New Trends in Mathematics and Informatics

**Jubilee International Conference 60 years
Institute of Mathematics and Informatics
Bulgarian Academy of Sciences**

SCIENTIFIC PROGRAM

**Sofia, Bulgaria
6-8 July, 2007**

All Conference activities will take place in the IMI building in Sofia

Registration of the participants:
      14:00 - 17:00 on Thursday, July 5
      8:30 – 10:00 on Friday, July 6

Friday, July 6, 2007

10:00 – 10:30   Opening ceremony, Room 055

10:30 – 11:00   Coffee break

11:00 – 18:30   Parallel sessions, corresponding to the Conference
                  topics

19:00   Welcome party (in the Institute Cafeteria)

Saturday, July 7, 2007

Parallel sessions

Sunday, July 8, 2007

Parallel sessions

Parallel Sessions

Algebra, Algebraic Geometry and Number Theory

Friday, July 6, 2007, Room 578

11:00-12:30   Algebra and Algebraic Combinatorics - Discussions and
Open Problems

Chair: Drensky V.
13:40-14:00   **Drensky V.** About the Department of Algebra
14:00-14:40   **Ford K**. The Covering Congruence Problems of Pál Erdös
14:40-15:00   **Todorova T. L., Tolev D. I.** Small Fractional Parts of αp for
Primes p of a Special Form
15:00-15:20   **Rangachev A.** Local Solvability of Diagonal Forms in Many
Variables
15:20-15:40   **Chipchakov I.** Multiplicative Structure, Character Groups
and Norm Groups of Quasilocal Fields

15:40-16:10   Coffee Break

Chair: Chipchakov I.
16:10-16:40   **Carini L.** On the Kronecker Product of Schur Functions in
Reduced Notation
16:40-17:10   **Iliev V. V.** On Some Lunn-Senior's Groups of Isomerism of
the Alkanes
17:10-17:30   **Rashkova Ts., Mladenov I.** An Algebraic Approach to
Saxon-Hutner Theorem
17:30-17:50   **Koshlukov P.** Graded Identities and Graded Embeddings
17:50-18:10   **Benanti F., Drensky V.** Defining Relations of Minimal
Degree of the Trace Algebra of 3 x 3 Matrices
18:10-18:30   **Horozov I.** Non-commmutative Two Dimensional Modular
Symbol

Saturday, July 7, 2007, Room 578

Chair: Tomanov G.
10:00-10:20   **Tzigantchev D.** Predegree Polynomials of Plane Configurations in
Projective Space
10:20-10:40   **Iliev A., Manivel L**. Prime Fano Threefolds and Integrable
Systems
10:40-11:00   **Iliev H.** On the Variety of Linear Series on Curves of Gonality at
Most 6

11:00-11:30 Coffee Break

Chair: Iliev V.

11:30-11:50	**Stoimenow A.** Hecke Algebra Representations of Braid Groups and a Conjecture of Jones
11:50-12:10	**Koshlukova D.** Knot-like Groups and Related Topics
12:10-12:40	**Guralnick R. M., Kantor W. M., Kassabov M., Lubotzky A.** Presentations of Finite Simple Groups
12:40-13:00	**Tomanov G.** Locally Divergent Orbits under Actions of Split Tori on Homogeneous Spaces and Applications
13:00-13:20	**Drensky V., Holtkamp R**. Planar Trees, Free Nonassociative Algebras, Invariants, and Elliptic Integrals
13:20-13:40	**May W.L., Mollov T., Nachev N.** Isomorphism of Modular Group Algebras of p-Mixed Abelian Group
13:40-14:00	**Mollov T., Nachev N.** On the Commutative Twisted Group Algebras

Approximation Theory, Numerical Methods and Applications

Friday, July 6, 2007, Room 403

Chair: Ivanov K.

