PUBLICATION LIST of K. ARUTYUNOV

Statistics on 15.03.2015		
Papers with referee practice		**55**
	In press / in preparation	2
	Monographs and reviews	7
	Regular papers	41
	Compilations & conference proceedings	5
Non-referred papers		**115**
	Conference proceedings	17
	Other	98
Invited talks		**85**
Patents		**3**

List of selected papers

1. O. V. Astafiev, L. B. Ioffe, S. Kafanov, Yu. A. Pashkin, K. Yu. Arutyunov, D. Shahar, O. Cohen, & J. S. Tsai. Coherent quantum phase slip, **Nature** 484(7394), 355 -- 358 (2012).

2. K. Yu. Arutyunov, T. T. Hongisto, J. S. Lehtinen, L. I. Leino, and A. L. Vasiliev. Quantum phase slip phenomenon in ultra-narrow superconducting nanorings, **Nature: Sci. Rep**. 2, 293 (2012).

3. J. S. Lehtinen, K. Zakharov, and K. Arutyunov, Coulomb blockade and Bloch oscillations in Superconducting Ti nanowires, **Phys. Rev. Lett**. 109, 187001-1—187001-5 (2012); arXiv 209.4259v1.

4. K. Yu. Arutyunov, D. S. Golubev, and A.D. Zaikin. Superconductivity in one dimension (invited review article) **Physics Reports** 464, 1-70 (2008).

5. M.Zgirski, K-P. Riikonen, V. Tuboltsev, P. Jalkanen, T. T. Hongisto and K. Yu. Arutyunov. Ion beam shaping and downsizing of nanostructures, **Nanotechnology** 19 055301 (2008).

6. M. Zgirski, K.-P. Riikonen, V. Touboltsev, and K. Arutyunov. Size Dependent Breakdown of Superconductivity in Ultranarrow Nanowires, **Nano Letters**, 5, 1029 (2005).

1. Currently in press

1. J. S. Lehtinen, T. Rantala and K. Yu. Arutyunov, Insulating State of a Quasi-1-Dimensional Superconductor, in press, arXiv.1311.3202

2. K. Yu. Arutyunov, A. Ramos, A. V. Semenov, A. A. Korneev , and G. N. Gol'tsman, Quasi-1-Dimensional Superconductivity in Highly Disordered NbN, in preparation

2. Monographs and reviews

1 Disseratation, degree of **Doctor of Physical-Mathematical Sciences** (= higher than PhD scientific degree in Russia, equivalent to *habilitation*) “Experimental study of current states

in low dimensional superconductors", Physics Faculty, Moscow State University, Moscow 2012.

2 K. Yu. Arutyunov, "Experimental study of the fluctuation-governed resistive state in quasi-one-dimensional superconductors", (invited review article) in "*Nanoscience Frontiers - Fundamentals of Superconducting Electronics, Springer Serie: Nanoscience and Technology*", 45-66, 2011.

3 K. Yu. Arutyunov, D. S. Golubev, and A.D. Zaikin "Superconductivity in one dimension" (invited review article) ***Physics Reports*** 464, 1-70 (2008); doi:10.1016/j.physrep.2008.04.009; http://authors.elsevier.com/offprints/PLREP1552/8da74ced0bfe7c62d6d41aecce859e03 arXiv:0805.2118v1

4 K.Yu.Arutyunov, "Fabrication of quasi-one-dimensional superconducting micro- and nanostructures" (invited review article), ***Recent Patents in NanoTechnology*** 1, 129-135 (2007).

5 K. Arutyunov, M. Zgirski, K.-P. Riikonen, and P. Jalkanen, "Quantum Limitations of Electron Transport in Ultra-Narrow Nanowires", (invited review article) ***International Review of Physics (IREPHY)*** , V. 1, N1, pp. 28-30, 2007

6 Disseratation, degree of **Ph.D. in Physics**, "Energy spectrum of semiconducting n-type Bi-Sb alloys in quantizing magnetic fields", Low Temperature Dept., Physics Faculty, Moscow State University, Moscow 1988.

7 Thesis **M.Sc. in Physics,** "Experimental study of the Shubnikov-de-Haas effect in Bi-Sb alloys", Physics Faculty, Moscow State University, Moscow 1985.

3. Regular articles in international scientific journals with referee practice

1. K.Yu.Arutyunov, G.A.Mironova, Ya.G.Ponomarev, "Effect of quantizing magnetic field on the parameters of electrons in $Bi_{1-x}Sb_x$ alloys", ***Sov. J. Low Temp. Phys***. 13(9), 554 (1987). (Sov: Fizika Nizkih Temperatur, 13, 973, 1987).

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4. K.Yu.Arutyunov, N.P.Danilova, A.A.Nikolaeva "Nonequilibrium galvanomagnetic properties of quasi-one-dimensional superconductors", ***Physica C*** 235-240, 1967, 1994.

5. K.Yu.Arutyunov, D.V.Gitsu, E.P.Kondrya, A.A.Nikolaeva, L.F.Rybalchenko, "Current-voltage characteristics and magnetoresistance peculiarities in bismuth microbridges", ***Physica B*** 218, 35 (1996).

6. K.Yu.Arutyunov, "Manifestation of Qusiparticle Branch Imbalance in Resistive Measurements of Mesoscopic Superconductors", ***Phys. Rev. B*** 53, 12304, 1996.

7. K.Yu.Arutyunov, V.A.Krupenin, S.V.Lotkhov, A.B.Pavolotski and L.Rinderer "Resistive State Measurements of Quasi-0-Dimensional Superconducting Structures", ***Czechoslovak Journal of Physics*** 46, 2309 (1996).

8. K.Yu.Arutyunov, S.V.Lotkhov, A.B.Pavolotski, D.A. Presnov and L.Rinderer, "On the reproducibility of Resistive State Anomalies in Superconducting Nanostructures", ***Helv. Phys. Acta***. 69(2), 31 (1996).

