

## Tuesday, August 19

16:00 – 19:00	Registration
18:00	Welcome drink

## Wednesday, August 20

### Plenary Session

Lecture Hall A	
08:30 – 09:00	Registration
Chairperson: I. Dimov	
09:00 – 09:15	Opening
09:15 – 10:00	<b>Bl. Sendov,</b> <i>Extreme problems in the geometry of polynomials (honorary lecture)</i>
10:00 – 10:45	<b>Vidar Thomée,</b> <i>On Positivity Preservation in some Finite Element Methods for the Heat Equation (plenary lecture)</i>
10:45 – 11:15	Coffee Break
Chairperson: R. Lazarov	
11:15 – 11:40	<b>Ivan Bazhlekov, D. Vasileva,</b> <i>Numerical Simulation of Drop Coalescence in the Presence of Inter-Phase Mass Transfer</i>
11:40 – 12:05	<b>Jan Busa,</b> <i>Target Localization by UWB Signals</i>
12:05 – 14:30	LUNCH
13:30 – 14:30	Registration

### Parallel Sessions

Lecture Hall A "Monte Carlo and Quasi-Monte Carlo Methods"	Lecture Hall B "Advanced numerical methods for scientific computing"
Chairperson: Stefan Heinrich	Chairperson: Svetozar Margenov
14:30 – 15:05 <b>Thomas Muller-Gronbach,</b> <i>Quadrature for self-similar distributions on <math>R^d</math> (keynote lecture)</i>	14:30 – 15:05 <b>Jun Hu,</b> <i>New Mixed Elements for Linear Elasticity Problems within the Hellinger--Reissner Variational Formulation (keynote lecture)</i>
15:05 – 15:30 Dominique Küpper, Anne Kværnø, <b>Andreas Rössler,</b> <i>Stochastic Runge-Kutta methods for Index 1 stochastic differential-algebraic equations with Scalar Noise</i>	15:05 – 15:30 <b>Clemens Hofreither,</b> Walter Zulehner <i>Spectral analysis of geometric multigrid methods for isogeometric analysis</i>
15:30 – 15:55 <b>Martin Hutzenthaler,</b> <i>A perturbation formula as universal tool for strong approximations of stochastic differential equations</i>	15:30 – 15:55 Johannes Kraus, Raytcho Lazarov, <b>Maria Lymbery,</b> Svetozar Margenov, Ludmil Zikatanov, <i>MinRes Iteration with Auxiliary Space Multigrid Preconditioning for Darcy problem</i>
15:55 – 16:20 <b>Arnulf Jentzen,</b> <i>On weak convergence rates for numerical approximations of SPDEs and on a mild Ito type formula</i>	15:55 – 16:20 <b>Jinbiao Wu,</b> <i>Multigrid methods for parameter dependent problems</i>

16:20 – 16:50	Coffee Break
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### Parallel Sessions

Lecture Hall A "Monte Carlo and Quasi-Monte Carlo Methods"	Lecture Hall B "Advanced numerical methods for scientific computing"
Chairperson: Thomas Muller-Gronbach	Chairperson: Jun Hu
<u>16:50 – 17:15</u> <b>Raphael Kruse,</b> <i>A new approach to weak convergence for numerical one step schemes and multistep methods</i>	<u>16:50 – 17:15</u> <b>Sihong Shao,</b> <i>Dirac Equation: Calculation and Analysis</i>
<u>17:15 – 17:40</u> <b>Pawel Przybyłowicz,</b> <i>Minimal asymptotic errors for global approximation of SDEs with time-irregular coefficients</i>	<u>17:15 – 17:40</u> Zahari Zlatev, <b>Krassimir Georgiev,</b> Ivan Dimov, <i>Some Remarks on the Absolute Stability Properties of the Richardson Extrapolation Combined with Explicit Runge-Kutta Methods</i>
<u>17:40 – 18:05</u> Denis Belomestny, <b>Tigran Nagapetyan,</b> <i>Sieve Minimum Variance Approach For Multilevel Monte Carlo Algorithm</i>	<u>17:40 – 18:05</u> Maria Ganzha, <b>Ivan Lirkov,</b> Marcin Paprzycki, <i>An Application of Parallel Algorithm for Solving Tridiagonal Linear Systems</i>

### Thursday, August 21

#### Plenary Session

Lecture Hall A	
Chairperson: I. Dimov	
09:00 – 09:45	<b>Stefan Heinrich,</b> <i>Multilevel Monte Carlo methods for parametric problems (plenary lecture)</i>
09:45 – 10:10	Coffee Break

