

Curriculum Vitae – Dr. Alexander A. Korneev

Name: Alexander A. Korneev
Date of birth: December 7, 1978
Place of birth: Moscow, Russia
Affiliation: Moscow Institute of Physics and Technology (State University), Head of the Laboratory of applied terahertz technology
Address: 9 Institutskiy per., Dolgoprudny, Moscow Region, 141700, Russian Federation
Office phone: +7 499 246 1202 **fax:** +7 499 246 6321 **e-mail:** korneev.aa@mipt.ru
Education: 2006 - Ph.D. in Physics
2000 – M.S. in Physics, Moscow State Pedagogical University

Professional activity:

2014 - present: Senior Researcher, Moscow Institute of Physics and Technology (State University)
2013 - present: Associate Professor, HSE Tikhonov Moscow Institute of Electronics and Mathematics
2007 - present: Associate Professor, Senior Research Scientist, Moscow State Pedagogical University
2005 - 2007: Assistant Professor, Moscow State Pedagogical University
2000 - 2005: Researcher, Moscow State Pedagogical University

Education:

2006 – Ph.D. in Physics
2000 – M.S. in Physics, Moscow State Pedagogical University

Honors and awards:

- Russian Federation President grant for young postdocs support MK-2221.2010.2

Area of scientific interests:

Non-equilibrium phenomena in superconducting nanostructures; development of superconducting single-photon detectors and their application in quantum optics, quantum computing and quantum cryptography; nanotechnology.

Scientific grants:

I was a Principle Investigator in the following grants:

- Russian Ministry of Science and Education State Contract 14.586.21.0016
- FP7 project ERANetRus-091 “Adaptor”
- Russian Ministry of Science and Education State Contract 11.519.11.4011
- Russian Ministry of Science and Education State Contract П2542
- Russian Foundation for Basic Research grant 12-02-31841
- Russian Foundation for Basic Research grant 03-02-06563-mac;

I was a researcher in the following international grants:

CRDF projects RE2-2227, RUP2-005054-MO-05, RP2-2365-MO-02, RE2-2531-MO-03, RE2-2529-MO-03, RUP2-000590-MO-06, INTAS 03-51-4145, European FP6 project #16433 “SINPHONIA”

Also I was a researcher in more than 20 grants supported by Russian Ministry of Science and Education.

List of selected publications:

Total number of publications 77 (Scopus),

Total number of citations: 964 (Scopus),

h-index: 16 (Scopus)

1. Yury Lobanov; Michael Shcherbatenko; Alexander Semenov; Vadim Kovalyuk; Oliver Kahl; Simone Ferrari; **Alexander Korneev** Superconducting Nanowire Single Photon Detector for Coherent Detection of Weak Signals IEEE Trans. on Appl. Supercond. 27(4):1-5 June 2017 (<https://doi.org/10.1109/TASC.2016.2645132>)
2. Vadim V. Vorobyov, Alexander Yu. Kazakov, Vladimir V. Soshenko, **Alexander A. Korneev**, Mikhail Y. Shalaginov, Stepan V. Bolshedvorskii, Vadim N. Sorokin, Alexander V. Divochiy, Yury B. Vakhtomin, Konstantin V. Smirnov, Boris M. Voronov, Vladimir M. Shalaev, Alexey V. Akimov, and Gregory N. Goltsman “Superconducting detector for visible and near-infrared quantum emitters”, Optical Materials Express 7(2) 2017, 513-526
3. Yu. Korneeva, M. Sidorova, A. Semenov, S. Krasnosvobodtsev, K. Mitsen, **A. Korneev**, G. Chulkova, G. Goltsman «Comparison of hot spot formation in NbC and NbN single photon detectors» IEEE Trans. on Appl. Superconductivity, Vol. 26 Issue: 3, pp. 1-4, 2016, (DOI: 10.1109/TASC.2016.2526009).