9. K.Yu.Arutyunov, V.A.Krupenin, S.V.Lotkhov, A.B.Pavolotski and L.Rinderer, "Resistive State Anomalies of Superconducting Nanostructures", ***Superlattices and Microstructures*** 21A, 27 (1997).

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11. J.P. Pekola, A.J. Manninen, M.M. Leivo, K.Arutyunov, J.K. Suoknuuti, and T. I. Suppula, and B. Collaudin, "Microrefrigeration by quasiparticle tunneling in NIS and SIS junctions", ***Physica B*** 280, 485--490 (2000).

12. K. Yu. Arutyunov, Sh. Farhangfar, D. Presnov, and J. P. Pekola, "Unconventional Behavior of small Superconductors in a Nonequilibrium State in the Proximity of a Normal Metal", ***Physica B*** 284-288, 1848 --1849 (2000).

13. K. Yu. Arutyunov, T. Suppula, J. K. Suoknuuti and J. P. Pekola, "Influence of magnetic field on cooling by normal-insulator-superconductor junctions", ***J. Appl. Phys***. 88, 326 -- 330, (2000).

14. K. Yu. Arutyunov, T. V. Ryynanen, J. P. Pekola, and A.B. Pavolotski, "Superconducting transition of single-crystal tin microstructures", ***Phys. Rev. B*** 63, 092506-1 -- 092506-4 (2001).

15. K. Yu. Arutyunov, J. P. Pekola, A.B. Pavolotski and D. A. Presnov, "Nonlocality in superconducting microstructures", ***Phys. Rev. B*** 64, 064519-1 -- 064519-6, (2001).

16. K. Yu. Arutyunov, T. T. Hongisto, and J. P. Pekola, "Interference of nonequilibrium quasiparticles in a superconductor", ***Physica B*** 329-333, 1429 -- 1430 (2003).

17. W. X. Huang, P. Dendooven, K. Gloos, N. Takahashi, K. Arutyunov, J. P. Pekola, and J. Aystö, " Transport and extraction of radioactive ions stopped in superfluid helium", ***Nuclear Instruments and Methods in Physics Research Section B***: Beam Interactions with Materials and Atoms 204 , 592 -- 596, (2003).

18. K. Yu. Arutyunov, T. T. Hongisto, "Normal metal – Insulator – Superconductor Interferometer", ***Phys. Rev. B*** 70, 064514-1 -- 064514-6 (2004). cond-mat/ 0308088.

19. M. Savolainen, V. Touboltsev, P. Koppinen, K.-P. Riikonen and K. Yu. Arutyunov, "Ion beam sputtering method for progressive reduction of nanostructures dimensions", ***Appl. Phys. A*** 79, 1769 -- 1773, (2004). cond-mat/0311383.

20. M. Zgirski, K.-P. Riikonen, V. Touboltsev, and K. Arutyunov "Size Dependent Breakdown of Superconductivity in Ultranarrow Nanowires", ***Nano Letters*** 5, 1029 -- 1033 (2005), cond-mat/0510181.

21. P. Jalkanen, V. Touboltsev, H. Koivisto, P. Suominen, T. Suppula, K. Yu. Arutyunov, and J. Räisänen "Superconductivity suppression in Fe-implanted thin Al films", ***J. Appl. Phys***. 98, 016105-1 -- 016105-3 (2005).

22. D. V. Vodolazov, F. M. Peters, T.T. Hongisto, and K. Yu. Arutyunov, "Microscopic analysis of multiple flux transitions in mesoscoopic superconducting loops", ***Europhys. Lett.*** 75(2), 315 -- 320 (2006). cond-mat/0606545

23. A.A. Shanenko, M. D. Croitru, M. Zgirski, F. M. Peters and K. Arutyunov, "Size dependent enhancement of superconductivity in nanowires", ***Phys. Rev. B*** 74, 052502-1 -- 052502-4 (2006), cond-mat/0605119

24. P. Jalkanen, V. Tuboltsev, A. Virtanen, K. Yu. Arutyunov, J. Räisänen, O. Lebedev and G. Van Tendeloo, "Critical temperature modification of low dimensional superconductors by spin doping", ***Sol. St. Comm.***142, 407 -- 411 (2007). http://arxiv.org/abs/cond-mat/0703368

25. M. Zgirski, K.Yu.Arutyunov "Experimental limits of the observation of thermally activated phase-slip mechanism in superconducting nanowires", ***Phys. Rev. B*** 75, 172509-1 -- 172509-4 (2007).

26. M. Zgirski and K.Yu. Arutyunov, "Resistive state of quasi-one-dimensional superconductors: fluctuations vs. sample inhomogeneity", ***Physica E*** 40, 160 -- 162 (2007). http://dx.doi.org/10.1016/j.physe.2007.05.022

27. K.Yu. Arutyunov, T. T. Hongisto, D. Y. Vodolazov, "Tunneling spectroscopy of persistent currents in superconducting microrings", ***Physica E*** 40, 184 --186 (2007). http://dx.doi.org/10.1016/j.physe.2007.05.021

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35. Pasi Jalkanen, Sampo Kulju, Konstantin Arutyunov, Liisa Antila, Pasi Myllyperkiö, Teemu Ihalainen, Tommi Kääriäinen, Marja-Leena Kääriäinen, Jouko Korppi-Tommola, Fabrication and characterization of vacuum deposited fluorescein thin films, ***Thin Solid Films*** 519, 3835 -- 3839 (2011). http://arxiv.org/abs/1106.3849

