Nationality Russian Marital status Married, 1 child Home Leninski prospekt 123-1-331, 117513 Moscow Office National Research University Higher School of Economics, 101000, Moscow, RU. karutyunov@hse. Languages Russian (native), English (fluent), French (elementary), Finnish (elementary) Experimental status EXPERTISE Background: Iow and ultra-low-T physics; superconductivity: Iow-D & mesoscopic systems; material science, nanotechnology Current interests: nanoscale superconductivity; nanoelectronics; interface and quantum size phenomena; applied nanotechnology 2014 Prof:: National Research University Higher School of Economics, Moscow Institute of Electronics and Mathematics Research: Low-T nanoelectronics, quantum size and interface phenomena at nanoscales, applied nanotechnology. 2002- Senior Lecturer, Docent, NanoScience Centre, University of Jyväskylä (Finland), Group of Prof. J. Pc Research: Low-T nanoelectronics, quantum size and interface phenomena at nanoscales, applied nanotechnology. 2002- Assistant professor, Docent, Department of Physics, University of Jyväskylä (Finland), Group of Prof. J. Pc Research: Low-T nanoelectron Study of 1-D nanostructures and NIS hybrid systems. 1998 Senior researcher, Department of Physics, University of Jyväskylä (Finland), group of Prof. J. Pekola Research: Experimental study of electron transport properties of various metal ananostructures. Quasipar cooling effect in NIS syst	N.T.		.	X7 ADIV		utyunov-CV			
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Home Leninski prospekt 123-131, 117313 Moscow Office National Research University Higher School of Economics, 101000, Moscow, RU, Lanutynovéhee, Languages Russian (native), English (fluen), French (clementary), Finnish (clementary) ENERGY Redeground: low and ultra-low-T physics; superconductivity; low-D & mecoscopic systems; material science, nanotechnology Corrent Interests: nanoscale superconductivity; low-D & mecoscopic systems; material science, nanotechnology 2014 Prof.; National Research University Higher School of Economics, Moscow Institute of Electronics and Mathematics Research: Low-T nanoelectronics; quantum size and interface phenomena at nanoscales, applied nanotechnology. 2004 Senior Lecturer, Docent, NanoScience Centre, University of Jyväskylä (Finland), Croup of Prof. J. Pc Net Research: Low-T anotechnology of 1-D anostructures and NB hybrid systems. 2005 Assistant professor. Docent, Department of Physics, University of Jyväskylä (Finland), Group of Prof. J. Pc Net Research Elow, Lab. Vaste-Stoffysica en Magnetism, Katholiek University Leuven (Belgium), group of Prof Indeck. 1998 Senior researcher, Department of Physics, University of Jyväskylä (Finland), Group of Prof. L. Rieder 1998 Research Elow, Lab. Vaste-Stoffysica en Magnetism, Katholiek University Leuven (Belgium), group of Prof Indecksee, Experimental study of transport properties of Varihol Lanarcetistics of Various superconducting interface phenomenca in superconducting interescophenomena in superconducting									
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EXPERTISE EXPERTISE EXPERTISE Current interests: nanoscale superconductivity: nanoelectronics; interface and quantum size phenomena; applied nanotechnology Current interests: nanoscale superconductivity: nanoelectronics; duantum size and interface phenomena inscretes and statematics Prof.: National Research University of Jyväskylä (Finland), FI Quantum nanoelectronics; quantum size and interface phenomena at nanoscales, applied nanotechnology Quitable State Technology Quitable State Tec									
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Current interests: anoscale superconductivity: nanoelectronics; interface and quantum size phenomena; applied nanotechnology Prof: National Research University Higher School of Economics, Moscow Institute of Electronics and Mathematics Research: Low-Tanoelectronics; quantum size and interface phenomena at anoscales; applied nanotechnology. 2004 Senter: Daw-Tanoelectronics; quantum size and interface phenomena at anoscales; applied nanotechnology. 