
MASTER PROGRAM

for

**SEVENTEENTH INTERNATIONAL CONFERENCE
APPLICATION OF MATHEMATICS IN TECHNICAL AND NATURAL
SCIENCES
JUNE 24-29, 2025**

**All times in the program are GMT+3 (East-European time). Please
synchronize your local time with respect to GMT and join the announced
Zoom sessions on time.**

THUESDAY, JUNE 24, 2025

FLAMINGO GRAND HALL

Join Zoom Meeting **08:00-18:00**

<https://us02web.zoom.us/j/85348193814?pwd=tNYzfzVuHSedjfsI2tv84ab80BSkZr.1>

Meeting ID: 853 4819 3814

Passcode: 076828

Hosted by Michail Todorov

08:30-09:00 OPENING SESSION

09:00-10:00 PLENARY LECTURE: Viktor Didenko
Title: *Approximate Solution of Non-Homogeneous Biharmonic
Problems in Non-Smooth Domains*

10:00-10:30 BREAK

10:30-12:00 Special Session E-LEARNING

- 10:30-11:00 Speaker: Irina Naskinova/Mikhail Kolev
Title: *Advancing Predictive Maintenance Modeling for Renewable Energy Systems*
- 11:00-11:30 Speaker: Irina Naskinova
Title: *Data-centric Reliability Modeling for Energy Assets*
- 11:30-12:00 Speaker: Yana Vasileva
Title: *The Synergy of Mathematics, Computer Science and Generative Artificial Intelligence*

Lunch Break

- 14:00-14:45 KEYNOTE TALK: Valentin Gushchin

Title: *Investigation of the Vortices Couple Motion in a Stratified Fluid*
- Session APPLIED ANALISYS
- 15:00-15:30 Speaker: Alex Fedoseev (Y. Gurimskaya)
Title: *First-Principles Study of Radiation-Induced Defects in Silicon Solar Cells and Annealing Using Density Functional Theory Simulation*
- 15:30-16:00 Speaker: Alex Fedoseyev
Title: *Improved Analytical Solution for Turbulent Flow in Channel*

Break

Session NUMERICAL METHODS & SCIENTIFIC
COMPUTING

- 16:30-17:00 Speaker: Ivan Hristov

Title: *A High Precision Implementation of Taylor Series Method for the N-body Gravitational Problem*

Session APPLIED ANALYSIS

17:00-17:30

Speaker: Roman Haynatzki

Title: *Methodological Framework Integrating Predictive and Causal Inference Techniques to Analyze a High-Dimensional Dataset*

17:30-18:00

Speaker: Stoyan Apostolov

Title: *Linear Systems and Integral Equations: A Stochastic Approach*

20:00

WELCOME PARTY – TERRACE OF THE RESTAURANT,
FLAMINGO GRAND HOTEL

WEDNESDAY, JUNE 25, 2025

FLAMINGO GRAND HALL

Join Zoom Meeting **08:00-18:00**

<https://us02web.zoom.us/j/81725832504?pwd=QcabHvktYdEnVgDXeSjnJQ7iRxlPRz.1>

Meeting ID: 817 2583 2504

Passcode: 952290

Hosted by Michail Todorov

08:30-09:30 **PLENARY SREAKER: Jianzhong Su**
Title *Brain Complex Data Analytics To Identify Epileptic Activity Sequences Based On EEG Source Localization Methods*

09:30-10:00 BREAK

10:00-11:00 Session MATHEMATICAL PHYSICS

10:00-10:30 Speaker: Bogdan Dimitrov
Title: *New Analytical Formulaes for the Weierstrass Invariants of Elliptic Integrals in the Weierstrass Form Depending on the Modulus Parameter q of the Integral in the Legendre Form*

10:30-11:00 Speaker: Georgi Grahovski
Title: *Thermodynamic Properties of Quantum Spin Systems: Scaling and Disorder*

11:00-11:30 Speaker: Yuri Bozhkov
Title: *An Analytic Investigation of the Emergence of a Secondary Diffusion in a Thin Film Model*

11:30-12:00 Speaker: Mikhail Kolev
Title: *On a Mathematical Model of Virus - Immune System Competition*

Lunch Break

FLAMINGO GRAND HALL

14:00-14:45 KEYNOTE SPEAKER

Roumen Anguelov

Title: *A Mathematical Model of CDK1 and APC Interactions in Cancer Cells: Exploring the Impact of Zingerone on Cell Proliferation*

