Scientific Program[*]

Sections in Mathematics

Algebra and Number Theory

Organizers: Kerope Chakaryan, Luchezar Avramov, Doichin Tolev

V. DRENSKY. Coordinates and automorphisms of polynomial and free associative algebras of rank three.

A. TODOROV. Algebraic discriminants, regularized determinants, higher dimensional analogue of the Dedekind eta function.

M. KASSABOV. Cartesian products as profinite completions and representation growth of groups.

I. CHIPCHAKOV. Galois extensions of primarily quasilocal fields and Brauer groups of stable fields.

P. KOEV. The role of Schur functions in 3D target recognition.

I. HOROZOV. Multiple zeta functions, modular forms, and adeles.

G. TOMANOV. Values of homogeneous forms at integer vectors and tori actions on homogeneous spaces.

F. NICOLAE. On Artin's L-functions.

N. NACHEV. Nilpotent elements and idempotents in commutative rings.

T. MOLLOV. Unit groups of commutative group rings.

S. MIHOVSKI. Resultants and discriminants of the polynomials over commutative rings.

I. MICHAILOV. p-Groups as Galois groups.

D. TOLEV. Sieve methods and squarefree numbers.

K. LAPKOVA. On the equation of Lagrange with almost-prime variables lying in a short interval.

C. YANKOV. On the convex closure of the graph of modular inversions.

T. PENEVA. Large gaps between Hardy-Littlewood numbers.

G. GRIGOROV. Euler systems and lower bounds for Tate-Shafarevich groups.

T. Gateva-Ivanova. Binomial skew polynomial rings, Artin-Schelter regularity, and binomial solutions of the Yang-Baxter equation.

M. Dimitrov. Images of residual Galois representations associated to Hilbert modular forms.

A. Tchernev. Topology of matroids and free resolutions of multigraded modules.

Applied and Computational Mathematics
Organizers: Raytcho Lazarov, Stefka Dimova

B. Popov. L_1 approximation of Hamilton-Jacobi equations.

L. Vulkov. Asymptotic analysis and numerical solution of singularly perturbed elliptic interface problems.

I. Angelova. Finite difference approximations of elliptic problems with intersecting interfaces.

Y. Kandilarov. A finite difference method for an elliptic interface problem arising in flame propagation.

R. Lazarov. Hybridization of interior penalty discontinuous Galerkin methods for second order elliptic problems.

S. Margenov, R. Lazarov. CBS constants for multilevel splitting of Graph-Laplacian and application to preconditioning of discontinuous Galerkin systems.

Z. Seyidmamedov, E. Ozbilge. The mathematical model and numerical solution of the transmission problem in a layered medium for the case of isolation.

H. Kojouharov. Positive and elementary stable nonstandard finite difference methods.

S. Dimova. Adaptive discrete methods, based on the invariant properties of the continuous models.

M. Koleva. Numerical solution of heat-conduction problems on a semi-infinite strip with nonlinear sources.

A. Andreev, M. Racheva. On a new approach to solve numerically some algebraic equations.

Approximation Theory
Organizers: Borislav Bojanov, Pencho Petrushev

K. Ivanov. Weighted approximations.

P. Simeonov. Weighted rational approximation with exponential weights.

G. Kiriazis. Jacobi decomposition of weighted Besov and Triebel-Lizorkin spaces.

I. GEORGIEVA, R. ULUCHEV. Regular schemes for bivariate polynomial reconstruction based on Radon projections.

H.-P. BLATT. Influence of poles in rational approximation automatic ontology acquisition from texts.

G. NIKOLOV. Inequalities for real-root polynomials.

SZ. REVESZ. An extremal problem of Landau – from Landau and Chakalov to Arestov, Kondratiev and further.

R. KOVACHEVA. Zeros, Ostrowski-gaps and overconvergence.

L. MILEV, N. NAIDENOV. Exact Markov inequalities for the Hermite and Laguerre weights.

P. PETRUSHEV. Localized polynomial frames and their application to nonlinear approximation.

B. BOJANOV. Interpolation by bivariate polynomials.

Coding Theory and Cryptography
Organizers: Danyo Danev, Stefan Dodunekov, Vassil Yorgov

