

EVGENY FEIGIN // CURRICULUM VITAE

Address.

Department of Mathematics,
National Research University Higher School of Economics,
Russia, 119048, Moscow, Usacheva str. 6.
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Personal data.

Born July 1980, Moscow. Married, 3 children. Citizenship: Russia.

Mathematical interests.

Representation theory, mathematical physics, algebraic geometry, combinatorics.

Habilitation thesis:

RAS Institute for Information Transmission Problems, Moscow, March 2013.
Title: PBW degeneration of the Lie theory and its applications.

Education.

PhD, Moscow State University, 2005.
Title: Demazure modules for affine Kac-Moody Lie algebra $\widehat{\mathfrak{sl}}_2$.
M.Sc. Independent University of Moscow, June 02 and Moscow State University, June 02.

Employment.

Deputy dean for research, Department of Mathematics, National Research University HSE, since Oct. 2015.
Professor, Skolkovo Institute of Science and Technology, since Jan. 2017.
Professor, Department of Mathematics, National Research University HSE, since Sep. 2014.
Associate Professor, Department of Mathematics, National Research University HSE, Sep. 2010 – Aug. 2014.
Senior research fellow, Tamm Theory Division, Lebedev Physics Institute, Feb. 09 – Jan. 17,
Research fellow, Tamm Theory Division, Lebedev Physics Institute, Feb. 07 – Jan. 09,
Junior research fellow, Tamm Theory Division, Lebedev Physics Institute, since Nov. 05 – Jan. 07,
Alexander von Humboldt fellow, Universities Cologne, Bonn, 2008,
Teacher of mathematics at Moscow State 57-th School, Sep. 98-Aug.05.
Visiting positions:
Hausdorff Research Institute for Mathematics, Bonn, Germany, Jan-Apr

2011.

Indiana University Purdue, Indianapolis, USA, May 2010;

Hausdorff Research Institute for Mathematics, Bonn, Germany, May-Aug 2008;

ETH Zuerich, Switzerland, May 2007;

Max Planck Institute for Mathematics in Bonn, Dec.2006-Jan.2007.

Grants, fellowships, awards.

RSF grant, 2019.

Moscow government prize, 2017.

RSF-DFG grant, 2016.

Simons IUM fellowship, 2012, 2014.

Dynasty foundation award, 2011, 2014.

Russian president grant, 2009, 2012.

Russian Foundation for Basic Research grants 2003, 2006, 2009, 2012.

Grants for leading scientific schools 2005, 2008.

Euler Foundation Award, 2007.

P.Deligne fellowship based on his 2004 Balzan prize in mathematics, 2007.

Alexander von Humboldt fellowship, 2008, 2009.

Professional services.

Referee for the journals:

Advances in Mathematics, Algebra & Number Theory, Algebras and Representation Theory, Annals of Combinatorics, Compositio Mathematica, Comptes rendus Mathematique, Central European Journal of Mathematics, Communications in Algebra, Duke Mathematical Journal, International Mathematics Research Notices, Inventiones Mathematicae, Izvestiya of Saratov University, Journal of Algebra, Journal of Algebraic Combinatorics, Journal of Combinatorial Theory A, Journal of Geometry and Physics, Journal of Physics A: Mathematical and Theoretical, Journal of Lie Theory, Letters in Mathematical Physics, Mathematische Zeitschrift, Mathematica Scandinavica, Mathematische Annalen, Moscow Mathematical Journal, Physica D: Nonlinear Phenomena, Research in the Mathematical Sciences, Results in Mathematics, Russian Mathematics (Iz. VUZ), SIGMA, Selecta Mathematica, Sbornik Mathematics, Theoretical and Mathematical Physics, Transactions of the Moscow Mathematical Society, Transformation Groups.

Conferences, schools, workshops.

Discussion meeting on representation theory, Bangaluru, 10-12.12.2020.

Regional Conference in Lie Theory, Montreal, 2-3.10.2020.