Session NUMERICAL METHODS

15:00-15:30 Speaker: Alex Fedoseyev

Title: *Turbulent Flow in Channel: Experiments versus Numerical Simulation and Analytical Solution*

15:30-16:00 Speaker: Alex Fedoseyev

Title: *Critical Reynolds Number for Transition to Turbulence of Viscous Flow in Channel*

Coffee Break

FLAMINGO GRAND HALL

16:30-18:30 Social Activity WOMAN'S PROGRAM

THURSDAY, JUNE 26, 2025

Flamingo Grand Hall

Join Zoom Meeting 08:00-12:30

<https://us02web.zoom.us/j/86426842393?pwd=kVnXH5N6MEZ7YOnzaaYaLmCwUbOORI.1>

Meeting ID: 864 2684 2393

Passcode: 887967

Hosted by Michail Todorov

08:30-09:30 PLENARY TALK

Speaker: Rossen Ivanov

Title: *On the Dynamics of Interacting Vortices and Water Waves*

09:30-10:00 Coffee Break

10:00-10:30 Session NUMERICAL METHODS

10:00-10:30 Speaker: Volodymyr Chumakov

Title: *Simulation Charging of the Forming Line by the Operator Method*

10:30-12:00 Session MATHEMATICAL MODELING IN ECONOMY
AND FINANCE

10:30-11:00 Speaker: Ivan R. Georgiev/Tsvetelina Ivanova

Title: *Modeling a Valid Work Schedule using Integer Optimization over a Non-Convex Set*

11:00-11:30 Speaker: Elitsa Raeva/Aleksandra Papazova

Title: *Bayesian Approach for Bulgarian Insurance Company Classification According the Policy Premiums*

11:30-12:00

Speaker: Elitsa Raeva/Iva Stefanova

Title: *Capital Asset Pricing Model in Insurance Risk Theory*

Lunch Break

14:00

Excursion to the town of Dobrich

Meeting point: the lounge of Flamingo Grand Hotel at 13:45.
Everybody is welcome.

Corella Hall

PARALLEL SESSION

Join Morning 2 Zoom Meeting 10:00-11:30
<https://essex-university.zoom.us/j/92040184669>

Hosted by Georgi Grahovski

10:00-11:30 Session APPLIED ANALYSIS

10:00-10:30 Speaker: Emin Ozcag
Title: *An Extension of the Definition on the Compositions of Generalized Functions and Powers of Some Singular Generalized Functions Defined as the N-limit of Regular Sequences*

10:30-11:00 Speaker: Meglena Lazarova
Title: *Some Properties and Applications of the Univariate and Bivariate Non-central Polya-Aeppli Distributions*

11:00-11:30 Speaker: Venelin Todorov
Title: *Advanced Monte Carlo Techniques for High Dimensional Fredholm and Volterra Integral Equations*

11:30-12:00 Speaker: Georgi Boyadzhiev
Title: *Comparison Principle for Reaction-Diffusion Systems with Delays and Application in SEIR Spatial models*

Lunch Break

14:00 Excursion to the town of Dobrich

Meeting point: the lounge of Flamingo Grand Hotel at 13:45.
Everybody is welcome.

FRIDAY, JUNE 27, 2025

FRIDAY, JUNE 27, 2025

Join Zoom Meeting **08:00-18:00**

<https://us02web.zoom.us/j/83157045195?pwd=IXg1ySg4gOFnsSGcXf0mfG58C9d6hV.1>

Meeting ID: 831 5704 5195

Passcode: 331729

Hosted by Michail Todorov

Flamingo Grand Hall

08:30-09:30 PLENARY TALK

Speaker: Nectarios Papanicolaou

Title: *Non-Self-Adjoint Sixth-Order Eigenvalue Problems*

Arising from Clamped Elastic Thin Films on Closed Domains

Coffee Break

10:00-12:00 Session MATHEMATICAL MODELLING IN ECONOMY
AND FINANCE

10:00-10:30 Speaker: Plamena Zlateva CANCELLED

Title: *A Modified Model of the Transportation Task with
Natural Disaster Risk Consideration*

10:30-11:00 Speaker: Silviya Assenova CANCELLED

Title: *Transport Safety - Methodology, Quantitative and
Qualitative Assessment of the Link Between Meteorological
Conditions and Safety*

