**Forth Annual Meeting of the**
**Bulgarian Section of SIAM**
**BGSIAM'09**

# SCIENTIFIC PROGRAM

**The event is hosted by the Institute of Mathematics and Informatics.**
**BGSIAM'09 is devoted to the 140th anniversary of the Bulgarian Academy of Science.**

## Monday, December 21

| | |
|---|---|
| 09:00 – 09:15 | Registration and Coffee Break |

09:15 – 11:30 **SESSION 1**

| | |
|---|---|
| Chairman | S. Margenov |
| 09:30 – 10:10 | Invited Plenary Talk |
| | T. Gramchev, Regularity and Decay Issues for Compactly Supported Solitary Waves |
| 10:10 – 10:50 | Invited Plenary Talk |
| | P. Vassilevski, Approximation Properties of Coarse Finite Element Spaces Constructed by Algebraic Multigrid |
| 10:50 – 11:10 | V. Veliov, Approximation Problems for Differential Multi-Systems |
| 11:10 – 11:30 | P. Popov, Multiscale Simulations of Fluid-Structure Interaction Problems with Applications to Bone Modeling |

| | |
|---|---|
| 11:30 – 13:30 | Lunch Break |
| 13:30 – 14:00 | Organization Meeting of BGSIAM |

14:00 – 15:40 **SESSION 2**

| | |
|---|---|
| Chairman | T. Gramchev |
| 14:00 – 14:40 | Invited Plenary Talk |
| | C. Christov, The Concept of Space as Mechanical Continuum and its Implications in Mathematical Physics |
| 14:40 – 15:00 | V. Gerdjikov, Generalized Zakharov-Shabat Systems and Nonlinear Evolution Equations with Deep Reductions |
| 15:00 – 15:20 | G. Grahovski, R. Ivanov, Camassa-Holm Hierarchy and Soliton Perturbations |
| 15:20 – 15:40 | N. Kostov, V. Gerdjikov, V. Mioc, Exact Solutions for a Class of Integrable Henon-Heiles-Type Systems |

| | |
|---|---|
| 15:40 – 16:10 | Coffee Break |

16:10 – 18:30 **SESSION 3**

| | |
|---|---|
| Chairman | K. Georgiev |
| 16:10 – 16:30 | A. Andreev, M. Racheva, Acceleration of the Convergence for Interpolated Nonconforming Elements |
| 16:30 – 16:50 | J. Kandilarov, A Second-Order Numerical Method for a Free-Boundary Problem in Prise Formation |
| 16:50 – 17:10 | M. Koleva, L. Vulkov, A Two-Grid Method for the Elliptic Monge-Ampere Equation |
| 17:10 – 17:30 | L.Vulkov, Numerical Analysis of Evolution Nonlocal Interface Problems |
| 17:30 – 17:50 | G. Bencheva, How Does Clinical Data Fit into two Leukopoiesis Models? |
| 17:50 – 18:30 | Invited Plenary Talk |
| | E. Nikolov, Computer Nano Viruses |

| | |
|---|---|
| 18:30 | RECEPTION |

**Tuesday, December 22**

08:30 – 10:30    **SESSION 4**

Chairman           A. Slavova

08:30 – 08:50    M. Durchova, R. Georgieva, S. Ivanovska, Numerical Study of Sensitivity Analysis Techniques

08:50 – 09:10    A. Karaivanova, E. Atanassov, S. Ivanovska,T. Gurov, M. Durchova, Parallel Quasi-Monte Carlo Quadratures on the Grid

09:10 – 09:30    S. Fidanova, P. Marinov, K. Atanassov, Adjoint Estimation of Ant Colony Optimization Starts Method

09:30 – 09:50    A. Slavova, V. Rashkova, Nonlinear Dynamics in Cellular Neural Networks

09:50 – 10:10    N. Dobrinkova, Decision Support System with Implementation in Natural Hazards Field Tests

10:10 – 10:30    M. Kostova, V. Djurov,  Application of Artificial Intelligence to Study the Influence of,

Radioholography Image Resolution Accuracy of Recognition of Aircrafts

10:30 – 11:00    Coffee Break

11:00 – 13:00    **SESSION 5**

Chairman           S. Dimova

11:00 – 11:40    Invited Plenary Talk

M. Neytcheva, Challenges for the Iterative Solution of Phase-Separation Flow Problems

11:40 – 12:00    R. Sviercoski, A Hybrid Multiscale Multigrid Approach by Incorporating Analytical Results

12:00 – 12:20    I. Georgiev, S. Margenov, Locally Optimized MIC(0) Preconditioning of Rotated Bilinear FEM Systems

12:20 – 12:40    K. Georgiev, Z. Zlatev, Notes on the Numerical Treatment of Sparse Matrices Arising in a Chemical Model

12:40 – 13:00    N. Kosturski, Scalable PCG Solution Algorithms for μFEM Elasticity Systems

CLOSING

BGSIAM
S. Margenov, Chair
S. Dimova, Vice Chair
A. Slavova, Secretary