2004 Assistant professor. Docent, Department of Physics, University of Jysakskyla (Finland), Eroumo of Prof. J. Pekola Research: Experimental study of electron transport properties of various metal and hybrid nanostructures. Quasipat cooling effect in NS systems. Experimental study of transport properties of various metal ananostructures. Quasipat cooling effect in NS systems. Experimental study of transport properties of various metal ananostructures. Non-interaction in mesoscopie-size superconducting structures. Prime Assistant, Physics Faculty, Lausanne University (Switzerland), groups of Prof. J. Detler and Prof. L. Rindere Researcher F Holy, Lausanne University (Switzerland), groups of Prof. J. Detler and Prof. L. Rindere Researcher J. Sperimental study of transport properties of various superconductors. Prime Assistant, Physics Faculty, Lausanne University (Switzerland), groups of Prof. J. Detler and Prof. L. Rindere Researcher F Holy, Lausanne University (Switzerland), groups of Prof. J. Networks and the systems. Prime Assistant, Physics Faculty, Moscow Sta									
PROFESSIONAL APPOINTMENTS Other Stational Research University ligher School of Beconomics, Moscow Institute of Electronics and Mathematics Research: Low-T nanoelectronics, quantum size and interface phenomena at nanoscales, applied nanotechnology. Senior Lecturer, Docent, NanoSciene Centre, University of Jyväskylä (Finland), PI Quantum nanoelectronics). Senior Tesearcher, Department of Physics, University of Jyväskylä (Finland), Coroup of Prof. J. P. 2002. Research: Experimental study of Lon mostructures and NB hybrid systems. 1998. Senior researcher, Department of Physics, University of Jyväskylä (Finland), Group of Prof. J. Pekola Research: Experimental study of clearbor properties of various metal and hybrid nanostructures. Quasipar cooling effect in NIS systems. Experimental study of transport properties of various metal and phybrid nanostructures. Quasipar cooling of the Lignd by of interface phenomena in superconductors 1998. Prime Assistant, Physics Faculty, Lausanne University (Switzerland), groups of Prof. J. Dieter and Prof. Linkley of thansport properties (VTLL) characteristics) of various superconductors and the linu neodole stage for atomic facer microscopt. 1998. Prime Assistant, Physics Faculty, Lausanne University (Switzerland), groups of Prof. J. Dieter and Prof. Linkley of thansport properties (VTLL) characteristics) of various superconductors and the linu neodole stage for atomic facer microscopt. 1999. Innior Scientific Researcher / Scientific Researcher, High-Tc group, Low Temperature Lab, Physics Faculty whiskers and (submicron filanced). Doctor of Physical-Mathematical Sciences (= higher han PhD scie									
 Prof.: National Research University Higher School of Economics, Moscow Institute of Electronics and Mathematics Research: Low-T nanoelectronics, quantum size and interface phenomena at nanoscales, applied nanotechnology. Senior Lecturer, Docent, NanoScience Centre, University of Jyväksljä (Finland), PI Quantum nanoelectronics, quantum size and interface phenomena at nanoscales, applied nanotechnology. Research: Low-T and ultra-low-T study of 1-D nanostructures and NIS hybrid systems. Senior researcher, Department of Physics, University of Jyväksljä (Finland), Group of Prof. J. Pekola Research: Experimental study of electron transport properties of various metal and hybrid nanostructures. Quasipa cooling effect in NIS systems. Experimental study of transport properties of various metal nanostructures. Non- interaction in mesoscopic-size superconducting structures. Porte Asistiant, Physics Faculty, Lausanne University (Switzerland), groups of Prof. J. Dietler and Prof. L. Rindere Research: Experimental study of transport properties (V(T.H.I) characteristics) of various superconductors inanostructures and M(H,T) dependencies of ultra-thin single crystalline wires using self-made SQUD magnetom Design of the liquid helum cooled stage for atomic force microscope. Junior Scientlife Researcher / Scientlife Researcher, High-Tc group, Low Temperature Lab, Physics Faulty, Low State University, group of Prof. V. Noschalkov, Research: Experimental study of nurrenion on-equilibrium resistive state in quasi-1-D conventional superconduc whiskers and (subhirorin filaments. Doctor of Physics-Mathematica Sciences (- higher than PhD scientific degree in Russia, equivalent to habilitar "Experimental study of current states in low dimensional superconductors", Physics Faculty, Moscow State University Docent in Material physics, Department of Physiss, Fa	Current i	nterests: nanosca	ale superco						
