

## CURRICULUM VITAE

### Personal information

Personal details **Aleksey K. Fedorov**, [rqc.ru/members/aleksey.fedorov](http://rqc.ru/members/aleksey.fedorov), November 1, 1993.  
Contact details [akf@rqc.ru](mailto:akf@rqc.ru), +7 (916) 297-09-77, 100 Novaya St., 143025, Skolkovo, Moscow, Russia.

### Education

Sept'09 – **Bauman Moscow State Technical University — Bauman University**,  
Computer science & Control systems, *supervisor*: Prof. M.P. Sychev ([zi@bmstu.ru](mailto:zi@bmstu.ru)).

### Research experience

Oct'12 – **Student fellow**, [Russian Quantum Center — RQC](#), *Quantum optics & Many body theory*,  
*point of contact*: Prof. A.I. Lvovsky.  
Dec'10 – **Engineer**, [Institute for Problem in Mechanics RAS](#),  
*Mechanics of controlled systems*, *supervisor*: Dr. A.I. Ovseevich.  
Dec'13 – Jan'14 **Visiting scholar**, [Department of Physics, Harvard University](#),  
*Condensed matter theory*, *supervisor*: Prof. E.A. Demler.  
Oct'12 – Jul'13 **Engineer**, [Department of Physics, Bauman University](#),  
*Condensed matter theory*, *supervisor*: Dr. S.O. Yurchenko.  
Jul'12 – Aug'12 **Visiting research associate**, [Department of Physics and Astronomy, University of Calgary](#),  
[Institute for Quantum Science and Technology](#), *supervisor*: Prof. A.I. Lvovsky.

### Teaching experience

2013 **Teaching**, [RQC quantum physics classes](#) for high school students.  
2012 **Teaching**, *Lecture course “Cryptography and steganography”*, [IMET at the Bauman University](#).  
2011 – 2013 **Teaching**, *Lecture course “General physics”*, [Evening school at Bauman University](#).  
2012 – 2013 **Supervising**, *co-supervisor in high school research projects at “Step into the Future, Moscow”*.

### Professional associations

Reviewing [PRA](#), [EPL](#), [J. Theor. Comp. Chem.](#)  
Membership Student membership in [AMS](#), [APS](#), [OSA](#), [SPIE](#), [IEEE](#).

### Fellowships and awards

Since 2014 Fellowship for students, [Dynasty Foundation](#).  
Since 2014 Scholarship for students, the scientific committee of the [Bauman University](#).  
Since 2013 Fellowship for students, [Russian Quantum Center](#).  
Since 2013 Scholarship for students, [Russian Federation Government](#).  
2012 – 2013 Scholarship for students work in science, [Bauman University](#).  
2013 **“New Generation” Award**, XV National forum for information security “INFOFORUM 2013”.  
2011 – 2013 The best conference talk, [Moscow Institute for Physics and Technology](#).  
2011 – 2013 The best student scientific work on theoretical physics, [Bauman University](#).  
2012 Award for students, [Institute for Problem in Mechanics RAS](#).  
2012 Award for the best student work on theoretical physics, [Bauman University](#).  
2011 Award for the best poster on “Conference of Young Physicist”, [Moscow Physical Society](#).  
2009 – 2012 UNESCO department diploma, [Bauman University](#).  
2009 The best scientific work in program “Step into the Future, Moscow”, [Bauman University](#).

### Journal publications

2014 **E.O. Kiktenko and A.K. Fedorov**. [Tomographic causal analysis of two-qubit states and tomographic discord](#) // *Physics Letters A* **378**, 1704–1710 (2014), [arXiv:1309.4948](#).  
2013 **A.K. Fedorov**. [Feynman integral and perturbation theory in quantum tomography](#) // *Physics Letters A* **377**, 2320–2323 (2013).

- 2013 **A.K. Fedorov and E.O. Kiktenko.** [Quaternion representation and symplectic spin tomography](#) // Journal of Russian Laser Research **34**, 477-487 (2013), [arXiv:1308.6549](#).
- 2013 **A.I. Ovseevich and A.K. Fedorov.** [Asymptotically optimal feedback control for a system of linear oscillators](#) // Doklady Mathematics **88**, 613-617 (2013).
- 2013 **A.I. Ovseevich and A.K. Fedorov.** [Feedback bounded control for a system of oscillators](#) // Vestnik of Lobachevsky State University of Nizhni Novgorod **1**, 278-283 (2013).
- 2012 **A.K. Fedorov and S.O. Yurchenko.** [Symplectic tomograms presented through Feynman path integrals](#) // Herald of the Bauman Moscow State Technical University **45**, 29-37 (2012).

