

National Academy of Sciences of Ukraine  
Bogolyubov Institute for Theoretical Physics  
Young Scientists Council

**VI Young Scientists Conference**

**Problems of Theoretical Physics**

dedicated to 105-th anniversary of  
M.M. Bogolyubov

**November 25-27, 2014**  
**Kyiv, Ukraine**

**Program**

Kyiv 2014

---

---

## Tuesday, November, 25, 2014

---

---

**08-45** Registration starts

**09-50** Conference opening (Opening remarks by the head of the organizing committee)

---

---

### Physics of Nuclei and Elementary-Particles (oral)

---

**10-00** **M. I. Gorenstein**

“Deconfinement in relativistic nucleus-nucleus collisions”

Lecture *Bogolyubov Institute for Theoretical Physics, NAS of Ukraine.*

---

**10-45** **V. Vovchenko, D. Anchishkin, L.P. Csernai**

“Time dependence and fluctuations of partition into spectators and participants in heavy-ion collisions”

O.1 *Taras Shevchenko National University of Kyiv;*

*Frankfurt Institute for Advanced Studies, University of Frankfurt*

---

**11-05** **V. Naboka**

“Initialization of hydrodynamics in relativistic heavy ion collisions with energy-momentum transport model”

O.2 *Bogolyubov Institute for Theoretical Physics, NAS of Ukraine.*

---

**11-25** **V. Yu. Denisov, T. O. Margitych**

“Barrier height between nuclei”

O.3 *Institute for Nuclear Research, NAS of Ukraine*

---

---

**11-45** **COFFEE BREAK**

---

---

### Astrophysics and Cosmology (oral)

---

**12-00** **D.A. Yakubovsky**

“New emission line at 3.5 keV - observational status, connection with radiatively decaying dark matter and directions for future studies”

Lecture *Bogolyubov Institute for Theoretical Physics, NAS of Ukraine.*

---

**12-45** **Y.V Taistra, V.O. Pelykh**

“Null solutions of Maxwell equations in Kerr space-time”

O.4 *Pidstryhach Institute for Applied Problems of Mechanics and Mathematics, NAS of Ukraine, Lviv*

---

**13-05** **V.M. Sliusar, V.I. Zhdanov**

“Microlensing of distant sources in multi-body gravitational lensing systems: light curves statistics”

O.5 *Taras Shevchenko National University of Kyiv, Astronomical Observatory*

---

**13-25** **A.Yu. Burgazli, M.V. Eingorn, A.I. Zhuk**

“Cosmological perturbations in approach of scalar fields”

O.6 *Odessa I.I.Mechnikov national university.*

---

---

**13-45** **LUNCH (Poster session starts)**

---

---

---

---

## Physics of Biological Macromolecules (oral)

---

15-00 **S.N. Volkov**

“Nanomechanics of DNA”

Lecture *Bogolyubov Institute for Theoretical Physics, NAS of Ukraine*

---

15-45 **T.Yu. Nikolaenko**

“Open-source software in quantum-chemical investigations of biomolecules: Natural Population Analysis as a case study”

O.7

*Taras Shevchenko National University of Kyiv, Faculty of Physics*

---

16-05 **D.V. Piatnytskyi , O.O. Zdorevskiy, S.M. Perepelytsya, S.N. Volkov**

“Creation of stable complexes of DNA double helix with hydrogen peroxide”

O.8

*Bogolyubov Institute for Theoretical Physics, NAS of Ukraine*

---

16-25 **K.G. Kravchuk, A.K. Vidybida**

“Rigorous description of a Leaky Integrate-and-Fire neuron's spiking statistics”

O.9

*Bogolyubov Institute for Theoretical Physics, NAS of Ukraine*

---

16-45 **K.G. Kravchuk, A.K. Vidybida**

“Effect of delayed feedback on spiking statistics of excitatory Leaky Integrate-and-Fire neuron”

O.10

*Bogolyubov Institute for Theoretical Physics, NAS of Ukraine*

---

---

17-05 **COFFEE BREAK**

---

---

## Mathematical Physics

---

17-20 **V.I. Gerasimenko**

"Modern development directions of the theory of kinetic equations and

Lecture

Bogolyubov's works on the kinetic theory"

*Institute of Mathematics, NAS of Ukraine*

---

18-05 **Kh. P. Gnatenko**

"Corrections to the energy levels of the hydrogen atom in rotationally invariant noncommutative space"

O.11

*Ivan Franko National University of Lviv, Department for Theoretical Physics*

---

18-25 **A. Kuzmak**

"The quantum brachistochrone problem on the rotational manifolds"

O.12

*Ivan Franko National University of Lviv, Department for Theoretical Physics*

---

18-45 **POSTER SESSION**

---

---

---

---

**Wednesday, November, 26, 2014**

---

**Condensed Matter Physics (oral)**

---

**10-00 Yu.V. Skrypnik**

Lecture “Dimensionality of a disordered system from the standpoint of the spectrum rearrangement”