4. K Yu Arutyunov, A Ramos-Álvarez, A V Semenov, Yu P Korneeva, P P An, **A A Korneev**, A Murphy, A Bezryadin and G N Gol'tsman «Superconductivity in highly disordered NbN nanowires» *Nanotechnology*, Vol.27, N. 47, 2016 (<http://dx.doi.org/10.1088/0957-4484/27/47/47LT02>)
5. Andreas Vetter, Simone Ferrari, Patrik Rath, Rasoul Alaee, Oliver Kahl, Vadim Kovalyuk, Silvia Diewald, Gregory N. Goltsman, **Alexander Korneev**, Carsten Rockstuhl, and Wolfram H. P. Pernice «Cavity-Enhanced and Ultrafast Superconducting Single-Photon Detectors» *Nano Letters.*, 2016 (DOI: 10.1021/acs.nanolett.6b03344).
6. Svetlana Khasminskaya, Felix Pyatkov, Karolina Słowik, Simone Ferrari, Oliver Kahl, Vadim Kovalyuk, Patrik Rath, Andreas Vetter, Frank Hennrich, Manfred M. Kappes, G. Gol'tsman, **A. Korneev**, Carsten Rockstuhl, Ralph Krupke and Wolfram H. P. Pernice «Fully integrated quantum photonic circuit with an electrically driven light source» *Nature Photonics*. P 1-7, 2016, (DOI: 10.1038/NPHOTON.2016.178).
7. Patrik Rath; Andreas Vetter; Vadim Kovalyuk; Simone Ferrari; Oliver Kahl; Christoph Nebel; Gregory N. Goltsman; **Alexander Korneev**; Wolfram H. P. Pernice «Travelling-wave single-photon detectors integrated with diamond photonic circuits: operation at visible and telecom wavelengths with a timing jitter down to 23 ps» *Proc. SPIE 9750, Integrated Optics: Devices, Materials, and Technologies XX, 97500T* (February 29, 2016); (<http://dx.doi.org/10.1117/12.2210828>)
8. Peltonen, J. T. ; Peng, Z.H.; Korneeva, Yu.P.; Voronov, B.M.; **Korneev, A.A.**; Semenov, A.V.; Gol'tsman, G.N.; Tsai, J.S; Astafiev, Oleg «Coherent dynamics and decoherence in a superconducting weak link» *Physic. Rev. B*, Vol. 94, No. 180508(R), 2016, p. 1-5. (<http://dx.doi.org/10.1103/PhysRevB.94.180508>)
9. Andrew Murphy, Alexander Semenov, **Alexander Korneev**, Yulia Korneeva, Grigory Gol'tsman,, and Alexey Bezryadin “Three Temperature Regimes in Superconducting Photon Detectors: Quantum, Thermal and Multiple Phase-Slips as Generators of Dark Counts” *Scientific Report 2015 5* (2015) 10174
10. Oliver Kahl, Simone Ferrari, Vadim Kovalyuk, Gregory N. Goltsman, **Alexander Korneev**, Wolfram H. P. Pernice "Waveguide integrated superconducting single-photon detectors with high internal quantum efficiency at telecom wavelengths" *Scientific Reports 5*, 10941 (2015)
11. Simone Ferrari, Oliver Kah, Vadim Kovalyuk, Gregory N. Goltsman, **Alexander Korneev**, Wolfram H. P. Pernice, “Waveguide-integrated single- and multi-photon detection at telecom wavelengths using superconducting nanowires”, *Appl. Phys. Lett.*, **106**, 151101 (2015)
12. **Alexander A. Korneev**, Yuliya P. Korneeva, Mikhail Yu. Mikhailov, Yuri P. Pershin, Alexander V. Semenov, D. Yu. Vodolazov, Alexander V. Divochiy, Yuri B. Vakhtomin, Konstantin V. Smirnov, Alexander G. Sivakov, Alexander Yu. Devizenko, and Gregory N. Goltsman «Characterization of MoSi Superconducting Single-Photon Detector in Magnetic Field» *Applied Superconductivity, IEEE Transactions on* doi: 0.1109/TASC.2014.2376892
13. R. Lusche, A. Semenov, Y. Korneeva, A. Trifonov, **A. Korneev**, G. Gol'tsman, and H.-W. Hübers “Effect of magnetic field on the photon detection in thin superconducting meander structures” *Phys. Rev. B* **89**, 104513 (2014)
14. R. Lusche, A. Semenov, K. Ilin, M. Siegel, Y. Korneeva, A. Trifonov, **A. Korneev**, G. Gol'tsman, D. Vodolazov, and H.-W. Hübers “Effect of the wire width on the intrinsic detection efficiency of superconducting-nanowire single-photon detectors” *J. Appl. Phys.* **116**, 043906 (2014)
15. Yu P Korneeva, M Yu Mikhailov, Yu P Pershin, N N Manova, A V Divochiy, Yu B Vakhtomin, **A A Korneev**, K V Smirnov, A G Sivakov, A Yu Devizenko and G N Goltsman “Superconducting single-photon detector made of MoSi film” *Supercond. Sci. Technol.* **27** (2014) 095012 (6pp)
16. **Alexander Korneev**, Yulia Korneeva, Nadezhda Manova, Pavel Larionov, Alexander Divochiy, Alexander Semenov, Galina Chulkova, Yury Vachtomin, Konstantin Smirnov, and Gregory Goltsman, "Recent Nanowire Superconducting Single-Photon Detector Optimization for Practical Applications", *IEEE Trans. Appl. Supercon.*, **23(3)**, 2013, 2201204"
17. Robert Lusche, Alexei Semenov, Konstantin Il'in, Yuliya Korneeva, Andrey Trifonov, **Alexander Korneev**, Heinz-Wilhelm Hübers, Michael Siegel, and Gregory Gol'tsman, "Effect of the Wire Width and Magnetic Field on the Intrinsic Detection Efficiency of Superconducting Nanowire Single-Photon Detectors", *IEEE Trans. Appl. Supercon.*, **23(3)**, 2013, 2200205
18. Y. Korneeva, I. Florya, A. Semenov, **A. Korneev**, and G. Goltsman “New Generation of Nanowire NbN Superconducting Single-Photon Detector for Mid-Infrared” *IEEE Trans on Appl Supercond*, **21**, (2011) 323-326,
19. G. Goltsman; **A. Korneev**; A. Divochiy; O. Minaeva; M. Tarkhov; N. Kaurova; V. Seleznev; B. Voronov; O. Okunev; A. Antipov; K. Smirnov; Yu. Vachtomin; I. Milostnaya; G. Chulkova, “Ultrafast superconducting single-photon detector”, *Journal of Modern Optics*, 1362-3044, **56**, (2009), 1670 – 1680
20. I. Milostnaya, **A. Korneev**, M. Tarkhov, A. Divochiy, O. Minaeva, V. Seleznev, N. Kaurova, B. Voronov, O. Okunev, G. Chulkova, K. Smirnov, G. Gol'tsman "Superconducting, single photon nanowire detectors for IR and THz applications" *J. Low Temp. Phys.* (2008) **151**, 591-596
21. M. Tarkhov, J. Claudon, J. Ph. Poizat, **A. Korneev**, A. Divochiy, O. Minaeva, V. Seleznev, N. Kaurova, B. Voronov, A. V. Semenov, and G. Gol'tsman "Ultrafast reset time of Superconducting Single Photon Detectors"