V. YORGOV. Modifying self-dual codes.

C. SARAMI. On classification of cyclic self-orthogonal codes.

Z. VARBANOV. Some results for identification for sources.

V. TONCHEV. Finite geometry codes, generalized Hadamard matrices, and Hamada's conjecture.

I. BOUYUKLIEV. Some results on non projective Griesmer codes over F_5.

R. DODUNEKOVA. Recent results on proper error-detecting codes.

E. NIKOLOVA. When a binary proper code performs better in error detection than an 'average code'?

S. NIKOVA. On distributed oblivious transfer.

V. NIKOV. On (proactive) verifiable secret sharing schemes.

P. HRISTOV. New quasi-cyclic quaternary linear codes.

S. KAPRALOV, M. MANEV. New lower bounds on the length of some $(2,3)$ superimposed codes.

V. VAVREK. Building linear codes.

P. KAZAKOV. On the binary CRC codes of minimum distance 4 generated by polynomials with odd weight.

Combinatorics
Organizers: Vladimir Tonchev, Stoyan Kapralov

C. SARAMI. Generalized Hadamard matrices and quantum codes.

V. YORGOV. Circulant weighing matrices.

Y. BORISSOV. Classification of cubic Boolean functions in 7 variables.

S. BOUYUKLIEVA. Doubly-even $[56, 21, 16]$ codes with a prescribed weight enumerator.

J. DOCHKOVA-TODOROVA. New results about minimum number of lattice points, when the conditions for the midpoints of the connecting segments are given.

Z. MATEVA, S. TOPALOVA. Hadamard 2-(63, 31, 15) designs invariant under the dihedral group of order 10.

I. LANDJEV. Point configurations in finite projective Hjelmslev geometries.

S. STOICHEV, P. BOGDANOV, V. KUKENSKA. An algorithm for the largest common subgraph problem with deeper selection.

I. BLUSKOV. On the covering number $C_1(v, 6, 2)$.

S. KAPRALOV. Uniqueness of some optimal superimposed codes.

V. TONCHEV. Combinatorial designs and code synchronization.

Differential Equations
Organizers: Petar Popivanov, Nedyu Popivanov

P. POPIVANOV. Gevrey hypoellipticity and solvability on the multidimensional torus of some classes of linear partial differential operators.

T. GRAMCHEV. Decay and holomorphic extensions for solutions of PDEs in $\mathbb{R}^n$.

S. TERSIAN. Existence results for a semilinear sixth-order ordinary differential equation.

J. CHAPAROVA, L. SANCHEZ. Positive solutions of fourth order singular boundary value problems.

G. BOYADZHIEV. Comparison principle for linear non-cooperative elliptic systems.

T. GYULOV. Mountain pass solutions for a class of nonsmooth fourth-order ordinary boundary value problem.

A. SLAVOVA. Polynomial cellular neural networks for studying complex systems.

N. KUTEV. The Bernstein method and viscosity solutions.

A. ERDEM. Differentiability and Lipschitz property of the cost function related to parabolic optimal control problems.

G. DACHEV. The Dirichlet problem for Tricomi equation.

M. Karatopraklieva. On a nonlocal boundary value problem for a class of nonlinear equations of mixed type.

N. Popivanov, T. Popov, R. Scherer. Asymptotic expansions for singular solutions of Protter problem.

T. Hristov, N. Popivanov. Singular solutions to Protters problem for 3D degenerating hyperbolic equations.

Dynamical Systems
Organizers: Emil Horozov, Lubomir Gavrilov

P. Topalov. On geodesic exponentials maps of the Virasoro group.

A. Stefanov. Attractors for evolution equations – a Fourier analytic approach.

D. Dragnev. Coisotropic intersections and Hamiltonian dynamics.

T. Milanov. Hirotas bilinear equations and spaces of Laurent polynomials in one variable.

A. Zhivkov. Relativistic Keplers laws.

D. Belcheva. Resolution of degree eight algebraic equations by genus three theta constants.

A. Lashkov. Topology and explicit solutions of the Eulers problem of two gravitational centers.

M. Ignatova. Differential Galois theory and nonintegrability of a system from celestial mechanics.

E. Horozov. Bispectral operators.

M. Stanislavova. Recent developments in applications of nonlinear Schrödinger equation in optics.

I. Iliev. Quadratic systems and elliptic curves.

N. Petrov. Critical objects in dynamical systems: regularity, self-similarity, singular measures.

P. Braynova. Nonintegrability of a Hamiltonian system, obtained from nonlinear oscillations of an elastic string.

O. Christov. Near integrability of low dimensional Gross-Neveu models.

Functional Analysis
Organizers: Stanimir Troyanski, Plamen Djakov

P. Djakov. Asymptotics of spectral gaps of the Hill-Schrödinger operator with a two-term potential.

KH. BOYADJIEV. Bounded functional calculus for sectorial and strip operators. Relation to bounded imaginary powers of operators and to operator logarithms.

