CURRICULUM VITAE
Pavel Tumarkin

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RESEARCH INTERESTS

Cluster algebras and quivers; combinatorics of Coxeter groups; reflection groups; hyperbolic geometry; Lie algebras; combinatorics of polytopes

EMPLOYMENT

2021–   : Professor in Pure Mathematics, Durham University.

2017–2021: Associate Professor in Pure Mathematics, Durham University.

2012–2017: Lecturer in Pure Mathematics, Durham University.

2009–2012: University Lecturer of Mathematics, Jacobs University Bremen.

2007–2008: Visiting Research Instructor, Michigan State University.

2005–2011: Researcher, Independent University of Moscow.

2004–2005: Researcher, Max Planck Institute for Mathematics, Bonn.

2001–2007: Teacher of mathematics, specialized mathematical high school 57, Moscow.

1998–2001: Teacher of mathematics, specialized mathematical high school 1543, Moscow.

1998–2004: Assistant, Independent University of Moscow.

EDUCATION

1998–2004: Ph.D. studies at the Moscow State University and at the Independent University of Moscow.

Ph.D., 2004: Moscow State University. Title: Hyperbolic Coxeter polytopes. Advisors: E. B. Vinberg, O. V. Shvarzman.

1993–1998: Undergraduate studies at the Moscow State University;
M.Sc., 1998: Mathematics and applied mathematics.

1993–1998: Undergraduate studies at the Independent University of Moscow;
M.Sc., 1998: Mathematics.

1990–1993: Specialized mathematical high school 57, Moscow.

RESEARCH VISITS

09.2024–12.2024: Max Planck Insitute for Mathematics (MPIM), Bonn, Germany
09.2021–12.2021: Isaac Newton Institute (INI), Cambridge, UK
08.2012–12.2012: Mathematical Sciences Research Institute (MSRI), Berkeley, USA
11.2008–01.2009: Institut des Hautes Études Scientifiques (IHÉS), Bures-sur-Yvette, France
05-11.2008, 04-08.2007: University of Fribourg, Switzerland

11.2004–05.2005: Max Planck Insitute for Mathematics (MPIM), Bonn, Germany

RECENT TALKS

- Pure Mathematics Colloquium, Durham, 2025

- Algebra and Algebraic Geometry oberseminar, Paderborn, 2024

- Oberseminar, MPIM, Bonn, 2024

- Algebra and Representation Theory seminar, Cologne, 2024

- "Journées de Géométrie Hyperbolique", Fribourg, 2024

- Geometry seminar, King's College London, 2023

- Geometry seminar, Manchester, 2023

- "Lattices in Negative Curvature", Les Diablerets, 2023

- Mathematics and Statistics seminar, Open University, Milton Keynes, 2023

- "Shabat-70", online, 2022

- Cluster algebras seminar, MSU, East Lansing, 2022

- Open problems seminar, INI, Cambridge, 2021

- Cluster algebras seminar, INI, Cambridge, 2021

- Geometry and Combinatorics seminar, St. Petersburg, 2020 (online)

- "Cluster algebras, geometry, and mathematical physics", RIMS, Kyoto, 2019

- "Cluster structures in geometry, physics, combinatorics and representation theory", Jerusalem, 2018

- 6th Workshop on Combinatorics of Moduli Spaces, Cluster Algebras and Topological Recursion, Moscow, 2018

- "Cluster Algebras and Mathematical Physics", East Lansing, MI, 2018

- North British Geometric Group Theory (NBGGT) seminar, Edinburgh, 2018

- "Lie Theory and Cluster Algebras", Rome, 2016

- Geometry and Topology seminar, Manchester, 2016

- Group Theory seminar, Düsseldorf, 2016

- 5th Workshop on Combinatorics of Moduli Spaces, Hutwitz Numbers, and Cohomological Field Theories, Moscow, 2016