### Parallel Sessions

Lecture Hall A "Monte Carlo and Quasi-Monte Carlo Methods"	Lecture Hall B "Advanced numerical techniques for PDEs and applications"
Chairperson: Emanouil Atanasov	Chairperson: Raytcho Lazarov
<u>10:10 – 10:35</u> <b>Thomas Daun,</b> <i>Complexity of Banach Space Valued and Parametric Stochastic Ito Integration</i>	<u>10:10 – 10:35</u> <b>Ludmil Zikatanov,</b> <i>Asymptotically disappearing solutions to Maxwell's and wave equations and their approximation</i>
<u>10:35 – 11:00</u> <b>Larisa Yaroslavtseva,</b> <i>Deterministic quadrature rules for marginals of SDEs based on weak Ito-Taylor steps</i>	<u>10:35 – 11:00</u> <b>Emre Mengi,</b> E.A. Yildirim and M. Kilic, <i>Numerical Optimization of Eigenvalues of Hermitian Matrix-Valued Functions</i>
<u>11:00 – 11:25</u> <b>Sonja Cox,</b> <i>Convergence in the supremum norm of numerical schemes: with applications</i>	<u>11:00 – 11:25</u> <b>Stefka Dimova,</b> Yonita Mihailova, <i>WENO Schemes for Singular in Space and Time Solutions of Nonlinear Reaction-Diffusion Problems</i>
<u>11:25 – 11:50</u> <b>Gowri Suryanarayana,</b> <i>Rank-1 lattices for the approximation of non-periodic functions</i>	<u>11:25 – 11:50</u> <b>Petr Vabishchevich,</b> Petr Zakharov, <i>Explicit-implicit Splitting Schemes for Parabolic Equations and Systems</i>

	<u>11:50 – 12:15</u> <b>Johann Cervenka</b> , P. Ellinghaus, M. Nedjalkov, <i>Deterministic Solution of the Discrete Wigner Equation</i>
<u>12:15 – 14:30</u>	LUNCH
<u>13:30 – 14:30</u>	Registration

#### Parallel Sessions

<b>Lecture Hall A</b> “Monte Carlo and Quasi-Monte Carlo Methods”	<b>Lecture Hall B</b> “Metaheuristics for optimization problems”
Chairperson: Mihail Nedjalkov	Chairperson: Stefka Fidanova
<u>14:30 – 15:05</u> <b>Asen Asenov</b> , <i>Kinetic Monte Carlo Simulation of Statistical Reliability in Nanoscale CMOS (keynote lecture)</i>	<u>14:30 – 15:05</u> <b>Carlos Cotta</b> , <i>On Meme Self-Adaptation in Spatially-Structured Multimemetic Algorithms (keynote lecture)</i>
<u>15:05 – 15:30</u> <b>J.M. Sellier</b> , R. Georgieva, I. Dimov, <i>Sensitivity Analysis of Design Parameters for Silicon Diodes</i>	<u>15:05 – 15:30</u> <b>Kalin Penev</b> , <i>Free Search in Multidimensional Space II</i>
<u>15:30 – 15:55</u> <b>P. Ellinghaus</b> , M. Nedjalkov, S. Selberherr, <i>Optimized Particle Regeneration Scheme for the Wigner Monte Carlo Method</i>	<u>15:30 – 15:55</u> <b>Alessandro Hill</b> , <i>Multi-exchange neighborhood search for the capacitated ring tree problem</i>
<u>15:55 – 16:20</u> <b>E. Atanassov</b> , M. Durchova, D. Dimitrov, S. Ivanovska, <i>On the Efficient Estimation of Parameters of Stochastic Models using Accelerators</i>	<u>15:55 – 16:20</u> <b>Todor Balabanov</b> , Iliyan Zankinski, Bozhidar Shumanov, <i>Slot Machines RTP Optimization with Genetic Algorithms</i>
<u>16:20 – 16:50</u>	Coffee Break

