

# Programme of the International Conference “Mathematical Physics, Dynamical Systems and Infinite- Dimensional Analysis-2021” (MPDSIDA)

The Moscow time is used (UTC+3)

## June 30, Wednesday

### Morning plenary session

*Chair: V. Zh. Sakbaev*

10.00–10.30 *Opening*

10.30–11.00 A. M. Raigorodskii: *Modularity in graphs*

11.10–12.00 D. V. Treschev: *Volume preserving diffeomorphisms as Poincare maps for volume-preserving flows*

*Break*

*Chair: L. S. Efremova*

12.20–13.10 I. V. Volovich: *Integrability and chaos*

13.20–14.10 O. G. Smolyanov: *Function integrals and quantum anomalies*

*Lunch*

### Afternoon plenary session

*Chair: V. Zh. Sakbaev*

15.10–16.00 V. V. Nekrashevich: *Growth of simple groups*

16.10–17.00 L. Accardi: *Orthogonal polynomials and the program of quadratic quantization*

*Break*

*Chair: L. S. Efremova*

17.20–18.10 M. Misiurewicz: *Topological entropy of Bunimovich stadium billiards*

## July 1, Thursday

### Morning plenary session

*Chair: V. Zh. Sakbaev*

10.00–10.50 F. A. Sukochev: *Singular traces and the density of states*

11.00–11.50 Sh. A. Ayupov: *Ring isomorphisms of Murray–von Neumann Algebras*

*Break*

### Parallel sessions

*Chair: L. S. Efremova*

12.15–12.55 A. A. Glutsyuk: *Dynamical systems on torus modeling Josephson junction, isomonodromic deformations and Painlevé 3 equations*

13.00–13.40 A. I. Bufetov: *Interpolation for determinantal point processes*

*Lunch*

*Chair: A. A. Glutsyuk*

15.00–15.30 M. Malkin and K. Safonov: *Monotonicity criterion of topological entropy and kneading invariants for Lorenz families*

15.35–16.05 A. V. Ivanov: *Primary and secondary collisions of linear cocycles over irrational rotations*

16.10–16.50 A. O. Kazakov: *On bifurcations of Lorenz attractors in the Lyubimov–Zaks model*

16.55–17.35 P. Oprocha: *On typical properties of Lebesgue measure preserving maps in dimension one*

*Break*

*Chair: S. I. Bezrodnykh*

12.15–12.55 S. Yu. Dobrokhotov: *Semiclassical approach for the effective Plancherel–Rotach type asymptotics of multiple Hermitian orthogonal polynomials*

13.00–13.40 A. L. Skubachevskii: *Stationary solutions of Vlasov–Poisson system and plasma confinement in Tokamak*

*Lunch*

*Chair: A. L. Skubachevskii*

15.00–15.30 E. V. Martynov: *Decay of solutions to damped Kawahara equation*

15.35–16.05 O. V. Solonukha: *On periodic solutions of parabolic problems with nonlocal boundary conditions*

16.10–16.50 S. L. Skorokhodov and V. I. Vlasov: *On the problem of cavern closure when an ideal fluid flows around an obstacle*

16.55–17.35 S. I. Bezrodnykh: *Analytic continuation of the multiple hypergeometric functions and some applications*

*Break*

*Chair: A. S. Trushechkin*

12.15–12.55 R. Kostecki: *Brègman relative entropies and nonexpansive operators over state spaces of  $W^*$ - and JBW-algebras*

13.00–13.40 O. N. Erkursun: *Ergodicities and spectral conditions for Markov operators on abstract states spaces*

*Lunch*

*Chair: V. Zh. Sakbaev*

15.00–15.30 Yu. N. Drozhzhinov: *On a problem in Tauberian theory*

15.35–16.05 E. V. Lipacheva: *Graded semigroup  $C^*$ -algebras and Banach modules*

16.10–16.50 S. G. Khaliullin: *Event structures and ultraproducts*

16.55–17.35 R. N. Gumerov: *Inductive limits for sequences of  $C^*$ -algebras*

*Break*

### Evening plenary session

*Chair: L. S. Efremova*

18.00–18.50 V. Yu. Protasov: *TBA*

19.00–19.50 R. Lozi: *Mug-shaped branched manifold as geometrical model of bursting neuron*

