
MASTER PROGRAM

for

**FOURTEENTH INTERNATIONAL HYBRID CONFERENCE
APPLICATION OF MATHEMATICS IN TECHNICAL AND NATURAL
SCIENCES
JUNE 22-27, 2022**

**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.**

WEDNESDAY, JUNE 22, 2022

Join Zoom Meeting **08:00-12:30**

<https://us02web.zoom.us/j/84946890203?pwd=OXV5OTI1U2c4YytFclJ0Z0loaG9VQT09>

Meeting ID: 849 4689 0203

Passcode: 044995

Hosted by Michail Todorov

08:30-09:00 OPENING SESSION

09:00-10:00 PLENARY LECTURE: Anna Dembinska
Title: *Parametric Inference for Geometric Lifetimes of Elements
of k-out-of-n Systems*

10:00-10:30 BREAK

Special Session APPLICATIONS OF PROBABILITY IN RELIABILITY
THEORY

- 10:30-11:00 Speaker: Krzysztof Jasinski
Title: *The Number of Failed Components in a Failed or Operating Coherent System Consisting of Multiple Types of Components*
- 11:00-11:30 Speaker: Agnieszka Goronsy
Title: *Bounds on Expected Lifetimes of k-out-of-n Systems with the Decreasing Reversed Failure Rate Components*
- 11:30-12:00 Speaker: Nikolay Nikolov
Title: *Inference for a Multilevel Step-Stress Model with Censored Exponential Data*
- 12:00-12:30 Session NUMERICAL METHODS
- 12:00-12:30 Speaker: Byulent Idirizov
Title: *Numerical Solution of American Option Pricing Problem with Free Boundaries and Volatility Regimes*

Lunch Break

Join Zoom Meeting **13:45-16:00**

<https://us02web.zoom.us/j/88374664030?pwd=bDFtSXEzaThKZW9aSGZoWGNPOUR6QT09>

Meeting ID: 883 7466 4030

Passcode: 304202

Hosted by Zhijun Qiao

- 14:00-15:00 PLENARY LECTURE: Yufeng Zhang
Title: *Coverings and Nonlocal Symmetries as well as Fundamental Solutions of Nonlinear Equations Derive from the Nonisospectral AKNS Hierarchy*
- 15:00-16:00 Session NUMERICAL METHODS
- 15:00-15:30 Speaker: Miglena Koleva
Title: *Analytical and Computational Analysis of Time*

Fractional Parabolic Models of Atmospheric Dispersion of Pollutants

15:30-16:00 Speaker: Ivailo Nikolaev
Title: *Method for Numerical Determining of the Instantaneous Flow Rate of a Three-Rotor Gear Pump with Bilateral Lantern Meshing*

Break

Join Zoom Meeting **16:15-18:00**

<https://us02web.zoom.us/j/86098585496?pwd=Zm1TcGZzSzRxRS9iN2ZUcysrcFltZz09>

Meeting ID: 860 9858 5496

Passcode: 404034

Hosted by Michail Todorov

16:30-18:00 Session NUMERICAL METHODS

16:30-17:00 Speaker: Emanouil Atanassov
Title: *A Novel Algorithm for Optimization of the Parameters of the Halton Sequence*

17:00-17:30 Speaker: Alex Fedoseyev
Title: *Optimal Wavelets for Single and Multi-Frequency Signals in Wavelet Based Communication*

17:30-18:00 Speaker: Alex Fedoseyev
Title: *Simulation of Rarefied Gas Flows, Comparison with Experimental Data II*

20:00 WELCOME PARTY – BAILANDO BAR, FLAMINGO
GRAND HOTEL

THURSDAY, JUNE 23, 2022

FLAMINGO GRAND HALL

Join Zoom Meeting **08:15-12:30**

<https://us02web.zoom.us/j/84782672453?pwd=WHVsRkVGZWdqay85M2x5SkIXMmdkZz09>

Meeting ID: 847 8267 2453

Passcode: 111560

Hosted by Michail Todorov

08:30-09:30 PLENARY LECTURE: Jing Li and Xiaodong Yang
Title: *Vibration and Control of Moving Structures*

