

National Academy of Sciences of Ukraine
Bogolyubov Institute for Theoretical Physics

Bogolyubov Kyiv Conference

Problems of Theoretical and Mathematical Physics
dedicated to the 115th anniversary of M.M. Bogolyubov (1909-1992)

September 24-26, 2024
Kyiv, Ukraine

Program

Tuesday, September 24

09-00 **Registration**

10-00 **Conference opening**
20 min **Academician of the NAS of Ukraine Anatoly Zagorodny**

Morning Session

10-20 **Mark Gorenstein**
30+10 min “Critical point in system of interacting bosons”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine

11-00 **Yurij Holovatch**
30+10 min “Reading Ernst Ising’s dissertation hundred years on”
Institute for Condensed Matter Physics of the NAS of Ukraine, Lviv

11-40 **Khrystyna Gnatenko**
20 min “Properties of multi-qubit states representing directed graphs and their studies with quantum programming”
Ivan Franko National University of Lviv

12-00 **COFFEE BREAK**

12-30 **Larissa Brizhik**
20 min “To 190 years of the Wave of Translation and 50 years of the Davydov’s soliton: Soliton dynamics in an oscillating magnetic field”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine

12-50 **Ivan Gandzha, Yuri Sedletsy**
20 min “Cubic-quintic interplay in the nonlinear Klein–Gordon model”
Institute of Physics of the NAS of Ukraine

13-10 **Andrij Kuzmak**
20 min “Entanglement of the diamond spin cluster”
Ivan Franko National University of Lviv

13-30 **LUNCH**

Afternoon Session

14-30 **Olexander Chalyi, L. A. Bulavin, K. O. Chalyy**
30+10 min “Methods of Neutron Optics for Studying Physical Properties of Liquids”
O.O. Bogomolets National Medical University, Kyiv

15-10 **Sergiy Perepelytsya**
20 min “Effects of metallic and molecular counterions in structural dynamics of the DNA double helix”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine

15-30 **Viktor Pergamenshchik**
20 min “General hydrodynamic approach for a cold Bose gas”
Institute of Physics, NANU, Kyiv & Center for Theoretical Physics, PAN, Warsaw, Poland

15-50 *COFFEE BREAK*

16-10 **Posters Presentation**

18-00 **Posters Discussion**

18-30 *CONFERENCE DINNER*

Wednesday, September 25

Morning Session

10-00 **Taras Bryk**
30+10 min “On a crossover between two mechanisms of sound propagation in liquids”
Institute for Condensed Matter Physics of the NAS of Ukraine, Lviv

10-40 **Volodymyr Kryvoruchko, Andrey Savchenko**
30+10 min “Quantum topological effects in magnetization dynamics: the Berry phase, the Aharonov–Casher effect and electric field control of spin waves dynamics”

11-20 **Dmytro Shapoval, Maxym Dudka, Yuriy Holovatch**
20 min “Critical Behavior of Structurally Disordered Systems Magnets with
Long-Range Interaction”
Institute for Condensed Matter Physics of the NAS of Ukraine, Lviv

11-40 **Taras Hutak**
20 min “Thermodynamics of the kagome Heisenberg antiferromagnets”
Institute for Condensed Matter Physics of the NAS of Ukraine, Lviv

12-00 **COFFEE BREAK**

12-30 **Roman Ovsianikov, Kurt Jacobs, Denys Bondar, Andrii Sotnikov**
20 min “Squeezing and amplification in open quantum systems with color
centers using the multilevel Janes-Cummings model”
*National Science Center "Kharkiv Institute of Physics and
Technology*

12-50 **Yevhenii Trotskyi, Eugen Syrkin, Viktor Lykah**
20 min “Domains and domain boundaries structure of benzene adsorbed on
graphene”
*B. Verkin Institute for Low Temperature Physics and Engineering,
Kharkiv, Ukraine*

13-10 **Oleh Ivakhnenko, Olexandr Todrin, Sergey Shevchenko**
20 min “Modeling temperature dynamics in non-uniform biological tissues
under cryogenic impact”
*B. Verkin Institute for Low Temperature Physics and Engineering,
Kharkiv*