## **July 2, Friday**

### Morning plenary session

*Chair: L. S. Efremova*

10.00–10.50 R. I. Grigorchuk: *Images of Markov measures under automaton coding*

11.00–11.50 M. L. Blank: *Dynamics of torus piecewise isometries*

*Break*

Parallel sessions

Stepin's memorial session

*Chair: O. N. Ageev*

12.15–12.55 V. V. Ryzhikov: *Entropy invariants of generic measure-preserving actions*

13.00–13.40 X. Ye: *Nilpotent structures in topological dynamics*

*Lunch*

Stepin's memorial session

*Chair: V. V. Ryzhikov*

15.00–15.30 A. Yu. Zhironov: *On one small problem about one-dimensional Williams solenoids*

15.35–16.05 M. E. Lipatov: *On ergodic theorems for flows and generalized Lyapunov exponents*

16.10–16.50 A. V. Kochergin and A. B. Antonevich: *The Hausdorff dimension of the Besicovitch set and the velocity tending to infinity*

16.55–17.35 O. N. Ageev: *Joinings realizations of measurable dynamical systems*

*Break*

*Chair: A. S. Trushechkin*

12.15–12.55 J. Anders: *Weak and ultrastrong coupling limits of the quantum mean force Gibbs state*

13.00–13.40 A. Das, A. Bera, and S. Chakraborty: *Thermodynamic quantities in quantum speed limit for non-Markovian dynamics*

*Lunch*

*Chair: J. Anders*

15.00–15.30 A. S. Trushechkin: *Quantum master equation for a system with strong decoherence*

15.30–16.10 A. E. Teretenkov: *Quantum Markovian dynamics after bath correlation time*

16.15–16.55 Á. Rivas: *The problem of quantum Markovianity for noninvertible dynamical maps*

17.00–17.40 M. Cattaneo: *Collision models can efficiently simulate any multipartite Markovian quantum dynamics*

*Break*

*Chair: E. A. Turilova*

12.15–12.55 V. Zh. Sakbaev: *Random Hamiltonian flows on infinite dimensional phase space*

13.00–13.40 N. N. Shamarov: *Generalized Lebesgue type measure as the limit of countable additive measures*

*Lunch*

*Chair: N. N. Shamarov*

15.00–15.30 K. Yu. Zamana: *Averaging of random operator semigroup of orthogonal transformations*

15.35–16.05 V. M. Busovikov: *Construction of one finitely additive measure on the Hilbert space using the direct limit*

16.10–16.50 E. A. Turilova: *Linearity of maps on operator algebras*

16.55–17.35 Yu. N. Orlov: *Approximation of Weyl quantization by linear one and generalized equation for evolution of Wigner function*

*Break*

#### Evening plenary session

*Chair: V. Zh. Sakbaev*

18.00–18.50 B. M. Gurevich: *Some old and new problems in the thermodynamic formalism of countable state Markov chains*

19.00–19.50 K. Khanin: *On stationary solutions to the stochastic heat equation*

## **July 3, Saturday**

#### Morning plenary session

*Chair: L. S. Efremova*

10.00–10.50 V. V. Vedenyapin: *On the derivation of the equations of electrodynamics and gravity from the principle of least action*

11.00–11.50 B. Dragovich: *Nonlocal gravity and its cosmology*

*Break*

12.15–13.40 Poster session

A. Bera: *No causal order and topological phases*

T. Bezryadina: *System of interacting magnon Bose-Einstein condensates: spectrum and eigenstates*

A. A. Imomov and Z. A. Nazarov: *Limit theorems for a sum of random variables of a special form of random variables*

V. Litvinov: *Математическое моделирование колебаний неограниченной струны с движущейся границей в нелинейной постановке*

E. A. Wase: *On nonexistence of weak solutions for higher order nonlinear singular parabolic inequalities with nonlocal source term*

*Lunch*

Parallel sessions

*Chair: M. E. Lipatov*

15.00–15.30 N. G. Gelfreikh and A. V. Ivanov: *Normal form of a slow-fast system with an equilibrium near folded slow manifold*

15.35–16.05 E. N. Makhrova: *To the question on the existence of periodic points of continuous maps on dendrites*

