CURRICULUM VITAE

Roman Bezrukavnikov

Born: April 1, 1973, Moscow, Russia.

Employment.

September, 2005 – present: Professor of Mathematics, Massachusetts Institute of Technology.

Spring 2018, on leave to MSRI as a Research Professor.

Fall 2014 and spring 2016 on leave to Columbia University, spring 2016 as Eilenberg Visiting Professor.

2010/11 – on leave to Hebrew University of Jerusalem: Fall 2010 participating in a special program at the Institute for Advanced Study of Hebrew University, Spring 2011 as a visiting professor at the Department of Mathematics.

07-08: on leave to Princeton Institute for Advanced Study serving as an organizer of the Special Year "New Connections of Representation Theory to Algebraic Geometry and Physics".

September, 02 – August, 05: tenure track Assistant Professor at Northwestern University (academic year 04/05: on leave to the Hebrew University of Jerusalem).

01-02: Long Term Prize Fellow at the Clay Mathematical Institute.

99-01: Dickson Instructor in Mathematics at the University of Chicago.

96-99: member at the Institute for Advanced Study, Princeton, NJ.

Grants, fellowships and awards. Simons Foundation Fellowships awarded in 2014, 2020.

NSF research grants, awarded in: 2000, 2005, 2011, 2016.

Sloan Research Fellowship awarded February 2004.

Clay Mathematical Institute Fellowship, January – June, 2000.

Team member in group grants: NSF Focused Research Group grant, awarded July 2009; Binational US – Israeli Science Foundation grants awarded 2009, 2013, 2017.

Education.

94-98: graduate student at the University of Tel-Aviv (96-98 on leave to the Institute for Advanced Study, Princeton, NJ), advisor Prof. Joseph Bernstein. PhD thesis "Homological properties of representations of p-adic groups related to geometry of the group at infinity" defended in 1998.

92-94: graduate student at Brandeis University, Waltham, MA, USA. MA degree awarded in 1994.

90-92: student of the Department of Mathematics and Mechanics of the Moscow State University.

Selected invited talks.

"Geometric Representation Theory" (online, hosted by Perimeter Institute and MPI, Bonn), June 2020.

"Representation theory and algebraic analysis" (in honor of J. Bernstein's 75th birthday) (online, hosted by Weizmann Institute), May 2020.

"Who is who in mirror symmetry", Moscow, Russia, 2019.

"Hodge Theory Old and New", Moscow and St-Petersburg, Russia, 2018.

Midrasha Mathematicae, Hebrew University of Jerusalem, 2018.

MSRI worskhop "Representations of Finite and Algebraic Groups", 2018.

Distinguished Lecture Series at UCLA, Los Angeles, California, January 2017.

"Symplectic Duality and Gauge Theory", Perimeter Institute, April 2016, Waterloo, ON, Canada.

Colloquium at the Simons Center, January 2016.

AMS Summer Institute in Algebraic Geometry, Salt Lake City, Utah, August 2015.

Conference on Representation Theory and Geometry of Symplectic Resolutions, May 2015.

Conference on Representation Theory, Paris, France, January 2015.

Minischool and conference in Geometric Representation Theory, Kyoto, Japan, July 2014.

Conference in honor of B. Feigin's 60th birthday, Moscow, Russia, January 2014. Representation Theory Days in Patagonia, Chile, January 2014.

Langlands program workshop at Sanya, China, December 2013.

"Algebraic groups and representation theory," in memory of T.A. Springer, Hong Kong, January 2013.

Conference on geometric Langlands duality and DAHA, Luminy, France, July 2011.

Conference on algebraic groups and quantum groups, Nagoya, Japan, August 2010.

Invited lectures at RIMS, Kyoto, Japan, organized by Clay Mathematical Institute, March 2009.

Sectional talk at the International Congress of Mathematicians, Madrid, Spain, August 2006.

Joint AMS-BSM meeting, Rio de Janeiro, Brazil, June 2008.

Conference on geometric Langlands duality, Guanzhou, China, June 2007.

Conference on Hecke algebras and Langlands duality, Luminy, France, June 2006.

Conference on Quantum Groups, Technion, Israel, July, 2004.

Workshop on Noncommutative Algebra and Algebraic Geometry, Warwick, UK: June, 2004.

Conference "Algebraische Gruppen", Oberwolfach, Germany, March, 2001; March, 2004.

