

# CONFERENCE PROGRAM

## NAA '08

### Monday, June 16

9:00 – 19:00 Registration, Hotel SUNSET beach

### Tuesday, June 17

9:30 – 9:45 Opening

### Lecture Hall A

**Chairman:** *S. Margenov*

10:00 – 10:45 F. Chatelin, M. Ahmadnasab, *Some Contributions of Homotopic Deviation to the Theory of Matrix Pencils*

10:45 – 11:05 A. Yonchev, P. Petkov, N. Christov, M. Konstantinov, *On the Local Sensitivity of the Discrete-time  $H_\infty$  Control Problem*

11:05 – 11:25 G. Kalogeropoulos, M. Mitrouli, A. Pantelous, D. Triantafyllou, *The Weierstrass Canonical Form of a Regular Matrix Pencil: Numerical Issues and Computational Techniques*

11:25 – 11:45 P. Petkov, M. Konstantinov, N. Christov, *LAPACK-based Condition Estimates for the Discrete-time LQG Design*

11:45 – 12:05 Tz. Ostromsky, I. Dimov, Z. Zlatev, *Parallel Performance and Scalability Experiments with the Danish Eulerian Model on the EPCC Supercomputers*

### Lunch break

**Chairman:** *I. Farago*

14:30 – 15:15 J. Kraus, S. Margenov, *Robust Algebraic Multilevel Methods and Algorithms*

15:15 – 15:35 P. Boyanova, S. Margenov, *Multilevel Splitting of Weighted Graph-Laplacian Arising in Non-conforming Mixed FEM Elliptic Problems*

15:35 – 15:55 O. Christov, *On the Number of Spikes of Solutions for a Singularly Perturbed Boundary-Value Problem*

### Coffee break

**Chairman:** *M. Konstantinov*

16:30 – 16:50 H. Benlaoukli, S. Olaru, *Model Predictive Control - Numerical Procedures for the Invariant Sets Approximation*

16:50 – 17:10 E. Babache, L. Kocic, *Minimal Simplex for IFS Fractal Sets*

17:10 – 17:30 A. Bica, *Quartic spline of interpolation with minimal quadratic oscillation*

17:30 – 17:50 C. Disibuyuk, H. Oruk, *Tensor Product  $q$ -Bernstein Bezier Patches*

17:50 – 18:10 **Poster:** I. Dimov, A. Penzov, St. Stoilova, N. Mitev, *Diaphony of Uniform Samples over Hemisphere and Sphere*

### Lecture Hall B

**Chairman:** *B. Jovanovic*

10:00 – 10:45 M. Borsuk, *The Transmission Problem For Elliptic Second Order Equations In A Conical Domain*

10:45 – 11:05 A. Andreev, M. Racheva, *Optimal Order FEM for a Coupled Eigenvalue Problem on 2D Overlapping Domains*

11:05 – 11:25 A. Andreev, M. Racheva, *New Approach of FEM for Eigenvalue Problems with Non-local Transition Conditions*

11:25 – 11:45	G. Dimitriu, <u>R. Stefanescu</u> , <i>Numerical Experiments for Reaction-Diffusion Equations Using Spectral Methods</i>
11:45 – 12:05	
<b>Lunch break</b>	
<b>Chairman:</b>	<b>M. Borsuk</b>
14:30 – 15:15	<u>B. Jovanovic</u> , L. Vulkov, <i>Numerical Approximation of Interface and Transmission Problems</i>
15:15 – 15:35	<u>M. Koleva</u> , L. Vulkov, <i>A Two-grid Approximation of an Interface Problem for the Nonlinear Poisson-Boltzmann Equation</i>
15:35 – 15:55	V. Kolmychkov, O. Mazharova, Yu. Popov, <u>O. Shcheritsa</u> , <i>Numerical Study for Rayleigh-Benard Convection in a Rectangular Box</i>
<b>Coffee break</b>	
<b>Chairman:</b>	<b>G. Dimitriu</b>
16:30 – 16:50	<u>L. Bikulciene</u> , Z. Navickas, <i>Expressions of solutions of linear partial differential equations using algebraic operators and algebraic convolution</i>
16:50 – 17:10	D. Marinova, <i>Damping Control Strategies for Vibration Isolation of Disturbed Structures</i>
17:10 – 17:30	V. Marinov, <i>Numerical Approaches to Scientific Information Search Systems</i>
17:30 – 17:50	<u>S. Martyshov</u> , Y. Martyshova, <i>Numerical Simulation of Non-stationary Flow on Block Regular Grids</i>
20:30	WELLCOME PARTY
<b>Wednesday, June 18</b>	
<b>Lecture Hall A</b>	
<b>Minisymposium</b>	<b><i>Reliable Numerical Modelling in Science and Engineering</i></b> (organised by I. Farago and S. Korotov)
<b>Chairman:</b>	<b>I. Farago</b>
10:00 – 10:45	I. Farago, <i>Maximum Principles for the Parabolic Problems</i>
10:45 – 11:05	A. Hannukainen, S. Korotov, <u>T. Vejchodsky</u> , <i>On Weakening Conditions for Discrete Maximum Principles for Linear Finite Element Schemes</i>
11:05 – 11:25	R. Horvath, <i>On the Sign-Stability of the Finite Difference Solutions of Semilinear Parabolic Problems</i>
11:25 – 11:45	<u>I. Lirkov</u> , M. Paprzycki, Y. Vutov, M. Ganzha, <i>Comparative Analysis of High Performance Solvers for 3D Elasticity Problems</i>
11:45 – 12:05	S. Korotov, <i>A technique for goal-oriented a posteriori error estimation</i>
<b>Lunch break</b>	
<b>Chairman:</b>	<b>I. Farago (continue minisymposium)</b>
14:30 – 14:50	<u>I. Pieczka</u> , J. Bartholy, R. Pongracz, A. Hunyady, <i>Analysis of Expected Climate Change in the Carpathian Basin Using a Dynamical climate Model</i>
14:50 – 15:10	T. Szabo, <i>On the discretization time-step in the finite element theta-method of the discrete heat equation</i>
15:10 – 15:30	V. Mosova, <i>How to Choose Basis Functions in Some Meshless Methods</i>
<b>Coffee break</b>	
<b>Chairman:</b>	<b>I. Zemlyanna</b>
16:30 – 16:50	M. Rasulov, V. Kilic, R. Colkesen, <i>Investigated the Quality of Water on</i>