Research: Low-T nanoelectronics, guantum size and interface phenomena at nanoscales, applied nanotechnology. 2004 Senior Lecturer, Docent, NanoScience Centre, University of Jyväks/lä (Finland), PI Quantum nanoelectron Research: Low-T nanoelectron Physics, University of Jyväks/lä (Finland), Croup of Prof. J. P. 2008 2002 Assistant professor. Docent, Department of Physics, University of Jyväks/lä (Finland), Group of Prof. J. P. 2008 2003 Research: Experimental study of electron transport properties of various metal and hybrid nanostructures. Quasipar cooling effect in NIS systems. Experimental study of transport properties of various metal and hybrid nanostructures. Quasipar cooling effect in NIS systems. Experimental study of interface phenomena in superconductors 1995 Research: Experimental study of interface phenomena in superconductors 1995 Prime Assistant, Physics Faculty, Lausane University (Switzerfand), groups of Prof. J. Dietler and Prof. I. Rindere Research: Experimental study of transport properties (V(T,H.I) characteristics) of various superconductors 1995 Indekou. Researcher J. Scientific Researcher, High-Tang, group of Prof. J. Dietler and Prof. I. Rindere Research: Experimental study of eramsport properties (V(T,H.I) characteristics) of various superconductors 1995 Indekou. Researcher J. Scientific Researcher, High-Tang, Ergorp. Low Temperature Lab, Physics Faculty, Noscow State University, Supervisor: Prof. Ya. Ponoma Trissies and (sub)micron filaments. 1995 Doctor of Physical-Mathematical Sciences (= higher fina PhD scientific degree in Russia, equivalent to									
Senior Lecturer, Docent, NanoScience Centre, University of Jyvaskyla (Finland), PT Quantum nanoelectronics, quantum size and interface phenomena at nanoscales, applied nanotechnology. 2002. Assistant professor, Docent, Department of Physics, University of Jyvaskyla (Finland), Group of Prof. J. Pc. Research: Experimental study of electron transport properties of various metal and hybrid nanostructures. Quasipat cooling effect in NS systems. Experimental study of transport properties of various metal ana hybrid nanostructures. Non-interaction in mesoscopic-size superconducting structures. 2008 Research: Elexperimental study of interface phenomena in superconductors 2009 Research Fellow, Law Vastes Stoffscia en Magnetism, Katholicke University Leuven (Belgium), group of Prof. Indekeu. <u>Research: Experimental study of transport properties (V(T,H,L)</u> characteristics) of various superconductors 2005 Prime Assistant, Privsics Faculty, Lausanne University (Switzerland), groups of Prof. J. Dedler and Prof. L. Rindere Research: Experimental study of transport properties (V(T,H,L) characteristics) of various superconductors 2008 Junior Scientific Researcher, J Scientific Researcher, High-Tc group, Low Temperature Lah, Physics Faculty, Moscow State University, group of Prof. V. Moshchalkov. <u>Research: Experimental study of eurrent states in low dimensional superconductors</u> . 2010 Docetor of Physical-Mathematical Sciences (- High-Ta group, Low Temperature Lah, Physics Faculty, Moscow State University. Supervisor: Prof. Y. a. Ponona Thesis "Energy spectrum of semiconducting n-type Bi-S balloys in quantizing magnetic fields". 202 Docetor of									
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2002. Assistant professor, Docent, Department of Physics, University of Jyväskylä (Finland), Group of Prof. J. Pc 2004 Research: Low-T and ultra-low-T study of 1-D nanostructures and NB hybrid systems. 2005 Senior researcher, Department of Physics, University of Jyväskylä (Finland), group of Prof. J. Pckola Research: Experimental study of electron transport properties of various metal ananostructures. Quasipar cooling effect in NIS systems. Experimental study of transport properties of various metal ananostructures. 1998 Research: Felow, Lab. vases: Stoffysica en Magnetism, Katholieke University Leuven (Belgium), group of Prof. Indekeu. Research: Experimental study of transport properties of V(T.H.I) characteristics) of various superconductors 1995 Prime Assistant, Physics Faculty, Lausanne University (Switzerland), groups of Prof. J. Dietler and Prof. I. Rindere manostructures and M(H.T) dependencies of ultra-thin single crystalline wires using self-made SQUID magnetom Design of the liquid helium cooled stage for atonic force microscope. 