36. J. S. Lehtinen, T. Sajavaara, K. Yu. Arutyunov, M. Yu. Presnjakov and A. Vasiliev, "Evidence of quantum phase slip effect in titanium nanowires", ***Phys. Rev. B*** 85, 094508-1 -- 094508-7 (2012).
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38. O. V. Astafiev, L. B. Ioffe, S. Kafanov, Yu. A. Pashkin, K. Yu. Arutyunov, D. Shahar, O. Cohen, & J. S. Tsai, Coherent quantum phase slip, ***Nature*** 484(7394), 355 -- 358 (2012).
DOI: 10.1038/nature10930],URL:
http://www.nature.com/nature/journal/v484/n7394/full/nature10930.html

39. J. S. Lehtinen, K. Zakharov, and K. Arutyunov, Coulomb blockade and Bloch oscillations in Superconducting Ti nanowires, ***Phys. Rev. Lett***. 109, 187001-1—187001-5 (2012);
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40. J. S., Lehtinen1 and K. Yu., Arutyunov, The quantum phase slip phenomenon in superconducting nanowires with a low-Ohmic environment, (invited topical paper), ***Supercond. Sci. and Technology***, 25 124007-1 -- 124007-5 (2012);
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arXiv 1207.2329v1.

41. J. S., Lehtinen1 and K. Yu., Arutyunov, The quantum phase slip phenomenon in superconducting nanowires with a low-Ohmic environment, (correction), ***Supercond. Sci. and Technology***, 26, 039503 (2013);

4. **Articles in international compilations and conferences proceedings with referee practice**

1. K.Yu.Arutyunov, N.P.Danilova, A.A.Nikolaeva, "Nonequilibrium transport in superconducting filaments", NASA Conference Publication 3290, Proceeding of the 4-th World Congress on Superconductivity, Orlando, June 24-27 1994, p.359.

2. K. Yu. Arutyunov, J. P. Pekola, A.B. Pavolotski, D. A. Presnov, "Nonlocality in superconducting microstructures" in ""Macroscopic Quantum Coherence and Quantum Computing", edited by D. V. Averin, B. Ruggiero and P. Silvestrini, Kluvert Academic Plenum Publishers, 2001, pp. 155-163.

3. K. Yu. Arutyunov, T. T. Hongisto, and J. P. Pekola, " Solid state analogue of a double slit interferometer", in "Superconducting Nano-Electronics devices"edited by J. Pekola, B. Ruggiero and P. Silvestrini, Kluvert Academic Plenum Publishers, 2002, pp. 43-51.

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5. M. Zgirski, K.-P.Riikonen, T. Holmqvist, M. Savolainen, V. Touboltsev, and K. Arutyunov,"Phase slip phenomena in ultra-thin superconducting wires", in "*Quantum Computation in Solid State Systems*" edited by B. Ruggiero, P. Delsing, C. Granata, Y. Pashkin, P.Silvestrini, pp. 70-75, Springer, 2006

5. Articles in compilations and conference proceedings.

1. K. Yu. Arutyunov, D. Presnov, Sh. Farhangfar and J. P. Pekola, "Non-trivial transport properties of superconducting nanostructures", Proceeding of the symposiom on micro- and nanocryogenics, August 1-3, 1999, Jyväskylä, Finland, p. 53.

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5. K. Yu. Arutyunov, P. Koppinen, V. Touboltsev, J. Räisänen, and J. Pekola, "Suppression of the superconducting transition temperature of aluminum films by ion implantation", proceedings of the XXXVI annual conference of the Finnish physical society, March 14-16, 2002, Joensu, p. 290.

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7. K. Yu. Arutyunov, P. Koppinen, V. Touboltsev, J. Räisänen, and J. Pekola, “Suppression of the superconducting transition temperature of aluminum films by ion implantation”, proceeding of the 4th International Conference on Low Temperature Chemistry, August 3-8, 2002, Keuru, Finland, pp. 82-83.

8. M Savolainen, P. Keinanen, A. Lindell and K. Yu. Arutyunov, “Superconductivity in progressively thined aluminum and niobium wires” proceedings of the Annual Meeting of the Finnish Physical Society, 20-22.03.03, Helsinki

9. T.T. Hongisto and K. Yu. Arutyunov, “Mesoscopic Normal Metal – Insulator-Superconductor Solid State Interferometer”, proceedings of the Annual Meeting of the Finnish Physical Society, 20-22.03.03, Helsinki

10. M. Zgirski, K.-P.Riikonen, M. Savolainen and K. Arutyunov, ”Experimental evidence of quantum phase slip phenomena in ultra-narrow superconducting channels”, proceedings of the XXXVIII Annual Conference of the Finnish Physical Society, 18-20.03.04, Oulu, p. 134.

11. P. Koppinen, M. Savolainen, V. Touboltsev, K.-P. Riikonen, K.Yu. Arutyunov, ”Ion beam sputtering method for progressive reduction of nanostructures dimensions”, proceedings of the XXXVIII Annual Conference of the Finnish Physical Society, 18-20.03.04, Oulu, p.133.

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14. T.T. Hongisto and K. Yu. Arutyunov “Tunneling spectroscopy of persistent currents in superconducting microrings”, proceedings of the XLI annual conference of the Finnish Physical Society, ed. By R. Vainio, J. Pomoell, & M. Louhivuori, University of Helsinki, 2007, p. 174, ISSN 0355-5801.

15. K. Yu. Arutyunov , J. S. Lehtinen, T. T. Hongisto “Quantum fluctuations in superconducting nanostructuctures”, Proceedings of the International Conference and Summer School “Mesoscopic systems: physics and applications”, 20-26.06.2010, Novosibirsk (Erlagol), Russia, p17-18.

16. J. Lehtinen and K. Arutyunov , ELECTRIC CURRENT STANDARD BASED ON QUANTUM FLUCTUATIONS OF THE SUPERCONDUCTING ORDER PARAMETER, PROCEEDINGS OF THE XLV ANNUAL CONFERENCE OF THE FINNISH PHYSICAL SOCIETY AND THE SECOND NORDIC PHYSICS MEETING, March 29–31, 2011, Helsinki, Finland, p.163.