#### Parallel Sessions

<b>Lecture Hall A</b> “Monte Carlo and Quasi-Monte Carlo Methods”	<b>Lecture Hall B</b> “Metaheuristics for optimization problems”
Chairperson: Jean Michel Sellier	Chairperson: Carlos Cotta
<u>16:50 – 17:15</u> <b>Sylvain Maire</b> , <i>Walk on equations and sequential Monte Carlo to solve linear systems (keynote lecture)</i>	<u>16:50 – 17:15</u> <b>Stefka Fidanova</b> , Petrica Pop, <i>An Ant Algorithm for the Partition Graph Coloring Problem</i>
“Solving large engineering and scientific problems with advanced mathematical models” Chairperson: Tzvetan Ostromsky	<u>17:15 – 17:40</u> <b>Peter Bujok</b> , <i>Hierarchical Topology in Parallel Differential Evolution</i>
<u>17:15 – 17:40</u> <b>Zahari Zlatev</b> , Ivan Dimov, Krassimir Georgiev, <i>Studying some relations between climatic changes and high pollution levels in Bulgaria</i>	
<u>17:40 – 18:05</u> <b>Georgi Gadzhev</b> , Kostadin Ganev, Nikolay Miloshev, Dimiter Syrakov, Maria Prodanova, <i>HPC simulations of the atmospheric composition climate of Bulgaria</i>	<u>17:40 – 18:05</u> <b>Petia Koprinkova</b> , <i>Hebbian versus Gradient Training of ESN Actors in Closed-loop ACD</i>
<u>18:05 – 18:30</u> <b>Angelos Liolios</b> , Konstantinos Liolios, Anaxagoras Elenas, Stefan Radev, Krassimir Georgiev, Ivan Georgiev, <i>Tall RC buildings environmentally degraded and strengthened by cables under multiple earthquakes: A numerical approach</i>	<u>18:05 – 18:30</u> <b>Ivan A. Starkov</b> , Alexander S. Starkov, <i>A Semi-Numerical Approach to Radiation Boundary Conditions</i>

## Friday, August 22

### Plenary Session

Lecture Hall A	
Chairperson: Stefka Dimova	
09:00 – 09:45	J.L. Guermond, <b>Peter Minev</b> , <i>High-order Artificial Compressibility for the Navier-Stokes Equations (plenary lecture)</i>
09:45 – 10:30	<b>Wil Schilders</b> <i>Model order reduction in the electronics industry (plenary lecture)</i>
10:30 – 10:50	Coffee Break
Chairperson: Stefka Dimova	
10:50 – 11:25	Bangti Jin, <b>Raytcho Lazarov</b> , Joseph Pasciak, Zhi Zhou, <i>Finite element method for fractional order partial differential equations (keynote lecture)</i>
11:30 – 12:30	LUNCH
12:30	EXCURSION
20:00	OFFICIAL DINNER

## Saturday, August 23

### Parallel Sessions

Lecture Hall B <i>“Solving large engineering and scientific problems with advanced mathematical models”</i>	Lecture Hall C <i>“Numerical simulations and back analysis in civil and mechanical engineering”</i>
Chairperson: Zahari Zlatev	Chairperson: Maria Datcheva
09:00 – 09:25 Hristina Kirova, <b>Ekaterina Batchvarova</b> , Sven-Erik Gryning, Henrik Skov, Lise Lotte Soerensesn, Christoph Munke, <i>The performance of mesoscale models in High Arctic area</i>	09:00 – 09:25 <b>K. Khaledi</b> , M. Datcheva, T. Schanz, <i>Parameter Identification of a Rate Dependent Constitutive Model for Rock Salt</i>
09:25 – 09:50 S. Filipov, <b>I. Gospodinov</b> , J. Angelova, <i>Solving Two Point Boundary Value Problems Using the Simple Shooting-Projection Method B</i>	09:25 – 09:50 <b>Vladimir Shiryaev</b> , Julia Orlik, <i>Modeling of Textiles as Nets of One-dimensional Hyperelastic Strings with Friction Controlled by Capstan Equation</i>
09:50 – 10:15 <b>Irina Georgieva</b> <i>Interpolating Solutions of the Poisson Equation in the Disk based on Radon Projections</i>	09:50 – 10:15 Chenyang Zhao, Arash Alimardani Lavasan, Thomas Barciaga, <b>Raoul Hölder</b> , Tom Schanz, <i>Constitutive Parameter Adjustment for Mechanized Tunneling with Reference to Sub-system Effects</i>
10:15 – 10:45	Coffee Break