	<i>The Model of Shallow Water Flow Over an Isolated Ring in a Class of Discontinuous Functions</i>
16:50 – 17:10	M. Rasulov, B. Sinsoysal, <i>Efficient Numerical Method of a One-Dimensional Motion of a Two-Phase Fluid Through a Porous Medium in a Class of Discontinuous Functions</i>
17:10 – 17:30	S. Olaru, I. Dumitrache, D. Dumur, <i>Geometrical Analysis of Model Predictive Control. A Parameterized Polyhedra Approach</i> (presented by H. Benlaoukli)
17:30 – 17:50	I. Nasirova, <i>About Accuracy of k-Step Method With The Third Derivatives</i>
17:50 – 18:10	G. Mehdiyeva, V. Ibrahimov, <i>On the Effective Method for Numerical Solving Volterra Integral Equation</i>

### Lecture Hall B

<b>Chairman:</b>	<b>I. Andronov</b>
10:00 – 10:45	A. Vyatkin, <u>V. Shaidurov</u> , G. Shchepanovskaya, <i>The Numerical Spherically Symmetric Modeling of Deep-Seated Geodynamics</i>
10:45 – 11:05	<u>I. Christov</u> , S. Dimova, T. Boyadjiev, <i>Stability and Bifurcation of the Magnetic Flux bound states in Josephson Junctions</i>
11:05 – 11:25	B. Dankovic, <u>P. Rajkovoich</u> , <i>On a Class of Almost Orthogonal Polynomials</i>
11:25 – 11:45	<u>H. Melemov</u> , T. Boyadjiev, <i>Numerical Solution of a Class of Boundary Value Problems Arising in the Physics of Josephson Junctions</i>
11:45 – 12:05	T. Neustupa, <i>Question of Existence and Uniqueness of Solution for Navier-Stokes Equation for Linear "do-nothing" type Boundary Condition on the Outflow</i>

### Lunch break

<b>Chairman:</b>	<b>T. Boyadjiev</b>
14:30 – 15:15	M. Kolev, <i>Mathematical Modelling of Cellular Immune Response to Virus</i>
15:15 – 15:35	L. Kocic, S. Gegovska-Zajkova, E. Babace, <i>Self-affine Fractals Generated by Nonlinear Systems</i>
15:35 – 15:55	<u>V. Arkhipov</u> , A. Glushak, O. Versilina, <i>The Numerical Solution of the Cast Billet Heating Problem with Nonlinear and Nonlocal boundary Conditions of the Radiation Type</i>

### Coffee break

<b>Chairman:</b>	<b>P. Popivanov</b>
16:30 – 16:50	A. Cvetkovic, <i>Orthogonal Systems with Respect to the Complex Borel Measures</i>
16:50 – 17:10	<u>S. Fidanova</u> , E. Alba, G. Molina, <i>Memetic Simulated Annealing for GPS Surveying Problem</i>
17:10 – 17:30	I. Andronov, <i>On the Influence of the Air upon Flexure Waves Diffraction in Thin Elastic Plate</i>
17:30 – 17:50	<u>M. Adyaman</u> , S. Somah, <i>Taylor's Decomposition on Two Points for One Dimensional Bratu Problem</i>

## Thursday, June 19

### Lecture Hall A

<b>Chairman:</b>	<b>S. Korotov</b>
10:00 – 10:45	<u>B. Popov</u> , L. Güermond, V. Dobrev
10:45 – 11:05	<u>A. Slavova</u> , P. Popivanov, <i>Special Type of Nonlinear Waves and Their CNN Realization</i>

