

Cirriculum Vitae of Oleg Karpenkov

PERSONAL DATA

- [born:] 14 January 1980, Moscow, Russia
[institution:] Department of Mathematical Science, University of Liverpool (since December 2012)
Lecturer in Mathematics
[address postal:] Department of Mathematics, Mathematical Sciences Building, Room 505, Peach Street,
University of Liverpool, Liverpool, L69 7ZL, United Kingdom
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EDUCATION

- [1997-2002] student of Department of Mechanics and Mathematics, Moscow State University, scientific advisers V. I. Arnold and V. M. Zakalyukin
[1997-2002] (at the same time) student of Higher College of Mathematics, Independent University of Moscow, scientific adviser A. B. Sossinsky
[2002-2005] PhD student of Department of Mechanics and Mathematics, Moscow State University, scientific advisers V. I. Arnold and V. M. Zakalyukin
[2002-2005] (at the same time) PhD student of Higher College of Mathematics, Independent University of Moscow, scientific adviser A. B. Sossinsky

POSTDOC POSITIONS

- [2005-2006] CEREMADE, Université Paris-Dauphine (France). Postdoc in Mathematics (fellowship of Mairie de Paris)
[2006-2008] Mathematical institute of Leiden University (Netherlands). Postdoc in Mathematics (DIAMANT cluster)
[2008-2011] TU Graz, Postdoc in Mathematics
[2011-2012] TU Graz, Senior Postdoc in Mathematics (Lise Meitner Fellowship, FWF)

ACADEMIC DEGREES

- [18/iv/2002] **BSc** and **MSc** in Mathematics. Independent University of Moscow
[vii/2002] **BSc** and **MSc** in Mathematics. Dept. of Mechanics and Mathematics, Moscow State Univ.
[15/iv/2005] **PhD** in Mathematics from Moscow State University. Thesis title: *On multidimensional continued fractions of Klein model: classification of two-dimensional faces, algorithms, examples*, scientific advisers V. I. Arnold and V. M. Zakalyukin
[18/xi/2010] **Habilitation** in Mathematics from Graz University of Technology. Habilitation title: *Geometry of lattice angles, polygons, and cones*
[2/vi/2014] **Certificate** in Professional Studies in Learning and Teaching in Higher Education, the University of Liverpool, UK

PRIZES AND AWARDS

- [1996] XXII All-Russian Mathematical Olympiad, II prize, Russia
[2004] Möbius article contest winner, Russia
[2005] Moscow Mathematical Society Prize for young mathematicians, Russia
[2005–2006] Bourse de la Mairie de Paris, France
[2015] SET for BRITAIN 2015 (poster competition/exhibition in the House of Commons), finalist, UK

RECENT GRANTS

- [2011–2012] FWF (Austria), **PI**, Lise Meitner Fellowship
- [2014] IMA, **PI**, Small Grant Scheme
- [2014] LMS, **PI**, Scheme 1
- [2015] LMS, **PI**, Scheme 2
- [2015–2019] EPSRC, **CI**, Centre for New Mathematical Sciences in Healthcare

CONFERENCE ORGANIZATION EXPERIENCE

- [2009] Local organizer of an international workshop *Surfaces, Meshes, Geometric Structures*, Admont (Austria)
<http://www.geometrie.tugraz.at/events/meshes.html>
- [2013] Principal organizer of an international workshop *Multidimensional continued fractions*, Graz (Austria)
<http://www.geometrie.tugraz.at/events/cf2013/>
- [2014] Principal organizer of a workshop *Continued Fractions and Geometry of Lattices*, Liverpool (UK)
<http://pcwww.liv.ac.uk/~karpenk/conference2014/cf2014.html/>
- [2016] Co-organizer of the international workshop *Singularities and Applications, Victor Goryunov 60*, Liverpool (UK)
- [2018] Co-organizer of the *6th International Conference on Uniform Distribution Theory* in CIRM, Marseille (France)

MEMBERSHIPS

- [1] Austrian Mathematical Society, member since 2010
- [2] London Mathematical Society, ordinary member since 2014
- [3] Higher Education Academy (UK), fellow since 2014
- [4] Arnold Mathematical Journal, editor since 2014

MASTER THESIS SUPERVISED

[2006-2007] Alvis Trevisan (student of the international programme ALGANT), Master thesis: *Lattice polytopes and toric varieties*