13-30 **LUNCH**

Afternoon Session

14-30 **Yurii Slyusarenko, Mykyta Bulakhov, Oleksandr Peletminskyi**
30+10 min “Effect of the photon subsystem on the magnetic properties of quantum
gases in equilibrium with radiation”

15-10 **Leonid Christophorov**
20 min "Resetting random walks in a bounded chain"
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine

15-30 **Oleksandr Borysenko, Mykhailo Bratchenko, Alessandro Lomi, Ihor Omelchenko, Andrii Sotnikov**
20 min "Application of Langevin dynamics for optimization in machine learning tasks"
National Science Center "Kharkiv Institute of Physics and Technology"

15-50 **COFFEE BREAK**

16-20 **Dmytro Anchyskin**
20 min "Four types of phase transitions in interacting boson system at high temperatures"
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine

16-40 **Artemiy Lysenko**
20 min "Chemical freeze-out curve in heavy-ion collisions and the QCD critical point"
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine, Kyiv, Ukraine

17-00 **EXCURSION TO FEOFANIA PARK**

Thursday, September 26

Morning Session

10-00 **Eugene Eliseev, Anna Morozovska**
20 min "Analytical Description of Size Effects, Strains and Ferro-ionic Coupling in Si-Compatible Nanosized Ferroelectrics"
Institute of Physics of the NAS of Ukraine

- 10-20** **Andrii Fesh, Yuri Shtanov, Sergei Sharapov**
20 min “Sagnac effect in solids”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine
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- 10-40** **Daryna Bukatova, Oleksii Yanchyshen, Yaroslav Zolotaryuk**
20 min “Impurity-induced localized modes in parallel Josephson junction arrays”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine
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- 11-00** **Tatiana Shatnii, Evgen Len, Tatiana Len**
20 min “Recursive Method for Calculating T-Matrix of Electron Scattering on Arbitrary Many-Particle Clusters in Strongly Correlated Systems”
G. V. Kurdyumov Institute for Metal Physics
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- 11-20** **Oleksandr Vidybida**
20 min “Stimulating excitable membrane of ORN with stochastic Markov process”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine
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- 11-40** **Oleksiy Vakhnenko**
20 min “Development and analysis of novel integrable nonlinear dynamical systems on quasi-one-dimensional lattices. Parametrically driven nonlinear system of pseudo-excitations on a two-leg ladder lattice”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine
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- 12-00** ***COFFEE BREAK***
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- 12-30** **Viktor Gerasimenko**
20 min “Dynamics of correlations of many colliding particles”
Institute of Mathematics of the NAS of Ukraine
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- 12-50** **Oleksiy Kapitanchuk, Elmar Petrov, Yevgen Shevchenko**
20 min “Kinetic model of the formation of STM-induced electrofluorochromism in molecular junctions”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine,
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- 13-10** **Oleksandr Cherniak, Bohdan Lev**
20 min “Polarization mechanism of bacteria motion in aquatic media”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine,

13-30 *LUNCH*

14-30 **Oleg Gerasymov**
20 min “Towards relations between compaction and compressibility of hard sphere mixtures”
Odesa Mechnikov National University

14-50 **Borys Grinyuk**
20 min “Elastic form factors of light alpha-cluster nuclei”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine,

15-10 **Nursultan Kalzhigitov, Victor Vasilevsky**
20 min “Pauli resonances in single- and many-channel systems”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine

15-30 *COFFEE BREAK*

15-50 **Serhii Kukhtaruk, Viacheslav Kochelap**
20 min “Initial value problem in the case of multivalued dispersion equations”
V. E. Lashkaryov Institute of Semiconductor Physics

16-10 **Marina Ishchenko, Peter Berczik, Margaryta Sobolenko**
20 min “Milky Way globular clusters in cosmological timescale. Probability of the interaction with the Galactic center”
Main Astronomical Observatory the NAS of Ukraine, Kyiv, Ukraine

16-30 **Oleksii Yanchyshen**
20 min “Orbital perturbation theory in Schwarzschild space-time”
Bogolyubov Institute for Theoretical Physics of the NAS of Ukraine,

16-50 *Closing of the conference*