

## Nonlinearity, Nonlocality and Ultrametricity

Dragovich 80

### International Conference NONLINEARITY, NONLOCALITY and ULTRAMETRICITY

Belgrade, 26–30. 05. 2025.

#### OPENING PROGRAM

#### Ceremonial Hall of the Serbian Academy of Sciences and Arts

Knez Mihailova Street 35

MONDAY, 26. 05. 2025.			
09.00 – 10.00	60'	Registration	
10.00 – 10.30	30'	Formal Opening	
10.30 – 11.15	45'	Viatcheslav MUKHANOV	<i>Modern Cosmology: Facts, Misconceptions and Myths</i>
11.15 – 12.00	45'	Salvatore CAPOZZIELLO	<i>Avoiding Singularities in Lorentzian-Euclidean Black Holes: The Role of Atemporality</i>
12.00 – 14.00	120'	Cocktail	

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MONDAY, 26. 05. 2025.

#### Serbian Academy of Sciences and Arts (SANU)

Knez Mihailova Street 35

Monday: SESSION – I (ACADEMY: LECTURE HALL 2 at 1st floor)			
14:35 – 15:10	35'	Branislav SAZDOVIC	<i>From Casimir invariants to equations for all spins and helicities</i>
15:10 – 15:45	35'	Voja RADOVANOVIC	<i>BV quantization of braided field theories</i>
15:45 – 16:20	35'	Igor SALOM	<i>Jordanian <math>sl(2)</math> chain</i>
16:20 – 16:50	30'	Coffee Break	
16:50 – 17:25	35'	Marko VOJINOVIC	<i>Operational verification of the existence of a spacetime manifold</i>
17:25 – 18:00	35'	Djordje MINIC*	<i>Quantum Gravity, Gravitized Quantum Theory and all that</i>

\* – online talk

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MONDAY, 26. 05. 2025.

#### Mathematical Institute of the Serbian Academy of Sciences and Arts (MISANU)

Knez Mihailova Street 36

Monday: SESSION – II (MATH. INST: LECTURE HALL 102 at 1st floor)			
14:35 – 15:10	35'	Mihailo CUBROVIC	<i>Ensemble averaging in LLM geometries</i>
15:10 – 15:45	35'	Predrag JOVANOVIC	<i>Possible influence of a fifth force on stellar orbits around the Galactic Center</i>
15:45 – 16:20	35'	Goran DJORDJEVIC	<i>Adelic dynamics and DBI Lagrangians</i>
16:20 – 16:50	30'	Coffee Break	
16:50 – 17:25	35'	Igor PRLINA	<i>Detecting High Frequency Nonlinear Quantum Phenomena Using Weak Measurements</i>
17:25 – 17:50	25'	Kostadin TRENCEVSKI*	<i>A model of universe as harmonic oscillator with periodic and avoided singularities of the mass and energy density</i>

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TUESDAY, 27. 05. 2025.

#### Serbian Academy of Sciences and Arts (SANU)

Knez Mihailova Street 35

Tuesday: PLENARY SESSION (ACADEMY: LECTURE HALL 2 at 1st floor)			
8:30 – 9:05	35'	Milivoj BELIC*	<i>Self-accelerating Scorer beams</i>
9:05 – 9:40	35'	Miguel A.F. SANJUAN	<i>Exploring Noisy Hamiltonian Dynamics</i>
9:40 – 10:15	35'	Radu CONSTANTINESCU	<i>Generalized second order NPDEs with similar classes of solutions</i>
10:15 – 10:45	30'	Coffee Break	
10:45 – 11:20	35'	Evgeny ZELEN OV	<i>Planck length and metric geometry</i>
11:20 – 11:55	35'	Wilson ZUNIGA-GALIDO	<i>p-Adic Quantum Mechanics, Quantum Walks, and the Discreteness of Space</i>
11:55 – 12:30	35'	Vladimir OSIPOV	<i>Ultrametricity in physics of complex systems: from proteins to quantum chaos</i>
12:30 – 14:00	90'	LUNCH	

