

CURRICULUM VITAE

Ivan Loseu¹.

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1. CONTACT INFORMATION.

E-mail: ivan.loseu@gmail.com

2. PERSONAL INFORMATION

Born: October, 18, 1981, Minsk, Republic of Belarus, USSR.

Marital status: Single.

Citizenship: Belarus, US.

Web-page: <https://gauss.math.yale.edu/~il282/>

3. EDUCATION

1999-2004: M.SC., Belarusian State University, Department of Applied Mathematics and Computer Science, diploma cum laud.

2004-2007: graduate student, Moscow State University, Department of Mechanics and Mathematics, Chair of Higher Algebra.

2004-2007: graduate student, Independent University of Moscow.

I obtained my PhD degree in October, 2007, at the Moscow State University.

¹“Loseu” is the transliteration of my family name from Belarusian to English. This variant appears in my passport and is the only version used officially. Usually I use the transliteration from Russian, which is “Losev”. The reason is that people who do not know Russian or Belarusian spell the Belarusian variant incorrectly.

Thesis advisor: Prof. E.B. Vinberg.

Thesis title: Classification of some coisotropic actions of algebraic groups.

4. EMPLOYMENT

Starting July 2019: Full Professor, Yale University, Department of Mathematics.

July 2018-June 2019: Full Professor, University of Toronto, Department of Mathematical and Computational Sciences, Mississauga campus.

July 2015-June 2018: Full Professor, Northeastern University, Department of Mathematics.

Sep. 2011-June 2015: Associate Professor, Northeastern University, Department of Mathematics.

Jul.2008- Jun. 2011: CLE Moore instructor, Massachusetts Institute of Technology, Department of Mathematics.

Nov. 2007- May 2008: Engineer-programmer, Belarusian State University, Department of Applied Mathematics and Computer Science.

5. VISITING POSITIONS

March 2017- December 2019: Research fellow and (starting July 2017) Chief Research fellow, International laboratory of Representation theory and Mathematical Physics, NRU-HSE, Moscow, Russia.

March-May 2018: Research Professor, MSRI.

6. RESEARCH INTERESTS

Representation theory and its connections to Algebraic and Symplectic geometry and Combinatorics.

7. PUBLICATION LIST

Publications in refereed journals.

[1] I.V. Losev. *Coisotropic representations of reductive groups*. Trudy Mosc. Mat. Ob-va, 66(2005), p. 157-181 (in Russian). English translation in: Trans. Moscow Math. Soc. (2005), 143-168.

[2] I.V. Losev. *Symplectic slices for reductive groups*. Mat. Sbornik 197(2006), N2, p. 75-86 (in Russian). English translation in: Sbornik Math. 197(2006), N2, 213-224.

[3] I.V. Losev. *On complex weakly commutative homogeneous spaces*. Trudy Mosc. Mat. Ob-va, 67(2006), 228-255 (in Russian). English translation in: Trans. Moscow Math. Soc. (2006), 199-223.

[4] I.V. Losev. *Computation of the Cartan spaces of affine homogeneous spaces*. Mat. Sbornik, 198(2007), 83-108 (in Russian). English translation in: Sbornik Math. 198(2007), no 10, 31-56. arXiv:math.AG/0606101v2.

[5] I.V. Losev. *Classification of weakly commutative complex homogeneous spaces*. Usp. Mat. Nauk 62(2007) N2, 181-182 (in Russian).

[6] I.V. Losev. *Combinatorial invariants of algebraic Hamiltonian actions*. Moscow Math. J. 8(2008), 493-519. arXiv:math.AG/0701823.

[7] I.V. Losev. *Uniqueness property for spherical homogeneous spaces*. Duke Math J., 147(2009), n.2, 315-343. arXiv:math.AG/0703543.