09:30-10:00 BREAK

10:00-12:30 Session SCIENTIFIC COMPUTING

10:00-10:30 Speaker: Todor Gurov
Title: *New Features in the Service for Estimating the Brown Bear (*Ursus arctos L.*) Population in Bulgaria*

10:30-11:00 Speaker: Tzvetan Ostromsky
Title: *Sensitivity Analysis in Air Pollution Modeling by Innovative Monte Carlo Methods*

11:00-11:30 Speaker: Ivan Lirkov
Title: *BURA Preconditioning of Multiphysics Problems*

11:30-12:00 Speaker: Elena Lilkova
Title: *Computational Approach to the Inhibition of SARS-CoV-2 Orf6*

12:00-12:30 Speaker: Nevena Ilieva
Title: *Computational Modeling of Carbon Diffusion in bcc Iron in the Presence of 1/2[111] Screw Dislocations*

Lunch Break

FLAMINGO GRAND HALL

Join Zoom Meeting **13:45-16:00**

<https://us02web.zoom.us/j/86311981821?pwd=UitFTWh4SnFZeU5Oam9vYVNDaG5pQT09>

Meeting ID: 863 1198 1821

Passcode: 755275

Hosted by Michail Todorov

14:00-16:00 Session SCIENTIFIC COMPUTING

14:00-14:30 Speaker: Xubiao Peng
Title: *Studying the Geometry and Dynamics of Prospective Parkinson-Inhibitor MCoCP4 Variants with Modified Grafting Topologies*

14:30-15:00 Speaker: Nectarios Papanicolaou
Title: *On the Transferability of the Deep Galerkin Method (DGM) for Solving Partial Differential Equations*

15:00-15:30 Speaker: Venelin Todorov
Title: *Multidimensional Sensitivity Analysis in Air Pollution Modeling by Lattice Rules with Optimal Generating Vectors*

15:30-16:00 Speaker: Roman Haynatzki
Title: *Machine Learning*

Coffee Break

FLAMINGO GRAND HALL

Join Zoom Meeting **16:15-18:15**

<https://us02web.zoom.us/j/84010584797?pwd=Z0h0TXpVNVJWk012b05EbHNuY2NUQT09>

Meeting ID: 840 1058 4797

Passcode: 768300

Hosted by Michail Todorov

- 16:30-17:15 **KEYNOTE SPEAKER:** Hristo Kojouharov
Title: *Higher-order Modified Nonstandard Finite Difference Methods for Autonomous Differential Equations*
- 17:15-18:15 Session **NUMERICAL METHODS**
- 17:15-17:45 Speaker: Andreas Aristotelous
Title: *Energy Stable Interior Penalty Discontinuous Galerkin Finite Element Scheme for the Growth Cahn-Hilliard Equation*
- 17:45-18:15 Speaker: Yuri Kandilarov
Title: *Reconstruction of Concentration Sources for Primary and Secondary Pollutant Models*

CORELA HALL: Parallel Zoom Session

Join Morning 2 Zoom Meeting **10:00-12:30**
<https://essex-university.zoom.us/j/92040184669>

Hosted by Georgi Grahovski

- 10:00-12:30 Special Session **NONLINEAR VIBRATION & CONTROL**
- 10:00-10:30 Speaker: Chao Fu
Title: *Quantification of Uncertainty in Nonlinear Vibrations of Mechanical Systems*
- 10:30-11:00 Speaker: Shaotao Zhu
Title: *Multiple Periodic Vibrations of Auxetic Honeycomb Sandwich Plates Subjected to In-Plane and Transverse Excitation*
- 11:00-11:30 Speaker: Lishuang Jiang

Title: *Bifurcations and Vibration Analysis of a Four-Dimensional Chaotic Hyperjerk Circuit System*