16.10–16.50 L. A. Kalyakin: *Asymptotics of dynamic Andronov-Hopf bifurcation*

16.55–17.35 L. S. Efremova: *On the space of smooth geometrically integrable maps in the plane*

*Break*

*Chair: A. O. Remizov*

15.00–15.40 T. A. Shaposhnikova: *Appearance of a nonlocal monotone operator in the limit problem when homogenizing the  $p$ -Laplace operator in a domain perforated along manifold with nonlinear dynamic boundary conditions*

15.40–16.20 V. B. Vasilyev: *On some elliptic problems with an integral condition*

16.20–17.00 M. V. Klivanov: *Carleman estimates for globally convergent numerical methods for coefficient inverse problems*

17.00–17.40 A. B. Muravnik: *Dirichlet problem in half-spaces for elliptic differential-difference equations*

*Break*

*Chair: A. E. Teretenkov*

15.00–15.30 O. V. Morzhin and A. N. Pechen: *Estimation of reachable and controllability sets for an open two-level quantum system driven by coherent and incoherent controls*

- 15.35–16.05 B. O. Volkov, O. V. Morzhin, and A. N. Pechen: *Quantum control landscape for phase shift quantum gates*
- 16.10–16.50 V. N. Petruvanov and A. N. Pechen: *On gradient of the control objective for a qubit driven by coherent and incoherent controls*
- 16.55–17.35 A. M. Basharov: *The effective Hamiltonian as a necessary basis of the quantum open system theory*

*Break*

#### Evening plenary session

*Chair: V. Zh. Sakbaev*

- 18.00–18.50 J. Gough: *Feedback, fractional linear transformations & Quantum open systems*
- 19.00–19.50 E. T. Shavgulidze: *Methods of calculation of the Schwarzian integrals*

### **July 5, Monday**

#### Morning plenary session

*Chair: V. Zh. Sakbaev*

- 10.00–10.50 A. S. Holevo: *Singular perturbations of quantum dynamical semigroups*
- 11.00–11.50 A. Ya. Helemskii: *Free and projective generalized multinormed spaces*

*Break*

#### Parallel sessions

*Chair: I. A. Andreeva*

- 12.15–12.55 J. Boronski: *Densely branching trees as models for Hénon-like and Lozi-like attractors*
- 13.00–13.40 A. O. Remizov: *Hyperbolic Rousarie vector fields*

*Lunch*

*Chair: A. O. Remizov*

- 15.00–15.30 R. Halfar: *Chaotic motions of cardiac electrophysiology*
- 15.30–16.00 I. A. Andreeva: *Phase portraits belonging to polynomial dynamic systems*
- 16.00–16.30 O. S. Yazovtseva: *Investigation of stability of an averaged catalyst oxidative regeneration model*
- 16.35–17.05 Ch. Pittet: *Continuity of the IDS for some discrete Schrödinger operators*

*Break*

*Chair: A. B. Sukhov*

12.15–12.55 I. Kh. Musin: *Toeplitz operators with separately radial symbols on Fock type spaces*

13.00–13.40 K. Yu. Fedorovskii: *Uniform approximation by polynomial solutions of second-order elliptic equations and systems on plane compact sets*

*Lunch*

*Chair: K. Yu. Fedorovskii*

15.00–15.30 S. A. Budochkina: *On symmetries and algebraic structures in the mechanics of infinite-dimensional systems*

16.10–16.50 A. B. Sukhov: *Some news from the Levi-flat world*

16.55–17.35 R. N. Garifullin: *Semidiscrete hyperbolic type equation. Method of generalized symmetries*

*Break*

*Chair: B. O. Volkov*

12.15–12.55 G. G. Amosov: *On capacity of quantum channels generated by irreducible unitary representation of finite groups*

13.00–13.40 M. E. Shirokov: *Finite-dimensional approximation property of quantum states and its use*

*Lunch*

*Chair: G. G. Amosov*

15.00–15.30 A. S. Mokeev: *On non-commutative operator graphs defined via various unitary groups*

15.30–16.10 S. N. Filippov: *Information properties of trace decreasing quantum operations*

16.10–16.50 D. Chruściński: *Random generators of Markovian evolution: A quantum to classical transition by superdecoherence*