17. L. Leino and and K. Yu. Arutyunov, SUPER-FINE ION BEAM SURFACE TREATMENT, PROCEEDINGS OF THE XLV ANNUAL CONFERENCE OF THE FINNISH PHYSICAL SOCIETY AND THE SECOND NORDIC PHYSICS MEETING, March 29–31, 2011, Helsinki, Finland, p.369.

6. Other Publications

1. K.Yu.Arutyunov, "The Electrons Energy Spectrum of Semiconducting $Bi_{0.92}Sb_{0.08}$ Alloys in Quantizing Magnetic Field", MSc dissertation, Moscow State University, Physics Faculty, 1985.

2. K.Yu.Arutyunov, Ya.G.Ponomarev, M.V.Sudakova "Inversion of spin splitted Landau levels in Bi-Sb alloys under pressure", proceeding of the XI International conference on high pressures, Kiev, 12-17 July 1987, p.290.

3. K.Yu.Arutyunov, G.A.Mironova "Spin effects in strong quantizing magnetic field in Bi-Sb alloys", proceeding of the III school on actual problems of physics in semimetals and narrow gap semiconductors, 24-30 August 1987, Kishinev, p.4.

4. K.Yu.Arutyunov, Ya.G.Ponomarev "Influence of the strong quantizing magnetic field on the properties of the charge carriers in doped semiconducting Bi-Sb alloys", proceeding of the seminar "Impurities and defects in narrow gap semiconductors", Pavlodar, 1987, p.168.

5. K.Yu.Arutyunov, G.A.Mironova, Ya.G.Ponomarev "Spin splitting of Landau levels in quantizing magnetic field in Bi-Sb alloys", proceeding of the 25-th Low Temperature Conference, Leningrad, 1988, p.194.

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15. К.Ю. Арутюнов, В.А. Крупенин, С.В. Лотхов, and Д.Е. Преснов. Экспериментальное исследование сверхпроводящих мезоскопических систем. *Информационный бюллетень РФФИ*, 3(2):171–171, 1995.

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18. K.Yu.Arutyunov, S.V. Lotkhov and L. Rinderer "Anomalie de Resistivité dans des Nanostructures Supraconducricies de Dimensionalite Quasi-Nulle", proceedings of the Quatriéme Séminaire Rhodanien de Physique "Physics of Surface", Dolomieu (France), 11-15 March 1996.

19. K.Yu.Arutyunov, S.V.Lotkhov and L.Rinderer "Resistive State Anomalies in Superconducting Mesoscopic Systems", proceeding of the International Conference "Mesoscopic Phenomena in Complex Quantum Systems", Triest (Italy), 11-14 June 1996.

20. K.Yu.Arutyunov, V.A.Krupenin, S.V.Lotkhov, A.B.Pavolotski and L.Rinderer, "Resistive State Measurements of Quasi-0-Dimensional Superconducting Structures", proceeding of the XXI International Conference on Low Temp. Physics, Prague, 8-14 August 1996.

21. K.Yu.Arutyunov, V.A.Krupenin, S.V.Lotkhov, A.B.Pavolotski and L.Rinderer, "Resistive State Anomalies of Superconducting Nanostructures", proceeding of the 5-th World Congress on Superconductivity, Budapest, 7-11 July 1996.

22. K.Yu.Arutyunov, S.V.Lotkhov, A.B.Pavolotski and L.Rinderer "Resistive State Anomalies of Superconducting Nanostructures", proceeding of the Swiss Workshop on Superconductivity and Novel Metals, Les Diablerets (Switzerland), September 30 - October 2, 1996.

23. K.Yu.Arutyunov, S.V.Lotkhov, A.B.Pavolotski, D.A. Presnov and L.Rinderer "On the reproducibility of Resistive State Anomalies in Superconducting Nanostructures", proceeding of the Annual Session of the Swiss Physical Society, Zurich, 10 October 1996.

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64. "Quantum phase slip phenomena in ultranarrow superconducting nanostructures", **oral talk** & proceedings of the International workshop "Fluctuations & Phase Transitions in superconductors", June 10-14, 2007, Nazareth Ilit, Israel, p. 9.

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71. K. Yu. Arutyunov , poster “Relaxation of non-equilibrium qausiparticles in superconductors”, JSPS-ESF International conference on NanoScience in Superconductivity, 23-26 March, 2009, Tsukuba, Japan, abstract booklet p. 59.

72. K. Yu. Arutyunov , oral talk (invited) “Quantum tunneling in superconducting nanowires and nanorings”, NEC, 27 March, 2009, Tsukuba, Japan, abstract booklet p. 54

73. K. Yu. Arutyunov , oral talk (invited) “Relaxation of non-equilibrium qausiparticles in a superconductor at ultra-low temperatures”, MESO-2009: Non-equlibrium and coherence phenomena at nanoscale, 11 -16 June 2009, Chernogolovka, Russia, abstract booklet p. 44.

74. K. Yu. Arutyunov , poster “Suppression of persistent currents in superconducting nanorings by qauntum fluctuations”, MESO-2009: Non-equlibrium and coherence phenomena at nanoscale, 11 -16 June 2009, Chernogolovka, Russia.

75. K. Yu. Arutyunov , oral talk (invited) “Relaxation of non-equilibrium qausiparticles in a superconductor at ultra-low temperatures”, International Conference on Quantum Phenomena at Nanoscale, Montenegro, August 30 – September 4, 2009.

76. K. Yu. Arutyunov, invited talk “Fundamental size limitations in quantum nanoelectronics: dead end or future development?”, International Workshop Nanotechnological Revolution, 27 Septemeber- 3 October 2009, Basita, France, abstract booklet, p. 8.

77. K. Yu. Arutyunov , oral talk (invited) “Quantum fluctuations in superconducting nanowires and nanorings”, SM2010-International Conference on Superconductivity and Magnetism: hubrid proximity nanostructures and intrinsic phenomena, Paestum, Salerno (Italy), 5-11.09.2010, anstract booklet p.50.

