

dedicated to the 110th anniversary of N.N.Bogolyubov's birth
September 9-13, 2019, Moscow - Dubna, Russia



PROBLEMS
OF THEORETICAL
AND MATHEMATICAL
PHYSICS



Russian Academy of Sciences



INTERNATIONAL BOGOLYUBOV CONFERENCE

Program

of the International Bogolyubov Conference

“Problems of Theoretical and Mathematical Physics”

September 9–13, 2019, Moscow–Dubna



DUBNA

PROBLEMS
OF THEORETICAL
AND MATHEMATICAL
PHYSICS



Russian Academy of Sciences



STEKLOV MATHEMATICAL INSTITUTE OF RAS

INTERNATIONAL BOGOLYUBOV CONFERENCE

MONDAY, SEPTEMBER 9

Moscow

08.00 – 10.00 Registration

PLENARY SESSIONS, Conference Hall, 9-th floor

Chair – D.V. Treschev

10.00 – 10.30 V.V. Kozlov (Moscow)
Polynomial conservation laws of quantum systems

10.30 – 11.00 I.V. Volovich (Moscow)
Advances in the problem of irreversibility

11.00 – 11.10 Break

Chair – L. Accardi

11.10 – 11.40 P. Exner (Rez near Prague)
Dirac operators with delta-shell interactions: spectral and scattering properties

11.40 – 12.10 V. Zagrebnov (Marseille)
Trotter-Kato product formulae for Gibbs semigroups

12.10 – 12.30 Coffee Break

Chair – P. Exner

12.30 – 13.00 V.A. Kazakov (Paris)
Conformal Fishnet Theory at any dimension

13.00 – 13.30 A. Gorsky (Moscow)
Resummation of instantons in Omega-deformed SYM and holography

13.30 – 14.00 K. Zarembo (Stockholm)
Exact results in holographic duality: CFT and beyond

14.00 – 15.00 Lunch

Chair – I.Ya. Arefeva

15.00 – 15.30 V.P. Neznamov (Sarov)
Quantum mechanics of stationary states of particles in external singular fields of black holes with event horizons of zero thickness

15.30 – 15.50 Coffee Break

15.50 – 16.50 PARALLEL SESSIONS

16.50 – 17.00 Break

17.00 – 18.00 PARALLEL SESSIONS

18.00 – 21.00 WELCOME RARTY

SECTION A, Conference Hall, 9-th floor

Chair – V. Zagrebnov

- 15.50 – 16.20** **V.A. Berezin** (Moscow)
Surface terms in the action integrals of Horndesi-type theories
- 16.20 – 16.50** **E. Akhmedov** (Moscow)
Out of equilibrium QFT in strong scalar wave background

16.50 – 17.00 Coffee Break

Chair – V. Berezin

- 17.00 – 17.30** **G.A. Alekseev** (Moscow)
Nonlinear interaction of arbitrarily strong gravitational and electromagnetic waves in the expanding universes
- 17.30 – 18.00** **S.Yu. Vernov** (Moscow)
Cosmological models with the Gauss-Bonnet term and non-minimally coupled scalar fields

SECTION B, Seminar Hall, 4-th floor

Chair – V. Belokurov

- 15.50 – 16.20** **S. Kozyrev** (Moscow)
Nonlinearity and quantum free statistics
- 16.20 – 16.50** **V.V. Zharinov** (Moscow)
Lie-Poisson structures

16.50 – 17.00 Coffee Break

Chair – V. Zharinov

- 17.00 – 17.30** **A.Yu. Nurmagambetov** (Kharkov)
Firewalls in spinning black holes
- 17.30 – 18.00** **M. Khramtsov** (Moscow)
Spontaneous symmetry breaking in the SYK model

SECTION C, Seminar Hall, 5-th floor

Chair – A. Koshelev

- 15.50 – 16.10** **O. Morzhin** (Moscow)
Time optimal control of two-level open quantum systems
- 16.10 – 16.30** **D. Ageev** (Moscow)
Chaos, operator size growth and holography
- 16.30 – 16.50** **O.V. Inozemcev** (Moscow)
Towards rigorous formulation of ETH

