

Alexey KYTMANOV

Curriculum Vitae

December, 2021

Address

School of Space and Information Technology

Siberian Federal University

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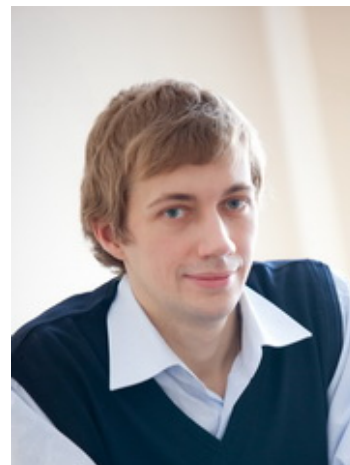
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[Math-Net.Ru profile](#)



Personal data

Birth date: September 25, 1978

Married, two children

Education, Academic Degrees and Ranks

2010 Siberian Federal University, D. Sc. in Applied Mathematics

2007 Siberian Federal University, Associate professor in Applied Mathematics

2005 University of Missouri-Rolla (MO, USA), Ph. D. in Mathematics

2003 Krasnoyarsk State University, Ph. D. in Mathematics

2000 Moscow State University, M. Sc. in Mechanics and Applied Mathematics

Employment

2010 – Siberian Federal University, Head of the Department of Applied Mathematics and Computer Security

2018 – 2021 Siberian Federal University, Dean of the School of Space and Information Technology

2008 – 2010 Siberian Federal University, Professor, Head of the Laboratory of Information Security

2005 – 2008 Siberian Federal University, Associate Professor

2003 – 2005 Krasnoyarsk State University, Senior Lecturer

2002 – 2005 University of Missouri-Rolla (MO, USA), Graduate Teaching Assistant

2000 – 2003 Krasnoyarsk State University, Graduate Student

Language Skills

Russian: native;

English: Proficiency (C2 level according to [CEFR](#) scale), [CPE](#) certificate awarded in 2019.

Research Interests

Computer Algebra, Computational Algebraic Geometry, Applied Data Science, Geographic Information Systems, Remote Sensing, Mathematics and Computer Science Education, Digital Transformation in Education.

Keywords

Systems of Nonlinear Equations, Stable Bundles, Applied Algorithms and Models, Machine Learning, Forest Cover Dynamics, Learning Analytics, Data-driven Management.

Teaching Activities

Calculus (all levels), Ordinary Differential Equations, Discrete Mathematics, Differential Geometry, Introduction to Topology, Information Theory, Data Compression, Scientific Computing, Research Seminar.

Awards

- | | |
|-------------|---|
| 2019 | Certificate of honor of the Ministry of Science and Higher Education of Russia. |
| 2013 | Winner of the prize of Open JSC Joint Stock Commercial Bank International Financial Club. |
| 2010 – 2011 | Winner of Vladimir Potanin Foundation contest for young teachers of public higher education institutions in Russia. |
| 2009 – 2010 | Winner of Vladimir Potanin Foundation contest “Teacher online”. |
| 2009 – 2010 | Winner of Vladimir Potanin Foundation contest for young teachers of public higher education institutions in Russia. |
| 2009 | Winner of the Krasnoyarsk Territory state prize for doctoral students of higher education institutions. |
| 2008 – 2009 | Winner of Vladimir Potanin Foundation contest for young teachers of public higher education institutions in Russia. |
| 2007 – 2008 | Winner of Vladimir Potanin Foundation contest for young teachers of public higher education institutions in Russia. |
| 2004 | Outstanding graduate student award, Missouri University of Science and Technology (former University of Missouri-Rolla), MO, USA. |
| 2002 – 2003 | President of Russian Federation Scholarship. |