11:00-11:30 Speaker: Borislav Chakarov/Slavi Georgiev
Title: *A Multicriteria Optimization Approach for Investment Project Funding*

11:30-12:00 Speaker: Aleksander Baykin/Zlatin Dimitrov
Title: *Impact of Inequality in Income Distribution on Population Happiness*

Lunch Break

14:00-14:45 KEYNOTE TALK

Speaker: Vesselin Gueorguiev
Title: *Reparametrization Invariant Scaling Symmetry as Resolution of the Li-7 Problem within the BBNS*

15:00-16:00 Session MATHEMATICAL MODELLING IN ECONOMY AND FINANCE

15:00-15:30 Speaker: Byulent Idirizov
Title: *Application and Development of the Block Maxima Method in Analysis of Silver Price*

15:30-16:00 Speaker: Petar Peshev
Title: *Panel Data Econometric Techniques for Modeling Bank Loan Supply in Bulgaria: Evidence from 21 Commercial Banks (2007-2024)*

Break

16:30-17:00 Speaker: Meglena Lazarova
Title: *Causal Relationship Between Bank Lending and Its Determinants: Evidence from Bulgarian Commercial Banks (2007-2024)*

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| 17:00-18:00 | Session E-LEARNING |
| 17:00-17:30 | Speaker: Stoyan Tranev/Velichka Traneva Title: <i>Bioeconophysical Science of Microeconomical Equilibrium of Stocks</i> |
| 17:30-18:00 | Speaker: Velichka Traneva Title: <i>Bioeconophysical Integrated Analysis of the Complex System Biosphere-Technosphere-Nosphere and the Role of Entropy and Albedo in System Sustainability</i> |
| 19:00 | Official Dinner – Bistro of Flamingo Grand Meeting point in the lobby of the Flamingo Grand hotel |

Corella Hall

PARALLEL ZOOM SESSION

Join Morning 2 Zoom Meeting 10:00-17:30
<https://essex-university.zoom.us/j/92040184669>

Hosted by Georgi Grahovski

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| 10:00-12:00 | Special Session INTERDISCIPLINARY FRONTIERS |
| 10:00-10:30 | Speaker: Din Wang Title: <i>Dynamic Analysis of Aircraft Engine-Pylon Coupled System</i> |
| 10:30-11:00 | Speaker: Hongzhen Zhao Title: <i>Research on the Dynamics and Damping Performance of Parallel-Grounded Damping Nonlinear Energy Sink Cells</i> |

- 11:00-11:30 Speaker: Yujiao Cui
Title: *Vibration Control and Parameter Optimization of a Negative Stiffness Dynamic Vibration Absorber*
- 11:30-12:00 Speaker: Ziyu Guo
Title: *Bifurcation of Periodic Solutions for a Multi-degree-of-freedom model of Resonator Metamaterials*

Lunch Break

15:00-16:00 Special Session INTERDISCIPLINARY FRONTIERS

15:00-15:30 Speaker: Nuri Ma
Title: *Low-frequency Vibration Attenuation in Metamaterial Beams with Embedded Inerters: Modeling and Dynamic Analysis*

15:30-16:00 Speaker: Liyi Ying
Title: *Dual-Path Network-Based Brain Tumor CT Image Anomaly Detection System*

16:30-17:30 Special Session INTERDISCIPLINARY FRONTIERS

16:30-17:00 Speaker: Yuzhan Zhang
Title: *Bifurcation of Periodic Solutions for a Cross-scale Oscillator Chain Model*

17:00-17:30 Speaker: Miao Wang
Title: *Hypergraph Mamba-based Dual-channel Denoising Network for Session-based Recommendation*

19:00 Official Dinner –Bistro of Flamingo Grand
Meeting point in the lobby of the Flamingo Grand hotel

SATURDAY, JUNE 28, 2025

Join Zoom Meeting **08:00-18:00**

<https://us02web.zoom.us/j/81434055350?pwd=zzDb2gwsTCozVMQtag9QQntlF6kkMj.1>

Meeting ID: 814 3405 5350

Passcode: 268886

Hosted by Michail Todorov

Flamingo Grand Hall

08:30-09:30 PLENARY TALK

Speaker: Runzhang Xu

Title: *Global Quantitative Stability of Wave Equations with Strong and Weak Dampings*

