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

09.2022–12.2022: 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

- "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
- "CombinaTexas08", 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

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–)

Ph.D. student: John Lawson (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

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

Referee for EPSRC, LMS, ICMS
Journals: Algebraic Combinatorics, Algebraic Geometry and Topology, Arnold Mathematical Journal, Compositio Mathematica, Discrete and Computational Geometry, European Journal of Combinatorics, Geometriae Dedicata, Geometry and Topology, International Journal of Algebra and Computation, International Mathematics Research Notices, Journal of Algebra, Journal of Combinatorial Theory A, Journal of Lie Theory, 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

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, since 07.2014)

Examiner for Ph.D. defences of 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

2012–2020 Riemannian Geometry, Single Mathematics A, Differential Geometry, Real Analysis, Geometry (Durham University).

2008–2011 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] *Categorifications of non-integer quivers: types H_4, H_3 and $I_2(2n+1)$* (with D. D. Duffield), submitted, arXiv:2204.12752

[2] *Friezes for a pair of pants* (with I. Canakci, A. G. Elsener and A. Felikson), submitted, arXiv:2111.13135

[3] Cluster algebras of finite mutation type with coefficients (with A. Felikson), submitted, arXiv:2110.12917

[4] *Mutation-finite quivers with real weights* (with A. Felikson), submitted, arXiv:1902.01997

PUBLISHED PAPERS

[5] *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)

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

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

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

[9] *SL_2-tilings do not exist in higher dimensions (mostly)* (with L. Demonet, P.-G. Plamondon, D. Rupel and S. Stella), Sém. Lothar. Comb. B76d (2018), 6 pp., `https://www.mat.univie.ac.at/~slc/wpapers/s76stella.html`

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

OTHER PREPRINTS

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