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Tuesday: SESSION – I (ACADEMY: LECTURE HALL 2 at 1st floor)			
14:00 – 14:35	35'	Paul SORBA	<i>Fifty years of Group Theory in Particle Physics and Beyond</i>
14:35 – 15:10	35'	Khodr SHAMSEDDINE	<i>Lebesgue-like measure and integration theory on Jordanian <math>sl(2)</math> chain</i>
15:10 – 15:45	35'	Debashis GHOSHAL	<i>Stuart-Landau Oscillator: Variations on a theme</i>
15:45 – 16:15	30'	Coffee Break	
16:15 – 16:50	35'	Miroslava VUKCEVIC	<i>Scattering of UHECR at small pitch angle by plasma wave turbulence</i>
16:50 – 17:25	35'	Vladimir ANASHIN*	<i>The <math>p</math>-adic view on causality and "true randomness"</i>
17:25 – 18:00	35'	Vladimir DOBREV*	<i>Langlands Duality and Invariant Differential Operators</i>

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14:00 – 14:35	35'	Sarthak PARIKH	<i>Holography on Bruhat-Tits Buildings</i>
14:35 – 15:10	35'	Ilaria SVAMPA	<i>Towards <math>p</math>-adic quantum computing via representations of the <math>p</math>-adic rotation group</i>
15:10 – 15:45	35'	Vincenzo PARISI	<i>Towards a theory of entanglement in <math>p</math>-adic quantum information</i>
15:45 – 16:15	30'	Coffee Break	
16:15 – 16:50	35'	Sergei KOZYREV	<i>Learning theory as physics</i>
16:50 – 17:25	35'	Patrick Erik BRADLEY	<i>Towards <math>p</math>-adic boundary value problems</i>
17:25 – 17:50	25'	Angel MORAN LEDEZMA	<i>Time-varying energy landscapes and temperature paths: Dynamic transition rates in locally ultrametric complex systems</i>

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#### Serbian Academy of Sciences and Arts (SANU)

Knez Mihailova Street 35

#### Wednesday: PLENARY SESSION (ACADEMY: LECTURE HALL 2 at 1st floor)

8:30 – 9:05	35'	Joseph BUCHBINDER	<i>Effective action in six-dimensional supersymmetric gauge theories</i>
9:05 – 9:40	35'	Evgeny IVANOV	<i>Amazing Efficiency of the Harmonic Superspace Methods</i>
9:40 – 10:15	35'	Alexey ISAEV	<i>Feynman diagrams, operator formalism and conformal field theory</i>
10:15 – 10:45	30'	Coffee Break	
10:45 – 11:20	35'	Natasa PRZULJ	<i>New AI Methods for Simplifying Multi-Omics Data Analyses in Precision Medicine</i>
11:20 – 11:55	35'	Andrzej BOROWIEC	<i>Scalar-tensor cosmology: unifying metric, Palatini and hybrid approaches</i>
11:55 – 12:30	35'	Aleksandar MIKOVIC	<i>Wavefunction of the Universe and the effective action</i>
13:00 – 21:00		EXCURSION	

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THURSDAY, 29. 05. 2025.

#### Serbian Academy of Sciences and Arts (SANU)

Knez Mihailova Street 35

#### Thursday: PLENARY SESSION (ACADEMY: LECTURE HALL 2 at 1st floor)

8:30 – 9:05	35'	Ignatios ANTONIADIS	<i>Landscape, Swampland and Extra Dimensions</i>
9:05 – 9:40	35'	George SAVVIDY	<i>Landscape of QCD Vacuum</i>
9:40 – 10:15	35'	Alexey KOSHELEV	<i>Resolution of singularities in infinite-derivative gravity theories</i>
10:15 – 10:45	30'	Coffee Break	
10:45 – 11:20	35'	George ZOUPANOS	<i>Unification of Conformal and Fuzzy Gravities with Internal Interactions based on the <math>SO(10)</math> GUT</i>
11:20 – 11:55	35'	Tristan HUBSCH	<i>Beyond Algebraic Solutions to Stringy Spacetime</i>
11:55 – 12:30	35'	Dejan STOJKOVIC	<i>Signals of the doomsday</i>
12:30 – 14:00	90'	LUNCH	