11:05 – 11:25	B. Popov, <u>P. Popov</u>
11:25 – 11:45	A. Soloviev, P. Kourbatova, N. Saprounov, <u>S. Shevtsov</u> , <i>The Neural Networks Approach to Identification of Local Damages in Elastic Structures</i>
11:45 – 12:05	R. Stefanescu, G. Dimitriu, <i>Numerical Approximation of a Free Boundary Problem for a Predator-Prey Model</i>

## Lecture Hall B

<b>Minisymposium</b>	<b><i>Robust Numerical Methods for Multiscale Singular Perturbation Problems</i></b> (organised by G. Shishkin and I. Tselishcheva)
<b>Chairman:</b>	<b>G. Shishkin</b>
10:00 – 10:45	G. Shishkin, <i>Higher-Order Accurate Numerical Methods for Singularly Perturbed Parabolic Equations with Discontinuous Initial-Boundary Conditions</i>
10:45 – 11:05	L. Shishkina, G. Shishkin, <i>Grid Approximation of Singularly Perturbed Parabolic Equations on a Ball in the Case of a Third--Kind Boundary Condition</i>
11:05 – 11:25	<u>I. Tselishcheva</u> , G. Shishkin, <i>Sequential and Parallel Schemes of Decomposition of the Method of Lines for a Singularly Perturbed Parabolic Convection-Diffusion Equation</i>
11:25 – 11:45	D. Vasileva, <i>On an Adaptive Semirefinement Multigrid Algorithm for Convection-Diffusion Problems</i>
11:45 – 12:05	O. Kharina, <i>Numerical Method for an Elliptic Problem with the Concentrated Source in a Strip</i>

## Lunch break

13:00	EXCURSION
-------	-----------

## Friday, June 20

## Lecture Hall A

<b>Chairman:</b>	<b>N. Kopteva</b>
10:00 – 10:45	<u>E. O’Riordan</u> , J.Stynes, M. Stynes, <i>An iterative numerical algorithm for a coupled system of singularly perturbed convection diffusion two point boundary value problems</i>
10:45 – 11:05	<u>E. Zemlyanaya</u> , I. Barashenkov, N. Alexeeva, <i>Temporally - Periodic Solutions of the Parametrically Driven Damped Nonlinear Schrödinger Equation</i>
11:05 – 11:25	<u>R. Bawa</u> , V. Kumar, <i>An Efficient Computational Technique For a System of Singularly Perturbed Initial Value Problems</i>
11:25 – 11:45	G. Shishkin, <i>Approximation of Singularly Perturbed Parabolic Equations in Unbounded Domains in the Case of Solutions Growing at Infinity</i>
11:45 – 12:05	

## Lunch break

<b>Chairman:</b>	<b>E. O’Riordan</b>
14:30 – 15:15	N. Kopteva, <i>Maximum norm a posteriori error estimates for singularly perturbed differential equations</i>
15:15 – 15:35	<u>I. Popov</u> , I. Fryazinov, <i>Finite-Difference Method for Computation of the Gas Dynamics Equations with Artificial Viscosity</i>
15:35 – 15:55	D. Simian, <u>C. Simian</u> , <i>Applications of the connection between approximation theory and algebra</i>

## Coffee break

**Chairman:** *V. Ibragimov*

16:30 – 16:50 M. Rasulov, K. Gocer, *The Grid Method for Solving the Traffic Flow Problem on the Highway in a Class of Discontinuous Functions*

16:50 – 17:10 M. Rasulov, H. Kul, *The Numerical Study of a Two-Phase Fluid in a Porous Medium in a Class of Discontinuous Functions*

17:10 – 17:30 D. Simian, *Properties and Applications of Generalized Polynomial Spaces in Three Variables*

17:30 – 17:50 D. Simian, V. Georgiev, Corina Simian, *An Optimization Model For A Network Having Broken Packages*

## Lecture Hall B

**Chairman:** *A. Andreev*

10:00 – 10:45 M. Konstantinov, *Perturbation Bounds for Matrix Products and Numerical Solution of Matrix Equations*

10:45 – 11:05 S. Xiang, *Numerical Quadrature For Bessel Transformations With High Oscillations*

11:05 – 11:25 N. Zhang, *Characteristics of the Group Interest Network*

11:25 – 11:45 Y. Zhou, S. Xiang, *Solving Ordinary Differential Equations by Simplex Integrals*

11:45 – 12:05 N. Elkin, A. Napartovich, V. Troshchieva, D. Vysotski, *Modeling of a vertical cavity surface emitting laser containing a multi-QW heterostructure*

## Lunch break

**Chairman:** *M. Resulov*

14:30 – 14:50 I. Jovanovich, B. Jovanovic, *About a Spectral Problem Containing Dirac Distribution*

14:50 – 15:10 N. Kolkovska, *Numerical Solution of an Elliptic Problem with a Non-standard Interface Condition*

## Coffee break

**Chairman:** *D. Simian*

16:30 – 16:50 J. Kandilarov, *A Coupling Interface Method for a Parabolic-Elliptic Nonlinear Problem*

16:50 – 17:10 M. Altunkaynak, V. Yakhno, *A New Method for Computing a Solution of the Cauchy Problem with Polynomial Data for the System of Crystal Optics*

20:30

CONFERENCE DINNER