Workshop "Quiver varieties and representation theory", Monreal, Canada, 12-16.08.2019.

Conference "Representation theory of Lie groups, mathematical physics, and combinatorics", Reims, France, 24-30.06.2019.

ABCD workshop "Geometric and computational aspects of representation theory of Lie algebras and quivers", Aachen, Germany, 12-14.02.2019.

Workshop "Geometry and representation theory at the interface of Lie algebras and quivers", Bochum, Germany, September 10–14, 2018.
Moscow-Pisa Colloquium, Moscow, Russia, October 1–5, 2018.
Geometry and Representation Theory of Algebraic Groups, Bad Honnef, Germany, 05–09.03.2018.
Workshop on Classical and Quantum Integrable Systems (CQIS-2017), Dubna, Russia, 24 – 29.07.2017.
Workshop "Quiver Grassmannians and their Applications", Wuppertal, Germany, 21.03 – 24.03.2017.
Winter school "Lie algebras, algebraic groups and invariants theory", Moscow, 31.01 – 04.02.2017.
Workshop "Lie Theory and Representation Theory", Cologne, Germany, 22.08 – 26.08.2016.
Workshop on Classical and Quantum Integrable Systems, Saint-Petersburg, Russia, 11.07 – 15.07.2016.
Workshop "PBW Structures in Representation Theory", Oberwolfach, Germany, 28.02 – 05.03.2016.
International summer school "Theoretical problems of physics of fundamental interactions", Zelenogorsk, 19.07 – 31.07.2015.
Summer school "Lie algebras, algebraic groups and invariants theory", Samara, 22.06 – 27.06.2015.
Conference "Enveloping Algebras and Geometric Representation Theory", Oberwolfach, 10.05 – 16.05.2015.
Workshop "On the Interaction of Representation Theory with Geometry and Combinatorics", Bonn, 22.03 – 02.04.2015.
Workshop "Aspects of Lie theory", Rome, Italy, 07.01 – 10.01.2015.
Summer school/PhD-workshop on PBW filtrations of modules for Lie algebras and their appearance/applications in Representation Theory, Glasgow, 19.05–23.05.2014.
Lie algebras, algebraic groups and invariant theory, Moscow, Russia, 27.01–01.02.2014.
Representation Theory and applications to Combinatorics, Geometry and Quantum Physics, Moscow, Russia, 12.2013.
Spring School on Orbits, Primitive Ideals and Quantum Groups, Rehovot, Israel, February - March, 2013.
Symmetric Spaces and their Generalisations - II, Trento, Italy, June 2012.
Algebra and Geometry, Moscow, Russia, June 2012.
Lie Theory and quantum analogues, Marseille, France, April 2012.
Enveloping algebras and geometric representation theory, Oberwolfach, Germany, March 2012.
International workshops on Classical and Quantum Integrable Systems, Dubna, Russia, Jan 2012.
Algebraic Geometry and Derived Categories, Moscow, Russia, Sep. 2011.
Workshop on the Interaction of Representation Theory with Geometry and Combinatorics, Bonn, Germany, Mar 2011.