16.50 – 17.00 Coffee Break

Chair – M.O. Katanaev

- 17.00 – 17.20** **A.E. Teretenkov** (Moscow)
Exact non-Markovian evolution with several reservoirs
- 17.20 – 17.40** **E. Pozdeeva** (Moscow)
Multifield Superpotential Method in Cosmological Models
- 17.40 – 18.00** **M. Altaisky**
Wavelet regularization for gauge theories



INTERNATIONAL BOGOLYUBOV CONFERENCE

TUESDAY, SEPTEMBER 10 **Moscow**

PLENARY SESSIONS, Conference Hall, 9-th floor

Chair – I.V. Volovich

- 10.00 – 10.30** **D.V. Treschev** (Moscow)
Entropy of a unitary operator
- 10.30 – 11.00** **L. Accardy** (Roma)
Extensions of quantum mechanics and quantum field theory canonically
emerging from the theory of orthogonal polynomials

11.00 – 11.10 **Break**

Chair – N. Slavnov

- 11.10 – 11.40** **G. Savvidy** (Athens)
Maximally Chaotic Dynamical Systems of Anosov-Kolmogorov
- 11.40 – 12.10** **E.I. Zelenov** (Moscow)
Entropy gain in p-adic quantum channels

12.10 – 12.30 **Coffee Break**

12.30 – 14.00 **PARALLEL SESSIONS**

14.00 – 15.00 **Lunch**

15.00 – 16.00 **PARALLEL SESSIONS**

16.00 – 16.20 **Coffee Break**

16.20 – 17.20 **PARALLEL SESSIONS**

17.20 – 18.00 **Coffee Break**

18.00 **Departure to Dubna**

SECTION C, Seminar Hall, 5-th floor

Chair – V. Pavlov

- 12.30 – 13.00** **E.A. Ivanov** (Dubna)
Supersymmetric Calogero from gauging in superspace
- 13.00 – 13.30** **I. Volobuev** (Moscow)
Quantum field theory beyond the S-matrix formalism
- 13.30 – 14.00** **A.S. Trushechkin** (Moscow)
Bogolyubov microscopic solutions of the Boltzmann-Enskog kinetic equation

14.00 – 15.00 **Lunch**

Chair – S. Vernov

- 15.00 – 15.30** **A. Koshelev** (Covilha)
Analytic infinite derivative gravity to become quantum gravity
- 15.30 – 16.00** **S. Smolyansky** (Saratov)
Method BBGKY in strong field QED

SECTION A, Conference Hall, 9-th floor

Chair – A. Pogrebkov

- 12.30 – 13.00** **J. Lukierski** (Wroclaw & Dubna)
Quantum-deformed twistors
- 13.00 – 13.30** **A.P. Isaev** (Dubna)
Twistorial and space-time description of massless infinite spin (super)particles and field
- 13.30 – 14.00** **N.M. Bogolyubov** (St. Petersburg)
The partition function of the four-vertex model in inhomogeneous external field

14.00 – 15.00 Lunch

Chair – J. Lukierski

- 15.00 – 15.30** **M. Plyushchay** (Santiago)
Exotic nonlinear supersymmetry and integrable systems
- 15.30 – 16.00** **A. Borowiec** (Wroclaw)
Hopf algebroids as a model for description of quantum phase space

16.00 – 16.20 Coffee Break

Chair – G. Savvidy

- 16.20 – 16.50** **A.I. Machavariani** (Dubna & Tbilisi)
Bogolyubov-Medvedev-Polivanov S-matrix method and its applications for the few body systems and high energy physics
- 16.50 – 17.20** **H. Boos** (Wuppertal)
Correlation functions of integrable models

SECTION B, Seminar Hall, 4-th floor

Chair – S. Kozyrev

- 12.30 – 13.00** **V.I. Manko** (Moscow)
Conventional Quantum statistics with probability distribution describing quantum system states
- 13.00 – 13.30** **J.-B. Bru** (Bilbao)
Macroscopic Long-Range Dynamics of Fermions and Quantum Spins on the Lattice
- 13.30 – 14.00** **A. Pechen** (Moscow)
Uncomputability of quantum control