Coffee Break

10:00-11:30 Session E-LEARNING

10:00-10:30 Speaker: Gleb Haynatzki

Title: *Probability Metrics for Kolmogorov-Arnold Net (KAN)*

10:30-11:00 Speaker: Dimitar Velez

Title: *The Synergy of Mathematics, Computer Science and Generative Artificial Intelligence*

11:00-12:00 Speaker: Marian Milev/ Dilyana Nikolova

Title: *A Model for Measuring the Economic Effects of Implementing Artificial Intelligence Technologies in Business Practices*

Lunch Break

14:00-14:45 KEYNOTE TALK

Speaker: Andrejs Koliskin

Title: *Amplitude Evolution Equation for a Convective Flow between Two Vertical Parallel Planes*

15:00-15:30 Session MATHEMATICAL PHYSICS

15:00-15:30 Speaker: Enrique Reyes

Title: *Equations in Infinitely Many Derivatives and the Zeta Function*

Session NUMERICAL METHODS AND SCIENTIFIC COMPUTING

15:30-16:00 Speaker: Oxana Kharchenko/Volodymyr Chumakov

Title: *Equations in Infinitely Many Derivatives and the Zeta Function*

Break

16:30-17:00 Speaker: Tzvetan Ostromsky

Title: *Advanced Stochastic Techniques for Sensitivity Analysis in Large-Scale Air Quality Modeling*

17:00-17:30 Speaker: Tzvetan Ostromsky

Title: *Application of LiDAR and Photogrammetric Technologies for Imaging, Mapping and 3D Modeling of Underground Karst Objects -- Results from Experiments in the Cave Svirchovitsa near Karlukovo Village, NW Bulgaria*

17:30-18:00 Speaker: Dzhihan Menseidov CANCELLED

Title: *Stochastic Monte Carlo–FEM Prediction of Electrical Conductivity in Carbon-Nanoparticle/Polymer Composites for Green Technologies*

Corella Hall

PARALLEL ZOOM SESSION

Join Morning 2 Zoom Meeting 10:00-12:00
<https://essex-university.zoom.us/j/92040184669>

Hosted by Georgi Grahovski

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| 10:00-10:30 | Special Session INTERDISCIPLINARY FRONTIER |
| 10:00-10:30 | Speaker: Zhengrui Yang Title: <i>Generative Adversarial Network with Vision Transformer for Pollen Grain Microscope Images Classification</i> |
| 10:30-11:00 | Speaker: Hongyuan Wang Title: <i>A Privacy-preserving Scheme for External Security in Blockchain-based Federated Learning</i> |
| 11:00-11:30 | Speaker: Haoxuan Zhang Title: <i>Structure-Aware and Consistency-Preserved Graph Contrastive Learning without Augmentation</i> |
| 11:30-12:00 | Speaker: Yaopeng Niu Title: <i>Dynamic Characterization of Aircraft Propellers under Erosion Cracks</i> |

SUNDAY JUNE 29, 2025

FLAMINGO GRAND HALL

Join Zoom Meeting **09:00-12:00**

<https://us02web.zoom.us/j/81874558275?pwd=Eljw0AQZVKXo77I1vig2KFNrm3VbR.1>

Meeting ID: 818 7455 8275

Passcode: 200873

Hosted by Michail Todorov

**Session MATHEMATICAL MODELING IN ECONOMY
AND FINANCE**

09:00-09:30 Speaker: Slavi Georgiev
Title: *Stock Prices Prediction Using Hybrid Convolutional
Neural Network/Long Short-Term Memory Network Model*

09:30-10:00 BREAK

10:00-12:00 Special Session NUMERICAL METHODS

10:00-10:30 Speaker: Slavi Georgiev
Title: *Inverse Modeling of Honeybee Hives Weight Dynamics*

Session CONTINUUM MECHANICS

10:30-11:00 Speaker: Ganna Shyshkanova
Title: *Non-stationary Wave Dynamics in Compound Structures:
Mathematical Modeling and Analysis*

11:00-11:30 RECAPITULATION AND OFFICIAL CLOSING SESSION
OF THE CONFERENCE

11:30-12:00 *Virtual Trip for the on-line participants*
Guided by Tzvetan Ostromsky

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| 11:30-12:00 | Good Bye Party for the off-line participants |
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