ANNA FELIKSON

Curriculum Vitae

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EDUCATION

1989–1993: Specialized mathematical high school 1543, Moscow.

1992–1997: Undergraduate study at the Independent University of Moscow.
M.S., 1997: Mathematics.

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

1997–2002: Ph.D. study at the Moscow State University and at the Independent University of Moscow.
Ph.D., 2002: Mathematics. Title: Coxeter decompositions of polytopes.
Advisers: E. B. Vinberg, O. V. Shwarzman.

RESEARCH INTERESTS

Cluster algebras, Coxeter groups, hyperbolic geometry, combinatorics of Coxeter polytopes, moduli spaces, low-dimensional topology, Kac-Moody algebras.

EMPLOYMENT

2016–present: Senior Lecturer in Pure Mathematics (Associate Professor), Durham University.

2013–2016: Lecturer in Pure Mathematics, Durham University.

2012: DFG research associate, Jacobs University Bremen.

2010–2011: Visiting researcher, Jacobs University Bremen.

2009–2010: Researcher, Max Planck Institute for Mathematics, Bonn.

2007–2008: INTAS Postdoctoral Fellow, University of Fribourg, Switzerland.

2002–2008: Researcher, Independent University of Moscow.

1997–2002: Assistant, Independent University of Moscow.

1996–2003: Teacher of mathematics, specialized mathematical high school 1543, Moscow.

SUPERVISION

PhD Students: John Blackman (PhD 2020).
Jon Wilson (PhD 2017).
MSc Students 1 in 2013, 3 in 2017.

RECENT GRANTS

10.2015–1.2018. EPSRC Standard Grant EP/N005457/1 (PI, £180K).
Research Associates: Ilke Canakci 10.2015–12.2016.;
Philipp Lampe (5.2017–4.2018).

01.2012–12.2013. DFG research position (grant FE 1421/2) at Jacobs University Bremen, PI, EUR 151K (interrupted after 1 year because of moving to Durham).

01.2007–12.2009. RFBR research grant 07-01-00390-a (co-PI).

01.2007–12.2008. INTAS postdoctoral fellowship YSF-1000014-5916 (PI).

01.2006–12.2007. Grant NSh-5666.2006.1 of President of Russia (co-PI).

RESEARCH VISITS

September 2021-December 2021 INI, Cambridge, programme "Cluster algebras and representation theory" (intended).

May 2018. HSE, Moscow.

September 2017. TU Berlin.

August–December 2012. MSRI, Berkely.

July 2010–December 2011. Jacobs University Bremen, Germany.

January–March 2009. Institut des Hautes Études Scientifiques, Bures-sur-Yvette.

November 2004–June 2005. Max Planck Institute for Mathematics, Bonn.

September 2004. University of Fribourg, Switzerland.

May, July–September 2002. University of Fribourg, Switzerland (post-doc SNF).

April–May 1998. University of Bielefeld, Germany (the program SFB 343 "Diskrete Strukturen in der Mathematik".)

RECENT TALKS

- **June, 2021**, "Computational Aspects of Discrete Subgroups of Lie Groups", ICERM (intended).
- **June, 2021**, 7TH Workshop on Combinatorics of Moduli Spaces, Cluster Algebras, and Topological Recursion (MoSCATR VII), (intended).
- **March, 2021** Workshop "Supergeometry and Bracket Structures in Mathematics and Physics", Fields Institute, Toronto (intended).
- **November, 2020** ICMS, Integrable Days, 65th birthday celebration for Alexander P. Veselov (by Zoom).
- **March, 2020**, Workshop "Cluster Algebras and the Geometry of Scattering Amplitudes", Higgs Centre for Theoretical Physics, Edinburgh.
- **10 December, 2019**, Workshop "Discrete Subgroups of Lie Groups", Banff.
- **28 November, 2019**, 56 ARTIN meeting, Edinburgh.
- **17 September, 2019**, Colloquium at Open University.
- **21 June, 2019**, Cluster algebras 2019, Kyoto.