14.00 – 15.00 Lunch

Chair – N.M. Bogolyubov

- 15.00 – 15.30** **M.O. Katanaev** (Moscow)
Geometric theory of defects, 't Hooft-Polyakov monopole, and disclinations
- 15.30 – 16.00** **V.Zh. Sakbaev** (Dolgoprudny)
Random walks and Hamiltonian flows in the infinite dimensional phase space

16.00 – 16.20 Coffee Break

Chair – E. Zelenov

- 16.20 – 16.50** **V.A. Stukopin** (Dolgoprudny)
On connection between super Yangians and quantum loop superalgebras
- 16.50 – 17.20** **A.A. Biryukov** (Samara)
The probability of transition of the system in space quantum-random events and the equations of quantum theory

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INTERNATIONAL BOGOLYUBOV CONFERENCE

WEDNESDAY, SEPTEMBER 11

Dubna

08.00 – 09.30 Registration

PLENARY SESSIONS, Conference Hall, 2-nd floor

09.30 – 10.00 V.A. Matveev (Dubna)

N.N. Bogoliubov and school of theoretical physics in Dubna

10.00 – 10.30 R.I. Ilkaev (Sarov)

N.N. Bogolyubov is an outstanding scientist and the founder of the mathematical school at KB-11

10.30 – 11.00 D.I. Kazakov (Dubna)

Bogoliubov R-operation in Non-renormalizable Theories

11.00 – 11.30 Coffee Break

Chair – A.P. Isaev

11.30 – 12.00 I.Ya. Arefeva (Moscow)

Holography for nonperturbative study of QFT

12.00 – 12.30 C. Bai (Tianjin)

Deformations and their controlling cohomologies of O -operators

12.30 – 13.00 V.K. Dobrev (Sofia)

Multiparameter quantum Minkowski space-time

13.00 – 14.30 Lunch

14.30 – 16.00 PARALLEL SESSIONS

16.00 – 16.30 Coffee Break

16.30 – 18.40 PARALLEL SESSIONS

20.00 CONCERT

SECTION A, Conference Hall, 2-nd floor

Chair – M.A. Ivanov

- 14.30 – 15.00** **V.V. Belokurov** (Moscow)
Functional integrals in quantum models invariant under the group of diffeomorphisms
- 15.00 – 15.30** **V.A. Petrov** (Protvino)
Diffractive Scattering in QCD
- 15.30 – 16.00** **L.L. Jenkovski** (Kiev)
Gluon-gluon scattering and glueball spectroscopy

16.00 – 16.30 **Coffee Break**

Chair – E.E. Boos

- 16.30 – 17.00** **N.V. Krasnikov** (Moscow)
Search for light dark matter
- 17.00 – 17.30** **R.B. Nevzorov** (Moscow)
 E_6 inspired composite Higgs model and baryon asymmetry generation
- 17.30 – 18.00** **A. Bednyakov** (Dubna)
Light scalars in NMSSM and $B \rightarrow K^*ll$ angular observables
- 18.00 – 18.20** **V. Henner** (Perm)
Overlapping resonances: K-matrix method vs Breit-Wigner unitary approach - advantages and disadvantages
- 18.20 – 18.40** **D.V. Kirpichnikov** (Moscow)
New limits on hidden sector from NA64 experiment

SECTION B, Blokhintsev Auditorium, 4-th floor

Chair – O.V. Teryaev

- 14.30 – 15.00** **V.A. Saleev** (Samara)
Dijet correlations in multijet production in the Regge limit of QCD
- 15.00 – 15.30** **B.A. Arbuzov** (Moscow)
N.N. Bogoliubov compensation approach and effective interactions in the Standard Model
- 15.30 – 16.00** **M.K. Volkov** (Dubna)
The decays $\tau \rightarrow K^*\pi\nu$ and $\tau \rightarrow [\phi\omega]K\nu$ in the extended Nambu-Jona-Lasinio model