Lie algebras, algebraic groups and invariant theory, Moscow, Russia, Feb 2011.
 Workshop on classical and quantum integrable Systems (CQIS-2011), Protvino, Russia, Jan 2011.
 Winterschool: Topics in representation theory, Bonn, Germany, Jan 2011.
 Derived categories of algebro-geometric origin and integrable systems, Jerusalem, Israel, Dec 2010.
 Geometry and Combinatorics in Representation Theory of Lie Algebras, Cologne, Germany, Oct 2010.
 Algebraic and combinatorial approaches to representation theory, Bangalore, India, Aug 2010.
 Representation theory and quantization, Zuerich, Jan. 2010.
 Perspectives in representation theory, Cologne, September 27 - October 3, 2009.
 Structures in Lie Representation Theory, Bremen, Germany, August 16-22, 2009.
 Classical groups seen from infinity, Moscow, Russia, August 13-14, 2009.
 New Trends in Quantum Integrable Systems, Kyoto, Japan, July 27 - 31, 2009.
 Lie algebras, algebraic groups and invariants theory, Samara, Russia, June 8-15, 2009.
 String Field Theory and Related Aspects, Moscow, Russia, April 12-19, 2009.
 Algebraic Lie structures with origin in physics, Cambridge, England, March 2009.
 Enveloping algebras and geometric representation theory, Oberwolfach, Germany, March 2009.
 Representations and cohomology, Cologne, Germany, March 2009;
 Contemporary Russian mathematics, Russia, Moscow, January 2009;
 Geometry and Integrability in Mathematical Physics, Marseille, France, September 15 - 19th, 2008;
 The Geometric Langlands Program, Leiden, Holland, 7 Jul 2008 - 11 Jul 2008;
 Noncommutative Geometry Conference, Bonn, Germany, July 28 - August 1, 2008;
 Exploration of New Structures and Natural Constructions in Mathematical Physics. Nagoya, March 5-8, 2007;
 Moduli Spaces and Physics, Zurich, December 5-7, 2007;
 Transformation groups, Moscow, Decemebr 17-22, 2007,
 Affine Hecke Algebras, Langlands Programm, Conformal Field Theory and Matrix Models, Marseille, June-July 2006.

Teaching.

2020: "Algebra", HSE; "Vertex operator algebras", Skoltech.

2019: "Lie groups and Lie algebras", HSE; "Affine Kac-Moody Lie algebras", Skoltech.

2018: "Lie groups and Lie algebras", HSE; "Vertex operator algebras", Skoltech.

2017: "Affine Kac-Moody Lie algebras", "Lie groups and Lie algebras", Department of Mathematics, National Research University HSE.

2016: "Vertex operator algebras", "Discrete mathematics", Department of Mathematics, National Research University HSE.

2015: "Affine Kac-Moody Lie algebras", "Discrete mathematics", Department of Mathematics, National Research University HSE and Independent University of Moscow.

2014: "Infinite-dimensional Lie algebras and vertex operator algebras", "Discrete mathematics", Department of Mathematics, National Research University Higher School of Economics and Independent University of Moscow.

2013: "Lie groups and Lie algebras", Department of Mathematics, National Research University Higher School of Economics.

2013: "Algebra", Independent University of Moscow.

2012: "Algebra", Department of Mathematics, National Research University Higher School of Economics.

2011: "Flag varieties", Department of Mathematics, National Research University Higher School of Economics. 2005-2007: "Algebra", "Combinatorics", "Kac-Moody algebras", "Infinite-dimensional Lie algebras", "Theta functions", Independent University of Moscow.

2005-2006: "Basic representation theory", Math in Moscow program, Independent University of Moscow.

2007, 2009, 2010: "Basic algebra", "Basic representation theory", Lebedev Physics Institute.

PUBLICATION LIST

1. *Semitoric degenerations of Hibi varieties and flag varieties*, arxiv:2008.13243 (with I.Makhlin).
2. *Beilinson-Drinfeld Schubert varieties and global Demazure modules*, arXiv:2003.12930 (with I.Dumanski and M.Finkelberg).
3. *Symmetric Dellac configurations*, Journal of Integer Sequences, Vol. 23 (2020), Article 20.4.6. (with A.Bigeni).
4. *Reduced arc schemes for Veronese embeddings and global Demazure modules*, arXiv:1912.07988 (with I.Dumanski).
5. *Peter-Weyl, Howe and Schur-Weyl theorems for current groups*, arxiv:1906.03290 (with A.Khoroshkin, I.Makedonskyi).
6. *Large tensor products and Littlewood-Richardson coefficients*, J. Lie Theory 29 (2019), no. 4, 927–940.