- **24 May, 2019**, LMS Women in Maths event, University of Kent.
- **April 7-13, 2019**, Mini-course (2 hours) at Mini-Workshop 1915b: Reflection Groups in Negative Curvature, Oberwolfach.
- **March 22, 2019**, Seminar on Algebra Representations, UNAM, Mexico-city.
- **March 4, 2019** Invited LMS lecture in MathSoc, Lancaster.
- **February 21, 2019** Geometry, Topology and Mathematical Physics Seminar, Manchester.
- **February 8, 2019**, Geometric Group Theory Seminar, Cambridge.
- **January 25, 2019**, Algebra, geometry and topology seminar, Univeristy of Kent.
- **December 10, 2018**, Workshop on Cluster structures in geometry, physics, combinatorics and representation theory, Jerusalem.
- **July 11-14, 2018**, Workshop on Cluster algebras and Algebraic Geometry, 3 lectures, Nottingham.
- **June 29, 2018**, LMS Postgraduate meeting, London.
- **June 14, 2018**, North British Geometric Group Theory meeting, St. Andrews.
- **June 6, 2018**, Workshop on Galois Covers, Grothendieck-Teichmüller Theory and Dessins d'Enfants, Leicester.
- **May 18, 2018** Seminar on Lie Algebras, Riemann Surfaces and Mathematical Physics, Independent University of Moscow.
- **May 17, 2018**, Seminar on Characteristic classes and Intersection theory, HSE, Moscow.
- **May, 2018**, Cluster Algebras and Math Physics, East Lansing (Michigan State Universtiy), poster.
- **April 21, 2018**, conference for Early Career Mathematicians, Durham.
- **March 19, 2018**, conference "Cluster Algebras: Twenty years on", CIRM, Luminy (Marseille, France).
- **January 29, 2018**, Selected topics in Mathematics Seminar, Liverpool.
- **December 19, 2017**, G. B. Shabat's Seminar, MSU, Moscow.
- **December 15, 2017**, Conference "Transformation groups 2017" dedicated to Prof. Ernest Vinberg on the occasion of his 80th birthday, Moscow.
- **October 25, 2017**, Geometry and Math Physics seminar, Loughborough.
- **October 4, 2017**, Pure Maths Colloquium, Sheffield.
- **September 18-20, 2017**, Summer School "Discrete Models in Geometry and Mathematical Physics", 3 lectures, TU Berlin.
- **June, 2017**, Algebraic and Geometric Combinatorics of Reflection Groups, Montreal.
- **May 22, 2017**, Algebra Seminar, York.
- **March 24, 2017**, Journées de Géométrie hyperbolique, Fribourg.
- **January 18, 2017**, East Midlands Seminar in Geometry, Sheffield.
- **October 20, 2016**, Geometry and Topology Seminar, Durham.

- **July 21, 2016**, Representation theory Seminar, Bielefeld.
- **July 13, 2016**, Algebraic Combinatorics and Group Actions, Herstmonceux Castle, UK.
- **May 6, 2016**, Quivers and Bipartite Graphs: Physics and Mathematics, University of Notre Dame, London.
- **March 11, 2016**, Workshop on Cluster Algebras and Geometry, Münster.
- **November 27, 2015**, Integrable Day at Loughborough.
- **November 20, 2015**, Departamental Colloquium in Liverpool.
- **November 18, 2015**, Undergraduate Colloquium, Durham.
- **July 23, 2015**, Workshop on Lie Groups and Algebraic Groups, Bielefeld.
- **June 5, 2015**, Workshop on Cluster Algebras and Finite Dimensional Algebras, Leicester.
- **May 7, 2015**, Geometry Seminar, Manchester.
- **December 15, 2014**, Conference in Cluster Algebras in Combinatorics and Topology, KIAS, Seoul.
- **October 29, 2014**, Pure Maths Seminar, Lancaster.
- **October 17, 2014**, LMS workshop on Cluster Algebras and Preprojective Algebras at the School of Mathematics, Cardiff.
- **May 29, 2014**, 4th Workshop on Combinatorics of Moduli Spaces, Cluster Algebras, and Symplectic Invariants, Moscow.
- **February 7, 2014**, Pure Maths Seminar, Southampton.
- **October 1, 2013**, Pure Maths Seminar, Leicester.
- **May 16, 2013**, Algebra and Geometry Seminar, Newcastle.
- **March 20, 2013**, Workshop on Triangulations and Mutations, Newcastle.
- **February 11 , 2013**, Pure Maths Colloquium, Durham.
- **February 7, 2013**, Geometry and Topology Seminar, Durham.
- **December 28, 2012**, Seminar on Lie Algebras, Riemann Surfaces and Mathematical Physics, Independent University of Moscow.
- **October 31, 2012**, Workshop on Cluster Algebras in Combinatorics, Algebra, and Geometry, MSRI, Berkeley.
- **June 23, 2012**, Workshop on Geometry, Representation Theory and Clusters, Leicester.
- **March 8, 2012**, Geometry Seminar, Durham.
- **March 5, 2012**, Algebra, Geometry, and Intergable Systems Colloquium, Leeds.
- **July 21, 2011**, Workshop on Lie Groups and Algebraic Groups, Bielefeld.
- **December 24, 2010**, Seminar on Lie Algebras, Riemann Surfaces and Mathematical Physics, Independent University of Moscow.
- **December 15, 2010**, Seminar on Lie Groups and Invariant Theory, Moscow State University.
- **October 5, 2010**, Dynamics Seminar, Jacobs University Bremen.