Conference "Algebraic Groups and Related Topics," Tokyo, Japan, August 2001.

Conferences on Representation Theory, Aarhus, Denmark: June, 2000 and June, 2003.

Graduate students supervised. Rina Anno, PhD 2008 (Harvard University); Simon Riche (co-directed by Patrick Polo), PhD 2008 (Ecole Normale); Qian Lin, PhD 2010; Chris Dodd, PhD 2011; Roman Travkin and Tsao-Hsien Chen, PhD 2012; Bhairav Singh, PhD 2013, Galyna Dobrovolska, PhD 2014 (University of Chicago, co-directed by Victor Ginzburg), Vinoth Nandakumar, PhD 2015, Dorin Boger, Dmitry Vaintrob and Michael Viscardi, PhD 2016, Gus Lonergan and Kostiantyn Tolmachov, PhD 2018, Pablo Boixeda Alvarez, Dmitry Kubrak and Guangyi Yue, PhD 2020. Supervising four currently enrolled MIT graduate students.

Synergistic activities. Member of Editorial Boards for: Advances in Mathematics, Selecta Mathematica, Forum of Mathematics Pi and Sigma.

Member of the MSRI scientific advisory board.

Served as an organizer for conferences: 2007 and 08 at Princeton IAS, 2010, 2018 at IAS of Hebrew University, 2011 at CIRM (Luminy, France), 2010, 2014, 2018 at MIT; 2012, 2019 at Northeastern University; a section at an AMS-IMU joint meeting in Tel Aviv, Israel (2014). Main organizer for the Park City Math Institute summer program, July 2015. Main organizer of a representation theory program at the Simons Center, Stony Brook, NY, 2016 and of Midrasha Mathematicae (Hebrew University, 2018).

Research interests. Representation theory and algebraic geometry.

LIST OF PUBLICATIONS

Roman Bezrukavnikov

(1) *On Koszul DG-algebras Arising from Configuration Spaces,* GAFA Math. J., 4 (1994), 119-136.
(2) *Dimension of the Fixed Point Sets on Affine Flag Manifolds,* Math. Research Letters, 4 (1996), 185-189.
(3) *On tensor Categories Attached to Cells in Affine Weyl Groups,* Representation theory of algebraic groups and quantum groups, 69–90, Adv. Stud. Pure Math., 40, Math. Soc. Japan, Tokyo, 2004.
(4) (with V. Ostrik) *On tensor Categories Attached to Cells in Affine Weyl Groups, II,* Representation theory of algebraic groups and quantum groups, 101–119, Adv. Stud. Pure Math., 40, Math. Soc. Japan, Tokyo, 2004.
(5) *Quasi-exceptional sets and equivariant coherent sheaves on the nilpotent cone,* Represent. Theory **7** (2003), 1-18.
(6) (with A. Braverman and L. Positselskii) *Gluing of abelian categories and differential operators on the basic affine space,* Journal of the Inst. of Math. Jussieu (2002) **1**(4), 543–557.
(7) (with A. Polischuk) *Kazhdan-Laumon category has infinite homological dimension,* appendix to the paper by A. Polischuk "Gluing of perverse sheaves on the basic affine space", Selecta Mathematica (New series) **7** (2001), no. 1, 144–146.
(8) (with A. Beilinson and I. Mirkovic) *Tilting exercises,* Mosc. Math. J. **4** (2004), no. 3, 547–557.
(9) parts of chapter 5 in: R. Bezrukavnikov, M. Finkelberg, V. Schechtman *Factorizable Sheaves and Quantum Groups,* Lecture Notes in Mathematics, 1691, Springer Verlag, Berlin, 1998.
(10) (with L. Positselskii) *On semi-infinite cohomology of finite dimensional graded algebras,* Compositio Math., **146** (2010), no. 2, pp 480-496.
(11) (with A. Braverman and I. Mirkovic) *Some results about the geometric Whittaker model,* Adv. Math. **186** (2004), no. 1, 143–152.
(12) (with I. Mirkovic and D. Rumynin) *Localization of modules for a semisimple Lie algebra in prime characteristic,* With an appendix by Bezrukavnikov and Simon Riche. Ann. Math. (2) **167** (2008), no. 3, 945–991.
(13) (with M. Finkelberg and I. Mirkovic) *Equivariant (K)-homology of affine Grassmannian and Toda lattice,* Compos. Math. **141** (2005), no. 3, 746–768.
(14) (with S. Arkhipov and V. Ginzburg) *Quantum Groups, the loop Grassmannian, and the Springer resolution,* J. Amer. Math. Soc. **17** (2004), 595-678.