16.55–17.35 K. Siudzińska: *Interpolating between positive and completely positive maps: a new hierarchy of entangled states*

*Break*

### Evening plenary session

*Chair: L. S. Efremova*

18.00–18.50 S. B. Kuksin: *Long-time behaviour of solutions for nonlinear PDEs with bounded random forces*

19.00–19.50 E. Yu. Panov: *On differential equations on the Bohr compact*



## July 6, Tuesday

### Morning plenary session

*Chair: L. S. Efremova*

10.00–10.50 A. G. Sergeev: *On mathematical problems in the theory of topological insulators*

11.00–11.50 M. A. F. Sanjuan: *Partial control and beyond: Forcing escapes and controlling chaotic transients with the safety function*

*Break*

### Parallel sessions

*Chair: M. V. Demina*

12.15–12.55 Yu. A. Kordyukov: *Berezin–Toeplitz quantizations associated with Landau levels of the Bochner Laplacian on a symplectic manifold*

13.00–13.40 N. I. Zhukova: *Chaotic behavior of Cartan foliations*

*Lunch*

*Chair: Yu. A. Kordyukov*

15.00–15.30 S. Ya. Startsev: *Two-point invertible transformations and Darboux integrability of discrete equations*

15.35–16.05 S. Minkov: *Attractors of direct products*

16.10–16.50 M. V. Demina: *W-meromorphic solutions of autonomous ordinary differential equations and related topics*

16.55–17.35 E. V. Zhuzhoma: *Two-dimensional attractors of A-flows and fibered links on 3-manifolds*

*Break*

*Chair: E. S. Baranovskii*

12.15–12.55 A. V. Faminskii: *Initial-boundary value problems on a half-strip for the Zakharov-Kuznetsov equation and its modification*

13.00–13.40 S. E. Pastukhova: *Resolvent approximations in homogenization of high order operators*

*Lunch*

*Chair: A. V. Faminskii*

15.00–15.30 E. S. Baranovskii: *Three-dimensional model for the steady-state fluid flow in a pipe network: existence analysis*

- 15.35–16.05 Yu. Belyaeva: *System of interacting magnon Bose–Einstein condensates: spectrum and eigenstates*
- 16.10–16.50 V. A. Sloushch and T. A. Suslina: *Homogenization of fourth order periodic elliptic operator*
- 16.55–17.35 A. V. Kalinin, A. A. Busalov, O. A. Izosimova, and A. A. Tyukhtina: *Application of order structures in the study of some classes of nonlinear problems of mathematical physics*

*Break*

*Chair: I. G. Tsar'kov*

- 12.15–12.55 G. E. Ivanov: *Approximative properties of weakly and strongly convex sets*
- 13.00–13.40 V. K. Zakharov: *Characterization of the extension of lattice linear space of continuous bounded functions, generated by  $\mu$ -Riemann-integrable functions, by means of order boundaries*

*Lunch*

*Chair: G. E. Ivanov*

- 15.00–15.30 I. Jabbarov and N. Allahyarova: *Fredholm type of integral equations in the space of Bohr almost periodic functions*
- 15.35–16.05 Y. M. Mukhsinov: *A quasilinear differential game of neutral type with integral constraints in a Hilbert space*
- 16.10–16.50 I. G. Tsar'kov: *Mach disks and caustic reflections, caustics, application to astrophysics*
- 16.55–17.35 A. S. Andreev and O. A. Peregudova: *Dynamical properties of differential equations with a discontinuous right-hand side and the principle of quasi-invariance*

*Break*

#### Evening plenary session

*Chair: V. Zh. Sakbaev*

- 18.00–18.50 S. Bianchini: *Differentiability in measure of the flow associated to a nearly incompressible BV vector field*
- 19.00–19.50 V. V. Zharinov: *A model of relativistic dynamics*

## July 7, Wednesday

### Morning plenary session

*Chair: L. S. Efremova*

10.00–10.50 N. Watanabe: *Note on complexity for the quantum dynamical systems*

11.00–11.50 V. I. Oseledets: *The Garsia entropy and related questions*

*Break*

### Parallel sessions

*Chair: D. A. Kulikov*

12.15–12.55 A. S. Andreev and O. A. Peregudova: *Dynamical properties of Volterra integro-differential equations and Lyapunov direct method in the stability study*