- **July 2, 2010**, Teichmüller Theory and its Interactions in Mathematics and Physics, Centre de Recerca Matematica, Barcelona, Spain.
- **June 16, 2010**, Seminar on Groups and Geometry, Bielefeld.
- **June 3, 2010**, Computational Algebra and Number Theory seminar, Dusseldorf.
- **May 27, 2010**, 2nd Workshop on Combinatorics of Moduli Spaces, Cluster Algebras, and Symplectic Invariants, Moscow.
- **April 20, 2010**, Oberseminar on Algebra and Algebraic Combinatorics, Hannover.
- **March 26, 2010** The second W.Killing and K.Weierstrass Colloquium, Braniewo, Poland.
- **February 1, 2010**, Topics in Topology seminar, MPI, Bonn.

OTHER PROFESSIONAL ACTIVITIES

- **Referee for:** Advances in Mathematics, Algebraic and Geometric Topology, Annales de l'Institut Fourier, Annals of Combinatorics, Bulletin of the LMS, Canadian Mathematical Bulletin, Compositio Mathematica, Discrete and Computational Geometry, Electronic Research Announcements in Mathematical Sciences, l'Enseignement Mathematique, European Journal of Combinatorics, Experimental Mathematics, Geometriae Dedicata, Journal of Algebra, Journal of Combinatorial Theory, Series A, Journal of Geometry and Physics, Journal of Lie Theory, Journal of Modern Dynamics, Journal of Pure and Applied Algebra, International Mathematical Research Notices, Involve, a Journal of Mathematics, Mathematische Nachrichten, Matematicki Vesnik, Pacific Journal of Mathematics, Proceedings of the Japan Academy, Series A, Proceedings of the LMS, Publications mathématiques de l'IHES, Science China Mathematics, Selecta Mathematica, SIGMA, Transformation Groups.
- **External Referee for**
  - peer review of grant applications to EPSRC (2019);
  - peer review of grant applications to BASIS fundation (2019);
  - peer review of grant applications to The Israel Science Foundation (2018);
  - peer review for application to "Russian Young Mathematics" contest (2017);
  - peer review of grant applications to Austrian Science Fund (FWF) (2017);
  - peer review of grant applications to NSA Mathematical Sciences Grant Program (2015);
  - peer review of grant applications to French National Research Agency ANR (2015).
- **Panel member** in NT-1 panel for Swedish Vetenskapsrådet (Science Council) evaluating applications for research support in mathematics for 2018-2019, 2019-2020 and 2020-2021.
- **Mathematics Discipline Reviewer** for Research Quality Review, University College Cork, Ireland (2015).
- **PhD examiner:**
  - external: Thomas Honey, (2020, Manchester);
  - external: Joe Pallister, (2020, Kent);
  - external: Diego Fernando Velasco Martínez, (2019, UNAM);
  - internal: Irene Pasquinelli (2018, Durham);
  - external: Thomas Booker-Price (2017, Lancaster);
  - internal: John Lawson (2017, Durham);
  - external: Rafael Guglielmetti (2017, Fribourg);
  - external: Hannah Vogel (2016, Graz);
  - external: Heather Riley (2015, Liverpool);
  - internal: John Mcleod (2013, Durham).

