New Horizons in Mathematical Physics

Dedicated to the 80th Anniversary of I. V. Volovich

The conference is devoted to current problems of mathematical physics arising in quantum theory, general relativity, and the theory of open quantum systems



SCIENTIFIC TOPICS

- p-adic mathematical physics
- open quantum systems and stochastic limit
- geometric theory of defects
- quantum gravity and cosmology
- black hole singularities, information loss, dualities
- equations of mathematical physics
- real quantum mechanics
- artificial intelligence models and other topics

PROGRAM COMMITTEE

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Andrei Khrennikov
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Sergei Kozyrev
Alexander Pechen
Vsevolod Sakbaev
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Viktor Zharinov
Evgeny Zelenov

Scientific secretary

Daniil Stepanenko: volovich80@mi-ras.ru

OCTOBER 5–9, 2026 · MOSCOW

Steklov Mathematical Institute, RAS
https://www.mathnet.ru/conf2723

МИАН
SIMC
Steklov International Mathematical Center

Monday, 5 October 2026

Time	Speaker	Talk title
10:30	**Registration**	
10:50	**Opening**	
11:00–11:30	**V.V. Kozlov**	Earnshaw's theorem and levitation
11:30–12:00	**D.V. Treschev**	Isonormal potentials in one degree of freedom
12:00–12:30	**Coffee break**	
12:30–13:00	**P. Frampton**	About p-adic Numbers and Professor Igor Volovich on the Occasion of his 80th Anniversary
13:00–13:30	**B. Dragovich**	A Closed Universe with Hybrid Nonlocality
13:30–14:00	**V.S. Anashin**	The "True Randomness" Cannot Be Certified Since Its Very Existence Cannot Be Proven
14:00–15:30	**Lunch**	
15:30–16:00	**E.I. Zelenov**	Planck length and metric geometry
16:00–16:30	**W. Zuniga-Galindo**	p-Adic Quantum Mechanics, Non-locality, and the Measurement Problem
16:30–17:00	**A. Khrennikov**	The Double Covariance Model: A Stochastic Reconstruction of Quantum Entangled States via Interplay of Micro-Macro Time Scales
17:00–20:00	**Conference dinner**	

Tuesday, 6 October 2026

Time	Speaker	Talk title
10:30–11:00	**G.V. Belozerov and A.T. Fomenko**	Generalized Jacobi–Chasles theorem in Minkowski spaces and spaces of constant sectional curvature
11:00–11:30	**S.V. Kozyrev**	How to accelerate grokking
11:30–12:00	**S.Y. Dobrokhotov**	Asymptotics of the Hermitian orthogonal polynomials with two indices: some questions about integrable Hamiltonian systems
12:00–12:30	**Coffee break**	
12:30–13:00	**N. Watanabe**	TBA
13:00–13:30	**V.A. Zagrebnov**	On Trotter product formula for affine semigroups
13:30–14:00	**L. Accardi**	New structures, techniques and results in mathematics and in physics emerged in more than 20 years of collaboration with Igor Volovich and with many researchers related with him
14:00–15:30	**Lunch**	
15:30–16:00	**A.G. Sergeev**	Quantization of the theory of topological insulators
16:00–16:30	**M.D. Missarov**	Renormalization Group on a Generalized Two-Dimensional Hierarchical Lattice
16:30–17:00	**F. Mukhamedov**	p-adic Ising models on ary trees
17:00–17:30	**Tea break**	
17:30–18:00	**V.P. Frolov**	Do Black Holes Need Singularities? The Regular Black Hole Paradigm
18:00–18:30	**V.A. Berezin**	Induced gravity + creation of the universe "from nothing" = Big Bang
18:30–19:00	**V.Zh. Sakbaev**	Piecewise-smooth extension of the Kruskal black hole spacetime and self-adjointness of the Liouville operator
19:00–19:30	**M.O. Katanaev**	Formation of a spherically symmetric black hole by a scalar field
19:30–20:00	**A.F. Zakharov**	Black hole shadows in alternative gravity theories

Wednesday, 7 October 2026

Time	Speaker	Talk title
10:30–11:00	**A.N. Shiryaev**	Non-asymptotic estimation of a parameter in diffusion-type processes
11:00–11:30	**A.S. Holevo**	On a new class of sharp entropy inequalities
11:30–12:00	**A.N. Pechen**	TBA
12:00–12:30	**Coffee break**	
12:30–13:00	**P. Gibilisco**	Solution of the Arnold problem for the α-Proudman–Johnson equations: a celebration of the unity of mathematics
13:00–13:30	**A.S. Trushechkin**	Quantum mechanics with real numbers
13:30–14:00	**G.G. Amosov**	On quantum channels generated by permutations of a fixed basis and their information characteristics
14:00–15:30	**Lunch**	
15:30–16:00	**R. Kerner**	The discrete origin of Lorentz and SU(3) symmetries
16:00–16:30	**V.P. Burskii**	On the traces of the solution of a general linear differential equation in a domain.
16:30–17:00	**F.S. Dzheparov**	Selected problems of nonequilibrium quantum statistical mechanics in neutron physics studies
17:00–17:30	**Tea break**	
17:30–18:00	**V.I. Manko**	TBA
18:00–18:20	**B.O. Volkov**	Lévy Laplacian and Heat Flows of Differential Forms
18:20–18:50	**N.G. Marchuk**	The Lanczos equation (1929) as an unconventional perspective on the Dirac equation (1928): what does it offer?
18:50–19:20	**V.V. Vedenyapin**	Derivation of Hubble's law and the accelerated expansion of the Universe from Hamiltonian dynamics