16.00 – 16.30 **Coffee Break**

Chair – Yu.M. Pismak

- 16.30 – 17.00** **M. Kalmykov** (Hamburg)
Differential Reduction versus Integration-by-Parts
- 17.00 – 17.30** **A. Nesterenko** (Dubna)
Dispersive approach to QCD and its applications
- 17.30 – 18.00** **Yu. Bystritskiy** (Dubna)
Electroweak radiative corrections at one loop level to Bhabha scattering for Belle II experiment
- 18.00 – 18.20** **G. Ganbold** (Dubna)
Mesons and Glueballs, the Strong Effective Coupling within Analytic Confinement

SECTION C, Lecture Hall, 2-nd floor

Chair – N.M. Plakida

- 14.30 – 15.00** **V.M. Fomin** (Dresden)
Topology- and geometry-driven quantum phenomena in semiconductor and superconductor nanoarchitectures
- 15.00 – 15.30** **V.I. Yukalov** (Dubna)
Hartree-Fock-Bogolubov method in the theory of Bose-condensed systems
- 15.30 – 16.00** **Yu.M. Shukrinov** (Dubna)
Resonance features of superconductor-ferromagnet-superconductor Josephson junctions

16.00 – 16.30 **Coffee Break**

Chair – R.N. Faustov

- 16.30 – 17.00** **N.N. Achasov** (Novosibirsk)
The fate of light scalar mesons
- 17.00 – 17.30** **M.A. Ivanov** (Dubna)
Doubly charmed baryons
- 17.30 – 18.00** **A.E. Dorokhov** (Dubna)
Hadronic contributions to the Lamb shift of muonic nuclei
- 18.00 – 18.20** **V. Galkin** (Moscow)
Semileptonic decays of heavy baryons
- 18.20 – 18.40** **N. Lenshina** (Moscow)
Minimal Subtractions without Dimensional Regularization

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THURSDAY, SEPTEMBER 12

Dubna

PLENARY SESSIONS, Conference Hall, 2-nd floor

Chair – N.V. Krasnikov

- 09.30 – 10.00 V.A. Rubakov** (Moscow)
Towards bouncing and Genesis cosmologies
- 10.00 – 10.30 G. Korchemsky** (Saclay)
Energy correlations at conformal collider
- 10.30 – 11.00 K.G. Chetyrkin** (Karlsruhe)
Multiloop Renormalization Group: status and recent developments

11.00 – 11.30 Coffee Break

Chair – V.A. Petrov

- 11.30 – 12.00 V.S. Fadin** (Novosibirsk)
BFKL equation: status and problems
- 12.00 – 12.30 S. Derkachov** (St. Petersburg)
Separation of variables and calculation of the Feynman diagrams
- 12.30 – 13.00 V.P. Spiridonov** (Dubna)
Superconformal indices, Seiberg dualities and special functions

13.00 – 14.30 Lunch

14.30 – 16.00 PARALLEL SESSIONS

16.00 – 16.30 Coffee Break

16.30 – 18.40 PARALLEL SESSIONS

20.00 BANQUET

SECTION A, Conference Hall, 2-nd floor

Chair – A.V. Smilga

- 14.30 – 15.00** **D.V. Fursaev** (Dubna)
Massless cosmic strings in expanding Universe
- 15.00 – 15.30** **O.V. Teryaev** (Dubna)
Gravitational couplings and forces inside hadrons
- 15.30 – 16.00** **A. Yung** (St. Petersburg)
Quantizing a solitonic string

16.00 – 16.30 Coffee Break

Chair – A. Bednyakov

- 16.30 – 17.00** **O.V. Tarasov** (Dubna)
Derivation and solution of functional equations for Feynman integrals
- 17.00 – 17.30** **F. Tkachov** (Moscow & Troitsk)
Towards efficient implementation of generalized integration-by-parts reduction algorithms
- 17.30 – 18.00** **N. Volchanskiy** (Dubna & Rostov-on-Don)
Two-loop kite master integral for a correlator of two composite vertices and its applications in QCD
- 18.00 – 18.20** **L.V. Bork** (Moscow)
Collinear OPE and Resummation in N=4 SYM
- 18.20 – 18.40** **A. Onishchenko** (Dubna & Dolgoprudny & Moscow)
Elliptic master integrals and non-relativistic QCD