- **Organiser** of OCAS (Online Cluster Algebra Seminar), since September 2020.
- **Organiser** of North British Geometric Group Theory Seminar meetings in Durham (12th March 2014, 4th March 2015, 22nd February 2016, 18 October 2017, February 6 2019).
- **Organiser** of Durham Pure Maths Colloquium (09.2013 – 03.2019).
- **Translation** into Russian of W. P. Thurston's book "Three-Dimensional Geometry and Topology" (parts 1, 2).
- **Administrative duties:**
  - **Chair** of Board of Examiners for MSc in Math Sciences (Since 11.2019)
  - **Secretary** of Board of Examiners for MSc in Math Sciences (06.2014 - 10.2019)
  - **Secretary** of Management Board of MSc in Mathematical Sciences (since 10.2014)
  - **Member** of Research Committee.

TEACHING AT DURHAM

Current:
- Course: Geometry III/IV;
- Tutorials for Linear Algebra I and Complex Analysis II.
- Project: "Associahedron" (3 students in Year III);
- Project: "Billiards and Kaleidoscopes" (3 students in Year IV);

Previous:
- Courses: Geometry III/IV, Riemannian Geometry IV, Differential Geometry III.
- Tutorials: Complex Analysis II, Analysis I, Linear Algebra I.
- Projects: "Geometries" (4 students in Year III 2019/2020);
  "Combinatorics of polytopes" (2 students in Year III 2018/2019);
  "Continued Fractions" (2 students in Year IV, 2018/2019).
  "Projective geometry" (2 students in Year III, 2017/2018);
  "Cluster algebras" (2 students in Year IV, 2017/2018);
  "Billiards" (2 students in Year III, 2016/2017);
  "Markov Numbers" (2 students in Year IV, 2016/2017).
  "Curves on Surfaces" (1 student in Year IV, 2015/2016).
  "Frieze patterns" (4 students in Year III, 2014/2015).
  "Catalan numbers" (4 students in Year III, 2013/2014).

PAST TEACHING

2007-2008. Math club for 12-16 years old students, Michigan State University.

2006 "Math in Moscow" program for American students at the Independent University of Moscow:
- Non–Euclidean Geometry, Topology.

1997–2007 Independent University of Moscow:
- Algebra, Geometry, Hyperbolic Geometry, Topology, Möebius Geometry, Complex Analysis;
- Advanced algebra, Riemannian Geometry, Differential Geometry.

1996–2003 Teacher of mathematics at the specialized mathematical high school 1543, Moscow:
- various courses including set theory, combinatorics, basic number theory, algebra, calculus;
- **1999–2000.** "Vector fields, manifolds and non-Euclidean geometry" for last year students.
- **1998-1999.** A course "Amusing Math" for 10-years old students.

OUTREACH ACTIVITIES

- **October 12, 2019.** Saturday Morning Science session at Durham University.
- **December 21, 2018.** Talk for high school students, School 1543, Moscow.
- **May 16, 2018.** Talk for high school students, School 1543, Moscow.
- **May 3, 2017.** Talk for high school students, Durham Johnston School, Durham.
- **September 25, 2012.** Advance Section of The Berkeley Math Circle, Berkeley.
- **March, 1998** Talk for high school students, School 2, Moscow.

PERSONAL INFORMATION

Born: June 11, 1976, Moscow, USSR.

Citizenship: citizen of Russia.

Marital status: married, three children (born 2000, 2003 and 2011).

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

PUBLICATIONS

RECENT PREPRINTS

[1] (with J. W. Lawson, M. Shapiro and P. Tumarkin) *Cluster algebras from surfaces and extended affine Weyl groups*, arXiv:2008.00480.

[2] (with Ph. Lampe) *Exchange graphs for mutation-finite non-integer quivers of rank 3*, arXiv:1904.03928.

[3] (with P. Tumarkin) *Mutation-finite quivers with real weights*, arXiv:1902.01997.

PUBLISHED PAPERS

[4] (with I. Canakci) *Infinite rank surface cluster algebras*, Advances in Mathematics 352 (2019): 862–942.

