Alexey Ananyevskiy

Curriculum Vitae, August 2024

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Employment

2022–	**Heisenberg Position**, Ludwig-Maximilans-Universität München, Munich, Germany
2017–2022	**Deputy Director**, EIMI, St. Petersburg, Russia
2017–2022	**Senior Researcher**, PDMI RAS, St. Petersburg, Russia
2017–2019	**Senior Researcher**, Chebyshev Laboratory at SPbU, St. Petersburg, Russia
2015–2019	**Deputy Head**, Chebyshev Laboratory at SPbU, St. Petersburg, Russia
2013–2017	**Postdoc**, Chebyshev Laboratory at SPbU, St. Petersburg, Russia
2010–2013	**Lecturer**, Algebra Department at SPbU, St. Petersburg, Russia

Education

2010–2013 **Ph.D. in Mathematics**, *SPbU, St. Petersburg, Russia*
Thesis: "On the algebraic K-theory of some varieties and related problems"
Doctoral advisor: Ivan Panin

2005–2010 **Specialist in Mathematics**, *SPbU, St. Petersburg, Russia*
Thesis: "Generalization of Colliot-Thélène and Sansuc theorem on principal T-bundles"

Research visits

May – June 2022	Isaac Newton Institute, Cambridge, UK (online participation due to travel restrictions)
March 2020	Isaac Newton Institute, Cambridge, UK; suspended due to the COVID-19 pandemic
October 2018	University of Oslo, Oslo, Norway
February – March 2018	University of Oslo, Oslo, Norway
January – April 2017	Mittag-Leffler Institute, Stockholm, Sweden
November 2016	Universität Osnabrück, Osnabrück, Germany
January – April 2015	Institute for Advanced Study, Princeton, USA
June 2014	Universität Duisburg-Essen, Essen, Germany
May 2013	Fields Institute, Toronto, Canada
July – August 2011	Universität Bielefeld, Bielefeld, Germany
June – July 2009	Universität Bielefeld, Bielefeld, Germany

Areas of specialization

Motivic Homotopy Theory, Algebraic K-theory, Homogeneous Varieties, Algebraic Geometry

Publications

21. Alexey Ananyevskiy, Marc Levine, *Combing a hedgehog over a field*, `https://arxiv.org/abs/2311.07486`

20. Alexey Ananyevskiy, Elden Elmanto, Oliver Röndigs, Maria Yakerson, *On the motivic Adams conjecture*, https://arxiv.org/abs/2310.00974

19. Alexey Ananyevskiy, *On the $\mathbb{A}^1$-Euler characteristic of the variety of maximal tori in a reductive group*, IMRN, 2022:19 (2022), 15390–15409, https://doi.org/10.1093/imrn/rnab156

18. Alexey Ananyevskiy, *Thom isomorphisms in triangulated motivic categories*, Algebraic and Geometric Topology, 21:4 (2021), 2085-2106, https://doi.org/10.2140/agt.2021.21.2085

17. Alexey Ananyevskiy, Grigory Garkusha, Ivan Panin, *Cancellation theorem for framed motives of algebraic varieties*, Advances in Mathematics, 383 (2021), 107681, http://doi.org/10.1016/j.aim.2021.107681

16. Alexey Ananyevskiy, *SL-oriented cohomology theories*, in *Motivic Homotopy Theory and Refined Enumerative Geometry*, Contemporary Mathematics, 745 (2020), 1-20, https://doi.org/10.1090/conm/745

15. Alexey Ananyevskiy, Oliver Röndigs, Paul Arne Østvær, *On very effective hermitian K-theory*, Mathematische Zeitschrift, 294 (2020), 1021-1034, https://doi.org/10.1007/s00209-019-02302-z

14. Alexey Ananyevskiy, Alexander Neshitov, *Framed and MW-transfers for homotopy modules*, Selecta Mathematica, 25:26 (2019), https://doi.org/10.1007/s00029-019-0472-0

13. Alexey Ananyevskiy, Andrei Druzhinin, *Rigidity for linear framed presheaves and generalized motivic cohomology theories*, Advances in Mathematics, 333 (2018), 423-462, https://doi.org/10.1016/j.aim.2018.05.013

12. Alexey Ananyevskiy, *On the zeroth stable $\mathbb{A}^1$-homotopy group of a smooth curve*, Journal of Pure and Applied Algebra, 222:10 (2018), 3195-3218, https://doi.org/10.1016/j.jpaa.2017.12.001