11:00-11:20	**Tachev G. T.** Voronovskaja's Theorem Revisited
11:20-11:40	**Milev L., Naidenov N.** An Extension of the Markov Inequality for the Hermite Weight
11:40-12:00	**Simeonov P., Ismail M.E.H.** q-difference Operators for Orthogonal Polynomials
12:00-12:20	**Jovanović B.** About Some Types of Stability of Operator-Differential Equations and Operator-Difference Schemes
12:20-12:40	**Popova L., Kamberov G., Hristov V., Marinov P.** Intermittent Transport in Magnetically Confined Plasma
12:40-13:00	**Buccella F.** Successes and Perspectives of the Parton Distributions Inspired to Quantum Statistics

Artificial Intelligence

Friday, July 6, 2007, Room 503

Chair: Gerov A.

14:00-14:20	**Gerov A.** Historical notes about AI Department and state of the art
14:20-15:00	*Keynote Talk*: **Popov N., Jebelean T.** Automated Support for the Algorithm Validation
15:00-15:20	**Dimovski I., Spiridonova M.** Operational Calculus Microenvironment in a Computer Algebra System
15:20-15:40	**Grigorov A., Angelov A., Detcheva E.** Using XML and Digital Signatures for Electronic Invoices

15:40-16:10   Coffee Break

Chair: Grigorov A.

16:10-16:30	**Valev V.** Supervised Pattern Recognition with Different Type of Features
16:30-16:50	**Varbanov S., Koychev I.** Software Agents' Architecture for a Business Game
16:50-17:10	**Brimkov V., Barneva R.** Optimally Fast Detection of Repetitions in Two-Dimensional Arrays
17:10-17:30	**Laue R., Nikolova D**. Visualizing t-Designs and t-Wise Balanced Designs

Complex Analysis

Friday, July 6, 2007, Room 256

Chair: Mushkarov O.

14:00-14:30	Opening procedure
14:30-15:05	**Sendov Bl.** Complex Analogues of the Rolle's Theorem
15:05-15:40	**Ramadanoff I.P.** An Integral Transform Generating Elementary Functions in Clifford Analysis

15:40-16:10   Coffee break

16:10-16:30	**Tomovski Z., Pogany T**. Integral Expressions for Mathieu Type Series of Fox's H Function Terms and Certain Related Consequences
16:30-16:50	**Dimovski I., Hristov V.** Commutants of the Dunkl Operators in C(R)
16:50-17:10	**Kiryakova V**. The Role of some Special Functions in Developing Generalized Fractional Calculus and New Integral Transforms
17:10-17:30	**Paneva-Konovska J.** Some Theorems on the Convergence of Series in Generalized Lommel-Wright Functions

Complex and Riemann Geometry

Friday, July 6, 2007, Room 478

Chair: Ganchev G.

11.00-11.10	**Davidov J.** Introduction
11.10-11.40	*Keynote Talk***: Sergeev A.** Harmonic Mappings into Loop Spaces and Yang-Mills Fields
11.40-12.10	*Keynote Talk***: Apostolov V., Tønnesen-Friedman Ch.** Kähler Metrics of Constant Scalar Curvature and Stability of Ruled Complex Surfaces
12.10-12.30	**Grantcharov G.** Remarks on 6 Dimensional Generalized Kähler Manifolds

Chair: Davidov J.

12.30-12.50	**Ganchev G.** A Survey
12.50-13.10	**Ganchev G., Milousheva V.** On the Theory of Surfaces in the Four-Dimensional Euclidean Space
13.10-13.30	**Hristov M.** Barycentric Calculus and Bezier Curves

Computability Theory, Nonclassical Logics and Applications

Saturday, 07.07.2007, Room 503

Chair: Guelev D.

10:00-10:20	**Ivanov L.** Opening
10:20-11:00	**Huisman M., Gurov D.** Reducing Behavioural to Structural Properties of Programs with Procedures

11:00-11:30 Coffee Break

Chair: Ivanov L.

11:30-12:00	**Dimitrov R. D.** Principal Filters in $\mathcal{L}^*(V_\infty)$ and Dependence Degrees of their Irreducible Elements.
12:00-12:30	**Zashev J.** Iterative Extensions of Storing Spaces
12:30-13:00	**Guelev D.** A Syntactical Proof of the Canonical Reactivity Form for Past Linear Temporal Logic
13:00-13:30	**Dobrev D.** The "sunshine" Method for Finding Finite Automata
13:30-14:00	**Sotirov V.** A Realization of Leibniz's Arithmetization of Logic

Digitalization of Scientific and Cultural Heritage

Friday, July 6, Room 055

Chair: Dobreva M.