13.00–13.40 V. A. Adarchenko, S. M. Voronin, and A. V. Panov: *Spherically symmetric flows of a rarefied two-phase fluid*

*Lunch*

*Chair: L. E. Rossovskii*

15.00–15.40 A. N. Kulikov and D. A. Kulikov: *Attractors of the nonlocal Ginzburg–Landau equation*

15.40–16.10 A. A. Belyaev: *Multipliers on periodic Bessel potential spaces: description theorems and applications to uniform resolvent approximation problem for Laplace type operators*

16.10–16.50 L. A. Beklaryan: *On the existence of bounded soliton solutions in the problem of longitudinal vibrations of an elastic infinite rod in a field with a nonlinear potential of general form*

16.55–17.35 V. V. Vlasov and N. A. Rautian: *Spectral analysis of Volterra integro-differential equations and associated operator semigroups*

*Break*

*Chair: M. A. Dorodnyi*

12.15–12.55 D. I. Borisov: *On bifurcations of essential spectrum under singular geometric perturbation*

13.00–13.40 V. V. Kapustin: *The set of zeros of the Riemann zeta function as the spectrum of an operator*

*Lunch*

*Chair: D. I. Borisov*

- 15.00–15.30 Yu. A. Tikhonov: *On analyticity of solution of the integrodifferential equation, arising in viscoelasticity*
- 15.35–16.05 A. Takase: *On the spectra of separable 2D almost Mathieu operators*
- 16.10–16.50 M. A. Dorodnyi: *Operator error estimates for homogenization of the nonstationary Schrödinger-type equations: sharpness of the results*
- 16.55–17.35 S. A. Stepin: *Dispersion relationship and spectrum in the collisionless plasma kinetic model*

*Break*

*Chair: N. V. Smorodina*

- 13.00–13.40 S. Ya. Novikov: *Sparks of dictionaries in sparse representations*

*Lunch*

*Chair: A. A. Imomov*

- 15.00–15.15 A. Murzhukova: *Differential properties of measures on Hilbert spaces and quantum anomalies*
- 15.15–15.30 V. A. Dubravina: *The representation by the Feynman formulae for the solutions to some evolution equations on ramified surfaces*
- 15.25–16.05 Ya. Kinderkneht: *Feynman-Kac formulae for generalized time-fractional evolution equations*
- 16.10–16.50 Ya. I. Belopolskaya: *Regular and singular systems of nonlinear forward Kolmogorov equations*
- 16.55–17.35 N. V. Smorodina: *An approximation of the Wiener process local time*

*Break*

### Evening plenary session

*Chair: V. Zh. Sakbaev*

- 18.00–18.50 A. Ashyralyev: *On the stability of hyperbolic differential and difference equations with unbounded time delay term.*
- 19.00–19.50 G. P. Panasenko: *Steady state non-Newtonian flow with strain rate dependent viscosity in thin tube structure*

## July 8, Thursday

### Morning plenary session

*Chair: V. Zh. Sakbaev*

11.00–11.50 A. E. Shishkov: *Large and very singular solutions of semi-linear elliptic equations*

*Break*

### Parallel sessions

*Chair: O. G. Proncheva*

12.15–12.55 S. V. Agapov: *Integrable geodesic flows on 2-surfaces*

13.00–13.40 T. V. Salnikova: *Existence and stability of equilibrium solutions of the Vlasov equation with a modified gravitational potential*

*Lunch*

*Chair: S. V. Agapov*

15.00–15.30 N. J. Buchlovská: *Movement characteristics of two models with closed curve equilibrium*

15.35–16.05 J. Tomčala: *A new method of time series prediction and its application to the prediction of supercomputer power consumption*

16.10–16.50 M. Lampart: *Dynamics of the impact body colliding with a moving belt*

16.55–17.35 P. E. Ryabov, S. V. Sokolov, G. P. Palshin: *New bifurcation diagram in one generalized model of the vortex dynamics*

*Break*

*Chair: S. M. Sitnik*

12.15–12.55 V. I. Burenkov: *On the recent results in the theory of operators in general Morrey-type spaces*

13.00–13.40 A. P. Soldatov: *Generalized Neumann problem for an elliptic equation on a plane*