11. Alexey Ananyevskiy, Marc Levine, Ivan Panin, *Witt sheaves and the η-inverted sphere spectrum*, Journal of Topology, 10:2 (2017), 370-385, https://doi.org/10.1112/topo.12015

10. Alexey Ananyevskiy, *Stable operations and cooperations in derived Witt theory with rational coefficients*, Annals of K-theory, 2:4 (2017), 517-560, https://doi.org/10.2140/akt.2017.2.517

9. Alexey Ananyevskiy, *On the zeroth stable $\mathbb{A}^1$-homotopy group of a smooth projective variety*, Journal of Mathematical Sciences, 222:4 (2017), 367-369 (translated from Russian), https://doi.org/10.1007/s10958-017-3306-7

8. Alexey Ananyevskiy, *On the push-forwards for motivic cohomology theories with invertible stable Hopf element*, Manuscripta Mathematica, 150:1-2 (2016), 21-44, https://doi.org/10.1007/s00229-015-0799-6

7. Alexey Ananyevskiy, *On the relation of special linear algebraic cobordism to Witt groups*, Homology, Homotopy and Applications, 18:1 (2016), 205-230, https://doi.org/10.4310/HHA.2016.v18.n1.a11

6. Alexey Ananyevskiy, *The special linear version of the projective bundle theorem*, Compositio Mathematica, 151:3 (2015), 461-501, https://doi.org/10.1112/S0010437X14007702

5. Alexey Ananyevskiy, Asher Auel, Skip Garibaldi, Kirill Zainoulline, *Exceptional collections of line bundles on projective homogeneous varieties*, Advances in Mathematics, 236 (2013), 111-130, https://doi.org/10.1016/j.aim.2012.12.016

4. Alexey Ananyevskiy, *Relationship between algebraic MSL-cobordisms and derived Witt groups*, Doklady Mathematics, 87:1 (2013), 76-78 (translated from Russian), `http://doi.org/10.1134/S1064562413010286`

3. Alexey Ananyevskiy, *On the algebraic K-theory of some homogeneous varieties*, Documenta Mathematica, 17 (2012), 167-193, `https://www.emis.de/journals/DMJDMV/vol-17/07.html`

2. Alexey Ananyevskiy, Nikolai Vavilov, Sergey Sinchuk, *Overgroups of $E(m;R)\otimes E(n;R)$. I. Levels and normalisers,* St. Petersburg Mathematical Journal, 23:5 (2012), 819-849 (translated from Russian), `http://doi.org/10.1090/S1061-0022-2012-01219-7`

1. Alexey Ananyevskiy, Nikolai Vavilov, Sergey Sinchuk, *On the description of overgroups of $E(m;R)\otimes E(n;R)$,* Journal of Mathematical Sciences, 161:4 (2009), 461-473 (translated from Russian), `https://doi.org/10.1007/s10958-009-9576-y`

Selected talks

January 15, 2024 — *Combing a hedgehog over a field*, *Algebra seminar*, Charles University, Prague, Czech Republic

November 23, 2023 — *Combing a hedgehog over a field*, *Kolloquium Geometrie und Arithmetik*, Johannes Gutenberg Universität Mainz, Mainz, Germany

October 19, 2023 — *On the motivic Adams conjecture*, *AG seminar*, Universität Regensburg, Regensburg, Germany

September 28, 2023 — *Non-Vanishing Sections of Vector Bundles and Chern Classes*, *ESAGA seminar*, Universität Duisburg–Essen, Essen, Germany

June 22, 2023 — *On the existence of non-vanishing sections of vector bundles*, *Séminaire d'arithmétique à Lyon*, ENS de Lyon, Lyon, France

May 10, 2023 — *Non-Vanishing Sections of Algebraic Vector Bundles and Trivial Chern Classes*, *Colloquium of Institut für Mathematik*, Universität Osnabrück, Osnabrück, Germany

November 17, 2022 — *On the existence of a nowhere vanishing section for a vector bundle with trivial top Chern class*, *Oberseminar zur Algebra und Zahlentheorie*, Universität Augsburg, Augsburg, Germany

October 27, 2022 — *On the existence of a nowhere vanishing section for a vector bundle with trivial top Chern class*, seminar *Motivic algebraic topology*, LMU, Munich, Germany

July 25 – 27, 2021 — *Motivic homotopy theory and vector bundles*, summer school *Algebra and Geometry*, Yaroslavl, Russia

May 20, 2021 — *An introduction to motivic homotopy theory*, Mini-workshop on Algebraic Geometry, EIMI, St. Petersburg, Russia