## Preprints on arxiv.org

- 2014 **A.K. Fedorov and A.I. Ovseevich.** Perturbation theory of observable linear systems, accepted in Russian Journal of Mathematical Physics [arXiv:1404.6901](#).
- 2014 **A.K. Fedorov, I.L. Kurbakov, and Yu.E. Lozovik.** Roton-maxon spectrum and instability for weakly interacting dipolar excitons in a semiconductor layer, [arXiv:1403.3956](#).
- 2014 **I.A. Fedorov, A.K. Fedorov, Y.V. Kurochkin, and A. I. Lvovsky.** Complete characterization of a multimode quantum black box, [arXiv:1403.0432](#).
- 2013 **A.K. Fedorov and A.I. Ovseevich.** Asymptotic control theory for a system of linear oscillators, [arXiv:1308.6090](#).

## Conference presentations

- 04/15/2014 [From approximate reachable sets to asymptotic control theory](#) (invited). [A.K. Fedorov](#) and [A.I. Ovseevich](#). International Youth Conference "Geometry & Control", Moscow.
- 04/14/2014 [Roton-maxon spectrum and stability problem for systems of dipolar bosonic particles](#). [A.K. Fedorov](#), [Y.E. Shchadilova](#), [I.L. Kurbakov](#), and [Yu.E. Lozovik](#). "Young Scientists of Russia", Dynasty Foundation, Moscow.
- 03/23/2014 [Roton-maxon excitation spectrum for Q2D weakly interacting dipolar excitons](#) (poster). [A.K. Fedorov](#), [I.L. Kurbakov](#), and [Yu.E. Lozovik](#). APS March Meeting 2014, Denver, Colorado, USA [[Bulletin of the American Physical Society](#) **59**, 1 (2014)].
- 11/29/2013 [Roton instability of quasi-two-dimensional weakly interacted dipolar excitons](#). [A.K. Fedorov](#), [I.L. Kurbakov](#), and [Yu.E. Lozovik](#). 56th Scientific Conference of the [Moscow Institute of Physics and Technology](#), Troitsk.
- 09/03/2013 [Asymptotically optimal feedback control for a systems of linear oscillators](#). [A.K. Fedorov](#) and [A.I. Ovseevich](#). The 37th Conference for Young Scientists and Engineers "Information Technology and Systems", Svetlogorsk.
- 07/23/2013 [Feynman path integrals in quantum tomography](#) (poster). [A.K. Fedorov](#). The 2nd International Conference on Quantum Technologies, Moscow.
- 07/23/2013 [2D tilted dipoles: density waves vs. phonon collapse](#) (poster). [A.K. Fedorov](#), [I.L. Kurbakov](#) and [Yu.E. Lozovik](#). The 2nd International Conference on Quantum Technologies, Moscow.
- 07/08/2013 [Asymptotically optimal feedback control for a system of linear oscillators](#) (invited). [A.I. Ovseevich](#), and [A.K. Fedorov](#). The International Conference on Mathematical Control Theory and Mechanics, Suzdal.
- 06/11/2013 [Asymptotically optimal feedback control for a system of linear oscillators](#) (plenary). [A.I. Ovseevich](#), and [A.K. Fedorov](#). The 39th International Conference "Application of Mathematics in Engineering and Economics", Sozopol, Bulgaria [[AIP Conference Proceedings](#) **1570**, 257 (2013)].
- 06/06/2013 [Sensing of phase transition in medium with terahertz pulsed spectroscopy](#) (poster). [K.I. Zaytsev](#), [I.N. Fokina](#), [S.O. Yurchenko](#), and [A.K. Fedorov](#). The 2nd Russia-Japan-USA Symposium on the Fundamental and Applied Problems of Terahertz Devices and Technologies, Moscow [[Journal of Physics: Conference Series](#) **486**, 012024 (2014)].
- 11/23/2012 [Density waves supersolid in a two-dimensional gas of tilted dipoles](#). [A.K. Fedorov](#), [I.L. Kurbakov](#), and [Yu.E. Lozovik](#). 55th Scientific Conference of Moscow Institute of Physics and Technology, Troitsk.
- 09/13/2012 [Phase delay distribution in dome lens antenna with displaced feed array](#). [V.I. Litun](#), [V.N. Mitrokhin](#), and [A.K. Fedorov](#). 22nd International Crimean Conference "Microwave & Telecommunication Technology", Sevastopol, Ukraine [[IEEE Proceedings Catalog Number CFP12788-PRT](#)].
- 07/27/2012 [Quantum tomograms and their application in quantum information science](#). [A.K. Fedorov](#), [S.O. Yurchenko](#), [K.I. Zaytsev](#), and [I.N. Fokina](#). 21st International Laser Physics Workshop, Calgary, Canada [[Journal of Physics: Conference Series](#) **414**, 012040 (2013)].