78. K. Yu. Arutyunov, “Quantum Phase Slip junction as a Quantum Standard of Electric Current”, talk at EURAMET workshop, Berlin 17-20 May 2011.

79. K. Yu. Arutyunov, H.-P. Auraneva, A. S. Vasenko, oral talk “Spatially resolved measurement of nonequilibrium quasiparticle relaxation in a superconductor”, Moscow International Symposium on Magnetism, MISM-2011, 21-25 August, 2011, Russia.

80. K. Yu. Arutyunov , oral talk (invited) “Spatially resolved measurement of nonequilibrium quasiparticle relaxation in a superconductor”, Interntaional conference on Vortex Matter in Nanostructured Supercondcutors, 10-17 Septemeber, 2011, Rhodes, Greece.

81. L. Leino and K. Yu. Arutyunov, poster “Super-fine ion beam surface treatment”, Physics Days 2011, Annual conference of the Finnish Physical Society, 23-25 March 2011, Helsinki.

82. K. Yu. Arutyunov , H.-P. Auraneva and A. S. Vasenko, poster **“**Charge imbalance and energy relaxation of nonequilibrium quasiparticles injected into a superconductor” , European conference on applied superconductivity EUCAS-2011, 18-23 September, Hague, Netherlands.

83. K. Yu. Arutyunov and J. Lehtinen , oral talk **“**Physics and applications of quantum phase slip effect in superconducting nanostructures” , European conference on applied superconductivity EUCAS-2011, 18-23 September, Hague, Netherlands.

84. K. Yu. Arutyunov oral talk **“**Coulomb effects in superconducting nanowires”, NANO-2011, 6-9 October, Chisinau, Moldova. Program and abstract book, Chisinau 2011.

85. L. Leino, P. Jalkanen and K. Yu. Arutyunov, poster “SUPER-FINE ION BEAM SURFACE TREATMENT”, Oxford Instrument Plasma workshop, 18.10. 2011, Grenoble, France.

86. K. Yu. Arutyunov and J. Lehtinen, poster, Insulating state of a supercondcutor and tunneling without a tunnel barrier, Nanoscience Days 2011, University of Jyväskylä, Finland, P-28.

87. K. Yu. Arutyunov and J. S. Lehtinen, ”Quantum phase slip junction”, abstract book of the International Workshop “Supercondduting NanoHybrids” SNh-2012, Septemebr 3-7, San Sebastian, Spain, p13. Donostia International Physics Center, 2012.

88. K. Yu. Arutyunov , oral talk ”Quantum fluctuations in superconducting nanostructures: physics and applications”, 13th International workshop on NanoScience and Nanotechnology, 01-04.10.2012, INFN Frascati, Italy. Abstract booklet, p. 36.

89. J. Lehtinen and K. Arutyunov, poster “Duality between physics of Josephson junction and superconducting ultra-narrow nanowire”, proceedings of the NanoScience Days 2012, University of Jyväskylä, Finland, abstract booklet. P-33.

90. L. Leino, P. Jalkanen and K. Arutyunov, poster “Super-fine Ion Beam Surface Treatment”, proceedings of the NanoScience Days 2012, University of Jyväskylä, Finland, abstract booklet. P-35.

91. T. Rantala and K. Arutyunov, poster “Quantum Fluctuations of the Energy Gap in quasi-1D supercondcutors”, poster at the Physics Days 2012, Helsinkli, March 2012.

92. J. Lehtinen and K. Yu. Arutyunov, Supercondcuting nanowire as a quantum standard of electric current, invited oral talk, EURAMET meeting, May 21-22, 2013, Madrid / Tres Cantos.

93. K. Yu. Arutyunov, invited talk “Qauntum flcutuations in nanoscale supercondcutors “, International Conference SUPERSTRIPES 2013, Ischia, Italy, May 27-June 1, 2013.

94. K. Yu. Arutyunov, “Quantum fluctuations: physics and applications “, Proceedings of the 2nd International Conference "Mesoscopic structures: fundamentals and applications", Novosibirsk, Russia, 23-29 June 2013, p. 38.

95. J. S. Lehtinen, T. Rantala, K. Yu. Arutyunov, “Quantum fluctuations in 1D supercondcutors: physics and applications”, oral talk at the Eigth International Conference in School format on Vortex Matter in Nanostructured Supercondcutors VORTEX-III, Rhodes-Greece, 21-26 September, 2013, abstract booklet p. 45.

96. T. Rantala, J. S. Lehtinen, K. Yu. Arutyunov, “Quantum fluctuations of the amplite of the order parameter in 1D suprcondcutors”, poster at the Eigth International Conference in School format on Vortex Matter in Nanostructured Supercondcutors VORTEX-III, Rhodes-Greece, 21-26 September, 2013, abstract booklet p. 169.

97. K. Yu. Arutyunov and J. S. Lehtinen, ”Superconducting nanowire as junctionless transistor and/or qautum standard of electric current”, oral talk at 11th European Conference on Applied Superconductivity EUCAS 2013, Genova, Italy September 15-19, abstract booklet p. 132

98. T. Rantala and K. Arutyunov, poster “Quantum Fluctuations of the Energy Gap in quasi-1D supercondcutors”, poster at the NanoScience Days 2013, Jyväskylä, 23-24.10.2013, abstract booklet p. 34.

99. J. S. Lehtinen, T. Rantala and K. Yu. Arutyunov , “Insulating state of a quasi-1D superconductor stimulated by qaunatum phase slippage”, International workshop on strongly disordered supercondcutors & the superconductor – insulator transition SIT2014, 9-14 February 2014, Villard-de-Lans, France; invited oral talk and proceedings booklet p. 19.