April 29, 2021 — *On the $\mathbb{A}^1$-Euler characteristic of the variety of maximal tori*, Motivic Algebraic Topology Seminar, LMU, online

January 12, 2021 — *On the $\mathbb{A}^1$-Euler characteristic of the variety of maximal tori*, Shafarevich Seminar, online

September 9, 2020 — *On the $\mathbb{A}^1$-Euler characteristic of the variety of maximal tori*, Conference *Motivic Geometry*, CAS, Oslo, Norway (moved to online)

June 20, 2019 — *Motivic cellular structure on some homogeneous varieties*, Conference *Number Theory and Algebraic Geometry (In memoriam of Alexei Zykin)*, Independent University of Moscow, Moscow, Russia

May 7, 2019 *SL-oriented cohomology theories*, Conference *Algebro-geometric and homotopical methods*, Institute Mittag-Leffler, Stockholm, Sweden

February 19, 2019 *Motives of smooth algebraic varieties*, Shafarevich Seminar, MI RAS, Moscow, Russia

October 24, 2018 *Non-vanishing sections of algebraic vector bundles and characteristic classes*, Geometry and Topology Seminar, University of Oslo, Oslo, Norway

June 29, 2018 *On the linear categories of motives*, Workshop *Motivic homotopy groups of spheres III*, Technische Universität Berlin, Berlin, Germany

May 14, 2018 SL*-oriented cohomology theories*, Workshop *Motivic homotopy theory and refined enumerative geometry*, Universität Duisburg-Essen, Essen, Germany

March 6, 2018 *Framed and Milnor-Witt transfers for homotopy modules*, Geometry and Topology Seminar, University of Oslo, Oslo, Norway

February 7, 2017 *Rigidity for framed presheaves and motivic homotopy groups*, Mittag-Leffler Seminar, Institute Mittag-Leffler, Stockholm, Sweden

November 29, 2016 *Algebraic K-theory of some homogeneous varieties*, Kollegseminar, Universität Osnabrück, Osnabrück, Germany

November 22, 2016 *Rigidity for motivic stable homotopy sheaves*, Topology Seminar, Universität Osnabrück, Osnabrück, Germany

June 24, 2016 *On the zeroth stable $\mathbb{A}^1$-homotopy group of a smooth curve*, Workshop on motivic homotopy groups of spheres II, Universität Duisburg-Essen, Essen, Germany

February 3, 2016 *Stable operations in derived Witt theory and motivic Serre finiteness*, Workshop *Algebraic Cobordism and Projective Homogeneous Varieties*, Oberwolfach, Germany

September 25, 2015 *Operations in derived Witt theory*, Minisymposium *Motivic Homotopy Theory and its application to problems in Algebra and Algebraic Geometry*, Hamburg, Germany

June 20, 2014 *Special linear oriented cohomology theories*, Workshop *Oriented theories and symplectic cobordism*, Universität Duisburg-Essen, Essen, Germany

September 28, 2013 *Cohomology theories with invertible Hopf element*, Workshop *Quantum and motivic cohomology, Fano varieties and mirror symmetry*, Euler Institute, St. Petersburg, Russia

May 8, 2013 *SL-oriented cohomology theories*, Spring School and Workshop on Torsors, Motives and Cohomological Invariants, The Fields Institute for Research in Mathematical Sciences, Toronto, Canada

April 23, 2013 *SL-oriented cohomology theories*, Shafarevich Seminar, MI RAS, Moscow, Russia

September 20, 2012 *The special linear version of the projective bundle theorem*, Conference *Algebraic groups and related structures*, Euler Institute, St. Petersburg, Russia

Grants, Fellowships and Awards

Grants

2023– DFG research grant AN 1545/4-1, project "Equivariant and weak orientations in the motivic homotopy theory", 226.650 euro.

2022– DFG Heisenberg Program, grant AN 1545/1-1, project "Motivic homotopy theory and cohomological properties of algebraic varieties", 311.400 euro.

2021–2022 "Basis" Foundation grant "Stable motivic homotopy theory, K-theory and generalized motivic cohomology", Principal Investigator, 1.200.000 RUB/year.

2020–2022 joint RSF-DFG grant 20-41-04401 "Algebraic bordism spectra: Computations, filtrations, applications", Principal Investigator on the Russian side, 6.000.000 RUB/year on the Russian side. Principal Investigator on the German side is Oliver Röndigs.

