

Arutyunov-CV

<b>Name</b>	<b>Konstantin Yu. ARUTYUNOV</b>		
<b>Nationality</b>	Russian		
<b>Marital status</b>	Married, 1 child		
<b>Home</b>	Leninski prospekt 123-1-331, 117513 Moscow		
<b>Office</b>	National Research University Higher School of Economics, 101000, Moscow, RU. karutyunov@hse.ru		
<b>Languages</b>	Russian (native), English (fluent), French (elementary), Finnish (elementary)		
<b>EXPERTISE</b>			
<b>Background:</b> low and ultra-low-T physics; superconductivity; low-D & mesoscopic systems; material science, nanotechnology.			
<b>Current interests:</b> nanoscale superconductivity; nanoelectronics; interface and quantum size phenomena; applied nanotechnology.			
<b>PROFESSIONAL APPOINTMENTS</b>			
<b>2014-pr.</b>	<b>Prof.:</b> National Research University Higher School of Economics, Moscow Institute of Electronics and Mathematics. <b>Research:</b> Low-T nanoelectronics, quantum size and interface phenomena at nanoscales, applied nanotechnology		
<b>2004-2014</b>	<b>Senior Lecturer</b> , Docent, NanoScience Centre, University of Jyväskylä (Finland), <b>PI</b> Quantum nanoelectronics. <b>Research:</b> Low-T nanoelectronics, quantum size and interface phenomena at nanoscales, applied nanotechnology.		
<b>2002-2004</b>	<b>Assistant professor</b> , Docent, Department of Physics, University of Jyväskylä (Finland), Group of Prof. J. Pekola <b>Research:</b> Low-T and ultra-low-T study of 1-D nanostructures and NIS hybrid systems.		
<b>1998-2002</b>	<b>Senior researcher</b> , Department of Physics, University of Jyväskylä (Finland), group of Prof. J. Pekola <b>Research:</b> Experimental study of electron transport properties of various metal and hybrid nanostructures. Quasiparticle cooling effect in NIS systems. Experimental study of transport properties of various metal nanostructures. Non-local interaction in mesoscopic-size superconducting structures.		
<b>1998</b>	<b>Research Fellow</b> , Lab. Vaste-Stoffysica en Magnetism, Katholieke University Leuven (Belgium), group of Prof. J. Indekeu. <b>Research:</b> Experimental study of interface phenomena in superconductors		
<b>1995-1998</b>	<b>Prime Assistant</b> , Physics Faculty, Lausanne University (Switzerland), groups of Prof. J. Dietler and Prof. L. Rinderer. <b>Research:</b> Experimental study of transport properties (V(T,H,I) characteristics) of various superconducting nanostructures and M(H,T) dependencies of ultra-thin single crystalline wires using self-made SQUID magnetometer. Design of the liquid helium cooled stage for atomic force microscope.		
<b>1989-1995</b>	<b>Junior Scientific Researcher / Scientific Researcher</b> , High-Tc group, Low Temperature Lab, Physics Faculty, Moscow State University, group of Prof. V. Moshchalkov. <b>Research:</b> Experimental study of transport properties of various high-Tc materials; current-induced non-equilibrium resistive state in quasi-1-D conventional superconductors: whiskers and (sub)micron filaments.		
<b>EDUCATION &amp; DEGREES</b>			
<b>2012</b>	<b>Doctor of Physical-Mathematical Sciences</b> (= higher than PhD scientific degree in Russia, equivalent to <i>habilitation</i> ) “Experimental study of current states in low dimensional superconductors”, Physics Faculty, Moscow State University		