[5] (with P. Tumarkin) *Geometry of mutation classes of rank* 3 *quivers*, Arnold Mathematical Journal, (2019) 5(1): 37–55.

[6] (with P. Tumarkin) *Acyclic cluster algebras, reflection groups and curves on a punctured disc*, Advances in Mathematics 340 (2018) 855–882.

[7] (with P. Tumarkin) *Bases for cluster algebras from orbifolds*, Advances in Mathematics, 318 (2017), 191–232.

[8] (with S. Natanzon) *Double pants decompositions revisited.* Moscow Math. J., 17(1): 51–58.

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

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

[11] (with J. Fintzen and P. Tumarkin) (2014). *Reflection subgroups of odd-angled Coxeter groups.* Journal of Combinatorial Theory, Series A 126 (2014), 92–127.

[12] (with M. Shapiro, H. Thomas and P. Tumarkin) *Growth rate of cluster algebras.* Proc. London Math. Soc. 109 (2014), 653–675.

[13] (with P. Tumarkin) *Essential hyperbolic Coxeter polytopes.* Israel Journal of Mathematics 199 (2014), 113–161.

[14] (with M. Shapiro and P. Tumarkin) *Cluster algebras and triangulated orbifolds.* Advances in Mathematics 231 (2012), 2953–3002.

[15] (with S. Natanzon) *Moduli via double pants decompositions.* Differential Geometry and its Applications 30 (2012), 490–508.

[16] (with M. Shapiro and P. Tumarkin) *Cluster algebras of finite mutation type via unfoldings.* Int. Math. Res. Notices 8 (2012), 1768–1804.

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

[18] (with P. Tumarkin) *Hyperbolic subalgebras of hyperbolic Kac-Moody algebras.* Transform. Groups 17 (2012), 87–122.

[19] (with S. Natanzon) *Labeled double pants decompositions.* Moscow Math. J. 11 (2011), 505–519.

[20] (with S. Natanzon) *Double pants decompositions of 2-surfaces.* Moscow Math. J. 11 (2011), 231–258.

[21] (with M. D. Sikiric and P. Tumarkin) *Automorphism group of root systems matroids.* Europ. J. Combin 32 (2011), 383–389.

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

[23] (with P. Tumarkin) *On Coxeter polytopes with a unique pair of disjoint facets.* J. Combin. Theory A 116 (2009), 875–902.

[24] (with A. Retakh and P. Tumarkin) *Regular subalgebras of affine Kac-Moody algebras.* J. Phys. A: Math. Theor. 41 (2008) 365204 (16pp).

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

[26] (with P. Tumarkin) *On compact hyperbolic d-polytopes with $d+4$ facets.* Trans. Moscow Math. Soc. 69 (2008), 105-151.

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

[28] (with P. Tumarkin) *Euclidean simplices generating discrete reflection groups.* Europ. J. Combin. 28 (2007), 1056–1067.

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

[30] (with P. Tumarkin) *Reflection subgroups of Euclidean reflection groups.* Sb. Math. 196 (2005), 1349–1369.

[31] *Coxeter decompositions of hyperbolic tetrahedra.* J. Math. Sci. 128 (2005), 3504–3514.

[32] *Coxeter decompositions of hyperbolic pyramids and triangular prisms.* Math. Notes 75 (2004), 583–593.

[33] *Lambert cube generating a discrete reflection group.* Math. Notes 75 (2004), 250–258.

[34] *Spherical simplices generating discrete reflection groups.* Sb. Math. 195 (2004), 585–598.

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

[36] *Coxeter decompositions of spherical simplices with fundamental dihedral angles.* Russian Math. Surveys 57 (2002), 420–421.

[37] *Coxeter decompositions of hyperbolic simplices.* Sb. Math. 193 (2002), 1867–1888.

[38] *Coxeter decompositions of hyperbolic polygons.* Europ. J. Combin. 19 (1998), 801–817.

[39] *On Thurston signatures.* Russian Math. Surveys 52 (1997), 826–827.

OTHER PREPRINTS

[40] (with P. Tumarkin) *A series of word-hyperbolic Coxeter groups.* arxiv:math.GR/0507389.

[41] (with P. Tumarkin) *Three symmetries groups.* Bielefeld, no. 98-104.