<u>10:45 – 11:10</u> <b>Tz. Ostromsky</b> , I. Dimov, V. Aleksandrov, Z. Zlatev, <i>Preparing Input Data for Sensitivity Analysis of an Air Pollution Model by using High-Performance Supercomputers and Algorithms</i>	<u>10:45 – 11:10</u> C. Furst, <b>I. Georgiev</b> , A. Haider, R. Iankov, S. Margenov, <i>Numerical Homogenization of Wood Polymer Composite Materials</i>
<u>11:10 – 11:35</u> <b>Vihar P Georgiev</b> , Asen Asenov, <i>Multi-Scale Computational Framework for Evaluation of the Performance of Molecular Based Flash Cells</i>	<u>11:10 – 11:35</u> L. Nguyen-Tuan, <b>M. Datcheva</b> , T. Schanz, <i>Coupled Thermo-Hydraulic-Mechanical Modeling of Water Infiltration under Non-isothermal Conditions</i>
<u>11:35 – 12:00</u> <b>Wolfgang Fenz</b> , Ivan Georgiev, Johannes Dirnberger, Vania Georgieva, Svetozar Margenov, Elena Nikolova, <i>GPU Simulations of Fluid-Structure Interaction Problems with Application to Cerebral Aneurysms</i>	<u>11:35 – 12:00</u> <i>Contributed talk:</i> <b>Rune Dalmo</b> , Jostein Bratlie, Borre Bang, <i>Performance of a Wavelet Shrinking Method</i>
<u>12:00 – 14:30</u>	<u>LUNCH</u>

### Parallel Sessions

<b>Lecture Hall B</b> "Advanced numerical methods for scientific computing"	<b>Lecture Hall C</b> Contributed talks
Chairperson: Ludmil Zikatanov	Chairperson: Stefka Fidanova
<u>14:30 – 14:55</u> F. J. Gaspar, X. Hu, <b>C. Rodrigo</b> , L. T. Zikatanov, <i>Multigrid methods for mimetic finite difference discretizations</i>	<u>14:30 – 14:55</u> <b>Miglena N. Koleva</b> , Lubin G. Vulkov, <i>Two-Grid Decoupled Method for a Black-Scholes Increased Market Volatility Model</i>
<u>14:55 – 15:20</u> I. Georgiev, S. Margenov, <b>Y. Vutov</b> , <b>E. Ivanov</b> , <i>Numerical Homogenization of Composite Materials</i>	<u>14:55 – 15:20</u> Andrey B. Andreev, <b>Milena R. Racheva</b> , <i>The Effect of a Postprocessing Procedure to Upper Bounds of the Eigenvalues</i>
<u>15:20 – 15:45</u> <i>Contributed talk</i> <b>Krassimira Vlachkova</b> , <i>Extremal Scattered Data Interpolation in <math>R^3</math> using Triangular Bezier Surfaces</i>	<u>15:20 – 16:45</u> <b>Andrey B. Andreev</b> , Milena R. Racheva, <i>On a Type of Nonconforming Morley Rectangular Finite Element</i>
	<u>16:45 – 17:10</u> <b>Jostein Bratlie</b> , Rune Dalmo, Borre Bang, <i>Wavelet compression of spline coefficients</i>
<u>17:10 – 17:40</u>	<u>Coffee Break</u>

### Lecture Hall B

*Discussion "Ultimate numerical algorithms for solving advanced problems in physics"*

<u>17:40 – 18:30</u>	<b>Moderator:</b> Ivan Dimov
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## Sunday, August 24

### Parallel Sessions

<b>Lecture Hall B</b> <i>“Monte Carlo and Quasi-Monte Carlo Methods”</i>	<b>Lecture Hall C</b> <i>Contributed Talks</i>
Chairperson: Stefka Fidanova	Chairperson: Tzvetan Ostromsky
<u>09:30 – 09:55</u> Ivan Dimov, Rayna Georgieva, <b>Venelin Todorov</b> , <i>Balancing of Systematic and Stochastic Errors in Monte Carlo Algorithms for Integral Equations</i>	<u>09:30 – 09:55</u> <b>Tasho D. Tashev</b> , Vladimir V. Monov, <i>A Numerical Study of the Upper Bound of the Throughput of a Crossbar Switch Utilizing MiMa-algorithm</i>
<u>09:55 – 10:20</u> Gergana I. Sirakova, Laszlo Szecsi, Laszlo Szirmay-Kalos, <b>Anton A. Penzov</b> , <i>Efficient Environment Mapping with Stratified Importance Sampling</i>	<u>09:55 – 10:20</u> <b>S. Stoykov</b> , C. Hofreither, S. Margenov, <i>Isogeometric Analysis for Nonlinear Dynamics of Timoshenko Beams</i>
11:30 – 13:00	LUNCH
13:00	DEPARTURE