

## **Данные об официальных оппонентах и ведущей организации**

по диссертации Новикова Александра Николаевича «Нелинейные эффекты в динамике многокомпонентного конденсата Бозе-Эйнштейна» на соискание ученой степени кандидата физико-математических наук по специальности 01.04.02 – теоретическая физика

### Официальные оппоненты

#### **1. Шагинян Василий Робертович**

доктор физико-математических наук,

ведущий научный сотрудник, НИЦ “Курчатовский институт” ФГБУ

“Петербургский институт ядерной физики им. Б.П.Константинова”

vrshag@thd.pnpi.spb.ru

тел. +7 (81371) 46096, факс +7 (81371) 31963

Россия, 188300, Ленинградская обл., г. Гатчина, Орлова роща, ФГБУ ПИЯФ

#### Список избранных публикаций Шагиняна В.Р. за 2009 - 2014 годы:

- 1) Shashkin A. A., Dolgopolov V. T., Clark J. W., [Shaginyan V. R.](#), Zverev M. V., Khodel V. A., Merging of Landau Levels in a Strongly Interacting Two-Dimensional Electron System in Silicon, Physical Review Letters, Vol. 112, 186402 (2014).
- 2) [Shaginyan V. R.](#), Msezane A. Z., Popov K. G., Japaridze G. S., Khodel V. A., General properties of phase diagrams of heavy-fermion metals, EPL, Vol. 106, 37001 (2014).
- 3) [Shaginyan V. R.](#), Msezane A. Z., Popov K. G., Clark J. W., Zverev M. V., Khodel V. A., Flat bands and enigma of metamagnetic quantum critical regime in Sr<sub>3</sub>Ru<sub>2</sub>O<sub>7</sub>, Physics Letters A, Vol. 377, p. 2800 (2013).
- 4) [Shaginyan V. R.](#), Popov K. G., Khodel V. A., Quasiclassical physics and T-linear resistivity in both strongly correlated and ordinary metals, Physical Review B, Vol. 88, 115103 (2013).

- 5) [Shaginyan V. R.](#), Msezane A. Z., Popov K. G., Japaridze G. S., Khodel V. A., Common quantum phase transition in quasicrystals and heavy-fermion metals, *Physical Review B*, Vol. 87, 245122 (2013).
- 6) [Shaginyan V. R.](#), Popov K. G., Khodel V. A., Strongly correlated quantum spin liquid in herbertsmithite, *JETP*, Vol. 116, p. 848 (2013).
- 7) [Shaginyan V. R.](#), Msezane A. Z., Popov K. G., Clark J. W., Zverev M. V., Khodel V. A., Magnetic field dependence of the residual resistivity of the heavy-fermion metal CeCoIn<sub>5</sub>, *Physical Review B*, Vol. 86, 085147 (2012).
- 8) [Shaginyan V. R.](#), Msezane A. Z., Popov K. G., Khodel V. A., Scaling in dynamic susceptibility of herbertsmithite and heavy-fermion metals, *Physics Letters A*, Vol. 376, p. 2622 (2012).
- 9) [Shaginyan V. R.](#), Msezane A. Z., Popov K. G., Japaridze G. S., Stephanovich V. A., Identification of strongly correlated spin liquid in herbertsmithite, *EPL*, Vol. 97, 56001 (2012).
- 10) [Shaginyan V. R.](#), Amusia M. Ya., Clark J. W., Msezane A. Z., Popov K. G., Zverev M. V., Khodel V. A., Comment on "Zeeman-Driven Lifshitz Transition: A Model for the Experimentally Observed Fermi-Surface Reconstruction in YbRh<sub>2</sub>Si<sub>2</sub>", *Physical Review Letters*, Vol. 107, 279701 (2011).
- 11) [Shaginyan V. R.](#), Msezane A. Z., Popov K. G., Thermodynamic properties of the kagome lattice in herbertsmithite, *Physical Review B*, Vol. 84, 060401 (2011).
- 12) [Shaginyan V. R.](#), Amusia M. Ya., Msezane A. Z., Popov K. G., Scaling behavior of heavy fermion metals, *Physics Reports-Review Section of Physics Letters*, Vol. 492, p. 31 (2010).
- 13) [Shaginyan V. R.](#), Amusia M. Ya., Popov K. G., Behavior of the antiferromagnetic phase transition near the fermion condensation quantum phase transition in YbRh<sub>2</sub>Si<sub>2</sub>, *Physics Letters A*, Vol. 374, p. 659 (2010).
- 14) [Shaginyan V. R.](#), Msezane A. Z., Popov K. G., Stephanovich V. A., Magnetic-field-induced reentrance of Fermi-liquid behavior and spin-lattice relaxation rates in YbCu<sub>5-x</sub>Aux, *Physics Letters A*, Vol. 373, p. 3783 (2009).