11:30-12:00 Speaker: Ting Gao
Title: *Optimization of a Novel Viscoelastic Dynamic Vibration Absorber with Lever, Inerter and Negative Stiffness*

12:00-12:30 Speaker: Tingting Quan
Title: *Bifurcation and Number of Subharmonic Solutions of Some 2n-Dimensional Systems and Its Application*

Lunch Break

CORELA HALL: Parallel Zoom Session

Join Afternoon 1 Zoom Meeting **14:00-15:30**
<https://essex-university.zoom.us/j/95733750048>

Hosted by Georgi Grahovski

14:00-15:30 Session BIOMATHEMATICS

14:00-14:30 Speaker: Meglena Lazarova
Title: *Reaction Networks with Application to Epidemiological Outbreaks and Biological Growth*

14:30-15:00 Speaker: Slavi Georgiev
Title: *Parameter Identification Analysis of the Transfer of Heavy Metals in Honey Bees*

15:00-15:30 Speaker: Silvi-Maria Gurova
Title: *Reaction Network of a Predator-Prey Model with SEIR and SEIRS Epidemic in the Prey population*

15:30-16:00 Speaker: Martin Dimitrov
Particle Filters in Epidemiology

Break

CORELA HALL: Parallel Zoom Session

Join Afternoon 2 Zoom Meeting 17:15-18:15
<https://essex-university.zoom.us/j/99184621459>

Hosted by Georgi Grahovski

17:15-18:15 Session SCIENTIFIC COMPUTING

17:15-17:45 Speaker: Miroslav Stoenchev
Title: *Elliptic Curves and Diophantine Equations*

17:45-18:15 Speaker: Stoyan Apostolov
Title: *Innovative Monte Carlo Algorithm for Linear Equations
Based on “Walk on Equations” Algorithm*

FRIDAY, JUNE 24, 2022

Flamingo Grand Hall

Join Zoom Meeting 08:15-12:30

<https://us02web.zoom.us/j/85978923581?pwd=xCfTU3i3RRbmlbHy2L3Ou82N75QcP7.1>

Meeting ID: 859 7892 3581

Passcode: 946479

Hosted by Michail Todorov

08:30-09:30 PLENARY TALK

Speaker: Ismihan Bayramoglu

Title: *Fuzzy Order Statistics in Reliability Analysis*

Cofee Break

10:00-11:00 PLENARY TALK

Speaker: Weinian Zhang

Title: *An Algorithm for Melnikov Functions and Application to a Chaotic Rotor*

Session APPLIED ANALYSIS

11:00-11:30

Speaker: Vesela Mihova

Title: *Numerical Modeling of the Noise Generated by Hydraulic Systems with Centrifugal Fan at Two Flow Rate Adjustment Methods*

11:30-12:00

Speaker: Andrei Shorikov

Title: *Minimax Estimation of the Forecast Set of the Dynamical Economic and Mathematical Model of the Production System*

12:00-12:30

Speaker: Victoria Akberina

Title: *A Tree-Level Hierarchical Agent-Oriented Model for Forecasting the State and Optimizing the Management of the Production Potential of the Region*

Lunch Break

14:00 Real Excursion
The historical park near the village of Neofit Rilski
Letters Museum in Pliska
Castle of Ovech near Provadia

Corella Hall

PARALLEL ZOOM SESSION

Join Morning 2 Zoom Meeting 11:00-12:30
<https://essex-university.zoom.us/j/92040184669>

Hosted by Georgi Grahovski

11:00-12:30 Session MATHEMATICAL PHYSICS:

11:00-11:30 Speaker: Viktor Olevskiy
Title: *Mathematical Modeling of the Electrochemical Phase Formation through a Supercooled Liquid State Stage in Metals*

11:30-12:00 Speaker: Katrin Laas
Title: *Stochastic Resonance of the Spectral Amplification for a Fractional Oscillator in a Fluctuating Magnetic Field*

12:00-12:30 Speaker: S. Singh
Title: *Analysis of Nonlinear Weakly Singular Integro-Partial Differential Equations Arising from Viscoelasticity*