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Thursday: SESSION – I (ACADEMY: LECTURE HALL 2 at 1st floor)			
14:00 – 14:35	35'	Andrei POGREBKOV	<i>Quantization of modified KdV (Boson-Fermion correspondence)</i>
14:35 – 15:10	35'	Vladimir DRAGOVIC	<i>Isoperiodic deformations of meromorphic differentials on Riemann surfaces and applications to Mathematical Physics</i>
15:10 – 15:45	35'	Bozidar JOVANOVIC	<i>Magnetic flows on spheres</i>
15:45 – 16:15	30'	Coffee Break	
16:15 – 16:50	35'	Boris MALOMED*	<i>A review: basic fractional nonlinear-wave models and solitons</i>
16:50 – 17:25	35'	Bosiljka TADIC*	<i>The origin of multiscale synchronization in human connectome networks</i>
17:25 – 18:00	35'	Vladimir SKARKA*	<i>Generalization of Boltzmann nonlinear equation using subdynamics approach</i>
19:30 – 23:30		CONFERENCE DINNER	

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14:00 – 14:35	35'	Natasa MISIC	<i>Scale-free computing inspired by the genetic code</i>
14:35 – 15:10	35'	Elena FIMMEL	<i>Quantum-like modelling of the genetic code</i>
15:10 – 15:45	35'	Salvatore CAPOZZIELLO	<i>The Chern-Simons current in systems of DNA-RNA transcriptions</i>
15:45 – 16:15	30'	Coffee Break	
16:15 – 16:50	35'	Emilio ELIZALDE	<i>Zeta functions in Physics: a comprehensive review</i>
16:50 – 17:25	35'	Jelena STANKOVIC	<i>Cosmological solutions of a nonlocal de Sitter <math>\sqrt{dS}</math> gravity</i>
17:25 – 17:50	25'	Ivan DIMITRIJEVIC	<i>Nonlocal de Sitter <math>\sqrt{dS}</math> gravity model and its local description</i>
19:30 – 23:30		CONFERENCE DINNER	

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Friday: PLENARY SESSION (ACADEMY: LECTURE HALL 2 at 1st floor)			
8:30 – 9:05	35'	Irina AREFEVA*	<i>On relations between the real Kähler and the complex Hilbert Spaces quantum mechanics</i>
9:05 – 9:40	35'	Igor VOLOVICH*	<i>Real Quantum Mechanics in a Kähler Space</i>
9:40 – 10:15	35'	Dmitry KAZAKOV*	<i>Quantum corrections to cosmological potentials and the origin of the cosmological constant</i>
10:15 – 10:45	30'	Coffee Break	
10:45 – 11:20	35'	Nediljko BUDISA	<i>Rewriting life's alphabet: Genetic code expansion and the rise of Xenobiology</i>
11:20 – 11:55	35'	Marko DJORDJEVIC	<i>Nonlinear Dynamics of Toxin-Antitoxin Systems in Regulating Gene Transfer and Persistence</i>
11:55 – 12:30	35'	Amare ABEBE	<i>Some cosmological viability constraints of modified gravity</i>
12:30 – 14:00	90'	LUNCH	

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14:00 – 14:35	35'	Sergei ODINTSOV*	<i>Cosmic evolution and black holes in modified gravity</i>
14:35 – 15:10	35'	Emmanuel SARIDAKIS*	
15:10 – 15:45	35'	Alexander ZAKHAROV*	<i>Cosmology: 100 years after A. A. Friedmann</i>
15:45 – 16:15	30'	Coffee Break	
16:15 – 16:50	35'	Sergey VERNOV*	<i>New slow-roll approximations for inflationary models with the Gauss-Bonnet term and nonminimal coupling</i>
16:50 – 17:25	35'	Ekaterina POZDEEVA*	<i>Primordial Black Holes in Induced Gravity</i>
17:25 – 17:35	10'	CLOSING (Lecture Hall of SESSION II)	

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14:00 – 14:35	35'	Andrei KHRENNIKOV*	<i>Ultrametrics, dendrograms, quantum potential and medical diagnostics of neurological diseases</i>
14:35 – 15:10	35'	Farukh MUKHAMEDOV*	<i>p-Adic countable state SOS model</i>
15:10 – 15:45	35'	Mukadas MISSAROV*	<i>Fixed points of the renormalization group transformation in a generalized fermionic hierarchical model</i>
15:45 – 16:15	30'	Coffee Break	
16:15 – 16:50	35'	Trond DIGERNES*	<i>Non-Archimedean Test Function Spaces: A Discussion</i>
16:50 – 17:25	35'	David WEISBART*	<i>Brownian Motion in the p-Adic Integers is a Limit of Discrete Time Random Walks</i>
17:25 – 17:35	10'	CLOSING	

\* – online talk