15) [Shaginyan V. R.](#), Amusia M. Ya., Popov K. G., Strongly correlated Fermi-systems: non-Fermi liquid behavior, quasiparticle effective mass and their interplay, Physics Letters A, Vol. 373, p. 2281 (2009).

## **2. Андреев Павел Александрович**

кандидат физико-математических наук,

ассистент кафедры Общей физики, Физический факультет, Московский государственный университет им. М. В. Ломоносова.

[andreevpa@physics.msu.ru](mailto:andreevpa@physics.msu.ru)

тел. +7 (495) 939-1090, факс +7(495)939-14-89

119991, ГСП-1, Москва, Ленинские горы, МГУ им. М.В.Ломоносова, дом 1, строение 2, Физический Факультет, КОФ.

Список избранных публикаций Андреева П.А. за 2009 - 2014 годы:

1) Andreev P. A., The quantum hydrodynamic description of quantum gases with different interactions, (To appear as a chapter in the book “Recent Developments in Bosons Research”).

2) Andreev P. A., First principles derivation of NLS equation for BEC with cubic and quintic nonlinearities at non zero temperature. Dispersion of linear waves. Int. J. of Mod. Phys. B, Vol. 27, p. 1350017 (25), 2013.

3) Andreev P. A., Kuz'menkov L. S., Waves of magnetic moment and generation of waves by neutron beam in quantum magnetized plasma, Int. J. of Mod. Phys. B, Vol. 26, p. 1250186 (17), 2012.

4) Andreev P. A., Kuz'menkov L. S., Bright-like soliton solution in quasi-one-dimensional BEC in third order by interaction radius, Mod. Phys. Lett. B, Vol. 26, p. 1250152 (14), 2012.

5) Andreev P. A., Quantum hydrodynamics of charge carriers in graphene, PIERS Proceedings, pp. 154-157, August 19-23, Moscow, Russia, 2012.

- 6) Andreev P. A., Polarization wave in the Bose-Einstein condensate, Russian Physics Journal, Vol. 54, N. 12, pp. 1360-1363, 2012.
- 7) Andreev P. A., Kuz'menkov L. S., Trukhanova M. I., Quantum hydrodynamics approach to the formation of waves in polarized two-dimension systems of charged and neutral particles, Physical Review B, Vol. 84, p. 245401 (13), 2011.
- 8) Andreev P. A., Trukhanova M. I., On the bright soliton in the Bose-Einstein condensate (to the third order in the interaction radius), Russian Physics Journal, Vol. 53, N. 11, pp. 1196-1203, 2010.
- 9) Andreev P. A. and Kuz'menkov L. S., Generation of waves by a neutron beam in a quantum plasma of nonzero spin. An influence of the spin-orbit interaction, PIERS Proceedings, pp. 1047-1051, March 20-23, Marrakesh, MOROCCO, 2011.