Supervision of Funded Projects

- 2022 – 2023 “Digital academic history and its application in early warning systems for education”, supported by the Russian Science Foundation grant 22-28-00413.
- 2017 – 2018 “Mathematical modeling of critical phenomena in kinetics of complex chemical reactions”, supported by the President of the Russian Federation grant MD-197.2017.1 for young researchers with D. Sc. degree.
- 2015 – 2016 “Computer algebra in computationally hard related problems of complex algebraic geometry and several complex variables”, supported by the Russian Foundation for Basic Research grant 15-31-20008-mol.a.ved.
- 2014 – 2016 “Computer algebra algorithms in the problems of study of equations and systems of equations of different types”, supported by the Russian Foundation for Basic Research grant 14-01-00283-a.
- 2013 – 2016 Local work group coordinator for the project “Applied Computing in Engineering and Science” (ACES), supported by EACEA grant 544609-TEMPUS-1-2013-1-AT-TEMPUS-JPCR.
- 2012 – 2013 “Theory of functions and toric geometry methods in the problems of systems of nonalgebraic equations research”, supported by the Russian Foundation for Basic Research grant 12-01-31021-mol.a.
- 2009 – 2012 Local work group coordinator for the project “Modernization of Master Program NETWORKS&COMMUNICATIONS” (MoNetCom), supported by EACEA grant 159386-TEMPUS-1-2009-1-DE-TEMPUS-JPCR.
- 2007 – 2008 “Integral representations, residues, holomorphic extension and systems of nonlinear equations”, supported by the President of the Russian Federation grant MK-914.2007.1 for young researchers with Ph. D. degree.

Participation in Funded Projects

- 2018 – 2021 “Groups close to finite with applications in computer algebra”, supported by the Russian Science Foundation grant 18-71-10007.
- 2015 – 2017 “Non-algebraic systems of equations, power sums of roots and computer algebra”, supported by the Russian Foundation for Basic Research grant 15-01-00277-a.
- 2014 – 2016 “Multidimensional complex analysis and differential equations”, supported by Government of the Russian Federation (project no. 14.Y26.31.0006).
- 2014 – 2016 “Algebraic and analytic methods of development of the algorithms for the solution of differential and polynomial systems: factorization, resolution of singularities and optimal lattices”, supported the state order of the Ministry of Education and Science of the Russian Federation for Siberian Federal University, task 1.1462.2014/K.
- 2012 – 2015 Member of academic group for Euro-Russian Academic Network Plus project, supported by EACEA grant 372235-EM-1-2012-1-ES-ERA MUNDUS-EMA21

- 2012 – 2014 “Non-algebraic systems of equations and computer algebra”, supported by the Russian Foundation for Basic Research grant 12-01-00007-a.
- 2011 – 2014 Member of academic group for Euro-Russian Academic Network-Mundus project, supported by EACEA grant 204444-EM-1-2011-1-ES-ERA MUNDUS-EMA21.
- 2010 – 2011 “Integral methods in complex analysis and its applications”, supported by the President of the Russian Federation grant NSh-7347.2010.1 for leading scientific schools.
- 2009 – 2010 “Algebraic-logic structures and complex analysis with applications to information transfer and information security, construction of artificial intelligence models. Training of specialists and development of higher education scientific potential”, supported by the grant 2.1.1/4620 of the government analytical target program “Development of higher education scientific potential”.
- 2008 – 2009 “Multidimensional residues and integral representations in complex analysis and its applications”, supported by the President of the Russian Federation grant NSh-2427.2008.1 for leading scientific schools.

Professional activities

- 2021 – A member of the reviewer board of [BDCC](#) (ISSN 2504-2289).
- 2017 – A reviewer for Mathematical Reviews.
- 2012 – 2024 An expert for the Federal Register of experts in scientific and technical sphere of Russian Federation.
- 2017 – 2019 An expert for the Russian Foundation for Basic Research (young researcher programs division).
- 2013 – 2018 An expert in the field of state accreditation of educational institutions and research organizations.

Organization of events

- A member of the Organizing Committee of the international conference on algebraic geometry, complex analysis and computer algebra, August 03–09, 2016, Northern (Arctic) Federal University, Koryazhma Branch, Koryazhma, Arkhangelsk region, Russia.
- A member of the Program Committee of the international conference “Web-technologies in Educational Space: issues, approaches, perspectives”, March 26–27, 2015, Lobachevsky State University of Nizhni Novgorod, Arzamas Branch, Arzamas, Nizhny Novgorod region, Russia.
- Member of the Program Committee of the international conference “Modern Problems of Mathematics, Computer Science and Scientific Knowledge”, September 15–18, 2014, Northern (Arctic) Federal University, Koryazhma Branch, Koryazhma, Arkhangelsk region, Russia.
- A member of the Organizing Committee of the international summer school on Climate and Environmental Change, July 11–17, 2011, Russian State Hydrometeorological University St. Petersburg, Russia.