14:00-14:05	**Dobreva M.** Opening.
14:05-14:40	*Keynote talk:* **Micheal Mac an Airchinnigh**. Digital re-Discovery of Culture & Game of Identity
14:40-15:00	**Mijajlović Ž., Pejović N.** Project: Digitalization of the Serbian Doctoral Dissertations
15:00-15:20	**Krustev D., Aneva S.** Joint Project Initiatives between Central Library of BAS and the Department "Digital Science Heritage" at the Institute of Mathematics and Informatics of BAS

15:20-15:30 Break

15:30-15:50   **Bekiarski A., Shishkov B., Dobreva M.**
High-order Statistics in Blind Image Restoration
15:50-16:10   **Pavlov P., Nisheva-Pavlova M.** Representation of Digitized
Archival Collections: A Case Study
16:10-16:30   **Devreni-Koutsouki A.** Presentation and Use of Heterogeneous
Archival Collections on the Example of the Archive of the
Ministry of Education of Bulgaria
16:30-16:50   **Sameva A.** One Digital Product – Several Issues

16:50-17:00   **Break**

Chair: Krustev D.

17:00-17:20   **Stoyanova N., Prangov G.** The Strategic Framework on
Digitization within the Action Plan for Accelerated Development
of Information Society in Bulgaria, 2007-2010
17:20-17:40   **Sotirova K.** The Digital Access to Bulgarian Artistic Heritage in
the "Age of Access"
17:40-18:10   **Galibov Z.** Development of a Digital Bulgarian Photographic
Collection 'Faces to Remember'
18:10-18:30   **Ognjanovic Z., Dobreva M., Ikonomov N.** South-Eastern
European Digitization Initiative – SEEDI

Educational Strategies in Information Environment

Saturday, July 7, 2007, Room 278

9:00-9:15   **Tabov J.** Presentation of the Department of Mathematics and
Informatics Education (MIE).

Chair: Grozdev S.

9:15 - 9:55   *Keynote talk:* **Sergeeva T.** Technology of Mathematics Teaching
9:55-10:35   *Keynote talk:* **Lazarov B., Vassileva A.** Diagnostics and
Assessment in ICT Organized Mathematical Learning – MITE
Perspective
10:35-10:50   **Gushev A.** Involving Students in Software Design by
Mathematical Projects.

11:05-11:30   **Coffee Breack**

11:30-12:10	*Keynote talk*: **Grozdev S., Chehlarova T.** Problem Solving Activity in Mathematics via the Synthesis of Consisting Actions
12:10-12:25	**Janceski M.** The Main Aspects of the Current Large-Scale Computerization of the Macedonian schools
12:25-12:40	**Wajt I.** (To be announced)
12:40-12:55	**Gortcheva I., Kelevedjiev E., Tabov J.** Information Environment Interdisciplinary Approach to Teaching Mathematics and Informatics
12:55-13:10	**Grozdev S., Baycheva Ts.** Application of Quadratic Functions and Equations to Mathematical Modelling of Practical Problems
13:10-13:25	**Nenkov V.** Euler's Line and Euler's Curve Dependent by a Point
13:25-13:40	**Peeva K.** Organizing the Self-Dependent Work of the Students by the Use of Computer Technologies
13:40-13:55	**Sharkova I.** Developing Imaginary Projection and Creativity using Technology

Equations of Mathematical Physics, Evolutionary PDE and Applications

Friday, July 6, 2007, Room 478

14:00-14:20	**Slavova A.** Introduction, historical notes and state of the art in the domain of Mathematical Physics and Applications
14:20-14:40	**Popivanov P.** Introduction, historical notes and state of the art in Evolutionary PDE and Applications
14:40-15:00	**Dafni G., Karadzhov G.E., Xiao J.** Classes of Measures Generated by Capacities
15:00-15:20	**Fabricant A., Rangelov T.** Doubly Nonlinear Degenerate Parabolic Equations in one Dimension
15:20-15:40	**Gramchev T.** Some Regularity and Decay Issues for Travelling Waves