TEACHING EXPERIENCE (ALL IN ENGLISH UNLESS SPECIFIED)

- [Autumn 2002] *Calculus*, exercises. Independent University of Moscow (in Russian)
- [Autumn 2003] *Topology I*, exercises. Programme “Math. in Moscow”, Independent University of Moscow
Topology I, exercises. Independent University of Moscow (in Russian)
- [Spring 2004] *Topology I*, exercises. Programme “Math. in Moscow”, Independent University of Moscow
- [Autumn 2004] *Topology I*, exercises. Programme “Math. in Moscow”, Independent University of Moscow
- [Spring 2005] *Complex analysis*, exercises. Independent University of Moscow (in Russian)
Topology I, exercises, Programme “Math. in Moscow”, Independent University of Moscow
- [Spring 2007] *Topology II*, lecture course and exercises, Leiden University
- [Autumn 2007] *Calculus*, teaching assistance, Leiden University
- [Autumn 2008] *Algebraic topology*, exercises, TU Graz
- [Spring 2009] *Knot theory*, lecture course, TU Graz
- [Autumn 2009] *Geometry of continued fractions*, lecture course, TU Graz
- [Spring 2011] *Continued fractions and generalizations*, lecture course, TU Graz
- [Autumn 2011] *Geometry of continued fractions*, lecture course, TU Graz
- [Spring 2012] *Knot theory*, lecture course, TU Graz
- [Spring 2013] MATH248: *Geometry of Curves*, lecture course with exercises, University of Liverpool
MATH206: *Group Project Module*, project, University of Liverpool
MATH102: *Calculus II*, tutorial, University of Liverpool
- [Autumn 2013] MATH101: *Calculus I*, tutorial, University of Liverpool
MATH111: *Mathematical IT Skills*, tutorial and projects, University of Liverpool
- [Spring 2014] MATH248: *Geometry of Curves*, lecture course with exercises, University of Liverpool
MATH349: *Differential Geometry*, lecture course with exercises, University of Liverpool
- [Autumn 2014] MATH103: *Linear Algebra*, tutorial, University of Liverpool
MATH111: *Mathematical IT Skills*, tutorial and projects, University of Liverpool
- [Spring 2015] MATH248: *Geometry of Curves*, lecture course with exercises, University of Liverpool
MATH349: *Differential Geometry*, lecture course with exercises, University of Liverpool
MATH102: *Calculus II*, tutorial, University of Liverpool
- [2014–2015] MATH490: *Project in M. Math: Flexions of 2-ribbon surfaces*, project advisor, University of Liverpool, (The project was awarded the best software departmental prize)
- [Autumn 2015] MATH111: *Mathematical IT Skills*, tutorial and projects, University of Liverpool
MATH399: *Project in Pure Mathematics: Spherical Voronoi Diagrams*, project advisor, University of Liverpool
MATH549: *Maple- \LaTeX Project: Möbius energy minimizers in the plane*, project advisor, University of Liverpool

ACADEMIC VISITS (APPROXIMATELY 1 MONTH EACH)

- [1] Stockholm University, Stockholm, Sweden, November 2001
- [2] Utrecht University, Utrecht, The Netherlands, March 2003
- [3] Université Paris-Dauphine - CEREMADE, Paris, France, May 2004
- [4] Laboratoire de Mathématiques Discrètes du CNRS (IML), Luminy, France, June 2004
- [5] Stockholm University, Stockholm, Sweden, May 2006
- [6] Institute of Applied Mathematics, Khabarovsk, Russia, January 2007
- [7] University of Liverpool, Liverpool, UK, March 2008
- [8] University of Liverpool, Liverpool, UK, May 2008
- [9] Poncelet Laboratory, Moscow, Russia, August 2011
- [10] University of Amsterdam, Netherlands, April 2014
- [11] TU Graz, Austria, September 2014