*Lunch*

*Chair: S.A. Budochkina*

15.00–15.30 A. Rozanova-Pierrat: *Existence of optimal shapes in linear acoustics*

15.35–16.05 E. L. Shishkina: *Reconstruction function by its weighted spherical mean*

16.10–16.50 S. M. Sitnik: *Voronezh school on the theory of singular differential equation and transformation operators*

16.55–17.35 L. E. Rossovskii, *Elliptic functional differential equation including affine transformation of argument*

*Break*

*Chair: A. E. Teretenkov*

13.00–13.40 S. Chakraborty: *On the Alberti-Uhlmann condition for unital channels*

*Lunch*

*Chair: B. O. Volkov*

15.30–16.10 N. A. Gusev: *On the structure of divergence-free vector measures on the plane*

16.10–16.50 E. Marconi: *Minimizing properties of the viscosity solution of the eikonal equation in a singularly perturbed variational problem*

16.55–17.35 P. B. Dubovski and M. Tamarov: *Mathematics of parking: Varying parking rate*

*Break*

#### Evening plenary session

*Chair: L. S. Efremova*

18.00–18.50 S. K. Vodopyanov: *Quasi-conformal analysis and problems of nonlinear elasticity theory*

19.00–19.50 S. V. Bolotin: *Separatrix map in slow-fast Hamiltonian systems*

## **July 9, Friday**

#### Morning plenary session

*Chair: V. Zh. Sakbaev*

10.00–10.50 Yu. A. Dubinskii: *Non-local boundary value problems of field theory*

11.00–11.50 I. Ya. Aref'eva: *Entanglement entropy*

*Break*

## Parallel sessions

*Chair: A. E. Rassadin*

12.15–12.55 A. A. Loboda: *Solution for multidimensional Belavkin equation*

13.00–13.40 S. V. Kozyrev: *Vibrons and quantum feedback control*

*Lunch*

*Chair: S. V. Kozyrev*

15.00–15.30 A. E. Rassadin, E. Alekseeva: *Exact solution of one nonlinear infinite-dimensional system of ordinary differential equations*

15.35–16.05 A. P. Senkevich: *Geometric interpretation of the properties of space-time*

16.10–16.50 E. T. Akhmedov: *On Green functions in de Sitter space-time*

16.55–17.35 S. I. Ogarkov: *On functional equations in variational derivatives and functional renormalization group*

*Break*

*Chair: B. Suleimanov*

12.15–12.55 I. T. Habibullin, A. R. Khakimova, and A. O. Smirnov: *Generalized invariant manifolds for integrable equations and their applications*

13.00–13.40 I. T. Habibullin and A. R. Khakimova: *Characteristic Lie algebras of integrable differential-difference equations in 3D*

*Lunch*

*Chair: I. T. Habibullin*

15.00–15.30 M. N. Kuznetsova: *Classification of integrable two-dimensional lattices*

15.35–16.05 A. M. Shavlukov: *The integrable Abel equation*

16.10–16.50 B. Suleimanov: *Isomonodromic quantization of the second Painlev'e equation by means of conservative Hamiltonian systems with two degrees of freedom*

16.55–17.35 V. A. Pavlenko: *Quantization of Kimura Hamiltonian system  $H(2,3)$*

*Break*

*Chair: I. V. Karzhemanov*

12.15–12.55 N. G. Marchuk: *Model Dirac and Dirac–Hestenes equations as covariantly equipped system of equations*

13.00–13.40 V. A. Stukopin: *Super Yangians and quantum loop superalgebras: representations and Hopf superalgebra structures*

*Lunch*

*Chair: V. A. Stukopin*

15.35–16.05 D. E. Shirokov: *On constant solutions of the Yang–Mills–Dirac equations*

16.10–16.50 I. V. Karzhemanov: *On homaloidal hypersurfaces*

16.55–17.35 D. V. Dubnov: *The Composition of associative algebras by homomorphisms and generalized non-commutative differentials*

*Break*

Evening plenary session

*Chair: L. S. Efremova*

18.00–18.50 A. V. Domrin: *On solutions of a matrix nonlinear Schrodinger equation*

19.00–19.50 V. E. Nazaikinskii: *Efficient semiclassical asymptotics*