- [8] I.V. Losev. *Proof of the Knop conjecture*. Ann. Inst. Fourier, 59(2009), n.3, 1105-1134. arXiv:math.AG/0612561.
- [9] I.V. Losev. *Demazure embeddings are smooth*. Int. Math. Res. Not, 14(2009), 2588-2596. arXiv:0704.3698.
- [10] I.V. Losev. *Lifting central invariants for quantized Hamiltonian actions*. Moscow Math J. 9(2009), 359-369. arXiv:0708.0630.
- [11] I.V. Losev. *Computation of weight lattices of G -varieties*. J. Math Sci 161(2009), N1, 70-96. arXiv:0709.0667v1.
- [12] I. Losev. *Classification of multiplicity free Hamiltonian actions of complex tori on Stein manifolds*. J. Sympl. Geom 7(2009), N3, 295-310. arXiv:0706.0632
- [13] I.V. Losev. *Algebraic Hamiltonian actions*, Math. Z. 263(2009), 685-723. arXiv:math.AG/0601023.
- [14] I.V. Losev. *Embeddings of homogeneous spaces into irreducible modules*. J. Algebra 322 (2009), 2621-2630, arXiv:math.RT/0606387.
- [15] I.V. Losev. *On fibers of algebraic invariant moment maps*. Transformation Groups, 14(2009), 887-930. arXiv:math. AG/0703296.
- [16] I.V. Losev. *Quantized symplectic actions and W -algebras*. J. Amer. Math. Soc. 23(2010), 35-59. arXiv:0707.3108.
- [17] I.V. Losev. *Computation of Weyl groups of G -varieties*. Representation Theory (electronic) 14(2010), 9-69. arXiv:0612559.
- [18] I. Losev. *On invariants of a set of elements of a semisimple Lie algebra*. J. Lie Theory, 20(2010), 17-30. arXiv:math.RT/0512538.
- [19] I. Losev. An appendix to: P. Etingof, T. Schedler, *Poisson traces and D -modules on Poisson varieties*, GAFA 20(2010), 958-987. arXiv:0908.3868.
- [20] I. Losev. *1-dimensional representations and parabolic induction for W -algebras*. Adv. Math. 226(2011), 6, 4841-4883. arXiv:0906.0157.
- [21] I.V. Losev. *Finite dimensional representations of W -algebras*. Duke Math J. 159(2011), n.1, 99-143. arXiv:0807.1023.
- [22] I. Losev. *On the structure of the category \mathcal{O} for W -algebras*. Séminaires et Congrès 24(2012), 351-368. arXiv:0812.1584.
- [23] I. Losev, *Completions of symplectic reflection algebras*. Selecta Math., 18(2012), N1, 179-251. arXiv:1001.0239.
- [24] I. Losev, *Primitive ideals in W -algebras of type A* . J. Algebra, 359 (2012), 80-88. arXiv:1108.4171.
- [25] I. Losev, *Isomorphisms of quantizations via quantization of resolutions*. Adv. Math. 231(2012), 1216-1270. arXiv:1010.3182.
- [26] I. Losev, *On isomorphisms of certain functors for Cherednik algebras*. Repres. Theory, 17 (2013), 247-262. arXiv:1011.0211.
- [27] I. Losev, *Highest weight \mathfrak{sl}_2 -categorifications I: crystals*. Math. Z. 274(2013), 1231-1247. arXiv:1201.4493.
- [28] I. Losev, A. Tsymbaliuk, *Infinitesimal Cherednik algebras as W -algebras*. arXiv:1305.6873. Transform. Groups. 19 (2014), 495-526.
- [29] I. Gordon, I. Losev, *On category \mathcal{O} for cyclotomic rational Cherednik algebras*. J. Eur. Math. Soc. 16 (2014), 1017-1079.
- [30] I. Losev, V. Ostrik, *Classification of finite dimensional irreducible modules over W -algebras*. arXiv:1202.6097. Compos. Math. 150(2014), N6, 1024-1076.
- [31] I. Losev, *On Procesi bundles*. arXiv:1303.4617. Math. Ann. 359(2014), N3, 729-744.