(15) (with D. Kaledin) *Fedosov quantization in algebraic context,* Mosc. Math. J. **4** (2004), no. 3, 559–592.

(16) (with D. Kaledin) *McKay equivalence for symplectic resolutions of singularities,* Tr. Mat. Inst. Steklova **246** (2004), Algebr. Geom. Metody, Svyazi i Prilozh., 20–42; translation in Proc. Steklov Inst. Math. 2004, no. 3 (246), 13–33.

(17) (with I. Mirkovic and D. Rumynin) *Singular localization and intertwining functors for reductive Lie algebras in prime characteristic,* Nagoya Math. J. **184** (2006) 1–55.

(18) (with D. Kaledin) *Fedosov quantization in positive characteristic,* J. Amer. Math. Soc. **21** (2008), no. 2, 409–438.

(19) (with A. Braverman) *Geometric Langlands Correspondence for D-modules in Prime Characteristic: the $GL(n)$ Case,* Pure and Applied Mathematics Quarterly **3** (2007) no 1, 153–181.

(20) *Noncommutative counterparts of the Springer resolution,* Proceeding of the International Congress of Mathematicians, Madrid, Spain, 2006, vol. 2, pp 1119–1144.

(21) (with S. Arkhipov) *Perverse sheaves on affine flags and Langlands dual group,* Israel J. Math., **170** (2009), 135–184.

(22) *Perverse sheaves on affine flags and nilpotent cone of the Langlands dual group,* Israel J. Math., **170** (2009), 185–206.

(23) (with S. Arkhipov, A. Braverman, D. Gaitsgory, I. Mirković *Modules over the small quantum group and semi-infinite flag manifold,* Transform. Groups **10** (2005), no. 3-4, 279–362.

(24) (with V. Ginzburg) *On deformations of associative algebras,* Ann. of Math. (2) **166** (2007), no. 2, 533–548.

(25) (with M. Finkelberg, V. Ostrik) *On tensor categories attached to cells in affine Weyl groups, III,* Isr. J. Math, **170** (2009), 207–234.

(26) (with A. Lachowska) *The small quantum group and the Springer resolution*, in: *Quantum groups,* 89–101, Contemp. Math., 433, Amer. Math. Soc., Providence, RI, 2007.

(27) (with M. Finkelberg and V. Ginzburg) *Cherednik algebras and Hilbert schemes in characteristic p.* With an appendix by Pavel Etingof. Represent. Theory **10** (2006), 254–298

(28) (with M. Finkelberg) *Equivariant Satake Category and Kostant-Whittaker reduction,* Moscow Math. J. **8** (2008), no. 1, 39–72, 183.

(29) *Cohomology of tilting modules over quantum groups, and t-structures on derived categories of coherent sheaves,* Inv. Math. **166** (2006), no 2, 327–357.

(30) (with P. Etingof) *Parabolic induction and restriction functors for rational Cherednik algebras,* Selecta Math. (N.S.) **14** (2009), no. 3-4, 397–425.

(31) (with L. Positselski) *On semi-infinite cohomology of finite dimensional graded algebras,* Compositio Math **146** (2010), no 2, 480-496.