2014–2015 RFBR grant 14-01-31095-mol_a *"Homotopical methods in algebraic geometry and derived Witt groups"*, Principal Investigator, 400.000 RUB/year.

Investigator (not PI) RFBR grants 19-01-00513-a, 18-31-20044-mol_a_ved, 16-01-00750-a, 15-01-03034-a, 13-01-00429-a, 12-01-33057-mol_a_ved, 12-01-31100-mol_a, 10-01-00551_a, RSF grant 14-11-00456

Fellowships and Awards

2020 Simons Foundation Fellowship to stay at Isaac Newton Institute, Cambridge

2018–2020 "Young Russian Mathematics" fellowship, 480.000 RUB/year

2017 Fellowship to stay at Mittag-Leffler Institute, Stockholm

2015 IAS fellowship to stay at Institute for Advanced Study, Princeton

2013–2015 Dynasty foundation fellowship for Russia's young mathematicians, 360.000 RUB/year

2013, 2015 Gazprom Neft prize for young mathematicians

2012 Young Mathematician prize of the St. Petersburg Mathematical Society

2010, 2012 Rokhlin prize for St. Petersburg young mathematicians

Mentorship and Research Direction

2022– Egor Zolotarev, PhD student at LMU Munich

2021–2022 Tariq Syed, Postdoc at EIMI

2020–2022 Principal Investigator on the Russian side of the joint RSF-DFG grant 20-41-04401 "Algebraic bordism spectra: Computations, filtrations, applications".
The research group on the Russian side includes:

1. Alexey Ananyevskiy (Senior Researcher),
2. Mikhail Bondarko (Associate Professor),
3. Victor Petrov (Associate Professor),
4. Andrei Druzhinin (Postdoc),
5. Andrei Lavrenov (Postdoc),
6. Vladimir Sosnilo (Ph.D. student),
7. Ignat Sokolov (M.Sc. student).

Being a PI I submitted the grant proposal, coordinated the research and wrote yearly reports. We had a regular seminar of our research group to overview the progress. As of now (2+ years from the start) we have four published or accepted for publication papers (in Math. Z., St. Petersburg Math. J., two in IMRN) and five submitted papers related to the grant.

2021–2022 Principal Investigator of the "Basis" Foundation grant "Stable motivic homotopy theory, K-theory and generalized motivic cohomology".
The research group includes:

1. Alexey Ananyevskiy (Senior Researcher),
2. Vladimir Sosnilo (Ph.D. student),
3. Egor Zolotarev (M.Sc. student).

Being a PI I submitted the grant proposal and coordinate the research. The project started in October 2021.

2014–2015 Principal Investigator of the RFBR grant 14-01-31095-mol_a *"Homotopical methods in algebraic geometry and derived Witt groups"*.
The research group included:

1. Alexey Ananyevskiy (Postdoc),
2. Andrei Druzhinin (Ph.D. student),
3. Konstantin Chepurkin (M.Sc. student).

Being a PI I submitted the grant proposal, coordinated the research and wrote yearly reports. We had published eight papers (journals include Compos. Math., HHA, Manuscripta Math. and J. Topol.) related to the grant.

Teaching record: lecture courses (L), seminars (S), and guided assignments (GA)

Spring 2024 Toric varieties (L)
Fall 2021 Stable homotopy theory (L)
Spring 2016 Vector bundles and characteristic classes II (L&GA)
Fall 2015 Vector bundles and characteristic classes I (L&GA)
Spring 2014 Complex algebraic geometry (S)
Spring 2014 Algebra IV: Jordan normal form, inner product spaces (GA)
Spring 2014 Algebra II: quadratic forms, finite groups (GA)
Spring 2014 Algebra II: linear algebra, inner product space, quadratic forms (GA)
Fall 2013 $\mathbb{A}^1$-topology (S)
Fall 2013 Algebra III: Jordan normal form, inner product spaces (GA)
Fall 2013 Algebra I: combinatorics, basic linear algebra, basic number theory (GA)
Fall 2013 Algebra I: combinatorics, complex numbers, basic number theory (GA)
Spring 2013 Complex K-theory (S)
Spring 2013 Algebra IV: finite groups, inner product spaces (GA)
Spring 2013 Galois theory (L&GA)
Spring 2013 Representation theory of finite groups (L&GA)
Spring 2013 Algebra II: linear algebra, quadratic forms (GA)
Fall 2012 Flat, étale and smooth morphisms (S)
Fall 2012 Algebra III: Jordan normal form, inner product spaces (GA)
Fall 2012 Algebra I: combinatorics, complex numbers, basic linear algebra (GA)
Fall 2012 Algebra I: combinatorics, basic linear algebra, basic number theory (GA)
Spring 2012 Galois theory (L&GA)
Spring 2012 Representation theory of finite groups (L&GA)