15:40-16:10	**Coffee Break**

16:10-16:30	**Horozov E.** Trigonometric Calogero-Moser Spaces and Representation Theory
16:30-16:50	**Kutev N**. Comparison Principle for Viscosity Solutions of Fully Nonlinear Elliptic Equations

16:50-17:10	**Mihajlova A**. Estimate for the Number of Zeros of Abelian Integrals along Level Curves of Cubic Hamiltonians
17:10-17:30	**Popivanov P., Slavova A., Zecca P.** Periodic Solutions of the Burgers-Hopf Equation with Small Parameter and Its Cellular Neural Network Model
17:30-17:50	**Slavova A., Markova M.** Polynomial Lotka-Volterra CNN Model: Dynamics and Complexity
17:50-18:10	**Georgiev V.** Uniqueness of Solutions for the Maxwell-Dirac system

Information Systems

Friday, July 6, 2007, Room 503

Chair: Stanchev P.

11:00-11:20	*Keynote talk:* **Peter Stanchev.** Information Research Department
11:20-11:40	**Kr. Markov, Kr. Ivanova, I. Mitov**. Introduction to NISL
11:40-12:00	**G. Simeonov, I. Koychev, J. Bennavail.** Visualization of Association Rules
12:00-12:20	**Bontchev V.** Cryptologic Methods Used in Computer Viruses

Linear Topological Spaces, Banach Spaces and Theory of the Operators in these Spaces

Friday, July 6, 2007, Room 256

Chair: Nedev S.

11.00-11.10	**Troyanski S.** Introduction
11.10-11.50	*Keynote Talk:* **Troyanski S.** Strictly Convex Renormings
11.50-12.30	*Keynote Talk:* **Choban M.** (to be announced)
12.30-12.50	**Dilworth S. J., Kutzarova D., Shuman K., N. Temlyakov V., Wojtaszczyk P.** Weak Convergence of Greedy Algorithms in Banach Spaces

Saturday, July 7, 2007, Room 256

Chair: Troyanski S.

10.00-10.20	**Karassev A., Krupski P., Todorov V., Valov V.** Generalized Cantor Manifolds and Homogeneity

10:20-10:40	**Kirchev K., Borisova G.** Solitonic Combinations and Wave Equations for Pairs of Commuting Non-Selfadjoint Non-Dissipative Operators
10:40-11:00	**Balikov G.I., Dimitrov I.P.** Spaces of Analytic Functions having Representation by Series of Hermit and Laguerre Polynomials
11:00-11:20	**Hakkaev S.** Existence of Solitary Waves for Fifth-Order Generalized Camassa-Holm Equation via Concentration Compactness

Saturday, July 7, 2007, Room 278

Chair: Kirchev K..

14:00-14:20	**Kochinas Lj.** (To be announced)
14:20-14:40	**Dimovski D.** Co Dimension One CoincidenceIndices
14:40-15:00	**Šekutkovski N.** Ends of Nonlocally Connected Spaces
15:00-15:20	**Athanassov Zh.** Stability of Ordinary Differential Equations via Ważewski Topological Principle

Mathematical Linguistics

Friday, July 6, 2007, Room 055

*30 years Department of Mathematical Linguistics
International Conference on Mathematical and Computational
Linguistics*

Chair: Pavlov R.

11:00-11:15	**Pavlov R.** 30 years Department of Mathematical Linguistics
11:15-11:30	**Dimitrova L., Pavlov R.** Digital Bulgarian Language Resources – Specifications, Corpora, Lexica
11:30-11:45	**Pericliev V.** Machine-Aided Linguistic Discovery
11:45-12:00	**Dimitrova L., Koseska-Toszewa V.** Digital Dictionaries – Problems and Features
12:00-12:15	**Braynov S.** Manipulation of Algorithm Input
12:15-12:30	**Derzhanski I.** Mathematics in Linguistic Problems
12:30-12:45	**Kotsyba N.** Slavic Lexical Aspects in the Light of Modern Linguistic Theories
12:45-13:00	**Markov M.** The Reversibility of Graph Layout Multistretchability
13:00-13:10	**Paneva D.** Service-based Architecture for Personalized and Adaptive Access to the Knowledge in Digital Library