- A secretary of the international conference “Modern Problems of Mathematical Modeling and Computational Technologies”, August 18–24, 2008, Siberian Federal University, Krasnoyarsk, Russia.

Monographs

- The evolution of education in the context of informatization (in Russian): monograph / author team leaders and resp. editors M. P. Lapchik, M. V. Noskov // Noskov, M. V., Dyachuk, P. P., Dobronets, B. S., Vainshtein, Y. V., Kytmanov, A. A., Lapchik, M. P., Ragulina, M. I., Henner, E. K., Zakharova, I. G., Pak, N. I., Stepanov, T. A., Mikheev, S. A., Skibitsky, E. G. – Krasnoyarsk: Sib. Feder. Univ., 2019. – 216 pp. ISBN 978-5-7638-4210-4.

Articles and papers in peer-reviewed journals

2021

- Osipov, N.N., Kytmanov, A.A. Simplification of Nested Real Radicals Revisited. (2021) Proceedings of CASC 2021: Computer Algebra in Scientific Computing: 23rd International Workshop, (F. Boulier et al. eds.), Lecture Notes in Computer Science, 12865, pp. 293–313, Springer International Publishing. [Link](#)
- Vokhmin S.A., Kytmanov A.A., Erlykov G.P., Shevnina E.V., Kurchin G.S., Kirsanov A.K. Prediction and Actual Oversized/Undersized Fragmentation in Underground Blasting. (2021) Journal of Mining Science, 57 (2), pp. 210–219. [Link](#)
- Kuzovatov, V.I., Kytmanov, A.A., Myshkina, E.K. An Algorithm for Constructing the Resultant of Two Entire Functions. (2021) Programming and Computer Software, 47 (2), pp. 139–143. [Link](#)
- Osipov, N.N., Kytmanov, A.A. An Algorithm for Solving a Family of Fourth-Degree Diophantine Equations that Satisfy Runge’s Condition. (2021) Programming and Computer Software, 47 (1), pp. 29–33. [Link](#)

2020

- Auzinger, W., Kytmanov, A.A., Tsarev, S.P. A Study of Anomalies in GPS Time Series via Polynomial Filtering. (2020) 2020 IEEE 15th International Scientific and Technical Conference on Computer Sciences and Information Technologies, CSIT 2020 – Proceedings, 1, pp. 175–178. [Link](#)
- Kuzovatov, V.I., Kytmanov, A.A., Kuzovatova, O.I. Algorithm for constructing an analogue of the Binet formula. (2020) Programming and Computer Software, 46 (2), pp. 105–109. [Link](#)

2019

- Kytmanov, A.A., Tikhomirov, A.S., Tikhomirov, S.A. Series of rational moduli components of stable rank two vector bundles on \mathbb{P}^3 . (2019) Selecta Mathematica, New Series, 25 (2), article 29. [Link](#)

- Gorshkov, I.B., Kaygorodov, I., Kytmanov, A.A., Salim, M.A. The variety of nilpotent Tortkara algebras. (2019) Journal of Siberian Federal University – Mathematics and Physics, 12 (2), pp. 173–184. [Link](#)

- Kytmanov, A.A., Kytmanov, A.M., Myshkina, E.K. Residue integrals and Waring’s formulas for algebraic or even transcendental systems. (2019) Complex Variables and Elliptic Equations, 64 (1), pp. 93–111. [Link](#)

2018

- Zykova, T.V., Shershneva, V.A., Vainshtein, Y.V., Danilenko, A.S., Kytmanov, A.A. E-learning courses in mathematics in higher education. (2018) Perspektivy Nauki i Obrazovania, 34 (4), pp. 58–65. [Link](#)