- "Quivers and Bipartite Graphs: Physics and Mathematics", London, 2016

- "Cluster Algebras and Geometry", Münster, 2016

- "Journées de Géométrie Hyperbolique", Fribourg, 2015

- "Lie Groups and Algebraic Groups", Bielefeld, 2015

- Algebra Seminar, Jena, Germany, 2015

- Mathematics Colloquium, Liverpool, 2014

- Pure Mathematics Seminar, Leicester, 2014

- "Cluster Algebras and Representation Theory", KIAS, Seoul, 2014

- "Topics in Negative Curvature", Basel, 2014

- "Discrete Groups and Geometric Structures, with Applications V", Leuven, 2014

- "Workshop on Triangulations and Mutations", Newcastle, 2013

- Pure Mathematics Seminar, Southampton, 2013

- "Geometry, representation theory and clusters", Leicester, 2012

- 3rd Workshop on Combinatorics of Moduli Spaces, Cluster Algebras, Knots, and Topological Recursion, Moscow, 2012

- "Tropical Geometry and Cluster Algebras", Paris, 2012

- Pure Mathematics Colloquium, Durham, 2012

- "Cluster algebras, representation theory, and Poisson geometry", Banff, 2011

- "Lie Groups and Algebraic Groups", Bielefeld, 2011

- 2nd Workshop on Combinatorics of Moduli Spaces and Cluster Algebras, Moscow, 2010

- Topology seminar, MPIM, Bonn, 2009

- "Coxeter groups and bounded cohomology", Fribourg, 2008

- "CombinaTexas'08", El Paso, Texas, 2008

- AGSC (Algebra, Geometry, Singularities, Combinatorics), Northeastern University, Boston, 2008

- Number theory seminar, University of Michigan, Ann Arbor, 2008

- "Lie groups, algebraic groups and transformation groups", Bielefeld, 2007

- Differential geometry seminar, Zurich, 2007

- Mathematics Colloquium, Fribourg, Switzerland, 2007

RECENT GRANTS

2024: LMS grant for organizing LMS Northern Regional Meeting and Workshop "Continued Fractions and SL_2-tilings" in Durham

2019–2023: Leverhulme Trust research grant RPG-2019-153

2015: LMS grant for organizing LMS Invited Lectures 2015 in Durham

2011–2013: RFBR research grant 11-01-00289-a

2007–2009: RFBR research grant 07-01-00390-a

2007–2008: INTAS Postdoctoral Fellowship YSF-06-10000014-5766 (at the University of Fribourg, Switzerland)

2006–2007: research grant MK-6290.2006.1 of President of Russia for young scientists.

2006–2008: research grant NSh-5666.2006.1 of President of Russia for scientific schools.

SUPERVISING

Postdoc: Drew Duffield (2019–2022)

Ph.D. student: John Lawson (PhD 2017)

M.Sc./MMath students: Sadie Turner-Knight, Michael Roberts, Edward Stedman, William Woof (2015), John Blackman (2016), Gregory Burr, Robert Findlay, James Heald, David Sheard, Ian Sulzmann, Adam Withers (2017), Mary Timms, Harry Walker (2019), Matthew Toinbee (2020), Amanda Burcroff (2021)

OTHER PROFESSIONAL ACTIVITIES

Organizer of   LMS Invited Lectures 2015 at Durham University:
"Cluster Algebras and Integrable Systems" by M. Shapiro

Workshop "SL_2-tilings and continued fractions", Durham, 2024

Referee for   EPSRC, LMS, ICMS
Journals: Advances in Mathematics, Algebraic Combinatorics, Algebraic Geometry and Topology, Arnold Mathematical Journal, Compositio Mathematica, Cubo, A Mathematical Journal, Discrete and Computational Geometry, Electronic Journal of Combinatorics, European Journal of Combinatorics, Geometriae Dedicata, Geometry and Topology, International Journal of Algebra and Computation, International Mathematics Research Notices, Journal of Algebra, Journal of Algebraic Combinatorics, Journal of Combinatorial Algebra, Journal of Combinatorial Theory A, Journal of Lie Theory, Journal of the London Mathematical Society, LMS Journal of Computation and Mathematics, Mathematische Nachrichten, Mathematische Zeitschrift, Michigan Mathematical Journal, Moscow Mathematical Journal, Proceedings of the American Mathematical Society, SIGMA, Transactions of the American Mathematical Society, Transformations Groups

Translation   of W. P. Thurston's book "Three-dimensional geometry and topology" into Russian (parts 1,2)

Member of   London Mathematical Society, Association for Mathematical Research

Secretary of   Board of Examiners for MSc in Math Sciences (Durham, 01.2013–06.2014)

Course Director for M.Sc. in Math Sciences program (Durham, 2014–2024)