<b>2002</b>	<b>Docent in Material physics</b> , Department of Physics, University of Jyväskylä (Finland)		
<b>1988</b>	<b>Ph.D. in Physics</b> , Low Temperature Dept., Physics Faculty, Moscow State University. Supervisor: Prof. Ya. Ponomarev. Thesis "Energy spectrum of semiconducting n-type Bi-Sb alloys in quantizing magnetic fields".		
<b>1985</b>	<b>M.Sc. in Physics</b> , Physics Faculty, Moscow State University: MSc in physics with specialization in experimental low temperature physics; thesis “Experimental study of the Shubnikov-de-Haas effect in Bi-Sb alloys”		
<b>1979</b>	<b>26th Moscow English School</b>		
<b>TEACHING</b>			
2014-pr.	HSE MIEM	Course design, lecturing “Physics”, BSc and MSc tutoring.	
1999-2014	NanoScience Centre, University of Jyväskylä, Dept. of Physics	Course design, lecturing “Superconductivity”, “Microsensors”, “Measuring technique”, tutoring, student assessment and feedback	
1996-97	University of Lausanne, Dept. of Physics	Student practicum design, tutoring	
1987-89	Moscow State Univ., Dept. of Physics	Student laboratory and practicum, tutoring	
2004-pr.	Various student summer schools	“Introduction to superconductivity”, “Introduction to nanoscience”	
<b>SUPERVISION of STUDENTS and YOUNG RESEARCHERS</b>			
1991-4	MSc	3	Moscow State Univ., Dept. of Physics, LT Lab
1996-7	MSc	2	University of Lausanne, Dept. of Physics
1999-p.r	BSc+MSc+Exchange PhD+PostDoc	3+9+3 6+3	University of Jyväskylä, Dept. of Physics & NanoScience Centre & MIEM
<b>REPRESENTATIVE RESEARCH ACCOMPLISHMENTS</b>			
<b>Recent</b>	<ul style="list-style-type: none"> <li>• first time observation of quantum size mediated metal-to-insulator transition <b>Nature: Quantum Materials</b> (2017)</li> <li>• first time observation of QPS-driven qubit operation: <b>Nature</b> 484, 355 (2012).</li> <li>• first time observation of persistent current size-dependent suppression in nanorings: <b>Nature: Sci. Rep.</b> 2, 293 (2012).</li> <li>• first time observation of Bloch oscillations in SC nanowires: <b>PRL</b>109, 187001 (2012); <b>patent</b> WO 2013/072568 A1.</li> </ul>		
<b>PI of research group</b>	<ul style="list-style-type: none"> <li>• invention of novel nanofabrication method down to sub-10 nm scales: <b>patents</b> FI-2007/050440; WO 2008/017733 A1</li> <li>• observation of quantum phase slip effect in SC nanowires: <b>Nano Lett.</b> 5, 1029 (2005); <b>PRB</b> 77, 054508 (2008).</li> <li>• spatially resolved observation of non-equilibrium quasiparticle relaxation in superconductors: <b>PRB</b> 83,104509(2011).</li> <li>• development of a novel approach to measure persistent currents in nanorings by tunneling spectroscopy: <b>PRB</b> 70, 064514 (2004); <b>Europhys. Lett.</b> 75, 315 (2006); <b>Physica E</b> 40, 184 (2007); <b>J. Phys</b> 97, 012114 (2008).</li> <li>• observation of negative magnetoresistance in SC nanostructures and model development: <b>Physica C</b> 468, 272 (2008).</li> <li>• observation of size dependent enhancement of superconductivity in nanowires: <b>PRB</b> 74, 052502 (2006).</li> </ul>		
<b>Member</b>	<ul style="list-style-type: none"> <li>• novel fabrication technique and experiments on SC single-crystalline nanostructure: <b>PRB</b> 63, 092506 (2001).</li> </ul>		