13:10-13:20	**Pavlov R., Paneva D., Draganov L., Pavlova-Draganova**. L. Ubiquitous Learning Applications on the Top of Iconographic Digital Library
13:20-13:30	**Rangochev K., Badev V., Paneva D., Luchev D.** Service-oriented Architecture of Bulgarian Folklore Digital Library
13:30-13:45	**Angelova G.** Knowledge Representation and Natural Language Processing
13:45-14:00	**Derzhanski I.** Extracurricular Activities in Linguistics for Secondary School Students

Mathematical Modeling in Biology

Friday, July 6, 2007, Room 278

Chair: Verdonk B.

11:00-11:10	**Markov S.** Opening
11:10-11:30	**Dimitrova N., Markov S.** Modeling of Metabolic Processes
11:30-11:50	**Kiriazov P.** Application of Mathematics in Computational Neuroscience: Optimization of Human Motion Control
11:50-12:10	**Nozhchev M.** Mathematical Modelling of an Influenza Epidemic with the SIR Model
12:10-12:30	**Ronkov A.** A Note about a Type of Difference Equation Connected with Discrete Delay Logistic Model
12:30-12:50	**Ivanov I.** Mathematical Modeling of Genomic Regulation: Issues and Challenges

Operations Research

Friday July 6, 2007, Room 403

Chair: Kenderov P.

14:00-14:20	**Revalski J.** Opening of the Session
14:20-15:00	*Keynote talk:* **Kounchev O.** New Multivariate Shannon-Kotelnikov-Whittaker formula by means of polyharmonic wavelets.
15:00-15:30	**Render H.** Interpolation with Radial Basis Functions on semi-regular grid
15:30-16:10	**Coffee break**

16:10-16:40	**Ivanchev D.** A Fast Algorithm for Solving the Optimum Circulation Problem
16:40-17:10	**Gatev G., Hossain M. A.** Interval Maximum Expected Flow in a Network
17:10-17:40	**Ginchev I., Rocca M.** On Constrained Set-Valued Optimization
17:40-18:10	**Ginchev I., Ivanov V.** Optimization Problems with Quasiconvex Inequality Constraints

Saturday, 07.07.2007, Room 256

Chair: Revalski J.

14:00-14:40	*Keynote talk:* **Todorov M.** Ill-Posedness in Continuous Linear Optimization via Partitions of the Space of Parameters
14:40-15:10	**Georgiev P.** Subdifferential Representation of Submonotone Operators and Applications
15:10-15:40	**Kirov N.** Optimization Models for Parliamentary Elections in Bulgaria

15:40−16:10 Coffee break

16:10-16:40	**Veliov V.** Trading with Emission Permits: Modeling and Preliminary Results
16:40-17:10	**Krastanov M.** On the Small-time Local Controllability of Linear Control Systems
17:10-17:40	**Donchev Tz.** Singularly Perturbed Evolution Inclusions
17:40-18:10	**Prskawetz A., Tsachev Ts., Veliov V.** Age-Specific Dynamic Human Capital Investment

Operations Research for Security

Sunday, July 8, 2007, Room 256

Chair: Tsachev Ts.

10:00-10:10	**Kounchev O.** Opening of the Session
10:10-11:00	*Keynote talk:* **Shalamanov V.** Crisis Management Computer Assisted Exercises for Integrated Security Sector (Governance Model)

11:00–11:30 Coffee break

11:30-12:00	**Minchev Z.** Modelling and Simulation in CAX for Crisis Management

12:00-12:30	**Dukov G.** Optimization of Common Operation Picture Representation in the context of C4ISR Systems
12:30-13:00	**Kelevedjiev E.** Critical Infrastructure as a Network Computational Problem
13:00-13:30	**Tsachev Ts.** Mathematical Models of Evacuation Activities – a Survey
13:30-14:00	**Tsenkov Yu.** Project Risk Management for CAX
14:00-14:30	**Ivanov V.** Characterizations of Quasiconvex and Pseudoconvex Perturbated Functions