- 07/25/2012 [Roton instability and phonon collapse of two-dimensional tilted dipole atoms](#). Yu.E. Lozovik, A.K. Fedorov, and I.L. Kurbakov (poster). 21st International Laser Physics Workshop, Calgary, Canada [[Journal of Physics: Conference Series](#) **414**, 012036 (2013)].
- 02/06/2012 [Roton instability phenomena of two-dimensional tilted dipole system in a thin layer](#). A.K. Fedorov, Yu.E. Lozovik, and I.L. Kurbakov (poster). Young Physicist Conference, Moscow [[Physics in High Education](#) (Supplementary) **18**, 61 (2012)].
- 11/25/2011 [Roton instability of two-dimensional tilted dipoles in a thin layer](#). I.L. Kurbakov, Yu.E. Lozovik, and A.K. Fedorov. 54th Scientific Conference of Moscow Institute of Physics and Technology, Troitsk.
- 02/01/2011 [Tomographic approach to quantum mechanics](#). A.K. Fedorov and S.O. Yurchenko (poster). Young Physicist Conference, Moscow [[Physics in High Education](#) (Supplementary) **17**, 23 (2011)].
- 01/26/2011 [Tomographic representation in quantum mechanics](#). A.K. Fedorov and S.O. Yurchenko. The 6th Russian Scientific Conference “Irreversible Processes in Nature and Technology”, Moscow.

## Seminars talks

- 04/30/2014 A.K. Fedorov. *Quantum information technologies and their applications*, Faculty of Informatics and Control Systems, Department of Information Defence (Head of the seminar is Prof. M.P. Sychev).
- 04/10/2014 I.A. Fedorov, A.K. Fedorov, Y.V. Kurochkin, and A. I. Lvovsky. *Tomography of multimode quantum processes*, Scientific Seminar of G.S. Landsberg Optical Department, Lebedev Physical Institute (Head of the seminar is A.V. Masalov).
- 02/23/2014 A.I. Ovseevich, A.K. Fedorov, *Generalized dry-friction-type control for damping of a system of linear oscillators*, Scientific Seminar on Control Theory and Dynamical Systems (Head of the seminar is academician F.L. Cheraus'ko).
- 11/26/2014 A.K. Fedorov. *Quantum tomography: current state and perspectives*, Faculty of Fundamental Science, Department of Physics, Bauman University (Head of the seminar Prof. A.N. Morozov).
- 10/29/2014 A.K. Fedorov. *2D and 1D systems with dipole-dipole interaction*, Faculty of Fundamental Science, Department of Physics, Bauman University (Head of the seminar Prof. A.N. Morozov).
- 01/17/2013 A.I. Ovseevich, A.K. Fedorov, *Feedback control for a system of linear oscillators*, Scientific Seminar on Control Theory and Dynamical Systems (Head of the seminar is academician F.L. Cheraus'ko).
- 04/09/2012 A.K. Fedorov, *Feynman path integrals for quantum tomograms*, Mechanics & Mathematics Faculty, Department of Theory of Functions and Functional analysis, Lomonosov Moscow State University (Head of the seminar is Prof. O.G. Smolyanov).
- 03/22/2012 A.K. Fedorov, *Tomographic methods in quantum mechanics*, Nanostructures Spectroscopy Laboratory, Institute for Spectroscopy RAS (Head of the seminar Prof. Yu.E. Lozovik).
- 03/07/2012 A.K. Fedorov, I.L. Kurbakov and Yu.E. Lozovik, *Instability of two-dimensional tilted dipole in a thin layer: phonon collapse and density matter waves*, Nanostructures Spectroscopy Laboratory, Institute for Spectroscopy RAS (Head of the seminar Prof. Yu.E. Lozovik).
- 02/21/2012 A.K. Fedorov, *Tomographic representation of quantum mechanics*, Center for Photonics and Infrared Engineering, Bauman University (Head of the seminar is Dr. S.O. Yurchenko).
- 06/01/2011 A.K. Fedorov, *Probability representation of quantum states: quantum tomography*, Faculty of Fundamental Science, Department of Physics, Bauman University (Head of the seminar Prof. A.N. Morozov).

## Public talks

- 06/07/2013 *Quantum information science*, Meeting of High School Students, Department of Computer Science & Control Systems, Bauman University.
- 04/24/2013 *Quantum physics for engineers*, Conference Dedicated to the 50th anniversary of the Evening Physics and Mathematics School at Bauman University, Bauman University.
- 11/15/2012 *Quantum optics and phase space*, Seminar of Optical Society of America Moscow Chapters “Optics and Everything-Everything-Everything”, Lomonosov Moscow State University.
- 10/03/2012 *Quantum cryptography*, Second Moscow Science Festival, Bauman University.
- 08/10/2012 *Quantum tomograms and their application in quantum information science*, Quantum Lunch, Institute for Quantum Information Science, University of Calgary.

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## Recommendations

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3. **Prof. A.I. Ovseevich**, Institute for Problem in Mechanics RAS.  
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