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<b>of a team</b>	<ul style="list-style-type: none"> <li>• microrefrigeration by quasiparticle tunneling in NIS junctions: <b>Physica B</b> 280, 485 (2000); <b>JAP</b> 88, 326 (2000).</li> <li>• observation and model development of resistive transition anomaly in SCs: <b>PRB</b> 53, 12304 (1996) &amp; 59, 6487 (1999).</li> <li>• observation of current-induced phase slips in 1D superconductors: <b>JAP</b> 76, 7139 (1994); <b>Physica C</b> 235, 1967 (1994).</li> <li>• observation of Little-Parks effect in high-Tc superconducting microcylinders: <b>Physica C</b> 185, 1259 (1991).</li> <li>• magnetic field induced semimetal-semiconductor transition in Bi<sub>1-x</sub>Sb<sub>x</sub> alloys, <b>Sov. J. Low T. Phys.</b> 13, 554 (1987).</li> </ul>
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**FUNDING, GRANTS AND AWARDS**

<b>2016-pr.</b>	<b>PI</b> of Russian Science Foundation project “Quantum fluctuations in superconducting nanostructures”, 18 MRUB
<b>2016-pr.</b>	<b>PI</b> of HSE Fund for basic research project “Macroscopic quantum phenomena at low temperatures”, 1.5 MRUB
<b>2012–14</b>	<b>PI</b> of the international project “NanoVision: Nanotechnology for medical applications”, 115 k€
<b>2010 –14</b>	<b>PI</b> of the Finnish Technical Academy project “Demanding applications: friction and energy”, 108 k€
<b>2010 –12</b>	<b>PI</b> and invited leading scientist, Russian Ministry of Science and Education project No. 02.740.11.5157 “Quantum standard of electric current”, 2 000 000 RUB
<b>2008</b>	<b>PI</b> of the Jyväskylä Innovation park JOSKE project “Applications of Ion Beam Etching Technique”, 17 k€.
<b>2007-09</b>	<b>PI</b> of the Finnish Academy of Science research project FUNANO “Functional nanoparticles and devices”, total budget 780 k€, group budget 60 k€.
<b>2006-07</b>	<b>PI</b> TULE grant, Jyväskylä scientific park “Commercial potential of the ion beam nanofabrication”, 6000 €.
<b>2004-07</b>	<b>Author, PI and scientific manager</b> - EU Commission FP6 NMP-3 “ULTRA-1D” project 505457 “Experimental and theoretical investigation of electron transport in ultra-narrow 1-dimensional nanostructures”, 2.4 M€ total budget, 670 k€ node budget
	<b>PI</b> EU Commission FP6 NMP-3 “SFINX” project 505587 “Superconductivity – Ferromagnetism Interplay in Nanostructured Hybrid Systems”, 1.8 M€ total budget, 340 k€ node budget
<b>2004-06</b>	<b>PI</b> , Russian Academy of Science Foundation for Basic Research 04-02-17397-A “Experimental study of spin-polarized injection of nonequilibrium quasiparticle excitations into a superconductor”, 350 000 RUB
<b>2000-03</b>	<b>PI</b> , grant of Russian Academy of Science Foundation for Basic Research “Experimental investigation of phase-sensitive electron transport in normal and superconducting nanostructures”, 250 000 RUB
<b>1998-00</b>	<b>PI</b> , grant of Russian Academy of Science Foundation for Basic Research “Experimental study of hybrid nanostructures metal - superconductor”, 150 000 RUB
<b>1995-97</b>	<b>PI</b> , grant of Russian Academy of Science Foundation for Basic Research “Experimental study of superconducting mesoscopic systems”, 110 000 RUB
<b>1995</b>	Annual Competition of Young Scientists, Moscow State University - II place

**ADMINISTRATIVE and POSITION-OF-TRUST EXPERIENCE**

Period	Description	Where
1995-pr	Author, PI, scientific and budget manager	Various national and international funding bodies
2004-08	Member of the steering committee	International Summer School, University of Jyväskylä
2005-09	Member of the organizing committee	International workshop “Quantum coherence and decoherence at the nanoscale”, 28.08 – 02.09.2005, Corfu, Greece.
		International Workshop “Quantum transport and noise”, Ermones, Greece, 03.09 – 15.09.06
		International Conference on Quantum Transport and Fluctuations at Nanoscale -2008 <a href="http://www.nanotransport2008.pmf.cg.ac.yu/">http://www.nanotransport2008.pmf.cg.ac.yu/</a>
		International Conference on Quantum Phenomena at Nanoscales, 30.08-04.09.2009, Montenegro, <a href="http://www.nano2009.pmf.ac.me">http://www.nano2009.pmf.ac.me</a>
2007-pr.	Selected expert evaluator	European Science Foundation
		EU Commission FP7, “Cooperation”, “Capacities” and “Nanosciences, Nanotechnologies, Materials and New Production Technologies –NMP”, EU Horizon-2020: Infrastructures, European Research Council
		EU Framework Programme for Research and Innovation, Horizon 2020
2004-pr.	PhD examiner	Several universities
2000-pr.	Referee	Nature, PRL&B, EurPhysLett, NanoLett, JLTP, SolStComm, JAP
2004-14	Teaching and curriculum committee	Dept. of Physics, University of Jyväskylä

**PUBLICATIONS**

>100 papers, 4 invited monographs, >70 invited talks at international conferences, workshops and seminars, 3 patents in nanotechnology. The most representative recent publications are:

1. E. A. Sedov, K.-P. Riikonen and K. Yu. Arutyunov, Quantum size phenomena in single-crystalline bismuth nanostructures, **Nature: Quantum Materials**, to be published (2017).
2. 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, 355 (2012).
3. 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).
4. J. S. Lehtinen, K. Zakharov, and K. Yu. Arutyunov, Coulomb Blockade and Bloch Oscillations in Superconducting Ti Nanowires, **Phys. Rev. Lett.** 109, 187001 (2012).
5. K. Yu. Arutyunov, and J. S. Lehtinen, Nanostructure and method for determining a dc electric current, **Patent** International Publication Number WO 2013/072568 A1(2014).