Invited conference and seminar talks

- [x/2000] Combinatorics, Dynamics, Probabilities // Stockholm, Sweden // *Combinatorics of boundary singularities B_n^l of k -immersions and Bernoulli—Euler updown numbers*
- [ix/2001] Viro's seminar in Uppsala University. // Uppsala, Sweden // *Energy of knots: variational equations.*
- [x/2001] Seminar on low-dimensional problems // St.Petersburg, Russia // *Energy of a knot (review).*
- [xii/2001] Fundamental Mathematics Today // Moscow, Russia // *Energy of a knot: variational principles*
- [vii-2002] Séminaire de mathématiques supérieures. Séminaire scientifique otan, 41-e session-été 2002 // Normal Forms, Bifurcations and Finiteness Problems in Differential Equations // Montréal, Canada // *Energies of knots: some examples*
- [iv/2003] The XXV conference for young mathematicians, Department of Mech. and Math. MSU // Moscow, Russia // *Combinatorics of multiboundary singularities for the series B_n^l and Bernoulli-euler numbers*
- [vii/2003] Knots in Poland 2003 // Warsaw and Bedlewo, Poland // *On some particular energies of knots*
- [v/2004] Arnold's seminar in Paris (Institut de Mathématiques de Jussieu) // Paris, France // *Multi-dimensional continued fractions*
- [vi/2004] Seminar "Arithmétique et théorie de l'information" // Marseille, France // *On some new examples for torus decompositions of two-dimensional continued fractions of cubic irrationalities*
- [xii/2004] Seminar on representation theory and dynamical systems in St.Petersburg // St.Petersburg, Russia // *On faces of multidimensional continued fractions*
- [ii/2005] International conference "Combinatorial methods in physics and knot theory" // Moscow, Russia // *Energies of knots and of certain graphs*
- [vi/2005] Seminar "Polyhedral Surfaces" // Berlin, Germany // *Multidimensional continued fractions*
- [vii/2005] XXIVèmes Journées Arithmétiques // Marseille, France // *On realizability condition in generalized Lagrange's theorem*
- [ix/2005] Journées Combinatoire et Géométrie des polyèdres // Paris, France // *On continued multidimensional fractions and multistory completely empty convex pyramids*
- [iii/2006] Seminar "Combinatoire Algébrique et Géométrique", Univ. Paris-6 // Paris, France // *Combinatorics of multidimensional continued fractions in the sense of Klein*
- [iii/2006] Seminar of pure mathematics of ENS Lyon, // Lyon, France // *Combinatorics of multidimensional continued fractions in the sense of Klein*
- [v/2006] "Seminar on low-dimensional mathematics", Uppsala University // Uppsala, Sweden // *Klein's generalization of ordinary continued fractions and some closely related facts of lattice geometry*
- [vi/2006] "Seminarium i matematik", Stockholm University // Stockholm, Sweden // *Multi-dimensional continued fractions and some problems in lattice geometry*
- [vi/2006] Seminar of Laboratoire Leibniz (IMAG, Grenoble) // Grenoble, France // *Multi-dimensional continued fractions and some problems in lattice geometry*
- [viii/2007] International conference Analysis and singularities (dedicated to the 70th birthday of V. I. Arnold) // Steklov Mathematical Institute, Moscow, Russia // *Invariant Möbius measure and Gauss-Kuzmin face distribution*
- [ix/2007] The Algebra and Geometry around Knots and Braids // Euler Institute, St.Petersburg, Russia // *Energies of knots and graphs*
- [i/2008] Colloque International sur la repartition uniforme // CIRM, Luminy (Marseille), France // *Gauss-Kuzmin face distribution and Invariant Möbius measure*