- [32] I. Losev. *Finite dimensional quotients of Hecke algebras*. arXiv:1407.6375. Algebra and Number theory, 9(2015), 493-502.
- [33] I. Losev, B. Webster, *On uniqueness of tensor products of irreducible categorifications*. arXiv:1303.1336. Selecta Math. 21(2015), N2, 345-377.
- [34] P. Etingof, E. Gorsky, I. Losev, *Representations of Cherednik algebras with minimal support and torus knots*. arXiv:1304.3412. Adv. Math. 277 (2015), 124-180.
- [35] I. Losev, *Dimensions of irreducible modules over W -algebras and Goldie ranks*. arXiv:1209.1083. Invent. Math. 200 (2015), N3, 849-923.
- [36] I. Losev. *Abelian localization for cyclotomic Cherednik algebras*. Int Math Res Notices (2015) vol. 2015, 8860-8873. arXiv:1402.0224.
- [37] I. Losev, *Highest weight \mathfrak{sl}_2 -categorifications II: structure theory*. Trans. Amer. Math. Soc. 367 (2015) 8383-8419. arXiv:1203.5545.
- [38] I. Losev, *Proof of Varagnolo-Vasserot conjecture on cyclotomic categories \mathcal{O}* . arXiv:1305.4894. Selecta Math. 22(2016), 631-668.
- [39] I. Losev. *Derived equivalences for Rational Cherednik algebras*. arXiv:1406.7502. Duke Math J. 166(2017), N1, 27-73.
- [40] I. Losev. *Bernstein inequality and holonomic modules* (with a joint appendix by I. Losev and P. Etingof). arXiv:1501.01260. Adv. Math. 308 (2017), 941-963.
- [41] I. Losev. An appendix to *Quantizations of conical symplectic resolutions II: category \mathcal{O} and symplectic duality* by T. Braden, A. Licata, N. Proudfoot, B. Webster. arXiv:1407.0964. Astérisque 384 (2016), 75-179.
- [42] I. Losev. *On categories \mathcal{O} for quantized symplectic resolutions*. arXiv:1502.00595. Compos. Math. 153 (2017), N12, 2445-2481.
- [43] J. Brundan, I. Losev, B. Webster, *Graded tensor product categorifications and the super Kazhdan-Lusztig conjecture*. arXiv:1310.0349. Int. Math. Res. Notices. (2017), vol. 2017 n. 20, 6329-6410.
- [44] I. Losev. *Wall-crossing functors for quantized symplectic resolutions: perversity and partial Ringel dualities*. arXiv:1604.06678. PAMQ, 13 (2017), n.2, 247-289.
- [45] I. Losev. *Quantizations of regular functions on nilpotent orbits*. arXiv:1505.08048. Bull. Inst. Math. Acad. Sin. 13 (2018), n.2, 199-225.
- [46] I. Losev, S. Shelley-Abrahamson. *On Refined Filtration By Supports for Rational Cherednik Categories \mathcal{O}* . arXiv:1612.08211. Selecta Math. 24 (2018), 1729-1804.
- [47] I. Losev. *Representation theory of quantized Gieseker varieties, I*. arXiv:1611.08470. Lie groups, Geometry, and Representation theory, Progress in Mathematics, 326 (2018), 273-314.
- [48] R. Bezrukavnikov, I. Losev, *On dimension growth of modular irreducible representations of semisimple Lie algebras*. arXiv:1708.01385. Lie groups, Geometry, and Representation theory, Progress in Mathematics, 326 (2018), 59-90.
- [49] I. Losev. *Cacti and cells*. J. Eur. Math. Soc. 21 (2019), 1729-1750.
- [50] I. Losev, *Derived equivalences for Symplectic reflection algebras*. Int. Math. Res. Notices, rnz178.

Accepted.

- [51] R. Bezrukavnikov, I. Losev, *Etingof conjecture for quantized quiver varieties*. arXiv:1309.1716. Accepted to Invent. Math.
- [52] P. Etingof, V. Krylov, I. Losev, J. Simental, *Representations with minimal support for quantized Gieseker varieties*. arXiv:2002.06741. Accepted to Math. Z.

[53] I. Losev, *Harish-Chandra bimodules over quantized symplectic singularities*. arXiv:1810.07625. Accepted to Transform. Groups.

[54] I. Losev. *Supports of simple modules in cyclotomic Cherednik categories O* . arXiv:1509.00526. Accepted to Adv. Math.