M. LUKAREVSKI. Characterization of the invertible elements in the quotient Banach algebra $L(X)/K(X)$ induced by projections.

E. TONEVA. The generalized Riemann and Lebesgue integrals through generalized sequences.

D. KUTZAROVA. On strongly asymptotic ℓ_p spaces and minimality.

Geometric Theory of Functions
Organizers: Blagovest Sendov, Dimitar Dimitrov, Petar Rusev

BL. SENDOV, P. MARINOV. On the mean value conjectures of Smale and Tischler.

V. KOSTOV. On the Schur-Szegö composition of polynomials.

D. DIMITROV. Fourier transforms in the Laguerre-Polya class and Riemann hypothesis.

G. NIKOLOV. Limits for the extreme zeros of Gegenbauer polynomials.

E. GODOY. Multivariate generalized Bernstein polynomials.

N. NIKOLOV. Invariant distances and metrics in complex analysis.

Geometry and Mathematical Physics
Organizers: Vasil Tsanov, Ivan Penkov, Tony Pantev,
Chavdar Lozanov, Oleg Mushkarov

I. TODOROV. Unitary positive energy representations of infinite dimensional Lie algebras occurring in conformal field theory.

S. DIMIEV. Analysis and geometry on bi-complex algebras.

V. APOSTOLOV. Kähler metrics of constant scalar curvature on ruled complex surfaces.

A. KASPARIAN. Platonic group action on Picard modular forms – I.

D. GRANTCHAROV. Automorphisms of Lie superalgebras.

M. SPIROVA. On orthogonality in a Minkowski plane.

V. DOBREV. Invariant differential operators and characters of the AdS algebras.

P. MOYLAN. Positive energy representations of quantum anti de Sitter algebras at roots of unity and some applications.

B. ALEXANDROV. Hermitian manifolds with parallel torsion.

V. GERDJIKOV. Riemann-Hilbert problems and integrable nonlinear evolution equations.

Mathematical Logic
Organizers: Dimiter Skordev, Valentin Goranko

T. TINCHEV. Logics with counting modal operators.

T. TINCHEV, M. YANCHEV. Modal operators for rational grading.

O. GERASSIMOV. Modal logic for 3D incidence geometry.

J. ZASHEV. Combinatory spaces or operative spaces with storage operation?

R. DIMITROV. Automorphisms of certain filters of the lattice of computably enumerable vector spaces.

I. SOSKOV. Extensions of the semi-lattice of the enumeration degrees.

G. GEORGIEV, T. TINCHEV. Monadic second order logic on equivalence relations.

P. BALBIANI, C. DUNCHEV, T. TINCHEV. Modal definability over a class of structures with two equivalence relations.

P. MITANKIN, S. MIHOV. Universal Levenshtein automata for a generalization of the Levenshtein distance.

I. PEIKOV. Direct construction of a bimachine for context-sensitive rewriting rule.

V. GORANKO. Infinite state model checking in modal logic.

D. GEORGIEV, T. TINCHEV, D. VAKARELOV. SQEMA – an algorithm for computing first-order correspondences in modal logic: a computer realization.

D. VAKARELOV. Solving recursive equations in complete modal algebras with applications to modal definability.

D. DOBREV. Parallel between definition of chess playing program and definition of AI.

Mathematics Education
Organizers: Gencho Skordev, Kiril Bankov, Ivan Tonov

I. TONOV. Heuristics, the art and craft of problem solving.

K. BANKOV, T. VITANOV. Methods for assessment of student achievement using samples. Some results from studies in Bulgaria.

I. GANCHEV. Acad. N. Obreshkov – student and pedagogue.

J. NINOVA, I. GANCHEV. Part of the pedagogical heritage of Acad. L. Chakalov.

I. TONOV. On some problems of Obreshkov and Chakalov.

D. RAKOVSKA, J. NINOVA, V. BALIGAND. Application of function properties in solving some equation (inequality) types.

T. TONOVA, I. IVANOV. New technologies in mathematics teaching and learning for children.

L. POLITOVA. Back to the traditions of writing textbooks in mathematics.

P. MATEEV, M. SLAVTCHOVA-BOJKOVA. Obreshkov's first course on probability.

Models in Economics and Finance
Organizers: Iordan Iordanov, Svetlozar Rachev

I. GEORGIEV. Functional Poisson convergence in asymptotics for linear processes.

W. SUN, S. RACHEV, F. FABOZZI. Self-similar processes in modeling long-range dependence and heavy tailedness of German equity market volatility.