*G.V. Kurdyumov Institute of Metal Physics, NAS of Ukraine*

**10-45 A. Slobodeniuk, E. Idrisov, E. Sukhorukov**

O.13 “Evolution of the single-electron excitation of the quantum Hall edge in the presence of Coulomb interaction”

*Departement de Physique Theorique, Universite de Geneve;  
Bogolyubov Institute for Theoretical Physics, NAS of Ukraine*

**11-05 E.V. Gorbar, V.A. Miransky, I.A. Shovkovy, P.O. Sukhachov**

O.14 “Quantum oscillations as a probe of interaction effects in Weyl semimetals in a magnetic field”

*Taras Shevchenko National University of Kyiv, Faculty of Physics;  
Bogolyubov Institute for Theoretical Physics, NAS of Ukraine*

**11-25 K. Haydukivska, V. Blavatska**

"Directed polymers in anisotropic environments"

O.15 *Institute for Condensed Matter Physics, NAS of Ukraine, Lviv*

**11-45 COFFEE BREAK**

---

**12-00 S.B. Feodosyev, M.S. Klochko, E.S. Syrkin**

O.16 “The Surface-projected Spectral Densities of the Vibrational States in Cubic Crystals”

*B.I. Verkin Institute for Low Temperature Physics and Engineering, NAS of Ukraine, Kharkiv*

**12-20 K.V. Germash, D.V. Fil**

O.17 “The suppression of screening as a hallmark of the electron-hole pairing in a double-layer graphene system”

*Institute for Single Crystals, NAS of Ukraine, Kharkiv*

**12-40 O. Pylypovskyi, V.P. Kravchuk, D.D. Sheka, D. Makarov, O.G. Schmidt, Yu. Gaididei**

O.18 “Coupling of Magnetical and Geometrical Chiralities in a Möbius ring”

*Taras Shevchenko National University of Kyiv, Faculty of Radiophysics, Electronics and Computer Systems*

**13-00 O.M. Volkov, V.P. Kravchuk, D.D. Sheka, Yu. Gaididei, F.G. Mertens**

O.19 “Magnetisation patterning by means of electrical spin-polarised current”

*Taras Shevchenko National University of Kyiv, Faculty of Radiophysics, Electronics and Computer Systems*

---

---

**13-20** **A.V. Glushchenko, M.Y. Kovalevsky**  
"Relaxation dynamics of spin  $s=1$  magnets and spectra of collective excitations"  
O.20  
*National Scientific Center "Kharkiv Institute of Physics and Technology"*

---

**13-40** **LUNCH**

---

**Statistical Theory of Many-body Systems (oral)**

---

**15-00** **V.I. Zasenko**  
"Physics of Plasmas and Controlled Fusion"  
Lecture *Bogolyubov Institute for Theoretical Physics, NAS of Ukraine*

---

**15-45** **O.I. Gerasymov, M.M. Somov**  
"To possibility of implementation of statistical mechanics methods in physics of granular materials"  
O.21  
*Odessa State Environmental University*

---

**16-05** **A. Galdina**  
"The features of critical behaviour of the hard squares model"  
O.22  
*Oles Honchar Dnipropetrovsk National University*

---

**16-25** **O. Bogyslavenko, O. Gerasymov, M. Somov**  
"To modeling of local structure in the jammed states of granular systems"  
O.23  
*Odessa State Enviromental Univercity*

---

**16-45** **COFFEE BREAK**

---

**17-00** **Yu.A. Mishchenko, A.M. Gavrilik**  
"Relating  $\tilde{\mu}$ ,  $q$ -Bose gas model to the (microscopics of) interaction and compositeness of particles based on  $\tilde{\mu}$ ,  $q$  -deformed virial expansion"  
O.24  
*Bogolyubov Institute for Theoretical Physics, NAS of Ukraine*

---

**17-20** **S.A. Sokolovsky, B.N. Dikarev**  
"Hydrodynamic phenomena in polaron subsystem of dielectrics and the Bogolyubov generalization of the Chapman-Enskog method"  
O.25  
*Prydniprovs'ka State Academy of Civil Engineering and Architecture, Dnipropetrovsk*

---

**17-40** **G. G. Orlovsky, A. I. Sokolovsky**  
" To the photon hydrodynamics in equilibrium medium "  
O.26  
*Oles Honchar Dnipropetrovsk National University*

---

**18-00** **M.A. Shcherbinin, I.O. Anisimov**  
"The motion of electron bunch in the magnetoactive plasma and it's influence on electric and magnetic fields configurations"  
O.27  
*Taras Shevchenko National University of Kyiv, Faculty of Radiophysics, Electronics and Computer Systems*

---

**18-20** **V.N. Gorev, A.I. Sokolovsky**  
"The damping of plasma ocsillations due to relaxation"  
O.28  
*Oles Honchar Dnipropetrovsk National University*

---

**18-40 Jury consultation**

---

**19-00 Closing of the conference**

---

---

**Thursday, November, 27, 2014**

Day of departure

---

---

## Poster session

Tuesday, November, 25, 2014

---

### Physics of Nuclei and Elementary Particles (poster)

---

P.1 V.V. Sagun, D.R. Oliinychenko, A.I. Ivanytskyi, K.A. Bugaev  
"Problem of Chemical Equilibrium in the Hadron Resonance Gas Model"