- [iii/2008] Singularity Seminar, University of Liverpool // Liverpool, UK // *Tensegrities*
- [iii/2008] Colloquium, University of Liverpool // Liverpool, UK // *On integer trigonometry*
- [iv/2008] Singularity Seminar, University of Liverpool // Liverpool, UK // *Conjugacy classes in $SL(n, \mathbb{Z})$*
- [v/2008] Geometry seminar, TU Graz // Graz, Austria // *Lattice discretization of trigonometric functions*
- [v/2008] Singularity Day, University of Liverpool // Liverpool, UK // *Energies of knots and graphs*
- [iv/2009] The 6th status seminar of the National Research Network “Industrial Geometry” // Strobl, Austria // *Flexibility of Kokotsakis meshes*
- [v/2009] Algebra-topology seminar, ETH // Zürich, Switzerland // *Toric geometry and lattice trigonometry*
- [v/2009] Applied Geometry Seminar, ETH // Zürich, Switzerland // *Tensegrities*
- [vii/2009] Surfaces, Meshes, Geometric Structures // Admont, Austria // *Flexibility of meshes and semidiscrete surfaces*
- [ix/2009] ÖMG+DMV Kongress // Graz, Austria // *On integer conjugacy classes of $SL(3, \mathbb{Z})$*
- [ii/2010] Towards new interactions between mathematics and computer science (Lattice algorithms) // CIRM, Luminy (Marseille), France // afternoon workshop *Multidimensional continued fractions and conjugacy classes of $SL(n, \mathbb{Z})$*
- [iii/2010] Invited lecture at Groningen University // Groningen, Netherlands // *Multidimensional continued fractions and conjugacy classes of $SL(n, \mathbb{Z})$*
- [vi/2010] Seventh International Conference on Curves and Surfaces // Avignon, France // *Flexibility and infinitesimal flexibility of discrete and semidiscrete surfaces*
- [ix/2010] Delone-120 // Moscow State University and Steklov Institute of Mathematics, Moscow, Russia // *Multidimensional Gauss Reduction Theory for conjugacy classes of $SL(n, \mathbb{Z})$*
- [v/2011] Invited lecture of the Faculty of Electrical Engineering and Computer Science // University of Maribor, Maribor, Slovenia // *Perfect forms of knot diagrams*
- [vi/2011] Toric geometry and applications // KU Leuven, Leuven, Belgium // *Global relations for toric surface singularities*
- [vi/2011] Numération 2011 // University of Liège, Liège, Belgium // *Klein polyhedra and its Gauss-Kuzmin statistics*
- [vii/2011] Contemporary Mathematics // Russian Academy of Sciences (mathematical section), Steklov Mathematical Institute, Moscow Department for Education and Moscow Center for Continuous Mathematical Education, Dubna, Russia // *Integer geometry and trigonometry* (minicourse)
- [x/2011] NRN Industrial Geometry - Closing Workshop // Vienna, Austria // *Curvatures of semidiscrete surfaces*
- [v/2012] Seminar “Algebra en Meetkunde”, University of Amsterdam // Amsterdam, Netherlands // *Geometry of continued fractions*
- [vi/2012] International conference “Algebra and Geometry” (dedicated to the 65-th anniversary of Askold G. Khovanskii), Higher School of Economics, Independent University of Moscow // Moscow, Russia // *Toric singularities of surfaces and lattice trigonometry*
- [vii/2012] 3rd International Conference on Uniform Distribution Theory, Congress Center of the Slovak Academy of Sciences // Smolenice, Slovakia // *Approximation of the maximal commutative subgroups of $GL(n, \mathbb{R})$*
- [vii/2012] Rigidity Theory: Progress, Applications and Key Open Problems Banff Center // Banff, Canada // *Strata of Tensegrity Frameworks*
- [vii/2012] Invited lecture University of Liverpool // Liverpool, UK // *Lattice trigonometry and toric singularities of surfaces*
- [xii/2012] Analysis and Singularities (Arnold-75) // Moscow, Russia // *Gauss-Kuzmin statistics of Klein polyhedra*