SECTION B, Blokhintsev Auditorium, 4-th floor

Chair – V. Saleev

- 14.30 – 15.00** **A. Kotikov** (Dubna)
On the Landau-Khalatnikov-Fradkin transformation and the mystery of even zeta-values in Euclidean massless correlators
- 15.00 – 15.30** **A.L. Kataev** (Moscow & Dolgoprudny)
AVV Triangle anomaly diagram in $SU(N_C)$ in perturbation theory and combined manifestation of axial and conformal anomalies + consideration of the conformal symmetry limit results
- 15.30 – 16.00** **A. Pikelner** (Dubna)
Cutting four-loop massless propagators

16.00 – 16.30 Coffee Break

Chair – A. Dorokhov

- 16.30 – 17.00** **A.B. Arbuzov** (Dubna)
Conformal symmetry breaking in the Standard Model
- 17.00 – 17.30** **Yu.M. Pismak** (St. Petersburg)
Basic principles of quantum field theory in modeling the interaction of quantum electrodynamics fields with two-dimensional materials
- 17.30 – 18.00** **M. Hnatic** (Dubna)
Quantum field theory methods in complex systems of classical physics
- 18.00 – 18.20** **C.R. Das** (Dubna)
Neutrino mass and singlet in BSM
- 18.20 – 18.40** **N.A. Gromov** (Syktyvkar)
Standard Model at high energies due to group contraction

SECTION C, Lecture Hall, 2-nd floor

Chair – S. Flach

- 14.30 – 15.00** **N.N. Bogolyubov** (Moscow)
Some constructive aspects of the current algebra representations and the factorized structure of the quantum integrable many-particle Schrödinger type models
- 15.00 – 15.30** **S. Petrovich** (Belgrade)
Classical and Quantum Crystal Rainbows
- 15.30 – 16.00** **A.L. Kuzemsky** (Dubna)
Time evolution of open nonequilibrium systems and irreversibility

16.00 – 16.30 Coffee Break

Chair – S. Petrovic

- 16.30 – 17.00** **M. Jurcisin** (Kosice)
Anomalous scaling in turbulence
- 17.00 – 17.30** **V. Ryzhov** (Moscow)
Berezinskii-Kosterlitz-Thouless transition and melting scenarios of two-dimensional systems
- 17.30 – 18.00** **A. Chizhov** (Dubna)
Quantum correlations in a quasi 1D macromolecular chain with single-vibronic excitation
- 18.00 – 18.20** **D. Chevizovich** (Belgrade)
On the propagation of electromagnetic pulses through quantum metamaterials
- 18.20 – 18.40** **Rassulova** (Tashkent)
The BBGKY hierarchy of quantum kinetic equations and its application for information technology

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FRIDAY, SEPTEMBER 13 **Dubna**

PLENARY SESSIONS, Conference Hall, 2-nd floor

Chair – V. Zagrebnov (Marseille)

- 09.30 – 10.00** **S. Flach** (Daejeon)
Ergodization Times of Weakly Nonintegrable Interacting Many-Body Systems
- 10.00 – 10.30** **N.M. Plakida** (Dubna)
Superconductivity in electronic systems with strong correlations
- 10.30 – 11.00** **V.I. Zakharov** (Moscow)
Manifestation of Quantum anomalies in Quantum Statistical mechanics

11.00 – 11.30 **Coffee Break**

Chair – G.M. Zinovjev (Kiev)

- 11.30 – 12.00** **D.S. Gorbunov** (Moscow)
Realistic inflation: Higgs on top of scalaron
- 12.00 – 12.30** **E.E. Boos** (Moscow)
SMEFT approach to BSM physics
- 12.30 – 13.00** **R.N. Faustov** (Moscow)
Properties of Baryons in the Relativistic Quark Model