(32) (with D. Arinkin) *Perverse coherent sheaves,* Moscow Math J. **10** (2010) no 1, 3–29.
(33) (with M. Finkelberg and V. Ostrik) *Character D-modules via Drinfeld center of Harsih-Chandra bimodules,* Inventiones Math. **188** (2012) no 3, 589–620.
(34) (with I. Mirković, and an Appendix by E. Sommers) *Representations of semisimple Lie algebras in prime characteristic and the noncommutative Springer resolution,* Annals Math. **178** (2013) 835–919.
(35) (with Z. Yun) *On Koszul duality for Kac-Moody groups,* Represent. Theory **17** (2013), 1-98.
(36) (with S. Riche) *Affine braid group actions on derived categories of Springer resolutions,* Annales Scientifiques de l'Ecole Normale Supérieure **45** (2012), 535-599.
(37) (with Q. Lin) *Highest weight modules at the critical level and noncommutative Springer resolution,* Contemp. Math. 565 (2012) 15–27.
(38) (with R. Anno and I. Mirković) *Bridgeland stabilities for Slodowy slices and real variation of stabilities,* Moscow Math. J. **15** no 1 (2015), 1–17.
(39) (with D. Kazhdan) *Geometry of second adjointness for p-adic groups,* Representation Theory **19** no 3 (2015) 299–332.
(40) (with M. Finkelberg) *Wreath Macdonald polynomials and categorical McKay correspondence,* (with Appendix by Vadim Vologodsky), Cambridge J. Math. **2** (2014), 163–190.
(41) *On two geometric realizations of an affine Hecke algebra,* Publ. IHES **123**(1) (2016), 1–67.
(42) (with D. Kazhdan and Y. Varshavsky) *On the stable center conjecture,* Astérisque **369** (2015), 27–97.
(43) (with I. Losev) *Etingof conjecture for quantized quiver varieties,* to appear in Inv. Math.
(44) (with M. Kapranov) *Microlocal sheaves and quiver varieties,* Annales de la Faculté des sciences de Toulouse: Mathématiques, **25** (2016), 473–516.
(45) (with D. Kazhdan and Y. Varshavsky) *On the depth r Bernstein projector*, Selecta Math. (N.S.) **22** (2016), no. 4, 2271–2311.
(46) Appendix to: A. Braverman, D. Kazhdan, *Bernstein components via Bernstein center,* Selecta Math. (N.S.) **22** (2016), no. 4, 2313–2323.
(47) (with M. Liebeck, A. Shalev, P.-H. Tiep) *Character ratios, growth and random walks on finite groups of Lie type,* Acta Mathematica, **221** no 1 (2018), 1–57.
(48) (with K. Vilonen) *Koszul Duality for Quasi-split Real Groups,* preprint arXiv:1510.08343, submitted.
(49) (with R. Travkin) *Quantization of Hitchin integrable system via positive characteristic,* preprint arXiv:1603.01327, with an Appendix joint with T.-S. Chen and X. Zhu.

(50) (with J. Bernstein and D. Kazhdan) *Deligne-Lusztig duality and wonderful compactification,* Selecta Math. (N.S.) 24 (2018), no 1, pp 7–20.
(51) (with D. Kazhdan) *Character values and Hochschild homology,* in: Proceedings Symposia in Pure Math, vol. 101 (2019) "Representations of Reductive Groups", 1–31.
(52) (with I. Losev) *On Dimension Growth of Modular Irreducible Representations of Semisimple Lie algebras,* in: Progress in Mathematics, vol. 326 (2018) "Lie Groups, Geometry and Representations Theory", 59–91.
(53) (with D. Gaitsgory, I. Mirković, L. Rider and S. Riche) *An Iwahori-Whittaker model for the Satake category,* to appear in Journal de l'École Politechnique **6** (2019), 707–735.
(54) (with S. Riche) *A topological approach to Springer theory,* to appear in "Interactions between Representation Theory and Algebraic Geometry", Birkhäuser (2019).
(55) (with A. Yom Din) *On parabolic restriction of perverse sheaves,* preprint (2018), to appear in: Publications of the Research Institute for Mathematical Sciences.
(56) (with A. Kapustin) *Localization properties of Chern insulators,* Arnold Math. J. **5** (2019), no. 1, 15–21.
(57) (with M. Rovinsky) *0-cycles on Grassmannians as representations of projective groups,* Arnold Math. J. 5 (2019), no. 2-3, 373–385.
(58) (with L. Rider and S. Riche) *Modular affine Hecke category and regular unipotent centralizer, I,* preprint arXiv:2005.05583
(59) (with I. Losev) *Dimensions of modular irreducible representations of semisimple Lie algebras,* preprint arXiv: arXiv:2005.10030, submitted.
(60) (with S. Riche) *Hecke action on the principal block,* preprint arXiv:2009.10587, submitted.
(61) (with K. Tolmachov) *Monodromic model for Khovanov-Rozansky homology,* preprint arXiv:2008.11379, submitted.
(62) *Koszul Property and Frobenius Splitting of Schubert Cells,* preprint, alg-geom/9502021.
(63) *Perverse coherent sheaves (after Deligne),* preprint arXiv:math/0005152.
(64) *Homological properties of representations of p-adic groups related to geometry of the group at infinity,* preprint arXiv:math/0406223.
(65) *On semi-infinite cohomology of finite dimensional algebras,* preprint arXiv:math/0005148.