

# Mikhail Alfimov

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## CURRENT POSITION

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| September 2016<br>-present | <b>Research fellow</b><br>Faculty of Mathematics,<br>National Research University Higher School of Economics.<br>Supervisor: Dr. Mikhail Bershtein (Landau Institute for Theoretical Physics RAS).              |
| December 2016<br>-present  | <b>Junior Research Fellow</b><br>I.E. Tamm Theoretical Physics Department,<br>Lebedev Physical Institute of the Russian Academy of Sciences.<br>Supervisor: Dr. A.V. Leonidov (Lebedev Physical Institute RAS). |
| February 2018<br>-present  | <b>Teaching assistant</b><br>Department of General and Applied Physics,<br>Moscow Institute of Physics and Technology.<br>Supervisor: Dr. A.G. Semenov (Lebedev Physical Institute RAS).                        |

## EDUCATION

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| 2016 | <b>PhD in Theoretical Physics</b><br>Lebedev Physical Institute Russian Academy of Sciences<br>Thesis: "Integrable structures, coset conformal field theories and instantons on ALE spaces"<br>Scientific adviser: Dr. A.V. Leonidov (Lebedev Physical Institute RAS) Scientific counsellor: Prof. Dr. A.A. Belavin (Landau Institute for Theoretical Physics RAS) |
| 2011 | <b>Master degree in Physics and Mathematics (cum laude)</b><br>Moscow Institute of Physics and Technology<br>Department of General and Applied Physics<br>Bachelor thesis: "On processes of quantum chromodynamics in a medium"<br>Supervisor: Dr. A.V. Leonidov (Lebedev Physical Institute RAS)  |
| 2009 | <b>Bachelor degree in Physics and Mathematics (cum laude)</b><br>Moscow Institute of Physics and Technology<br>Department of General and Applied Physics<br>Bachelor thesis: "On processes of quantum electrodynamics in a medium"<br>Supervisor: Dr. A.V. Leonidov (Lebedev Physical Institute RAS)   |

## SCHOLARSHIPS AND AWARDS

2012	Special Diploma for the article “Parafermionic Liouville field theory and instantons on ALE spaces” on the Young Scientists Contest at Lebedev Physical institute RAS
2010	Dynasty Foundation Scholarship for undergraduate students
2009	Dynasty Foundation Scholarship for undergraduate students

## RESEARCH INTERESTS

Supersymmetric gauge theories, conformal field theories, BFKL physics, integrability, integrable deformations of quantum field theories, instanton calculus, AGT correspondence, BFKL physics.

## RESEARCH EXPERIENCE

2013-2016	<b>Early Stage Researcher</b> , Laboratoire de physique théorique, École Normale Supérieure (supervisor Prof. Vladimir Kazakov) and Institut de Physique Théorique CEA Saclay (supervisor Prof. Gregory Korchemsky). <ul style="list-style-type: none"><li>• AdS/CFT correspondence</li><li>• spectrum of anomalous dimensions in <math>\mathcal{N} = 4</math> SYM</li><li>• Quantum Spectral Curve</li><li>• BFKL physics</li></ul>
2011-2013	<b>Research Assistant</b> , I.E.Tamm Theory Department, Lebedev Physical Institute RAS. <ul style="list-style-type: none"><li>• coset conformal field theory</li><li>• instanton counting in supersymmetric gauge theories</li><li>• AGT correspondence</li><li>• integrable deformations of CFT</li></ul>

## TEACHING

2011-2013	<b>Teaching Assistant</b> , Moscow Institute of Physics and Technology. Course on Stochastic Processes for undergraduate students.
2011-2012	<b>Teaching Assistant</b> , Moscow Institute of Physics and Technology. Physics Laboratory course for undergraduate students.
2017	<b>Research fellow</b> , Innapolis University. Summer School on Mathematics conducted by the lyceum “Second School”.
2017-present	<b>Research fellow</b> , National Research University Higher School of Economics. Course “Integrable systems and AdS/CFT correspondence”.
2018-present	<b>Teaching assistant</b> , Moscow Institute of Physics and Technology. Course “Group Theory and Representations”.

## PUBLICATIONS

1. Mikhail Alfimov, Nikolay Gromov and Grigory Sizov, “BFKL Spectrum of  $\mathcal{N} = 4$  SYM: non-Zero Conformal Spin,” accepted to JHEP, [arXiv:1802.06908].
2. M. N. Alfimov and A. V. Litvinov, “On spectrum of ILW hierarchy in conformal field theory II: coset CFT’s,” JHEP **1502**, 150 (2015) [arXiv:1411.3313].
3. Mikhail Alfimov, Nikolay Gromov and Vladimir Kazakov, “QCD Pomeron from AdS/CFT Quantum Spectral Curve”, JHEP **1507**, 164 (2015) [arXiv:1408.2530].
4. M. N. Alfimov, A. A. Belavin and G. M. Tarnopolsky, “Coset conformal field theory and instanton counting on  $\mathbb{C}^2/\mathbb{Z}_p$ ,” JHEP **1308**, 134 (2013) [arXiv:1306.3938].
5. M. N. Alfimov and G. M. Tarnopolsky, “Parafermionic Liouville field theory and instantons on ALE spaces,” JHEP **1202**, 036 (2012) [arXiv:1110.5628].
6. M. Alfimov and A. Leonidov, “Quantum Spectrum of Cherenkov Glue,” Nucl. Phys. A **875**, 160 (2012) [arXiv:1106.5231].
7. A. V. Leonidov and M. N. Alfimov, “Cherenkov Radiation of Gluon Currents,” Proceedings of “Quarks 2010,” [arXiv:1011.0340].
8. M. Alfimov, “Cherenkov radiation in moving medium,” Int. J. Theor. Phys. **49**, 2215 (2010) [arXiv:1004.0286].