- Styugin, M.A., Kytmanov, A.A., Yamskikh, T.N. Formalization of the problem of protection against reconnaissance in conflict systems. (2018) Journal of Discrete Mathematical Sciences and Cryptography, 21 (3), pp. 679–694. [Link](#)

- Kuzovatov, V.I., Kytmanov, A.A. Algorithm for Constructing an Analog of Plan’s Formula. (2018) Programming and Computer Software, 44 (2), pp. 100–104. [Link](#)

2017

- Vokhmin, S.A., Kytmanov, A.A., Kurchin, G.S., Trebush, Y.P., Kirsanov, A.K. Calculation of loss volumes and dilution of mineral deposits in near-contact zones. (2017) ARPN Journal of Engineering and Applied Sciences, 12 (19), pp. 5447–5456. [Link](#)

- Kytmanov, A.A., Lyapin, A.P., Sadykov, T.M. Evaluating the rational generating function for the solution of the Cauchy problem for a two-dimensional difference equation with constant coefficients. (2017) Programming and Computer Software, 43 (2), pp. 105–111. [Link](#)

- Kurchin G.S., Vokhmin S.A., Kytmanov, A.A. Impact of the shape of geological contact on mining losses in the process of near-contact zone development (2017) Journal of Mining Institute, 223, pp. 37–43. [Link](#)

2016

- Kytmanov, A.A., Noskov, M.V., Safonov, K.V., Savelyeva, M.V., Shershneva, V.A. Competency-based learning in higher mathematics education as a cluster of efficient approaches. (2016) Bolema – Mathematics Education Bulletin, 30 (56), pp. 1113–1126. [Link](#)

- Bogdanov, D.V., Kytmanov, A.A., Sadykov, T.M. Algorithmic computation of polynomial amoebas. (2016) Proceedings of CASC 2016: Computer Algebra in Scientific Computing: 18th International Workshop, (V.P. Gerdt et al. eds.), Lecture Notes in Computer Science, 9890, pp. 87–100, Springer. [Link](#)

- Kytmanov, A.A., Osipov, N.N., Tikhomirov, S.A. Finding Ein components in the moduli spaces of stable rank 2 bundles on the projective 3-space. (2016) Siberian Mathematical Journal, 57 (2), pp. 322–329. [Link](#)

- Kytmanov, A.A., Shchuplev, A.V., Zykova, T.V. Algorithm for construction of volume forms on toric varieties starting from a convex integer polytope. (2016) *Programming and Computer Software*, 42 (2), pp. 99–106. [Link](#)

2015

- Styugin, M.A., Kytmanov, A.A. Mathematical modeling of user perception in information security systems. (2015) *Journal of Siberian Federal University – Mathematics and Physics*, 8 (4), pp. 454–466. [Link](#)
- Kytmanov, A.A., Kytmanov, A.M., Myshkina, E.K. On finding residue integrals for a class of systems of non-algebraic equations. (2015) *ACM Communications in Computer Algebra*, 49 (3), pp. 77–79. [Link](#)
- Kytmanov, A.A., Kytmanov, A.M., Myshkina, E.K. Finding residue integrals for systems of non-algebraic equations in \mathbb{C}^n . (2015) *Journal of Symbolic Computation*, 66 (1), pp. 98–110. [Link](#)

2014

- Kuzovatov, V.I., Kytmanov, A.A. On the zeta-function of zeros of some class of entire functions. (2014) *Journal of Siberian Federal University – Mathematics and Physics*, 7 (1), pp. 22–34. [Link](#)

2013

- Kytmanov, A.A., Shchuplev, A.V. An algorithm for constructing toric compactifications. (2013) *Programming and Computer Software*, 39 (4), pp. 207–211. [Link](#)

2012

- Kytmanov, A.A. Algorithm for constructing an integral representation from the fan of a toric variety. (2012) *Journal of Mathematical Sciences (United States)*, 186 (3), pp. 453–460. [Link](#)