1995 Junior Scientific Researcher / Scientific Researcher, High-Tc group, Low Temperature Lab, Physics Fac Usicos State University, group of Prof. V. Moschalkov. Research: Experimental study of ruransport propertiti various high-Tc materials: current-induced non-equilibrium resistive state in quasi-1-D conventional superconduc whiskers and (sub)micron filaments. 2012 Doctor of Physical-Mathematical Sciences (= higher than PhD scientific degree in Russia, equivalent to habilitar "Experimental study of current states in low dimensional superconductors", Physics Faculty, Moscow State University variaes "Engly									
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2002 Research: Experimental study of electron transport properties of various metal and hybrid nanostructures. Quasipan cooling effect in NIS systems. Experimental study of transport properties of various metal anostructures. Non-interaction in mesoscopic-size superconducting structures. 1998 Research: Fellow, Lab. Vaste-Stoffysica en Magnetism. Katholieke University Leuven (Belgium), group of Prot-Indekeu. Researche: Experimental study of transport properties (VCT.H.) characteristics) of various superconduct nanostructures and M(H,T) dependencies of ultra-thin single crystalline wires using self-made SQUID magnetoms Design of the liquid helium cooled stage for atomic force microscope. 1998. Junior Scientiffe Researcher / Scientiffe Researcher / High-Tc group, Low Temperature Lab, Physics Fac Moscow State University, group of Prof. V. Moschalkov. Researche: Experimental study of transport properties (various high-Tc materials; current-induced non-equilibrium resistive state in quasi-1-D conventional superconduc whiskers and (sub)micron filaments. 2012 Doctor of Physical-Mathematical Sciences (= higher than PhD scientific degree in Russia, equivalent to <i>habilitat</i> "Experimental study of current states in low dimensional superconductors", Physics Faculty, Moscow State University 2012 Doctor of Physical-Mathematical Sciences (= higher than PhD scientific degree in Russia, equivalent to <i>habilitat</i> "Experimental study of current states in low dimensional superconductors", Physics Faculty, Moscow State University 2012 Doctor of Physics, Physics Faculty, Moscow State University. Supervisor: Prof. Ya. Ponoma Thesis "Energy spectrum of semiconducting n-type Bi-Sb alloys in quantizing magnetic fields".									
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Interaction in mesoscopic-size superconducting structures. 1998 Research Fellow, Lab. Vaste-Stoffysica en Magnetism, Katholieke University Leuven (Belgium), group of Prof. 1998 Research Experimental study of interface phenomena in superconductors. 1998 Prime Assistant, Physics Faculty, Lausanne University (Switzerland), groups of Prof. J. Dietler and Prof. L. Rindere macroscope. 1998 Research: Experimental study of transport properties (V(T,HL) characteristics) of various superconduc nanostructures and M(H,T) dependencies of ultra-thin single crystalline wires using self-made SQUID magnetoms Design of the liquid helium cooled stage for atomic force microscope. 1989- Junior Scientific Researcher / Scientific Researcher, High-Tc group, Low Temperature Lab, Physics Faculty wiskers and (sub)micron filaments. 2012 Doctor of Physical-Mathematical Sciences (= higher than PhD scientific degree in Russia, equivalent to habilitat "Experimental study of current states in low dimensional superconductors", Physics Faculty, Moscow State University 202 Docent in Material physics, Department of Physics, Laiversity of Jyaskyld (Finland) 1988 Ph.D. in Physics, Eaculty, Moscow State University, Supervisor: Prof. Ya. Ponoma Thesis: "Experimental study of the Shabuhox-de-Haas effect in Bi-Sb alloys" 1997 2014 pr. HEACHING 2014 pr. HSC MIEM Course design, lecturing "Physics", BSc and MSc tutoring. "Masoring technique", tutoring, student ansoestnet", "Measu									
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• observation of size dependent enhancement of superconductivity in nanowires: PRB 74, 052502 (2006).									