S. WILKENS, P. STOIMENOV. The pricing of leverage products: an empirical investigation of the German market for long and short stock index certificates.

E. PANCHEVA, I. MITOV. Sum and extremal processes over explosion area.

VL. VELIOV. Present effects of future technological progress: selected results and the mathematics behind.

I. IORDANOV, A. VASSILEV. Optimal relocation strategies for spatially mobile consumers.

K. DIMITROVA. Forecasting the inflation in Bulgaria.

L. MINKOVA, TZ. TZENOVA. Pensionable service modeled by a semi-Markov processes.

R. ROZENOV, M. KRASTANOV. Stackelberg differential games and optimal policies.

P. MANCHEV. Oligopoly model of a debit card network.

S. STOYANOV. Optimal portfolio management in highly volatile markets.

Probability Theory
Organizers: Boyan Dimitrov, Nikolay Yanev

N. M. YANEV. Professor Nikola Obreshkov – the pioneer of the stochastics in Bulgaria. Some results from the renewal theory and their contemporary development.

L. MUTAFCHIEV. Limit theorems for certain random plane partition statistics.

L. MINKOVA. Mixed Polya-Aeppli processes.

P. NEYTCHEV, W. ZUCCHINI, H. HRISTOV, N. NEYKOV. Linking synoptic atmospheric circulation to daily precipitation patterns in Bulgaria.

E. STOIMENOVA, K. PRODANOVA, R. STOJANOVA. Probability forecast of electricity demand.

M. Slavtchova-Bojkova. Branching models applications and statistical inferences.

P. Mayster. Branching processes with autoregressive type control.

D. Atanasov, V. Stoimenova. A system for simulation and estimation of branching processes – an immigration mean example.

Operations Research
Organizers: Asen Donchev, Jordan Mitev

Y. Mitev. BIN-Packing and transportation problems.

Vl. Veliov. Present effects of future technological progress: selected results and the mathematics behind.

R. Rozenov, M. Krastanov. Stackelberg differential games and optimal policies.

Special Functions
Organizers: Ivan Dimovski, Petar Rusev, Virzhinia Kiryakova

I. Dimovski. The N. Obrechkoff integral transform of Bessel type.

T. Tonev. Shift-invariant algebras of analytic functions on compact groups.

Kh. Boyadzhiev. Polyexponencials: Definition and basic properties.

J. Paneva-Konovska. Some theorems on the convergence of series in generalized Bessel-Maitland functions.

Spectral and Scattering Theory
Organizers: Vesselin Petkov, Georgi Popov

G. Raikov. Resonances and singularities of the spectral shift function near the Landau levels.

A. Fabricant, N. Kutev, Ts. Rangelov. On the asymptotic behaviour of the first eigenvalue for linear second order elliptic equations.

S. Bayramov-Gunduz. Joint spectra of family of noncommutative operators.

V. Georgiev. Nonexistence of nonzero resonances for Schrödinger operators with singular perturbations.

A. Stefanov. Strichartz estimates for Schrödinger equations with first order perturbations and applications.

G. Popov, P. Topalov. Spectral rigidity of Liouville billiard tables.

Topology
Organizers: Georgi Dimov, Vesko Valov

L. Kocinac, E. Tymchatyn, D. Dimovski. Diagonalization and cardinal invariants simultaneous linear extensions of uniformly continuous functions $(3, 1, \rho)$-metrizable topological spaces.

V. Valov, T. Banakh. Parametric general position properties.

I. Gotchev, W. Comfort, L. Recoder-Nunez. Continuous factorizations and extensions of functions defined on dense subsets of products.

V. Todorov. Minimal (n, ε)-compacta are Alexandroff manifolds.

M. Najdenova. Uniform coverings – connectedness and lifting of maps.

M. Najdenova, N. Milev, G. Kostadinov. A classification of the uniform coverings.

E. Ivanova, G. Dimov. Construction of all paracompact and all paracompact locally compact extensions of a Tychonoff space.

G. Dimov. Some generalizations of De Vries' and Fedorchuk's duality theorems.

E. Toneva. Nets, filters or generalized sequences and applications.

C. Gunduz, S. Bayramov. On fuzzy exact homotopy sets.

N. Shekutkovski, B. Andonovik. Continuity and path connectedness.

D. Dikranjan. Topological entropy of endomorphisms of compact groups.