7. Invited Talks & Seminars

1. “Normal Metal - Insulator – Superconductor Mesoscopic Analogue of an Optical Interferometer”, invited seminar at University of Antwerpen, Belgium, 20.01.2004

2. “Evidence of macroscopic quantum tunneling in ultra-narrow aluminum nanowires”, invited seminar at University of Antwerpen, Belgium, 21.01.2004

3. “Normal Metal - Insulator – Superconductor Mesoscopic Analogue of an Optical Interferometer”, invited seminar at University of Lancaster, UK, 03.02.2004

4. “Normal Metal - Insulator – Superconductor Mesoscopic Analogue of an Optical Interferometer”, invited seminar at University of Leeds, UK, 04.02.2004

5. K. Yu. Arutyunov ”Normal Metal - Insulator – Superconductor Interferometer”, invited talk at the 8th International workshop “From Andreev reflection to the International space Station”, Björkliden, Kiruna, Sweden, March 20-27, 2004.

6. “Mesoscopic NIS interferometers”, invited seminar in Physikalisch-Technische Bundesanstalt, Braunschweig, Germany, 09.09.2004.

7. K. Arutyunov , ”Normal metal – Insulator- Superconductor Quantum Interferometer”, invited talk at the International Workshop “Nanoscale Dynamics and Quantum Coherence”, Hamburg, 19.09-23.09, 2004.

8. ”Quantum size phenomena in low dimensional semimetals”, invited talk at the international workshop “Quantum coherence and decoherence at the nanoscale”, 28.08 – 02.09.2005, Corfu, Greece.

9. K. Arutyunov,”Quantum tunneling in 1D aluminum nanowires”, invited talk at the 9th International workshop “From Andreev reflection to the Earliest Universe”, Björkliden, Kiruna, Sweden, April 2-9, 2005.

10. “Quantum size phenomena in ultra-narrow 1D nanowires”, invited seminar at University of Turku, Wihuri lab, 02.12.2005.

11. K. Arutyunov, “Quantum size phenomena in ultra-narrow 1D nanowires”, invited talk at the International Conference NANOLECTRONICS-2006, 8-11 January 2006, Lancaster, UK.

12. K. Arutyunov, “Size Dependent Breakdown of Superconductivity in Ultra-Narrow Nanowires”, invited talk at APS meeting,, March 13-17, 2006, Baltimore, US.

13. K. Arutyunov, , “Ion beam-assisted methods of nanostructure fabrication”, oral talk at International Congress and Exhibition “ Nanotechnology in Northern Europe”, 16-18 May 2006, Helsinki, Finland.

14. K. Arutyunov, “Quantum phase slip phenomena in ultra-narrow 1D superconductors”, invited talk at International Seminar and Workshop “Quantum coherence, noise and decoherence in nanostructures”, May 15-26, 2006, Dresden, Germany.

15. K. Arutyunov, invited talk “Tunneling spectroscopy of persistent currents in mesoscopic-size superconducting loops”, international Workshop “Quantum transport and noise”, Ermones, Greece, 03.09 – 15.09.06.

16. K. Arutyunov, invited talk “Phase Slip Phenomena in Superconductiviting Nanowires”, international Workshop “Quantum transport and noise”, Ermones, Greece, 03.09 – 15.09.06.

17. “Phase slip phenomena in superconducting nanowires”, invited seminar at University of Antwerpen, Belgium, 18.10.2006

18. “Phase slip phenomena in superconducting nanowires”, invited seminar at University of Leven la Neuve, Belgium, 19.10.2006.

19. “Tunneling spectroscopy of persistent currents in superconducting mesoscopic rings”, invited seminar at University of Antwerpen, Belgium, 20.10.2006

20. “Tunneling spectroscopy of persistent currents in superconducting mesoscopic rings”, invited talk at NordForsk workshop “Low dimensional physics: the theoretical basis of nanothechnology”, NanoScience Centre, University of Jyväkskylä, 25.10.2006

21. “Superconductivity in ultra-narrow nanowires”, invited seminar at UC Irvine, USA, 29.11.2006

22. “Quantum fluctuations in superconductiing nanowires”, invited seminar at UC Riverside, USA, 30.11.2006

23. “Superconductivity in ultra-narrow nanowires”, invited seminar at University of Urbana Champaign, Illinois, USA, 05.12.2006

24. “Tunneling spectroscopy of persistent currents in superconducting mesoscopic rings”, invited seminar at University of Urbana Champaign, Illinois, USA, 06.12.2006

25. “Quantum fluctuations in superconductiing nanowires”, invited seminar at SUNY, Stony Brook, USA, 08.12.2006

26. “Tunneling spectroscopy of persistent currents in superconducting mesoscopic rings”, **invited talk** at SFINX workshop, Oslo, 01-02 March 2007.

27. K.Yu.Arutyunov, Relaxation of non-equlibrium quasiparticles injected into a superconductor at ultra-low temperatures, **invited talk** at European Workshop on Electron Interactions in Ultra 1D Nanostructures, 15-20 May 2007, Nice, France.

28. “Quantum phase slip phenomena in ultranarrow superconducting nanostructures”, **invited talk** at “Fluctuations & Phase Transitions in superconductors”, June 10-14, 2007, Nazareth Ilit, Israel.

29. “Phase slips in 1D superconductors”, **invited talk** at International workshop “Physics of nanoscale superconducting heterostructures”, Leiden, The Netherlands, 02-07.07.2007.

30. “Quantum phase tunneling in superconducting nanostructures” **invited talk** at International symposium SPIN&QUBIT, Niels Bohr Institute, 28.08.2007, Copenhagen, Denmark.

31. “Relaxation of non-equilibrium quasiparticles injected into a superconductor at ultra-low temperatures”, **invited talk** at seminar at CNRS-CRTB & University J. Fourier, Grenoble, France, 12.12.2007.

32. “Quantum phase tunneling is superconducting nanowires”, **invited talk** at seminar at CNRS-CRTB & University J. Fourier, Grenoble, France, 13.12.2007.