[55] I. Losev, I. Panin, *Goldie ranks of primitive ideals and indexes of equivariant Azumaya algebras*. arXiv:1802.05651. Accepted to Moscow Math. J.

Preprints.

[56] I.V. Losev. *The Kempf-Ness theorem and Invariant theory*. Preprint (2006), arXiv:math.AG/0605756.

[57] I.V. Losev. *Computation of combinatorial invariants of G -varieties*. Preprint (2006), available at: www.moebiuscontest.ru/files/2006/losev.pdf (in Russian).²

[58] I. Losev, *Quantizations of nilpotent orbits vs 1-dimensional representations of W -algebras*. arXiv:1004.1669.

[59] I. Losev, *Towards multiplicities for cyclotomic rational Cherednik algebras*. arXiv:1207.1299.³

[60] I. Losev. *Etingof conjecture for quantized quiver varieties II: affine quivers*. arXiv:1405.4998.⁴

[61] I. Losev. *Totally aspherical parameters for Cherednik algebras*. arXiv:1409.3965.

[62] I. Losev. *Deformations of symplectic singularities and Orbit method for semisimple Lie algebras*. arXiv:1605.00592.

[63] B. Elias, I. Losev, *Modular representation theory in type A via Soergel bimodules*. arXiv:1701.00560.

[64] I. Losev, *On modular categories O for quantized symplectic resolutions*. arXiv:1712.07726.

[65] I. Losev, *On inductive construction of Procesi bundles*. arXiv:1901.05862.

[66] R. Bezrukavnikov, I. Losev, *Dimensions of modular irreducible representations of semisimple Lie algebras*. arXiv:2005.10030.

Expository and review texts.

[67] I. Losev. *Quantized Hamiltonian actions of reductive groups and their applications*. In "Fundamental mathematics in the work of young scientists". Moscow, MCCME, 2009, p.64-80.

[68] I. Losev. *Uniqueness properties for spherical varieties*.⁵ Les cours de CIRM, Annee 2010, http://ccirm.cedram.org/ccirm-bin/fget?id=CCIRM_2010, 113-120. arXiv:0904.2937.

[69] I. Losev, *Finite W -algebras*. Proceedings of the International Congress of Mathematicians Hyderabad, India, 2010, p. 1281-1307. arXiv:1003.5811.

[70] I. Losev, *Representations of general linear groups and categorical actions of Kac-Moody algebras*. arXiv:1209.1067.

[71] I. Losev, *Procesi bundles and Symplectic reflection algebras*. arXiv:1501.00643. Algebraic and Analytic Microlocal Analysis, Springer Proceedings in Mathematics and Statistics, 269 (2018), 3-62.

[72] I. Losev, *Rational Cherednik algebras and categorification*. arXiv:1509.08550. Contemp. Math. 683, "Categorification and Higher Representation theory", A. Beliakova, A. Lauda, eds, 1-41.

²Contains the results of [11],[15],[17] together with some additional results

³This preprint is replaced by arXiv:1305.4894

⁴This preprint is superseded by arXiv:1502.00595, arXiv:1604.06678, arXiv:1611.08470.

⁵Expanded lecture notes of a mini-course given at CIRM, Luminy, in April 2009

8. GRANTS, AWARDS, AND DISTINCTIONS

- 1) *2004-2007*: RFBR grant 05-01-00988.
- 2) *The 10th Moebius contest, Moscow, 2006*: the first prize⁶, <http://www.moebiuscontest.ru/history.php?l=0&part=11>.
- 3) *2009-2013*: NSF grant DMS-0900907, \$137,751.
- 4) *2010*: Invited sectional speaker for ICM 2010.
- 5) *2012-2016*: NSF grant DMS-1161584, \$129,999.
- 6) *Fall 2014- Fall 2016*: Sloan fellowship, \$50,000.
- 7) *2015*, NSF conference grant DMS-1507869, \$40,000.
- 8) *2015-2018*, NSF grant DMS-1501558, \$309,060.
- 9) *08/2017-09/2019*: Co-PI on the NSF RTG grant, DMS-1645877, ≈\$ 2,200,000.
- 10) *2017*, NSF conference grant DMS-1744157, \$12,500.
- 11) AMS fellow, Class of 2018.
- 12) *2020-2025*, NSF grant DMS-2001139, \$560,000.