## TALKS

- “On the applications of the AdS/CFT Quantum Spectral Curve to BFKL spectrum of  $\mathcal{N} = 4$  SYM,” Lebedev Physical Institute RAS, Moscow, Russia, 31.05.18.
- “On the applications of the AdS/CFT Quantum Spectral Curve to BFKL spectrum of  $\mathcal{N} = 4$  SYM,” Operators, Functors and Systems of Mathematical Physics Conference, Khazar University, Baku, Azerbaijan, 23.05.18.
- “On the applications of the AdS/CFT Quantum Spectral Curve to the spectral problem of  $\mathcal{N} = 4$  SYM,” Young Researcher Integrability School, Monte Verità, Ascona, Switzerland, 07.01.18.
- “AdS/CFT Quantum Spectral Curve and its applications to the calculation of the spectrum of  $\mathcal{N} = 4$  supersymmetric Yang-Mills theory,” Lebedev Physical Institute RAS, Moscow, Russia, 28.09.17.
- Minicourse “AdS/CFT Quantum Spectral Curve and its applications to the calculation of the spectrum of  $\mathcal{N} = 4$  super Yang-Mills,” Mimar Sinan Gúzel Üniversitesi, Istanbul, Turkey, 18.08.2017-25.08.2017.
- “QCD Pomeron with nonzero conformal spin from AdS/CFT Quantum Spectral Curve,” Classical and Quantum Integrable Systems, Joint Institute for Nuclear Research, Dubna, Russia, 26.07.2017.
- “QCD Pomeron with nonzero conformal spin from AdS/CFT Quantum Spectral Curve,” Integrability in Gauge and String Theory, Ecole Normale Supérieure, Paris, France, 17.07.2017.
- “QCD Pomeron with nonzero conformal spin from AdS/CFT Quantum Spectral Curve,” Higher Spin Theory and Holography, Lebedev Physical Institute RAS, Moscow, Russia, 31.05.2017.
- “QCD Pomeron with nonzero conformal spin from AdS/CFT Quantum Spectral Curve,” Young Researchers Integrability School and Workshop, Trinity College, Dublin, Ireland, 03.03.2017.
- “Finite volume spectrum of 2d field theories,” Landau Institute for Theoretical Physics, Chernogolovka, Russia, 09.12.16.
- “QCD Pomeron with nonzero conformal spin from AdS/CFT Quantum Spectral Curve,” Institut d’Astrophysique de Paris, France, 13.06.16.
- “Integrable structures, coset conformal field theories and instantons on ALE spaces,” Institute for Information Transmission Problems, Moscow, Russia, 28.04.16.
- “QCD Pomeron with nonzero conformal spin from AdS/CFT Quantum Spectral Curve,” GATIS Workshop, DESY, Hamburg, Germany, 29.02.16.
- “QCD Pomeron with nonzero conformal spin from AdS/CFT Quantum Spectral Curve,” Lebedev Physical Institute RAS, Moscow, Russia, 29.01.16.

- “QCD Pomeron from AdS/CFT Quantum Spectral Curve,” Landau Institute for Theoretical Physics, Chernogolovka, Russia, 10.04.15.
- “QCD Pomeron from AdS/CFT Quantum Spectral Curve,” Workshop “Integrability and Gauge Theories,” Institut Henri Poincaré, Paris, France, 11.03.15.
- “On spectrum of ILW hierarchy in conformal field theory,” Landau Institute for Theoretical Physics, Chernogolovka, Russia, 21.11.14.
- “On spectrum of ILW hierarchy in conformal field theory,” Lebedev Physical Institute RAS, Moscow, Russia, 21.11.14.
- “Coset conformal field theory and instanton counting on  $\mathbb{C}^2/\mathbb{Z}_p$ ,” Workshop on the Strongly Coupled Gauge Theories, King’s College, London, 11.02.14.
- “Introduction to AdS/CFT,” Landau Institute for Theoretical Physics, Chernogolovka, Russia, 27.13.13.
- “Coset conformal field theory and instanton counting on  $\mathbb{C}^2/\mathbb{Z}_p$ ,” Student Conference on Gravity, String theory and Cosmology 2013, Munich, Germany, 08.11.13.
- “Coset conformal field theory and instanton counting on  $\mathbb{C}^2/\mathbb{Z}_p$ ,” Landau Days 2013, Landau Institute for Theoretical Physics, Chernogolovka, Russia, 26.06.13.
- “Instanton counting on  $\mathbb{R}^4/\mathbb{Z}_p$  and coset conformal field theory,” Sakura in Saclay, Institut de Physique Théorique CEA Saclay, 29.05.13.
- “CFT with the  $\mathcal{A}(r, p)$  algebra and instanton counting, Landau Institute for Theoretical Physics, Chernogolovka, Russia, 01.03.13.
- “Quantum Spectrum of Cherenkov Glue” , Ginzburg Conference, Lebedev Physical Institute RAS, 31.05.12.
- “Parafermionic Liouville field theory and instantons on ALE spaces,” program “Exact results in gauge-string dualities,” NORDITA, 16.02.2012.
- “Quantum radiation of Cherenkov glue,” Conference of the Nuclear Physics Section of RAS, Institute of Theoretical and Experimental Physics, 23.11.2011.
- “Parafermionic Liouville field theory and instantons on ALE spaces,” Landau Institute for Theoretical Physics, Chernogolovka, Russia, 28.10.11.
- “Synthesis of integrabilities in the context of duality between the string theory and gauge theories,” Higher School of Economics, Moscow, Russia, 16.09.2011.