33. “Quantum tunneling in superconducting nanowires and nanorings”, **invited talk** at Joint International Workshop on "A new generation of ultra-sensitive detectors for dark energy and cosmology experiments", Bjorkliden, Kiruna, Sweden, March 30 - April 6, 2008.

34. “Fundamental limitations of electric conductivity at nanoscales”, **invited lecturer** at Summer School, 24-31.08.2008, Ivanova Korita, Montenegro.

35. K. Yu. Arutyunov , **invited talk** “Quantum tunneling phenomena in superconducting nanostructures”, International Conference on Quantum Transport and Fluctuations at Nanoscale, Montenegro, 31 August- 05 Septemeber 2008.

36. K. Yu. Arutyunov , **invited talk** “Relaxation of non-equilibriunm qausiparticles in superconductors”, National Physical Laboratory, Teddington, UK, 26.11.2008

37. K. Yu. Arutyunov , **invited talk** “Quantum phase slip phenomena in superconducting nanowires”, National Physical Laboratory, Teddington, UK, 27.11.2008

38. K. Yu. Arutyunov , **invited talk** “Quantum tunneling in superconducting nanowires and nanorings”, JSPS-ESF International conference on NanoScience in Superconductivity, 23-26 March, 2009, Tsukuba, Japan.

39. K. Yu. Arutyunov , **invited talk** “Quantum tunneling in superconducting nanowires and nanorings”, NEC, 27 March, 2009, Tsukuba, Japan.

40. K. Yu. Arutyunov , **invited talk** “Relaxation of non-equilibrium qausiparticles in superconductors”, NEC, 27 March, 2009, Tsukuba, Japan.

41. K. Yu. Arutyunov , **invited talk** “Relaxation of non-equilibrium qausiparticles in a superconductor at ultra-low temperatures”, MESO-2009, 15 June 2009, Chernogolovka, Russia.

42. K.Yu. Arutyunov , **invited talk** “Relaxation of non-equilibrium qausiparticles in a superconductor at ultra-low temperatures”, International Conference on Quantum Phenomena at Nanoscale, Montenegro, August 30 – September 4, 2009.

43. K. Yu. Arutyunov , **invited talk** “Fundamental size limitations in quantum nanoelectronics: dead end or future development?”, International Workshop Nanotechnological Revolution, 27 September- 3 Octoberv 2009, Basita, France.

44. K. Yu. Arutyunov , **invited talk** “Quantum fluctuations in superconducting nanostructures”, KIT, Dept. of Physics, Karlsruhe, Germany, 23.11.2009.

45. K. Yu. Arutyunov , **invited talk** “Relaxation of non-equlibrium qausiparticles in superconductors at ultra-low temperatures”, KIT, FZK, Karlsruhe, Germany, 25.11.2009

46. K. Yu. Arutyunov , **invited talk** “Quantum fluctuations in superconducting nanostructures”, PTB, Braunschweig, Germany, 26.11.2009.

47. K. Yu. Arutyunov , **invited talk** **“**Ion beam nano-scale accurate treatment of steel surfaces”, VTT, Helsinki, 02.12.2009.

48. K. Yu. Arutyunov , **invited talk** “Fundamental limitations and perspective of development of nanoelectronics”, Russian Corporation of Space Engineering and Information, Moscow 28.06.2010.

49. K. Yu. Arutyunov , **invited talk** “Fundamental limitations and perspective of development of nanoelectronics”, International conference “Dialogue”, 30.03-02.04.2010, Tomsk, Russia.

50. K. Yu. Arutyunov , **invited talk** “Quantum fluctuations in superconducting nanowires and nanorings”, International conference and summer school “Mesoscopic systems: physics and applications”, 20-26.06.2010, Novosibirsk (Erlagol), Russia.

51. K. Yu. Arutyunov , **invited talk** “Quantum fluctuations in superconducting nanowires and nanorings”, SM2010-International Conference on Superconductivity and Magnetism: hybrid proximity nanostructures and intrinsic phenomena, Paestum, Salerno (Italy), 5-11.09.2010.

52. K. Yu. Arutyunov , **invited talk** “Quantum phase slip junction standard of electric current”, Joint iMERAplus Dissemination Meeting and EURAMET Expert Meeting on quantum electrical metrology, 18-20 May, 2011, Berlin, Germany.

53. K. Yu. Arutyunov , **invited talk** “Ion beam super-fine surface shaping and polishing”, Working Seminar on Global Cooperation in Nanotech Business Jyvaskyla, Finland, 07.06.2011

54. K. Yu. Arutyunov , **invited talk** “Insulating state of a superconductor”, Moscow International Symposium on Magnetism MISM-2011, August 21-25, 2011, Moscow, Russia.

55. K. Yu. Arutyunov , **invited talk** “Insulating state of a superconductor”, Workshop Nanotechnological revolution, NTR-2011, 04-10 August, 2011, Becici, Montenegro.

56. K. Yu. Arutyunov , **invited talk “**Insulating state of a superconductor”, Seventh International Conference on Vortex matter in Nanostructurred Supercondcutors, VORTEX-VII, 10-17 September 2011, Rodes, Greece.

57. K. Yu. Arutyunov , **invited talk “**Coulomb effects in superconducting nanowires”, NANO-2011, 6-9 October, Chisinau, Moldova**.**

58. K. Yu. Arutyunov , **invited talk** “Ion beam superfine surface finishing”, Nanotechnolgy workshop, 30 November 2011, Jyväskylä, Finland**.**

59. K. Yu. Arutyunov , **invited talk** “How to become an evaluator for FP7”, FP7 workshop, Friday 9.12.2011, Jyväskylä, Finland**.**

60. K. Yu. Arutyunov , **invited talk** “Quantum phase slip phenomena in superconducting nanostructures”, International conference MAMA-ProTheo - Multifunctional Advanced Materials: Probe and Theory, 19-23.03.2012, Vietri sul Mare, Italy.