9. TEACHING

- 1) Fall 2005, Independent University of Moscow: A course "Moment map", lecturer. The program and lecture notes (in Russian) are available at: www.iuum.mccme.ru/f05/momentum.html
- 2) Fall 2005, Spring 2006, Fall 2006: Independent University of Moscow: Algebra seminars for first year students, teaching assistant.
- 3) Fall 2006, Independent University of Moscow: A course "Lie groups and Lie algebras", lecturer. The program and exercise sheets (in Russian) are available at: www.iuum.mccme.ru/f06/lie.html
- 4) Fall 2007, Spring 2008, Belarusian State University, Minsk, Belarus: A course "Young tableaux", lecturer.
- 5) Spring 2008, Belarusian State University: A course "Advanced linear algebra", lecturer.
- 6) Spring 2008, Number theory and Geometry lectures for the Belarusian IMO team.
- 7) Fall 2008, MIT: section leader for single variable calculus course (18.01) with Prof. B. Brubaker.
- 8) Spring 2009, MIT: section leader for differential equations course (18.03) with Prof. D. Jerison.
- 9) August 2009, Belarusian State University: A crash-course "Hamiltonian mechanics and representations of quivers", lecturer.
- 10) Fall 2009, MIT: section leader for 18.01 with Prof. B. Brubaker.
- 11) Spring 2010, MIT: section leader for Project lab in math (18.821) with Prof. D. Jerison.
- 12) August 2010, Belarusian State University: A crash-course "Quadratic forms over \mathbb{Q} ".
- 13) Fall 2010, MIT: section leader for 18.01 with Prof. P. Seidel.
- 14) Spring 2011, MIT: section leader for 18.03 with Prof. D. Jerison.
- 15) July 2011, summer school "Modern Mathematics", Dubna, Russia: A crash course "Representations of groups and the Burnside theorem", lecturer.
- 16) December 2011, Higher School of Economics, Moscow Russia: A crash course "Calogero-Moser systems and Rational Cherednik algebras", 4 hours.
- 17) Spring 2012, Northeastern University. MATH 4555, Complex variables. Lecturer.

⁶awarded for the preprint [29]

- 18) July 2012, summer school “Modern Mathematics”, Dubna, Russia: a 5 hour crash course “Quantum groups, knots, and Jones polynomial”, lecturer.
- 19) Fall, 2012, Northeastern University. MATH 1242, Calculus II, Lecturer.
- 20) Fall, 2012, Northeastern University. MATH 7364, Topics in Representation Theory: Symplectic Reflection algebras.
- 21) Fall, 2013, Northeastern University. MATH 1341, Calculus I for Science and Engineering, lecturer and course coordinator.
- 22) May 2014, Higher School of Economics, Moscow, Russia. Crash course “Representations of quivers and deformed preprojective algebras”.
- 23) Fall 2014, Northeastern University. MATH 1341, Calculus I for Science and Engineering, lecturer.
- 24) Fall 2014, Northeastern University. MATH 7322, Geometry 3 (Symplectic geometry).
- 25) July 2015, summer school “Modern Mathematics”, Dubna, Russia: a 5 hour crash course “Representation theory of the symmetric groups as a first step towards categorical actions of Lie algebras”.
- 26) Fall 2015, Northeastern University. MATH 7313, Representation theory (modern introduction).
- 27) December 2015, Higher School of Economics, Moscow. A crash-course “Representation theory of symmetric groups in positive characteristic and Kac-Moody algebra actions on categories”. 4.5 hours, aimed at undergraduate and graduate students.
- 28) December 2015, Belarusian State University, Minsk. A talk “Equipartite polyhedra and tensor products” aimed at high school students, 1 hour.
- 29) July 2016, Summer school “Algebra and Geometry”, Yaroslavl, Russia. Lecture series “Hilbert schemes and Combinatorics” aimed at undergraduate and graduate students, 4.5 hours.
- 30) August 2016, A crash-course “Quadratic forms over \mathbb{Q} ” aimed at undergraduate students, Belarusian State University, Minsk, Belarus, 6 hours.
- 31) Fall 2016, MATH 1341, Calculus 1 for Science and Engineering, lecturer and course coordinator.
- 32) March 2017, A crash-course “Around representations of quivers” aimed at undergraduate and graduate students, Chebyshev laboratory, St. Petersburg, Russia, 8 hours.
- 33) April 2017, A crash-course “Representations of Rational Cherednik algebras”, HSE, Moscow, Russia, around 17 hours.
- 34) July 2017, Lecture series “Representations of groups and the Burnside theorem” aimed at high school and undergraduate students, 3.5 hours, Dubna, Russia.
- 35) August 2017, Lecture “Around Young tableaux” aimed at high school and undergraduate students, 2 hours, Minsk, Belarus.
- 36) Fall 2017, Northeastern, MATH 7320, Modern Algebraic Geometry (Invariant theory).
- 37) July 2018, Lecture series “Catalan numbers: Combinatorics and Algebraic geometry” aimed at high school and undergraduate students, 3.5 hours, Dubna, Russia.
- 38) December 2018, Lecture series “Introduction to Invariant theory” for undergraduate and master students, HSE, Moscow, Russia. 12 hours.
- 39) Spring 2019, University of Toronto, MAT 224, Linear Algebra II, 2 sections.
- 40) Fall 2019, Yale University, MATH 380, Modern Algebra I.
- 41) Spring 2020, Yale University, MATH 757, D-modules.
- 42) May 2020, Independent University of Moscow, Introduction to quiver varieties. 20 hours, via Zoom.