#### Conferences and scientific schools.

- 07.01.18-13.01.18 Young Researcher Integrability School, Monte Verità, Ascona, Switzerland.
- 24.07.17-28.07.17 Classical and Quantum Integrable Systems, Joint Institute for Nuclear Research, Dubna, Russia.
- 17.07.17-21.07.17 Integrability in Gauge and String Theory, Ecole Normale Supérieure, Paris, France.
- 31.05.17-02.06.17 Higher Spin Theory and Holography, Lebedev Physical Institute RAS, Moscow, Russia.
- 27.02.17-03.03.17 Young Researchers Integrability School and Workshop, Trinity College, Dublin, Ireland.
- 21.01.17-27.01.17 Second school-conference on string theory, integrable models and representation theory, Independent Moscow University, Moscow, Russia.
- 27.11.16-01.12.16 GATIS Closing Workshop, DESY, Hamburg, Germany.
- 22.08.16-26.08.16 Conference “Integrability in Gauge and String Theory,” Humboldt University, Berlin, Germany.
- 15.08.16-19.08.16 Mathematica Summer School on Random Matrix Theory and Applications, Humboldt University, Berlin, Germany.
- 11.07.16-15.07.16 Workshop on Classical and Quantum Integrable Systems, Euler Mathematical Institute, St. Petersburg, Russia.

- 07.06.16-01.07.17 Summer School Integrability: from statistical systems to gauge theory, Les Houches Physics School, Les Houches, France.
- 29.02.16-04.03.16 GATIS Workshop, DESY, Hamburg, Germany.
- 29.01.16-03.02.16 School-conference on string theory, integrable models and representation theory, Independent Moscow University and National Research University Higher School of Economics, Moscow, Russia.
- 13.07.15-17.07.15 Conference “Integrability in Gauge and String Theory,” King’s College London, Great Britain.
- 11.03.15-13.03.15 Workshop “Integrability and Gauge Theories”, Institut Henri Poincaré, Paris, France.
- 21.07.14-26.07.14 Summer School on String Theory and Holography, Porto University, Porto, Portugal.
- 14.07.14-18.07.14 Conference “Integrability in Gauge and String Theory,” DESY, Hamburg, Germany.
- 10.02.14-14.02.14 Workshop on Strongly Coupled Gauge Theories, King’s College London, Great Britain.
- 07.11.13-09.11.13 Student Conference on Gravity, Strings and Cosmology, Munich, Germany.
- 19.08.13-23.08.13 Conference “Integrability in Gauge and String Theory,” Utrecht University, Utrecht, Netherlands.
- 01.10.12-01.11.12 Program “Integrability in Modern Theoretical and Mathematical Physics,” organized by N. Nekrasov and S. Shatashvili, Simons Center for Geometry and Physics, Stony Brook, USA.
- 28.05.12-02.06.12 Ginzburg Conference on Physics, Lebedev Institute, Moscow, Russia.
- 04.03.12-09.03.12 “Random Matrices and Integrable systems,” Les Houches, France.
- 22.01.12 - 18.02.12 Program “Exact results in gauge-string dualities,” Nordic Institute for Theoretical Physics, Stockholm, Sweden.
- 23.08.10 - 30.08.10 6th International Workshop on Critical Point and Onset of Deconfinement, Dubna, Russia.
- 21.08.10 - 04.09.10 Dubna International Advanced School for Theoretical Physics “Dense QCD phases in Heavy-Ion Collisions,” Dubna, Russia.
- 04.07.10 - 20.07.10 Dynasty foundation Summer School for Theoretical Physics “Actual problems of condensed matter physics,” Zelenogorsk, Russia.
- 10.08.09 - 20.08.09 Dynasty foundation Summer School for Theoretical Physics “Elementary particle physics on the threshold of LHC,” Protvino, Russia.