- [iv/2013] Geometric and topological graph theory, Heilbronn Institute for Mathematical Research University of Bristol // Bristol, UK // *On finite and infinitesimal flexibility of discrete and semidiscrete surfaces*
- [ix/2013] Singularities in geometry and applications III, ICMS // Edinburgh, UK // *Global relations for toric singularities*
- [xi/2013] Seminar in Pure Mathematics, University of Lancaster // Lancaster, UK // *On finite and infinitesimal flexibility of discrete and semidiscrete surfaces*
- [xi/2013] Seminar “Ergodic Theory and Dynamical Systems”, University of Bristol // Bristol, UK // *Gauss-Kuzmin statistics of Klein polyhedra*
- [iv/2014] Seminar Geometry and “Mathematical Physics”, University of Amsterdam // Amsterdam, Netherlands // *Multidimensional Gauss-Kuzmin statistics*
- [iv/2014] Seminar Geometry and “Mathematical Physics”, University of Amsterdam // Amsterdam, Netherlands // *Flexibility of discrete surfaces*
- [iv/2014] Mathematics and Statistics Departmental seminar, The Open University // Milton Keynes, UK // *Global relations for toric singularities.*
- [v/2014] Topology seminars, The University of Manchester // Manchester, UK // *Global relations for toric singularities.*
- [vi/2014] Geometric Rigidity One Day Workshop, Lancaster University // Lancaster, UK // *Configuration spaces of tensegrities.*
- [vi/2014] The 8th PhD Student Mathematical Conference on Number Theory, University of Ostrava // Ostrava, Czech Republic // A minicourse (4 hours): *Lattice Geometry and Continued Fraction.*
- [vii/2014] The 4th International Conference on Uniform Distribution Theory, University of Ostrava // Ostrava, Czech Republic // *Klein polyhedra and their Gauss-Kuzmine statistics.*
- [vii/2014] International Conference on Differential Equations and Dynamical Systems, Mathematical Steklov’s institut of Moscow, Vladimir State University, Moscow State University // Suzdal, Russia // *Toric singularities and lattice trigonometry.*
- [x/2014] Celebrating new appointment conference “Continued Fractions and Geometry of Lattices”, University of Liverpool // Liverpool, UK // *Lattice structures of multidimensional continued fractions.*
- [x/2014] Analysis Seminars of Cardiff University // Cardiff, UK // *Toric singularities of surfaces in terms of lattice trigonometry*
- [x/2014] Pure Maths Colloquium of Durham University // Durham, UK // *Toric singularities of surfaces in terms of lattice trigonometry*
- [iii/2015] Participation in the poster session: SET for Britain 2015 (held in House of Commons) // London, UK // *Lattice trigonometry*
- [iv/2015] Knots and Links in Fluid Flows, Independent University of Moscow // Moscow, Russia // *Energies of knots and graphs*
- [vi/2015] Geometric Rigidity Workshop, University of Lancaster // Lancaster, UK // *Infinitesimal and finite flexibility of semidiscrete surfaces*
- [vii/2015] International Conference Mathematical Control Theory and Mechanics, Mathematical Steklov’s institut of Moscow, Vladimir State University, Moscow State University // Suzdal, Russia // *Finite and infinitesimal flexibility of semidiscrete surfaces*
- [vii/2015] Advances in Combinatorial and Geometric Rigidity, Banff Center // Banff, Canada // *Finite and infinitesimal flexibility of semidiscrete surfaces*
- [vii/2015] Global Rigidity, Banff Center // Banff, Canada // *Semidiscrete flexibility via discrete flexibility and vice versa*
- [vii/2015] Topological methods in singularity theory, ICMS // Edinburgh, UK // *On finite and infinitesimal flexibility of discrete surfaces*
- [xii/2015] Singularity Day // Liverpool, UK // *On finite and infinitesimal flexibility of discrete surfaces*

Publications

BOOKS

- [1] O. Karpenkov, *Geometry of continued fractions*, Algorithms and Computation in Mathematics, 26. Springer-Verlag, Berlin, 2013, xvii+405 pp.