- Appl. Phys. Lett., **92**, (2008) 241112
22. A. Divochiy, F. Marsili, D. Bitauld, A. Gaggero, R. Leoni, F. Mattioli, **A. Korneev**, V. Seleznev, N. Kaurova, O. Minaeva, G. Goltsman, K. G. Lagoudakis, M. Benkhaoul, F. Levy, and A. Fiore, "Superconducting nanowire photon number resolving detector at telecom wavelength", *Nature Photonics*, **2**, 302–306, (2008)
 23. W. Słysz, M. Wegrzecki, J. Bar, P. Grabiec, M. Górska, V. Zwiller, C. Latta, P. Böhi, A. Pearlman, A. Cross, D. Pan, J. Kitaygorsky, I. Komissarov, A. Verevkin, I. Milostnaya, **A. Korneev**, O. Minayeva, G. Chulkova, K. Smirnov, B. Voronov, G. Goltsman, and R. Sobolewski. Fibre-coupled, single photon detector based on nbn superconducting nanostructures for quantum communications. *Journal of Modern Optics*, **54**, 315–326, (2007).
 24. **Korneev, A.**; Vachtomin, Y.; Minaeva, O.; Divochiy, A.; Smirnov, K.; Okunev, O.; Gol'tsman, G.; Zinoni, C.; Chauvin, N.; Balet, L.; Marsili, F.; Bitauld, D.; Alloing, B.; Lianhe Li; Fiore, A.; Lunghi, L.; Gerardino, A.; Halder, M.; Jorel, C.; Zbinden, H. "Single-Photon Detection System for Quantum Optics Applications" *Selected Topics in Quantum Electronics, IEEE Journal of* **13**. (2007) 944 – 951
 25. W. Słysz, M. Wegrzecki, J. Bar, M. Gorska, V. Zwiller, C. Latta, P. Bohi, I. Milostnaya, O. Minaeva, A. Antipov, O. Okunev, **A. Korneev**, K. Smirnov, B. Voronov, N. Kaurova, G. Gol'tsman, A. Pearlman, A. Cross, I. Komissarov, A. Verevkin, R. Sobolewski, "Fiber-coupled single-photon detectors based on NbN superconducting nanostructures for practical quantum cryptography and photon-correlation studies", *Appl. Phys. Lett.* **88**, 261113 (2006).
 26. **A. Korneev**, P. Kouminov, V. Matvienko, G. Chulkova, K. Smirnov, B. Voronov, and G. N. Gol'tsman, M. Currie, W. Lo and K. Wilsher, J. Zhang, W. Słysz, A. Pearlman, A. Verevkin, and Roman Sobolewski, "Sensitivity and gigahertz counting performance of NbN superconducting single-photon detectors", *Applied Physics Letters* **84**, (2004) 5338-5340
 27. A. Verevkin, J. Zhang, R. Sobolewski, A. Lipatov, O. Okunev, G. Chulkova, **A. Korneev**, K. Smirnov, G. Gol'tsman, A. Semenov, "Detection efficiency of large-active-area NbN single-photon superconducting detectors in ultraviolet to near-infrared range.", *Applied Physics Letters*, **80**, (2002) 4687-4689
 28. A. Semenov, G. Gol'tsman, **A. Korneev**, "Quantum detection by current carrying superconducting film", *Physica C*, **352** (2001) 349-356