Examiner for Ph.D. defences of Naomi Bredon (Fribourg, 2024), Supanat Kamtue (Durham, 2021), Samuel Borza (Durham, 2021), Jenny Swinson (King's College London, 2021), Edoardo Dotti (Fribourg, 2020), Ekaterina Stuken (Moscow, 2019), Daniel Ballesteros-Chavez (Durham, 2019), Nicolas Pastant (Strasbourg, 2019), Isobel Webster (Leeds, 2019), Jon Wilson (Durham, 2017), Matthieu Jacquemet (Fribourg, 2015), Nasser Bin Turki (Liverpool, 2014)

TEACHING

2012–2025   Topics in Combinatorics, Riemannian Geometry, Single Mathematics A, Differential Geometry, Real Analysis, Geometry (Durham University).

2009–2011   Analysis, Linear Algebra, Discrete Mathematics, Riemann Surfaces, Complex Analysis, Topology, Engineering and Science Mathematics (Jacobs University Bremen).

2007–2008   Calculus (Michigan State University).

2005–2007   Geometric Group Theory and Coxeter Groups, Non-Euclidean Geometry ("Math in Moscow" program at the Independent University of Moscow).

2001–2004   Basic Algebra, Non-Euclidean Geometry ("Math in Moscow" program at the Independent University of Moscow).

1998–2006   Algebra, Geometry, Analysis, Hyperbolic Geometry, Topology, Complex Analysis, Riemannian Geometry, Differential Geometry, Geometry of Manifolds and Bundles (Independent University of Moscow).

2001–2007   Teacher of mathematics at the specialized mathematical high school 57, Moscow.

1998–2001   Teacher of mathematics at the specialized mathematical high school 1543, Moscow.

PERSONAL INFORMATION

Born: July 21, 1976, Moscow.

Citizenship: Russia, UK.

Languages: Russian (native), German (basic), English, French

PUBLICATIONS

PREPRINTS

[1] *Punctured surfaces, quiver mutations, and quotients of Coxeter groups* (with A. Felikson and M. Shapiro), arXiv:2412.04960

[2] *Friezes from surfaces and Farey triangulation* (with A. Felikson), arXiv:2410.13511

[3] *Categorifications of non-integer quivers: type $I_2(2n)$* (with D. D. Duffield), arXiv:2302.06988

PUBLISHED PAPERS

[4] *3D Farey graph, lambda lengths and SL_2-tilings* (with A. Felikson, O. Karpenkov and K. Serhiyenko), Geom. Dedicata 219 (2025), article 33.

[5] *Polytopal realizations of non-crystallographic associahedra* (with A. Felikson, E. Yildirim), Algebr. Comb. 8 (2025), 17–28.

[6] *Categorifications of non-integer quivers: types H_4, H_3 and $I_2(2n + 1)$* (with D. D. Duffield), Represent. Theory 28 (2024), 275–327.

[7] *Cluster algebras of finite mutation type with coefficients* (with A. Felikson), arXiv:2110.12917, J. Comb. Algebra 8 (2024), 375–418.

[8] *Mutation-finite quivers with real weights* (with A. Felikson), Forum Math. Sigma 11 (2023), paper e9, 22 pp.

[9] *Friezes for a pair of pants* (with I. Canakci, A. G. Elsener and A. Felikson), Sém. Lothar. Comb. 86b (2022), paper B86.32, 12 pp.

[10] *Cluster algebras from surfaces and extended affine Weyl groups* (with A. Felikson, J. W. Lawson and M. Shapiro), Transform. Groups 26 (2021), 501–535 (special volume dedicated to the memory of E. Vinberg)

[11] *Geometry of mutation classes of rank 3 quivers* (with A. Felikson), Arnold Math. J. 5 (2019), 37–55.

[12] *Bases of cluster algebras from orbifolds with one marked point* (with I. Canakci), Algebr. Comb. 2 (2019), 355–365.

[13] *Acyclic cluster algebras, reflection groups, and curves on a punctured disc* (with A. Felikson), Adv. Math. 340 (2018), 855–882.

[14] *SL_2-tilings do not exist in higher dimensions (mostly)* (with L. Demonet,   P.-G. Plamondon, D. Rupel and S. Stella), Sém. Lothar. Comb. B76 (2018), paper B76e, 6 pp.