JOURNAL PAPERS

- [2] O. Karpenkov, Combinatorics of multiboundary B_n^l singularities and Bernoulli—Euler numbers. *Funct. Anal. Appl.* 36(1), 65–67, 2002.
- [3] O. Karpenkov, Energy of a knot: variational principles. *Russian Jour. of Math. Phys.*, vol. 9(3), 275–287, 2002.
- [4] O. Karpenkov, Energy of a knot: some new aspects. *Fundamental Mathematics Today*, IUM, MCCME, 214–223, 2003.
- [5] O. Karpenkov, On tori triangulations associated with two-dimensional continued fractions of cubic irrationalities. *Funct. An. and Appl.*, vol. 38(2), 102–110, 2004.
- [6] O. Karpenkov, On two-dimensional continued fractions for integer hyperbolic matrices with small norm. *Russian Math. Surveys*, vol. 59(5), 959–960, 2004.
- [7] O. Karpenkov, Classification of three-dimensional multistory completely empty convex marked pyramids. *Russian Math. Surveys*, vol. 60(1), 165–166, 2005.
- [8] O. Karpenkov, Möbius energy of graphs. *Math. Notes*, vol. 79(1), 134–138, 2006.
- [9] O. Karpenkov, Classification of lattice-regular lattice convex polytopes, *Funct. Anal. Other Math.*, vol. 1(1), 17–35, 2006.
- [10] O. Karpenkov, Three examples of three-dimensional continued fractions in the sense of Klein, *C. R. Acad. Sci. Paris, Ser. B*, vol. 343, 5–7, 2006.
- [11] O. Karpenkov, On existence and uniqueness conditions of lattice triangles, *Russian Math. Surveys*, vol. 61(6), 1178–1179, 2006.
- [12] O. Karpenkov, On examples of difference operators for $\{0, 1\}$ -valued functions over finite sets, *Funct. Anal. Other Math.*, vol. 1(2), 175–180, 2006.
- [13] O. Karpenkov, Completely empty pyramids on integer lattices and two-dimensional faces of multidimensional continued fractions, *Monatshefte für Mathematik*, vol. 152, 217–249, 2007.
- [14] O. Karpenkov, On invariant Möbius measure and Gauss-Kuzmin face distribution, *Proceedings of the Steklov Institute of Mathematics*, vol. 258, 74–86, 2007.
<http://arxiv.org/abs/math.NT/0610042>
- [15] O. Karpenkov, Elementary notions of lattice trigonometry, *Math. Scand.*, vol. 102(2), 161–205, 2008.
- [16] O. Karpenkov, On irrational lattice angles, *Funct. Anal. Other Math.*, vol. 2(2-4), 221–239, 2009.
- [17] O. Karpenkov, Constructing multidimensional periodic continued fractions in the sense of Klein, *Math. Comp.*, vol. 78, 1687–1711, 2009.
- [18] O. Karpenkov, Bernoulli-Euler numbers and multiboundary singularities of type B_n^l (in Russian), in *Fundamental Mathematics in Works of Young Scientists*, MCCME, Moscow, 43–54, 2009.
<http://arxiv.org/abs/0910.4046> (English version).
- [19] F. Doray, O. Karpenkov, J. Schepers, Geometry of configuration spaces of tensegrities, *Disc. Comp. Geom.*, vol. 43, no. 2, 436–466, 2010.
- [20] O. Karpenkov, On the flexibility of Kokotsakis meshes, *Geom. Dedicata*, vol. 147, 15–28, 2010.
- [21] O. Karpenkov, On determination of periods of geometric continued fractions for two-dimensional algebraic hyperbolic operators, *Russian Math. Notes*, vol. 88, no. 1, 30–42, 2010.
- [22] O. Karpenkov, A. Vershik, Rational approximation of the maximal commutative subgroups of $GL(n, \mathbb{R})$, *J. Fixed Point Theory*, vol. 7, no. 1, 241–263, 2010.

- [23] O. Karpenkov, Continued fractions and the second Kepler law, *Manuscripta Math.*, vol. 134, 157–169, 2011.
- [24] O. Karpenkov, A. Sossinsky, Energies of knot diagrams, *Russian J. Math. Phys.*, vol. 18, no. 3, 306–317, 2011.
- [25] O. Karpenkov, J. Schepers, B. Servatius, On stratifications for planar tensegrities with a small number of vertices, *ARS Mathematica Contemporanea*, vol. 6, no. 2. 305–322, 2013.
- [26] S. Avvakumov, O. Karpenkov, A. Sossinsky, Euler elasticae in the plane and the Whitney-Graustein theorem *Russian J. Math. Phys.*, vol. 20, no. 3, 257–267, 2013
- [27] O. Karpenkov, Multidimensional Gauss Reduction Theory for conjugacy classes of $SL(n, \mathbb{Z})$, *J. Théor. Nombres Bordeaux*, vol. 25, no. 1, 99–109, 2013.
- [28] O. Karpenkov, J. Wallner, On offsets and curvatures for discrete and semidiscrete surfaces, *Beiträge zur Algebra und Geometrie / Contributions to Algebra and Geometry*, vol. 55, no. 1, 207–228, 2014.
- [29] O. Karpenkov, Finite and infinitesimal flexibility of semidiscrete surfaces, *Arnold Math J*, vol. 1, no. 4, 403–444, 2015.

PREPRINTS

- [30] T. Boiko, O. Karpenkov, Mean value property for nonharmonic functions, 16 pages.
- [31] O. Karpenkov, A. Ustinov, Geometry and combinatorics of Minkowski-Voronoi 3-dimensional continued fractions, 33 pages.
- [31] O. Karpenkov, The combinatorial geometry of stresses in frameworks, 44 pages.

OTHER PAPERS

- [32] O. Karpenkov, *Vladimir Igorevich Arnold*, *Internat. Math. Nachrichten*, no. 214, 49–57, 2010.
<http://arxiv.org/abs/1007.0688>