Spring 2012	Algebra II: linear algebra, quadratic forms (GA)
Spring 2012	Algebra II: finite fields, basic groups theory (GA)
Spring 2012	Algebra II: linear algebra, inner product spaces, quadratic forms (GA)
Fall 2011	Algebra III: Jordan normal form, inner product spaces, finite fields (GA)
Fall 2011	Algebra I: combinatorics, complex numbers, basic number theory (GA)
Fall 2011	Algebra I: basic linear algebra, complex numbers, basic group theory (GA)
Fall 2011	Algebra I: combinatorics, basic number theory (GA)
Fall 2010	Algebra I: basic linear algebra, complex numbers, basic number theory (GA)
Fall 2010	Algebra III: Jordan normal form, inner product spaces, quadratic forms (GA)
Fall 2010	Algebra III: Jordan normal form, inner product spaces, quadratic forms (GA)
Spring 2010	Algebra IV: tensor algebra, polynomials, finite dimensional algebras (GA)
Spring 2010	Algebra II: multilinear algebra, basic group theory (GA)

Services to the community

Refereeing	Adv. Math., Algebr. Geom. Topol., Ann. Inst. Fourier, Compos. Math., Doc. Math., IMRN, Invent. Math., Izv. Math., J. Algebra, J. Pure Appl. Algebra, Math. Proc. Cambridge Philos. Soc., Pacific J. Math., St. Petersburg Math. J., MathSciNet
Organizing Zoom seminar	Zoom seminar on $\mathbb{A}^1$-topology, motives and K-theory in 2020-2022 `https://indico.eimi.ru/category/12/`.
Organizing conferences	**Emerging Research in Algebraic Groups, Motives, and K-Theory**, September 9-13, 2019 at EIMI, St. Petersburg, Russia. Organizers: Alexey Ananyevskiy, Anastasia Stavrova and Nikolai Vavilov. `https://sites.google.com/view/agmspb2019` **Petersburg motives (dedicated to Ivan Panin's 60th birthday)**, September 2-6, 2019 at EIMI, St. Petersburg, Russia. Organizers: Alexey Ananyevskiy, Alexander Merkurjev and Serge Yagunov. `https://sites.google.com/view/agmspb2019` **Motives in St. Petersburg 2018**, September 3-14, 2018 at EIMI, St. Petersburg, Russia. Organizers: Alexey Ananyevskiy, Grigory Garkusha and Ivan Panin. `https://sites.google.com/view/mispb2018` **Moscow – St. Petersburg algebraic geometry symposium for young mathematicians**, May 10-11, 2018 at Chebyshev Laboratory, SPbU, St. Petersburg, Russia. Organizers: Alexey Ananyevskiy, Valery Gritsenko, Peter Zograf. `https://chebyshev.spbu.ru/en/ag2018/`

Experience in academic self-administration

Deputy Director of EIMI
2017 – 2022

As a Deputy Director of EIMI I coordinated the organization of international conferences, summer schools and workshops (about 20 events per year) as well as hiring postdocs and organization of visitors research stays. This included:

1. organizations of calls for applications for conferences, postdocs, research stays,
2. preparation of the general schedule of events based on the availability of facilities and funding and its finalizing with the organizers,
3. coordination of the work of the EIMI personnel: visa support, housing support, travel support, catering, etc.,
4. financial management:
   (a) management of the grant from the Simons Foundation awarded to PDMI RAS to support conferences, thematic programs and workshops, July 2017 – June 2022, 200.000 USD/year,
   (b) coordination of grant applications for conference support; we usually had about 80.000 USD/year from different foundations and sponsors besides the Simons grant,
   (c) general financial planning of the Institute's activities based on the existing applications and expected funding (in Russia all the funding usually had to be renewed every year which adds some uncertainty).
5. preparation of grant reports and reports for the Ministry of Science and Higher Education.

Committees

Served on hiring committees at EIMI and Chebyshev Laboratory.
In 2019-2021 we hired to EIMI 34 postdocs based on the open calls for postdocs with 400+ applications received and 100+ interviews conducted. We also hired 30+ Ph.D. students from PDMI RAS and SPbU for joint junior researcher positions.