Thursday, 8 October 2026

Time	Speaker	Talk title
10:30–11:00	**D.O. Orlov**	Noncommitative geometry and geometric realizations
11:00–11:30	**A.I. Shafarevich**	Bundles over Lagrangian manifolds and short-wave asymptotics for hyperbolic equations with jumps of coefficients
11:30–12:00	**A.A. Davydov**	Local and Nonlocal Canonical Forms of Mixed-Type Equations in the Plane
12:00–12:30	**Coffee break**	
12:30–13:00	**L.S. Efremova**	On the Omega-Blowup Phenomenon in Multi-dimensional Smooth Skew Products
13:00–13:30	**A.K. Gushchin**	The Dirichlet problem for a second-order elliptic equation
13:30–14:00	**M.E. Shirokov**	Optimal Hamiltonian for a quantum state with finite entropy
14:00–15:30	**Lunch**	
15:30–15:50	**A.E. Teretenkov**	Long-Time Markovianity beyond Factorized System–Reservoir States
15:50–16:10	**R. Singh**	Quantum Sensitivity of N-Component Cat States
16:10–16:30	**M.G. Ivanov**	Conic singularities in Minkowski geometry
16:30–16:50	**F. Karakus**	Scattering and Tunneling in Real Quantum Mechanics
17:00–17:30	**Tea break**	
17:30–17:50	**A.I. Mikhailov**	20 years of functional mechanics — a new approach to the foundations of thermodynamics
17:50–18:10	**M.A. Khramtsov**	State counting in gravity and maximal entropy principle
18:10–18:30	**D.O. Stepanenko**	Black Hole/Bose gas duality
18:30–18:50	**I.D. Remizov**	Dependence of the convergence rate of Chernoff approximations on the initial condition: a numerical experiment and open questions
18:50–19:20	**J. Wawrzycki**	QFT Hamiltonians on the Einstein Universe

Friday, 9 October 2026

Time	Speaker	Talk title
10:30–11:00	**M.A. Korolev**	The "repulsion" phenomenon for the Riemann zeta function: how do its "distant" zeros know about the "nearby" zeros?
11:00–11:30	**V.I. Bogachev**	On uniqueness of probability solutions to Fokker-Planck-Kolmogorov equations
11:30–12:00	**A.A. Shkalikov**	Direct and inverse spectral problems for the Sturm–Liouville operator and its perturbations
12:00–12:30	**Coffee break**	
12:30–13:00	**E.T. Shavgulidze**	Schwarzian Integrals and Unitary Representations of Diffeomorphism Groups
13:00–13:30	**A.L. Skubachevskii**	Global Solutions of Vlasov–Poisson System and Plasma Confinement
13:30–14:00	**N.A. Rautian**	Finite velocity of propagation of perturbations in the Cauchy problem for the Volterra integro-differential equation arising in viscoelasticity theory
14:00–15:30	**Lunch**	
15:30–16:00	**Z. Rakic**	On a simple model of nonlocal de Sitter Gravity
16:00–16:30	**E.A. Turilova**	Linear Maps Preserving Function Calculus and Entropies
16:30–17:00	**L.B. Tyapaev**	Characterization of Dendrograms via Archimedean, Non-Archimedean, and Gromov–Hausdorff Metrics
17:00–17:30	**Tea break**	
17:30–18:00	**T.V.Dudnikova**	Derivation of the energy transport equation and hydrodynamic equations for a harmonic crystal interacting with a Klein–Gordon field
18:00–18:30	**N.N. Shamarov**	Unitary Fourier transformation of Fock–Smolyanov functional space with Banach domain over Q_p
18:30–19:00	**A.I. Bufetov**	Point processes and multiplicative chaos

Saturday, 10 October 2026

Time	Speaker	Talk title
11:00–11:30	**K. Khachatryan**	Constructive Fixed-Point Principles for Nonlinear Monotone and Strongly Concave Operators in Normal Cones
11:30–12:00	**I.A. Taimanov**	Distribution type solutions to the Novikov-Veselov equation
12:00–12:30	**H. Kaneko**	Riemann–Hurwitz formula for graph morphisms based on recurrent random walk
12:30–13:00	**Dao Van Duong**	On the Hausdorff operator on p-adic vector spaces
13:00–13:20	**O.V. Morzhin**	Optimization of coherent controls for two-qubit gate synthesis in SU(4) dynamics and dissipative two-qutrit dynamics
13:20–13:40	**A.P. Zubarev**	Ultrametric organization of energy landscapes on random Erdős–Rényi graphs: topological origin of barrier hierarchy
13:40–14:00	**I. Matajz**	The Adelic Spectral Cosmos: from Volovich's p-adic physics to spectral geometry and emergent spacetime
14:00–14:20	**I.A. Lopatin**	TBA
14:20–14:40	**Break**	
14:40–15:10	**A.Ya. Burinskii**	Kerr–Newman Electron as a String Quark of Strong Gravity
15:10–15:40	**N.L. Chuprikov**	Asymptotes of non-stationary solutions of the Schrödinger equation for a particle interacting with a one-dimensional δ-potential
15:40–16:10	**I.Ya. Aref'eva**	Real Quantum Field Theory and J-Quantization
16:10–16:40	**I.V. Volovich**	Adventures in Mathematical Physics: A Personal Journey through Spacetime and Beyond

All times: Moscow (MSK, UTC+3). CEST = MSK-1; EDT = MSK-7; JST = MSK$+6$; China Standard Time = MSK$+5$.