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Probability Theory, Mathematical Statistics, Random Processes and their Applications

Sunday, July 8, 2007, Room 403

Chair E.Stoimenova

09:00 -9:30	**Yanev N.** Branching Stochastic Processes in IMI - from Obreshkov up to now
9:30-10:00	**Mitov K., Mitov G**. Randomly Indexed Bienaim´e-Galton-Watson Branching Processes. 9:30-10h
10:00-10:30	**Mutafchiev L**. Survival Probabilities for N-ary Subtrees on a Galton-Watson Family Tree
10:30–11:00	**Pancheva E.** Records, Extremal Processes and Point Processes Approach to a Problem of Epidemiology

11:00–11:30 Coffee break

Chair N.Yanev

11:30-12:00	**Boshnakov G.** Maximum Entropy and Time Series
12:00-12:30	**Stoimenova E.** Nonparametric Estimation of Probability Density With Censored Data
12:30-13:00	**Veleva E.** Test for Independence of the Variables with Missing Elements in One and the Same Column of the Empirical Correlation Matrix

13:00-14:00 Lunch break

Chair E.Pancheva

14:00-14:30	**Filzmoser P.** Robust Principal Components
14:30-15:00	**Neykov N.** The Trimmed Likelihood Methodology

15:00 – 15:30 Coffee break

Chair P.Filzmoser

15:30-16:00	**Todorov V.** Robust Location and Scatter Estimators for Multivariate Analysis in R
16:00-16:30	**Neytchev P., Neykov N.** Stochastic Precipitation Models
16:30-17:00	**Alt R., Lamotte J.-L., Markov S.** Stochastic Arithmetic and its Application for Numerical Problems with Uncertain Data
17:00-17:30	**Popeska Z., Mihova M.** Reliability of k-out-of-n Multi-State System with Standby Components

Scientific Computations

Friday, July 6, 2007, Room 278

Chair: Nikolov G.

14:30 15:20	*Keynote talk:* **Gander W.** Computing Zeros of Polynomials

15:20−15:40 Coffee break

Chair: Gander W.

15:40-16:10	*Keynote talk:* Cuyt A, Golub G., Milanfar P., Verdonk B. Reconstructing Shapes from Moments.
16:10-16:30	**Popova E.** Explicit Characterization of a Class of Parametric Solution Sets
16:30-17:00	**Atanassov, E., T. Gurov, A. Karaivanova, M. Nedjalkov**, **S. Ivanovska, R. Georgieva.** SALUTE - GRID Application for Problems in Quantum Transport. Recent Developments
17:00-17:20	**Markov S., Surilov R.** Visualization Software Tools for Interval And Stochastic Operations
17:20-17:40	**Dimitrova N., Krastanov M.** Nonlinear Adaptive Control of a Model of an Uncertain Fermentation Process

Telecommunications

Saturday, 07.07.2007, Room 478

Chair: Shishkov B.

10:00-10:20   **Shishkov B.** Introduction, Historical Notes andState of the Art in the Telecommunication Research in IMI-BAS

10:20-11:00   *Keynote Talk:* **Shishkov B.** Asymptotic Optimal Algorithms in Statistical Communication Theory

11:00-11:30   Coffee Break

11:30-12:00   **Mirtchev, S.** Study of Queuing Systems with State Dependent Mean Service Time

Chair: Mirchev S.

12:00-12:20   **Goleva R., Goleva M., Atamian D., Nikolov T., Golev At.** Quality of Service System Approximation in All IP Wired and Wireless Networks

12:20-12:40   **Saranova E.** Approach for Network Redimensioning Sensitivity Determination

12:40-13:00   **Poryazov S., Kharkevich D.** Request Life Cycle States in the Terminal Teletraffic Theory

13:00-14:00   Lunch Break

Chair: Poryazov S.

14:00-14:20   **Ganchev I., O'Droma M., Poryazov P., Kalchev N.** Consumer-Driven ABC&S paradigm realization

14:20-14:40   **Dimiev S.** Hight Level Hyper Complex Extentions of the Field of Complex Numbers and the Corresponding Holomorphicity.