2010

- Kytmanov, A.A. An algorithm for calculating power sums of roots for a class of systems of nonlinear equations. (2010) *Programming and Computer Software*, 36 (2), pp. 103–110. [Link](#)
- Kytmanov, A.A., Semusheva, A.Y. Averaging of the Cauchy kernels and integral realization of the local residue. (2010) *Mathematische Zeitschrift*, 264 (1), pp. 87–98. [Link](#)

2009

- Kytmanov, A.A. Analogs of recurrent Newton formulas. (2009) *Russian Mathematics*, 53 (10), pp. 34–44. [Link](#)

2008

- Kytmanov, A.A. Integral representations and volume forms on Hirzebruch surfaces. (2008) *Journal of Siberian Federal University – Mathematics and Physics*, 1 (2), pp. 125–132. [Link](#)

2005

- Kytmanov, A.A. An analog of the Bochner-Martinelli representation in d -circular polyhedra in the space \mathbb{C}^d . (2005) *Russian Mathematics*, 49 (3), pp. 49–55. [Link](#)

2003

- Kytmanov, A.A. An analog of the Fubini-Study form for two-dimensional toric varieties. (2003) *Siberian Mathematical Journal*, 44 (2), pp. 286–297. [Link](#)

Talks and presentations

2021

- “Interdisciplinary connections of the course of Information Theory in training of bachelors in the fields of information security and computer security” (A. A. Kytmanov, V. A. Lazareva, V. A. Shershneva), *International Conference “Digital Transformation of Education and e-Learning Methods: Digital Technology in Education”*, Siberian Federal University, Krasnoyarsk, September 21–24, 2021.
- “Simplification of nested real radicals revisited” (N. N. Osipov, A. A. Kytmanov), *CASC 2021: The 23rd International Workshop on Computer Algebra in Scientific Computing*, Sirius Mathematics Center, Sochi, Russia, September 13–17, 2021.

2020

- “A study of anomalies in GPS time series via polynomial filtering” (W. Auzinger, A. A. Kytmanov, S. P. Tsarev), *2020 IEEE 15th International Conference on Computer Sciences and Information Technologies (CSIT)*, Zbarazh Castle, Ukraine, September 23–26, 2020.
- “Number theoretic aspects in problems of study of semistable rank 2 sheaves on 3-dimensional projective space” (S. A. Tikhomirov, A. A. Kytmanov, N. N. Osipov, T. L. Troshina), *74-th International conference “Ushinsky readings”*, Yaroslavl State Pedagogical University named after K. D. Ushinsky, Yaroslavl, Russia, March 05–06, 2020.

2019

- “A synergetic effect of use of testing in the lms moodle in teaching mathematical analysis” (E. S. Belko, T. V. Zykova, A. A. Kytmanov, S. A. Tikhomirov), *“XV Kolmogorov readings”, dedicated to the memory of prof. M. I. Zaykin*, Arzamas branch of Lobachevsky State University of Nizhny Novgorod, Arzamas, Russia, September 10–13, 2019.
- “An algorithm for solving a family of diophantine equations of degree four which satisfy Runge’s condition” (N. N. Osipov, A. A. Kytmanov.), *The 3rd International Conference “Computer Algebra”*, Dorodnicyn Computing Center, Federal Research Center “Computer Science and Control” of Russian Academy of Sciences and Peoples’ Friendship University of Russia, Moscow, Russia, June 17–21, 2019.

2018

- “On analogs of Waring’s formulas for algebraic systems of equations” (A. A. Kytmanov, A. M. Kytmanov, E. K. Myshkina.), *International School-Conference “Sobolev Readings”*, Sobolev Institute of Mathematics of the Siberian Branch of the Russian Academy of Sciences, Novosibirsk, Russia, December 10–16, 2018.
- “On a number of Ein components in the moduli spaces of stable rank 2 bundles” (A. A. Kytmanov, A. M. Kytmanov, E. K. Myshkina.), *Modern Problems of Physical and Mathematical Sciences IV, All Russian Research and Practice Conference*, Oryol State University, Oryol, Russia, November 22–25, 2018.
- “On computing a rational generating function for the solution of the Cauchy problem” (A. A. Kytmanov, A. P. Lyapin), *Crimea Autumn Mathematical School KROMSH–2018*, V. I. Vernadsky Crimea Federal University, Batiliman (Sevastopol), Russia, September 17–29, 2018.
- “On properties of discrete orthogonal polynomials arising in the study of anomalous values in IGS final orbits of GPS satellites”, *Research seminar*, Palacky University Olomouc, Olomouc, Czech Republic, June 6, 2018.