#### **Ведущая организация**

ФГБУ “Институт спектроскопии Российской академии наук” (ИСАН)

Тел. +7 (495) 851-0579, факс +7 (495) 851-0886

isan@isan.troitsk.ru

142190 г. Москва, г.Троицк, ул. Физическая, 5, Институт спектроскопии РАН

#### **Список избранных избранных публикаций сотрудников ИСАН за 2009 - 2014 ГОДЫ:**

- 1.R. Driben, Ya. Kartashov, B. A. Malomed, et al., Soliton Gyroscopes in Media with Spatially Growing Repulsive Nonlinearity, PHYSICAL REVIEW LETTERS, Vol. 112, 020404, 2014.
2. A. G. Mal'shukov, H. Skarsvag, A. Brataas, Nonlinear magneto-optical and magnetoelectric phenomena in topological insulator heterostructures, PHYSICAL REVIEW B, Vol. 88, 245122, 2013.
3. D. K. Efimkin, Yu. E. Lozovik, Drag effect and Cooper electron-hole pair fluctuations in a topological insulator film, PHYSICAL REVIEW B, Vol. 88, 235420, 2013.

4. V. E. Lobanov, Ya. V. Kartashov, V. A. Vysloukh, et al., Anderson localization of light with topological dislocations, *PHYSICAL REVIEW A*, Vol. 88, 053829, 2013.
5. A. M. Kamchatnov, Y. V. Kartashov, Oblique Breathers Generated by a Flow of Two-Component Bose-Einstein Condensates Past a Polarized Obstacle, *PHYSICAL REVIEW LETTERS*, Vol. 111, 140402, 2013.
6. A. M. Kamchatnov, Periodic waves in two-component Bose-Einstein condensates with repulsive interactions between atoms, *EPL*, Vol. 103, 60003, 2013.
7. D. K. Efimkin, Yu. E. Lozovik, Fluctuational internal Josephson effect in a topological insulator film, *PHYSICAL REVIEW B*, Vol. 88, 085414, 2013.
8. Y. V. Kartashov, V. V. Konotop, F. K. Abdullaev, Gap Solitons in a Spin-Orbit-Coupled Bose-Einstein Condensate, *PHYSICAL REVIEW LETTERS*, Vol. 111, 060402, 2013.
9. O. L. Berman, R. Ya. Kezerashvili, G. V. Kolmakov, et al., Turbulence in a Bose-Einstein condensate of dipolar excitons in coupled quantum wells, *PHYSICAL REVIEW B*, Vol. 86, 045108, 2012.
10. N.S. Voronova, A.A. Elistratov, Y.E. Lozovik, Bose-Einstein condensate of cavity exciton polaritons in a trap, *Jetp Letters*, 93 (10), 580-584, 2011.
11. A. E. Golomedov, G. E. Astrakharchik, Yu. E. Lozovik, Mesoscopic supersolid of dipoles in a trap, *PHYSICAL REVIEW A*, Vol. 84, 033615, 2011.
12. G.E. Astrakharchik, J. Boronat, I.L. Kurbakov, Y.E. Lozovik, F. Mazzanti, Low-dimensional weakly interacting Bose gases: Nonuniversal equations of state, *Physical Review A*, Vol. 81, 013612, 2010.
13. O.L. Berman, R.Y. Kezerashvili, Y.E. Lozovik, Bose-Einstein condensation of quasiparticles in graphene, *Nanotechnology*, Vol. 21, 134019, 2010.
14. V.M. Akulin, Y.E. Lozovik, I.E. Mazets, A.G. Rudavets, A. Sarfati, Tunneling electroconductance of atomic Bose-Einstein condensates, *Physical Review A*, Vol. 79, 063614, 2009.

15. G.E. Astrakharchik, J. Boronat, J. Casulleras, I.L. Kurbakov, Y.E. Lozovik, Equation of state of a weakly interacting two-dimensional Bose gas studied at zero temperature by means of quantum Monte Carlo methods, *Physical Review A*, Vol. 79, 051602, 2009.