61. K. Yu. Arutyunov , **invited talk** ”Quantum phase slip junction”, International Workshop “Supercondduting NanoHybrids” SNh-2012, Septemeber 3-7, San Sebastian, Spain.

62. K. Yu. Arutyunov , **invited talk** ”Quantum fluctuations in low dimensional superconductors” 01.10.2012, ENEA, Frascati, Italy.

63. K. Yu. Arutyunov , **invited talk** ”Fundamental limitations and persepectives of development of nanoelectronics”, University of Salerno, 03.10.2012.

64. K. Yu. Arutyunov , **invited talk** ”Quantum fluctuations in superconducting nanostructures: physics and applications”, University of Salerno, 03.10.2012.

65. K. Yu. Arutyunov , **invited talk** ”Fundamental limitations and persepectives of development of nanoelectronics”, National Institute of Microtechnology (Bucharest), Romania, 08.01.2013.

66. K. Yu. Arutyunov , **invited talk** “Cohernt quantum phase slip phenomena” 22.01.2013, LPTHE, Pierre and Marie Curie University (Paris VI), Paris, France.

67. K. Yu. Arutyunov , **invited talk** “Quantum fluctuations in superconducting nanostructures” , 24.01.2013, ESPCI, (CNRS-UMR8213) Paris, France

68. J. Lehtinen and K. Yu. Arutyunov, Supercondcuting nanowire as a quantum standard of electric current, **invited talk**, EURAMET meeting, May 21-22, 2013, Madrid / Tres Cantos.

69. K. Yu. Arutyunov, **invited talk** “Quantum fluctuations in nanoscale supercondcutors “, International Conference SUPERSTRIPES 2013, Ischia, Italy, May 27-June 1, 2013.

70. K. Yu. Arutyunov, **invited talk** “Quantum fluctuations in 1D supercondcutors: physics and applications “, 2nd International Conference "Mesoscopic structures: fundamentals and applications", Novosibirsk, Russia, 23-29 June 2013.

71. K. Yu. Arutyunov, **invited talk** at seminar “Quantum fluctuations in 1D supercondcutors: physics and applications “, Moscow State Pedagogical University, 02 July 2013.

72. K. Yu. Arutyunov, **invited talk** “Quantum fluctuations in 1D supercondcutors: physics and applications”, MicroKelvin Workshop, Sannäs Manor House, Porvoo, Finland 9 – 13 September, 2013. http://ltl.tkk.fi/wiki/Events/Microkelvin_2013

73. Yu. Arutyunov, **invited talk** “Quantum fluctuations in 1D supercondcutors: physics and applications”, Eigth International Conference in School format on Vortex Matter in Nanostructured Supercondcutors VORTEX-III, Rhodes-Greece, 21-26 September, 2013.

74. K. Yu. Arutyunov , **invited talk** ”Fundamental limitations and persepectives of development of nanoelectronics”, National Center for Scientific Research "Demokritos", Greece, 20.11.2013.

75. K. Yu. Arutyunov , **invited talk** ”Fundamental limitations and persepectives of development of nanoelectronics”, Institute of Electronic Structure & Laser (IESL) and Foundation for Research & Technology Hellas (FORTH), Greece, 22.11.2013.

76. K. Yu. Arutyunov , **invited talk** “Nano treatment of intraocular lenses”, NanoVision Workshop, Moscow, 24-25.01.2014

77. K. Yu. Arutyunov , **invited talk** “Insulating state of a quasi-1D superconductor stimulated by qaunatum phase slippage”, International workshop on strongly disordered supercondcutors & the superconductor – insulator transition SIT2014, 9-14 February 2014, Villard-de-Lans, France.

78. K. Yu. Arutyunov , **invited talk** “Quantum fluctuations in quasi-1D supercondcutors: physics and applications”, 13 February 2014, Grenoble CNRS, France.

79. K. Yu. Arutyunov , **invited talk, "** Quantum fluctuations in quasi-1D superconductors: Physics and applications**",** NanoPeter-2014, 21.06-27.06.2014, St. Petersburg.

80. K. Yu. Arutyunov, **invited talk** "Quantum fluctuations in supercondcuting nanostructures", Moscow International Syposium on Magnetism: MISM-2014, 29.06-03.07.2014, Moscow.

81. K. Yu. Arutyunov, **invited talk** "Fundamental limitations and future trends in nanoelectronics"**,** seminar at University of Otago, New Zaland, 04.08.2014.

82. K. Yu. Arutyunov, **invited talk** "Fundamental limitations and future trends in nanoelectronics"**,** seminar at School of Physics and Astronomy, University of Canterburry, New Zaland, 08.08.2014.

83. К. Ю. Арутюнов, **приглашенный доклад** "Фундаментальные ограничения и перспекивы развития наноэлектроники", семинар Лаборатории Криогенной Наноэлектроники, Нижний Новгород, 23.01-26.01.2015.

84. К. Ю. Арутюнов, **приглашенный доклад** "Квантовые флуктуации в сверхпроводниках: физика и приложения", семинар Лаборатории Криогенной Наноэлектроники, Нижний Новгород, 23.01-26.01.2015.

85. К. Ю. Арутюнов, **мастер-класс** "Наноэлектроника - перспекивы развития и фундаментальные ограничения", зимняя Инженерно-техническая школа НИУ ВШЭ, Вороново, 25.01-29.01.2015.

8. Patents

1. K. Yu. Arutyunov, “Ion beam etching method and ion beam etching apparatus”, national patent FI-122010.

2. K. Yu. Arutyunov, V. Tuboltsev and M. Kaarre, “Ion beam etching processing”, PCT/FI/2007/050440, International Publication Number WO 2008/017733 A1

3. K. Yu. Arutyunov, and J. S. Lehtinen, ”Nanostructure and method for determining a dc electric current”, patent PCT/FI2012/051133, International Publication Number WO 2013/072568 A1