2017

- “An algorithm for computing residue integrals for a class of systems of algebraic equations” (A. A. Kytmanov, A. M. Kytmanov, E. K. Myshkina.), *The 2nd International Conference “Computer Algebra”*, Dorodnicyn Computing Center, Federal Research Center “Computer Science and Control” of Russian Academy of Sciences and Plekhanov Russian University of Economics, Moscow, Russia, October 30 – November 3, 2017.
- “On computing residue integrals for a class of nonlinear transcendental systems” (A. A. Kytmanov, A. M. Kytmanov, E. K. Myshkina.), *ISSAC 2017: The 42nd International Symposium on Symbolic and Algebraic Computation*, the University of Kaiserslautern, Kaiserslautern, Rheinland-Pfalz, Germany, July 25–28, 2017.
- “Number-theoretic algorithms in the study of moduli spaces of stable bundles on \mathbb{P}^3 ”, *Research seminar in Algebra and Number Theory*, Friedrich Schiller University Jena, Jena, Germany, April 4, 2017.

2016

- “Algorithmic computation of polynomial amoebas” (D. V. Bogdanov, A. A. Kytmanov, T. M. Sadykov), plenary talk, *CASC 2016: The 18th International Workshop on Computer Algebra in Scientific Computing*, University of Bucharest, Bucharest, Romania, September 19–23, 2016.
- “Number-theoretic algorithms in the problems of study moduli spaces of bundles on \mathbb{P}^3 ” (A. A. Kytmanov, S. A. Tikhomirov), plenary talk, *International Conference on Algebraic Geometry, Complex Analysis and Computer Algebra*, Koryazhma, Arkhangelsk region, Russia, August 03–09, 2016.

2015

- “On computing Vedernikov’s and Ein’s components of stable rank 2 bundles on \mathbb{P}^3 ” (A. A. Kytmanov, S. A. Tikhomirov), plenary talk, *V School and Conference on Algebraic Geometry and Complex Analysis for young scientists from Russia*, Koryazhma, Arkhangelsk region, Russia, August 17–22, 2015.
- “On finding residue integrals for a class of systems of non-algebraic equations” (A. A. Kytmanov, A. M. Kytmanov, E. K. Myshkina.), *ISSAC 2015: The 40th International Symposium on Symbolic and Algebraic Computation*, The University of Bath, Bath, UK, July 06–09, 2015.

2014

- “Symbolic algorithm for construction of toric compactifications” (A. A. Kytmanov, A. V. Shchuplev), *SCSS 2014: 6th International Symposium on Symbolic Computation in Software Science*, Gammarth, La Marsa, Tunisia, December 07–11, 2014.
- “Computer algebra in research and contemporary education”, plenary talk, *International conference “Modern Problems of Mathematics, Computer Science and Scientific Knowledge”*, Koryazhma, Arkhangelsk region, Russia, September 15–18, 2014.

2013

- “On construction of toric compactifications”, *CIMC-2013: Crimea International Mathematical Conference*, Simferopol, Ukraine, September 23 – October 04, 2013.
- “On computing of power sums of roots of certain systems of non-algebraic equations”, *Summer School and Conference on Algebraic Geometry and Complex Analysis for young scientists from Russia*, Yaroslavl, Russia, May 20–25, 2013.
- “On construction of an integral representation starting from a fan of a toric variety”, *LXVI International conference “Herzen Readings — 2013”*, St. Petersburg, Russia, April 15–20, 2013.

2010

- “On elimination of unknowns from certain systems of non-algebraic equations”, *School-conference for young scientists “Lobachevskiy Readings — 2010”*, Kazan, Russia, October 01–06, 2010.