43) Fall 2020, Yale University, MATH 380, Modern Algebra I.

10. CONFERENCES AND WORKSHOPS ORGANIZED

- 1) Representation theory and geometry of symplectic resolutions, May 2015, Northeastern.
- 2) Transformation groups, December 2017, Independent University of Moscow.
- 3) Quantum structures in Algebra and Geometry, August 2019, Northeastern.
- 4) Clay research workshop on Modular representation theory, October 2019, Oxford.

11. STUDENTS SUPERVISED

Graduate:

Do Kien Hoang, Yale, starting 2020.

Dmytro Matvieievskyi, NEU, starting 2016.

Aleksei Pakharev, NEU, jointly with P. Etingof, 2015-2017.

Seth Shelley-Abrahamson, MIT, jointly with P. Etingof, 2014-2018.

Jose Simental Rodriguez, NEU, 2013-2017.

Boris Tselikhovskiy, NEU, 2015-2020.

Yaochen Wu, Yale, starting 2019.

Huijun Zhao, NEU, 2013-2018.

Master (advised unofficially):

Vasily Krylov, HSE (Moscow), jointly with M. Finkelberg, 2016-present.

Dmitry Korb, HSE (Moscow), jointly with M. Finkelberg, 2013-2014.

Undergraduate (advised unofficially):

Daniil Klyuev, SPSU (Saint Petersburg), 2016-present.

Uladzislau Stazhinsky, BSU (Minsk), 2011-2013.

Aliaksandr Minets, BSU (Minsk), 2009-2011.

Ruslan Maksimau, BSU (Minsk), 2007-2008.

12. LANGUAGES

Russian, English.

13. PROFESSIONAL ACTIVITIES

Journals:

Referee for: Advances in Mathematics, Algebra and Number theory, Duke Math Journal, IMRN, Journal of Algebra, Journal of Lie theory, Selecta Math., Transformation groups, Invent. Math., J. Amer. Math. Soc., Representation theory, Math. Z, Asterisque, Math. Annalen.

A member of the editorial board for Transformation groups, Selecta Mathematica and Journal of Combinatorial Algebra.

University service: Hiring committees at Northeastern: research instructors (2011-2012, 2012-2013, 2014-2015 – chair), tenure track (2013-2014, 2015-2016). Chair of Full Professor committee (May 2016-December 2016) and Chair of Chair selection committee (AY2016-2017). Graduate committee (starting Sept 2017).

Grant reviews: In 2013-2016 I have reviewed grant applications for NSF, NSA, NSERC.