

# **IX Conference of Young Scientists "Problems of Theoretical Physics"**

**Tuesday 04 December 2018 - Wednesday 05 December 2018**

**Bogolyubov Institute for Theoretical Physics of the National Academy of Sciences of Ukraine**

## **Scientific Programme**

**Tuesday, December 4**

**8-30** Registration begins

**9-50** Conference opening (Opening talk of Prof. A. G. Zagorodny)

**Morning Session**

**10-00 \$Dr. M.Z. Iorgov\$**

Lecture "*Solitons of Korteweg–de Vries equation and Bogoliubov transformations*"  
Bogolyubov Institute for Theoretical Physics, NAS of Ukraine, Kyiv

**10-45 \$V.N. Gorev, A.I. Sokolovsky\$**

"*Linear-in-gradients hydrodynamic equations for a system with small interaction*"  
National Mining University, Dnipro

**11-05 \$O.I. Gerasymov, A.Ya. Spivak\$**

"*Towards the problem of the Nesterenko's soliton waves propagation in nonlinear inhomogeneous Hertzian chains*"  
Odesa State Environmental University, Odesa, Ukraine

**11-25 \$O. Kryvchikov\$**

"*The influence of inhomogeneities on physical characteristics of ferromagnetic clusters inside of antiferromagnetic matrix in an external field*"  
B. Verkin Institute for Low Temperature Physics and Engineering, NAS of Ukraine, Kharkiv

**11-45** COFFEE BREAK

**12-05 \$K.M. Haponenko, A.I. Sokolovsky\$**

"*Calculation of thermodynamic potential for Bose system near condensate point*"  
Oles Honchar Dnipro National University, Dnipro

**12-25 \$O. Shchur, A. Vidybida\$**,

"*Relation between firing statistics of spiking neuron with delayed feedback and without feedback*"  
Bogolyubov Institute for Theoretical Physics, NAS of Ukraine, Kyiv

**12-45 \$O. Zdorevskiy, D.V. Piatnytskyi, S.N. Volkov\$**

"*Blocking of DNA sites of specific recognition by hydrogen peroxide molecules in the process of ion beam therapy*"  
Bogolyubov Institute for Theoretical Physics, NAS of Ukraine, Kyiv

**13-05 \$T. Nikolaienko, L. Bulavin\$**

"*Atomic charges for reproducing the dependence of molecular dipole moment on conformation*"  
Taras Shevchenko National University of Kyiv

**13-25 O. Kulish, A. Vasiliev**

*"Modeling of activation and deactivation processes in postsynaptic membrane"*

Taras Shevchenko National University of Kyiv

**13-45 LUNCH**

**Afternoon Session**

**15-00 O. Sergijenko**

*"Reconstructed potentials of the 2-field model of dark energy with canonical and non-canonical kinetic terms"*

Taras Shevchenko National University of Kyiv

**15-20 D. Savchenko, D. Iakubovskiy**

*"The 3.5 keV dark matter candidate line in Galactic bulge region"*

Bogolyubov Institute for Theoretical Physics, NAS of Ukraine, Kyiv

**15-40 A. Rudakovskiy, D. Iakubovskiy**

*"21-cm observations and warm dark matter models"*

Bogolyubov Institute for Theoretical Physics, NAS of Ukraine, Kyiv

**16-00 I. Babyk**

*"Constraints on the excess energy in low-mass systems"*

Main Astronomical Observatory of the National Academy of Science, Kyiv

**16-20 M.V. Khelashvili, A.M. Gavrilik, I.I. Kachurik, A.V. Nazarenko**

*" $\mu$ -Bose-Einstein condensate dark matter model"*

Bogolyubov Institute for Theoretical Physics, NAS of Ukraine, Kyiv

**16-40 WELCOME PARTY**

***Wednesday, December 5***

**Morning Session**

**10-00 Dr. E.V. Gorbar**

Lecture *"Dirac and Weyl semimetals"*

Bogolyubov Institute for Theoretical Physics, NAS of Ukraine, Kyiv

**10-45 D.Y. Kononenko, O.V. Pylypovskiy, Yu. Gaididei, D.D. Sheka**

*"Equilibrium states of aniferromagnetic ring-shaped and helix-shaped spin chains with*

*hard-tangential anisotropy*"

Taras Shevchenko National University of Kyiv

**11-05 \$O. Krupnitska\$**

*"An effective theory for Heisenberg antiferromagnet on one-dimensional frustrated lattices at high magnetic fields"*

Institute for Condensed Matter, NAS of Ukraine, Lviv

**11-25 \$V. Baliha\$**

*"Ground-state phases of frustrated bilayer quantum Heisenberg antiferromagnets"*

Institute for Condensed Matter, NAS of Ukraine, Lviv

**11-45 COFFEE BREAK**

**12-05 \$O.Y. Pastukh, V.E. Sakhnyuk, A.M. Shutovsky\$**

*"Boundary conditions for the superconducting junctions at temperatures close to critical"*

Lesya Ukrainka Eastern European National University, Lutsk

**12-25 \$A.M. Shutovsky, O.Y. Pastukh, V.E. Sakhnyuk, A.V. Svidzinskyi\$**

*"A current density dependence on phase differences in layered superconducting structures of SISIS type"*

Lesya Ukrainka Eastern European National University, Lutsk

**12-45 \$S. Shevchenko, A. Konstantinov\$**

*"The third sound as an electric field generator"*

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

**13-05 \$Y. Mankovska, M. Isaev, Ali~ Belarouci\$**

*"Features of light coupling in low-loss 2D periodic structures supporting phonon polariton"*

Taras Shevchenko National University of Kyiv

**13-25 \$D. Dobushovskyi\$**

*"Influence of correlated hopping on the optical conductivity spectra"*

Institute for Condensed Matter, NAS of Ukraine, Lviv

**13-45 LUNCH**

**Afternoon Session**

**15-00 \$A. Semenov\$**

*"On consistency of classical homogenization models for the permittivity of statistically homogeneous mixtures"*

Odessa I.I.Mechnikov National University, Odessa

**15-20 \$O. Nepochatyi, V. Kuryliuk, M. Isaev\$**

*"Features of thermal transport in strained and compressed crystalline silicon"*  
Taras Shevchenko National University of Kyiv

**15-40** \$D. Panchenko\$  
*"Physics of singular self-adjoint extensions of one-dimensional Dirac operator"*  
Odessa I.I.Mechnikov National University, Odesa

**16-00** \$V. Davydovych\$  
*"Tumour growth model: Lie symmetries and exact solutions"*  
Institute of Mathematics, NAS of Ukraine, Kyiv

**16-20** \$V. Skalozub, \underline{P. Minaiev}\$  
*"The electroweak phase transition in a spontaneously magnetized vacuum"*  
Oles Honchar Dnipro National University, Dnipro

**16-40** \$R. Poberezhnyuk\$  
*"Non-congruent phase transitions in strongly interacting matter within the Quantum van der Waals model"*  
Bogolyubov Institute for Theoretical Physics, NAS of Ukraine, Kyiv

**17-00** *Juri consultation*

**17-20** *Closing of the conference*

## **Astrophysics and Cosmology**

## **Mathematical Physics**

## **Statistical Theory of Many-body Systems**

## **Physics of Biological Macromolecules**

## **Condensed Matter Physics**

## **Physics of Nuclei and Elementary Particles**