[15] *Bases for cluster algebras from orbifolds* (with A. Felikson), Adv. Math. 318 (2017), 191–232.

[16] *Coxeter groups, quiver mutations and geometric manifolds* (with A. Felikson), J. London Math. Soc., 94 (2016), 38–60.

[17] *Exchange relations for finite type cluster algebras with acyclic initial seed and principal coefficients* (with S. Stella), SIGMA 12 (2016), 067.

[18] *Coxeter groups and their quotients arising from cluster algebras* (with A. Felikson), Int. Math. Res. Notices (2016), 5135–5186.

[19] *Growth of cluster algebras* (with A. Felikson, M. Shapiro and H. Thomas), Proc. London Math. Soc. 109 (2014), 653–675.

[20] *Reflection subgroups of skew-angled Coxeter groups* (with A. Felikson and J. Fintzen), J. Combin. Theory A 126 (2014), 92–127.

[21] *Essential hyperbolic Coxeter polytopes* (with A. Felikson), Isr. J. Math. 199 (2014), 113–161.

[22] *Cluster algebras and triangulated orbifolds* (with A. Felikson and M. Shapiro), Adv. Math. 231 (2012), 2953–3002.

[23] *Cluster algebras of finite mutation type via unfoldings* (with A. Felikson and M. Shapiro), Int. Math. Res. Notices (2012), 1768–1804.

[24] *Hyperbolic subalgebras of hyperbolic Kac-Moody algebras* (with A. Felikson), Transform. Groups 17 (2012), 87–122.

[25] *Skew-symmetric cluster algebras of finite mutation type* (with A. Felikson and M. Shapiro), J. Eur. Math. Soc. 14 (2012), 1135–1180.

[26] *Automorphism groups of root systems matroids* (with M. Dutour Sikirić and A. Felikson), Europ. J. Combin. 32 (2011), 383–389.

[27] *Reflection subgroups of Coxeter groups* (with A. Felikson), Trans. Amer. Math. Soc. 362 (2010), 847–858.

[28] *Coxeter polytopes with a unique pair of non-intersecting facets* (with A. Felikson), J. Combin. Theory A 116 (2009), 875–902.

[29] *Regular subalgebras of affine Kac-Moody algebras* (with A. Felikson and A. Retakh), J. Phys. A 41 (2008), 365204 (16pp).

[30] *On hyperbolic Coxeter polytopes with mutually intersecting facets* (with A. Felikson), J. Combin. Theory A 115 (2008), 121–146.

[31] *On compact hyperbolic Coxeter n-polytopes with n+4 facets* (with A. Felikson), Trans. Moscow Math. Soc. 69 (2008), 105–151.

[32] *On simple ideal hyperbolic Coxeter polytopes* (with A. Felikson), Izv. Math. 72 (2008), 113–126.

[33] *Compact hyperbolic Coxeter n-polytopes with n + 3 facets,* Electron. J. Combin. 14 (2007).

[34] *Euclidean simplices generating discrete reflection groups* (with A. Felikson), European J. Combin. 28 (2007), 1056–1067.

[35] *On hyperbolic Coxeter n-polytopes with n + 2 facets* (with A. Felikson and T. Zehrt), Adv. Geom. 7 (2007), 177–189.

[36] *Reflection subgroups of Euclidean reflection groups* (with A. Felikson), Sb. Math. 196 (2005), 1349–1369.

[37] *Groups of signature* $(0; n; 0)$, J. Math. Sci. 128 (2005), 3501–3503.

[38] *Reflection subgroups of reflection groups* (with A. Felikson), Funct. Anal. Appl. 38 (2004), 313–314.

[39] *Hyperbolic Coxeter n-polytopes with n + 2 facets,* Math. Notes 75 (2004), 848–854.

[40] *Maximal rank root subsystems of hyperbolic root systems,* Sb. Math. 195 (2004), 121–134.

[41] *Hyperbolic Coxeter n-polytopes with n+3 facets,* Trans. Moscow Math. Soc. 65 (2004), 235–250.

[42] *Non-compact hyperbolic Coxeter n-polytopes with n+3 facets,* Russian Math. Surveys, 58 (2003), 805–806.

OTHER PREPRINTS

[43] *A series of word-hyperbolic Coxeter groups* (with A. Felikson), arXiv:math/0507389