13.00 – 14.30 **Lunch**

14.30 – 16.00 **PARALLEL SESSIONS**

16.00 – 16.30 **Coffee Break**

16.30 – 18.40 **PARALLEL SESSIONS**

18.40 **CLOSING**

SECTION A, Conference Hall, 2-nd floor

Chair – A. Yung

- 14.30 – 15.00** **A.V. Smilga** (Nantes)
Differential geometry through supersymmetric glasses
- 15.00 – 15.30** **A.A. Zheltukhin** (Kharkov)
Brane mechanism of spontaneously generated gravity
- 15.30 – 16.00** **S.O. Krivonos** (Dubna)
Supersymmetric Calogero models

16.00 – 16.30 Coffee Break

Chair – A.L. Kataev

- 16.30 – 17.00** **K.V. Stepanyantz** (Moscow)
NSVZ relation and NSVZ scheme in non-Abelian supersymmetric gauge theories
- 17.00 – 17.30** **A. Golubtsova** (Dubna)
On the drag force of a heavy quark via the Kerr-AdS/CFT correspondence
- 17.30 – 18.00** **A. Kotov** (Dubna)
Lattice study of QCD phase diagram in (B, T, μ) space
- 18.00 – 18.20** **E. Shchetinin** (Moscow)
General method for building neural networks on quantum computers
- 18.20 – 18.40** **M. Bures** (Dubna)
Wigner function positivity of Bures and Hilbert-Schmidt ensembles of qubit and qutrit

SECTION B, Blokhintsev Auditorium, 4-th floor

Chair – E.A. Kolganova

- 14.30 – 15.00** **V.V. Pupyshev** (Dubna)
Bohr-Zommerfeld quantization rule in the case of decreasing power potential
- 15.00 – 15.30** **A.K. Motovilov** (Dubna)
Unphysical sheets and resonances in the Friedrichs-Faddeev model
- 15.30 – 16.00** **V.I. Korobov** (Dubna)
Precision Physics of the Coulomb Three-Body Systems

16.00 – 16.30 Coffee Break

Chair – A.K. Motovilov

- 16.30 – 17.00** **V.S. Melezhik** (Dubna)
Confinement-induced resonances in two-center problem
- 17.00 – 17.30** **E.A. Kolganova** (Dubna)
Van der Waals three-body systems
- 17.30 – 18.00** **V.P. Gerdt** (Dubna)
Algorithmic analysis of PDE systems
- 18.00 – 18.20** **D.S. Shirokov** (Moscow)
On constant solutions of $SU(2)$ Yang-Mills equations
- 18.20 – 18.40** **S. Mayburov** (Moscow)
Nuclear decay oscillations: model and experimental update

SECTION C, Lecture Hall, 2-nd floor

Chair – L.L. Jenkovski

- 14.30 – 15.00** **I.F. Ginzburg** (Novosibirsk)
Problems with variable Hilbert space in quantum mechanics
- 15.00 – 15.30** **A. Leonidov** (Moscow)
Fluctuations in relativistic anisotropic hydrodynamics
- 15.30 – 16.00** **R.G. Nazmitdinov** (Dubna)
From chaos to order in finite fermi-systems: periodic orbits and quantum degeneracy

16.00 – 16.30 Coffee Break

Chair – D.V. Fursaev

- 16.30 – 17.00** **D.E. Alvarez-Castillo** (Dubna)
The neutron star equation of state in the multi-messenger era
- 17.00 – 17.30** **P.P. Fiziev** (Dubna & Sofia)
New Results for Quasinormal Modes of Gravitational Waves
- 17.30 – 18.00** **A.F. Zakharov** (Moscow)
Constraints on gravity theories with galactic center and the center of M87 observations
- 18.00 – 18.20** **D.B. Blaschke** (Dubna & Wroclaw)
Boiling QCD in heavy-ion collisions, neutron star mergers and supernovae
- 18.20 – 18.40** **A.N. Baushev** (Dubna) (Dubna)
The radius, at which a galaxy group stops the Hubble stream, and the group mass: an exact analytical solution