Member • novel fabrication technique and experiments on SC single-crystalline nanostructure: PRB 63, 092506 (2001).	Member	 novel fabrication 	on techniqu	ue and expen	riments on	SC single-crystalline nanostructure: PRB 63, 092506 (2001).			

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team	• observation and model development of resistive transition anomaly in SCs: PRB 53, 12304 (1996) & 59, 6487 (1999					
	• observation of current-induced phase slips in	n 1D superconductors: JAP 76, 7139 (1994); Physica C 235, 1967 (1994).				
	• observation of Little-Parks effect in high-Tc	superconducting microcylinders: Physica C 185, 1259 (1991).				
	• magnetic field induced semimetal-semicond	luctor transition in Bi _{1-x} Sb _x alloys, Sov. J. Low T. Phys . 13, 554 (1987).				
		G, GRANTS AND AWARDS				
2016-pr.		Quantum fluctuations in superconducting nanostructures", 18 MRUB				
2016-pr.	PI of HSE Fund for basic research project "Macroscopic quantum phenomena at low temperatures", 1.5 MRUB					
2012-14	PI of the international project "NanoVision: Nanotechnology for medical applications", 115 k€					
2010-14						
2010 - 12	standard of electric current", 2 000 000 RUB					
2008	PI of the Jyväaskylä Innovation park JOSKE project "Applications of Ion Beam Etching Technique", 17 k€.					
2007-09	PI of the Finnish Academy of Science research project FUNANO "Functional nanoparticles and devices", total budget					
2006.05	780 k€, group budget 60 k€.					
2006-07	PI TULE grant, Jyväskylä scientific park "Commercial potential of the ion beam nanofabrication", 6000 €.					
2004-07	Author, PI and scientific manager - 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					
	Nanostructured Hybrid Systems", 1.8 M€ tot					
2004-06	PI , 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					
2000-03	PI , 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					
1998-00	PI , grant of Russian Academy of Science Formetal - superconductor", 150 000 RUB	oundation for Basic Research "Experimental study of hybrid nanostructures				
1995-97	PI , grant of Russian Academy of Science mesoscopic systems", 110 000 RUB	Foundation for Basic Research "Experimental study of superconducting				
1995	Annual Competition of Young Scientists, Me	oscow State University - II place				
	ADMINISTRATIVE and	d 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 <u>http://www.nanotransport2008.pmf.cg.ac.yu/</u>				
		International Conference on Quantum Phenomena at Nanosclaes, 30.08-				
		04.09.2009, Montenegro, http://www.nano2009.pmf.ac.me				
2007-pr.	Selected expert evaluator	European Science Foundation				
2007-pr.	Selected expert evaluator					
2007-pr.	Selected expert evaluator	European Science Foundation				
2007-pr.	Selected expert evaluator	European Science Foundation EU Commission FP7, "Cooperation", "Capacities" and "Nanosciences,				
2007-pr.	Selected expert evaluator	European Science Foundation EU Commission FP7, "Cooperation", "Capacities" and "Nanosciences, Nanotechnologies, Materials and New Production Technologies –NMP",				
2007-pr. 2004-pr.	Selected expert evaluator PhD examiner	European Science Foundation EU Commission FP7, "Cooperation", "Capacities" and "Nanosciences, Nanotechnologies, Materials and New Production Technologies –NMP", EU Horizon-2020: Infrastructures, European Research Council				
		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	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 Several universities				

>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, <u>K. Yu. Arutyunov</u>, D. Shahar, O. Cohen, & J. S. Tsai. Coherent quantum phase slip, **Nature** 484, 355 (2012).

3. <u>K. Yu. Arutyunov</u>, T. T. Hongisto, J. S. Lehtinen, L. I. Leino, and A. L. Vasiliev. Quantum phase slip phenomenon in ultranarrow superconducting nanorings, **Nature: Sci. Rep.** 2, 293 (2012).

4. J. S. Lehtinen, K. Zakharov, and <u>K.Yu. Arutyunov</u>, 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).