*Bogolyubov Institute for Theoretical Physics, NAS of Ukraine*

---

P.2 A.I. Ivanytskyi, K.A. Bugaev, D.R. Oliinychenko, V.V. Sagun  
I.N. Mishustin, D.H. Rischke, L.M. Satarov, G.M. Zinovjev  
"Chemical Freeze-out Irregularities as Signals of Quark Gluon Plasma Formation"

*Bogolyubov Institute for Theoretical Physics, NAS of Ukraine*

---

### Physics of Biological Macromolecules (poster)

---

P. 3 O.O. Liubysh, A.V. Vlasiuk, S.M. Perepelytsya  
"Structuring features of Na<sup>+</sup>, K<sup>+</sup>, and Cs<sup>+</sup> counterions in DNA ion-hydrate shell: a molecular dynamics study"

*Taras Shevchenko National University of Kyiv, Faculty of Physics*

---

P. 4 O. Hrebnyov, V. Korolovych, O. Inozemtseva, A. Severyukhina,  
D. Gorin, G.Sukhorukov, L. Bulavin  
"Alginate beads with oil for odors encapsulation"

*Taras Shevchenko National University of Kiev, Faculty of Physics*

---

### Mathematical Physics (poster)

---

P.5 Yu. Samoylenko  
"Existence of a solution to the inhomogeneous equation with the one-dimensional Schrödinger operator in the space of quickly decreasing functions"

*Taras Shevchenko National University of Kyiv*

---

### Condensed Matter Physics (poster)

---

P.6 V.I. Dvoretzka, D.A. Gavryushenko  
"Binary solution osmotic pressure in the vicinity of the critical point of stratification"

*Taras Shevchenko National University of Kyiv*

---

P.7 S.V. Khrapatiy  
"Effects of hydrodynamic retardation and interparticle interactions on the self-assembly in a drying droplet, containing suspended solid particles"

*Taras Shevchenko National University of Kyiv, Institute of Biology*

---

P.8	<b>V.A. Tatarenko, I.M. Melnyk, V.S. Kharchenko, S.S. Lugovskiy</b> "Pressure and temperature dependences of the shear viscosity and self-diffusion coefficients for simple liquids" <i>G.V. Kurdyumov Institute for Metal Physics, NAS of Ukraine</i>
P.9	<b>P.A. Sayko, I.P. Shapovalov</b> "Axial quadrupole phase of a uniaxial spin-1 magnet" <i>Odessa I.I.Mechnikov National University</i>
P.10	<b>D.M. Shevchenko, A.V. Brytan, G.M. Verbinskya, D.A. Gavrushenko, O.V. Korobko</b> "Optical irradiation influence into the behavior of suspended alcohols droplets for diffusion evaporation regime" <i>Taras Shevchenko National University of Kyiv</i>
P.11	<b>O. O. Sobol, E. V. Gorbar, V. P. Gusynin</b> "Supercritical instability in the system of two charged impurities in graphene" <i>Taras Shevchenko National University of Kyiv, Faculty of Physics</i>
P.12	<b>K.V. Yershov, V. P. Kravchuk, D.D. Sheka, Yu. Gaididei</b> "Control of Chirality of Vortex Magnetization on Hemispherical nanoshells" <i>Bogolyubov Institute for Theoretical Physics, NAS of Ukraine; National University of "Kyiv-Mohyla Academy"</i>
<b>Statistical Theory of Many-body Systems (poster)</b>	
P.13	<b>Sh. Demesh</b> "Ionization energies of molecular orbitals and appearance energies of ion fragments in sulfur fluoride molecules" <i>Institute of Electron Physics, NAS Ukraine, Uzhgorod</i>
P.14	<b>V.N. Gorev, A.I. Sokolovsky</b> "The Grad theory and the Bogolyubov generalization of the Chapman-Enskog method " <i>Oles Honchar Dnipropetrovsk National University</i>
P.15	<b>T.V. Hvoz, Yu.V. Kalyuzhnyi</b> "Two and three-phase fractionation of polydisperse Yukawa hard-sphere fluid. Second-order approximation of the Barker-Henderson perturbation theory" <i>Institute for Condensed Matter Physics, NAS of Ukraine, Lviv</i>
P.16	<b>Yu.A. Mishchenko, A.M. Gavrilik</b> "Correlation function intercepts for $\tilde{\mu}, q$ -deformed and the symmetric Tamm-Dancoff type $q$ -Bose gas models" <i>Bogolyubov Institute for Theoretical Physics, NAS of Ukraine</i>
P.17	<b>R. Romanova, O. Gerasymov</b> "Modeling of learning processes" <i>Odessa State Environmental University</i>



P.18

**N.A. Atamas, D.A. Gavryushenko, K.V. Taradiy**

"Radiation emission influence on thermodynamic and structure parameters of liquid argon"

*Taras Shevchenko National University of Kiev*