkova, N. Ilieva, L. Litov, Is molecular mimicry a player in SARS2-CoV successful cell invasion?

17:00 – 17:20 **E. Lilkova**, P. Petkov, M. Rangelov, N. Todorova, N. Ilieva, and L. Litov, Inhibiting the SARS-CoV-2 protein ORF6: a computational study

17:20 – 17:40 **P. Sirakova**, E. Lilkova, P. Petkov, N. Ilieva, L. Litov, Aggregation energetics of putative linear AMPs: a case study

17:40 – 18:00 **M. Staneva**, I. Sazdova, M. T. Iliev, E. Ivanova, Influence semantic priming on the characteristics volitional saccades on evaluation detailed colourful photos according to sex orientation in the separated part in visial field

18:00 **Poster session and reception**

### Wednesday, December 13

Chairperson: E. Lilkova

09:30 – 09:55 **S. Fidanova**, K. Kapanova, K. Atanassov, A Novel Memetic Simulated Annealing Algorithm Applied on GPS Surveying Problem

09:55 – 10:20 **E. Atanassov**, T. Gurov, A. Karaivanova, S. Ivanovska, M. Durchova, S. Spasov, T. Atanassov, Hemus: benchmarking results analysis

10:20 – 10:45 **V. Kotev**, I. Ivanov, S. Ranchev, M. Ivanova, P. Dobreva, Machine learning and computer vision for collecting of statistical data from vegetable fields

10:45 – 11:00 **Coffee break**

Chairperson: E. Lilkova

11:00 – 12:00 *Invited talk:* **D. Doneva**, Numerical relativity simulations in theories beyond General Relativity

12:00 – 14:00 **Lunch break**

*Chairperson:* M. Datcheva

- 14:00 – 14:30 **T. Popov**, Solutions with exponential singularity for (3+1) -D Protter problems
- 14:30 – 14:50 **M. Rashevski**, S. Slavtchev, Mathematical modelling of laminar convective flows in water-flow glazing
- 14:50 – 15:10 **P. Iliev**, A Numerical Study on the Effects of Packed-Bed Thermal Energy Storage Wall Expansion and Contraction
- 15:10 – 15:30 **Z. Zhelev**, M. Datcheva, Finite element analysis of impact response of laminated glass
- 15:30 – 15:50 N. Dobrinkova, **V. Vassilev**, N. Tsvetkova, Comparative analysis of European fuel models for 2022 Razdel fire (Bulgaria)
- 15:50 – 16:10 **R. Menda-Shabat-More**, **Z. Minchev**, IoT Cybersecurity Certification – A multicriteria Assessment Approach
- 16:10 **Closing**

### List of Posters

1. E. V. Nikolova, Several solitary wave solutions of conformable time-fractional Wu–Zhang system via Simple Equations Method (SesM)
2. Toddor Velez, Nina Dobrinkova, Mariya Veleza, Modeling Information Security Management System (ISMS) with Neural Networks (NN)
3. M.Koleva, L. Vulkov, Construction and Realization of Nonstandard Difference Schemes for SIR and SEIR Models with and without Spatial Diffusion
4. M. Koleva, L. Vulkov, Simultaneous Identification of Two Coefficients in Reaction Diffusion Systems from Final- time Measurements
5. A. Z. Atanasov, S. G. Georgiev, L. G. Vulkov, Analysis of an Extended Model of Infection in Honeybee Colonies with Social Immunity
6. I. Georgiev, M. Raykovska, N. Petkov, Multi-Sampling Holder for Improved Scanning Sequences in Dental Micro-CT Examinations
7. T. Stefanova, T. Georgiev, External Validation of Paraphrasing Language Models with Respect to Bulgarian

The event will be held in hybrid mode:

On-site at the Joint Innovation Centre of the Bulgarian Academy of Sciences  
Sofia 1113, Acad. G. Bonchev Str. Bl. 26B

and

Online at the ZOOM platform  
Topic: 18th Annual Meeting of the Bulgarian Section of SIAM  
Join Zoom Meeting

<https://us02web.zoom.us/j/89893059037?pwd=V242OElyUkxnbUNNQ3V5WnN4ZEQwQT09>

Meeting ID: 898 9305 9037

Passcode: bgsiam2023