7. *Linear degenerations of flag varieties: partial flags, defining equations, and group actions*, *Mathematische Zeitschrift* 296 (2020), no. 1, pp. 453–477 (with G. Cerulli Irelli, X. Fang, G. Fourier, M. Reineke).
8. *Symmetric Dellac configurations and symplectic/orthogonal flag varieties*, *Linear Algebra and its Applications*, vol. 573 (2019), pp. 54–79. (with A. Bigeni).
9. *Vertex algebras and coordinate rings of semi-infinite flags*, *Commun. Math. Phys.* (2019) 369: 221. (with I. Makedonskyi).
10. *Weighted PBW degenerations and tropical flag varieties*, *Communications in Contemporary Mathematics* Vol. 21, No. 01, 1850016 (2019) (with X. Fang, G. Fourier, I. Makhlin).
11. *Semi-infinite Plücker relations and Weyl modules*, *International Mathematics Research Notices*, rny121, <https://doi.org/10.1093/imrn/rny121> (with I. Makedonskyi).
12. *Representation theoretic realization of non-symmetric Macdonald polynomials at infinity*, *Journal fuer die reine und angewandte Mathematik (Crelles Journal)*, DOI: 10.1515/crelle-2019-0011 (with S. Kato and I. Makedonskyi).
13. *Generalized Weyl modules for twisted current algebras*, *Teoret. Mat. Fiz.* 192 (2017), no. 2, 284–306. (with I. Makedonskyi).
14. *Generalized Weyl modules and nonsymmetric q -Whittaker functions*, *Advances in Mathematics*, vol. 330, pp. 997–1033. (with I. Makedonskyi and D. Orr).
15. *Vertices of FFLV polytopes*, *J. Algebraic Combinatorics* 45 (2017), no. 4, 1083–1110 (with I. Makhlin).
16. *Linear degenerations of flag varieties*, *Math. Z.* 287 (2017), no. 1–2, 615–654 (with G. Cerulli Irelli, X. Fang, G. Fourier and M. Reineke).
17. *Generalized Weyl modules, alcove paths and Macdonald polynomials*, *Selecta Mathematica, New Series* (2017), vol. 23, no. 4, pp. 2863–2897 (with I. Makedonskyi).
18. *Schubert Quiver Grassmannians*, *Algebr. Represent. Theory* 20 (2017), no. 1, 147–161 (with G. Cerulli Irelli and M. Reineke).
19. *Weyl modules for $\mathfrak{osp}(1, 2)$ and nonsymmetric Macdonald polynomials*, *Mathematical Research Letters* 24 (2017), no. 3, 741–766 (with I. Makedonskyi).
20. *Degenerate affine Grassmannians and loop quivers*, *Kyoto J. Math.* Volume 57, Number 2 (2017), 445–474 (with M. Finkelberg and M. Reineke).
21. *Nonsymmetric Macdonald polynomials, Demazure modules and PBW filtration*, *Journal of Combinatorial Theory, Series A*, pp. 60–84, 2015. (with I. Makedonskyi).
22. *Extremal part of the PBW-filtration and E -polynomials*, *Adv. Math.* 282 (2015), 220–264. (with I. Cherednik).
23. *Favourable modules: Filtrations, polytopes, Newton-Okounkov bodies and flat degenerations*, *Transform. Groups* 22 (2017), no. 2, 321–352 (with G. Fourier and P. Littelmann).
24. *Homological approach to the Hernandez-Leclerc construction and quiver varieties*, *Representation Theory*, 2014, no. 18. pp. 1–14 (with G. Cerulli Irelli and M. Reineke).

25. *Desingularization of quiver Grassmannians for Dynkin quivers*, Advances in Mathematics, 2013, no. 245, pp. 182–207 (with G. Cerulli Irelli and M. Reineke).
26. *Degenerate flag varieties: moment graphs and Schröder numbers*, Journal of Algebraic Combinatorics, Volume 38, Issue 1 (2013), Page 159–189 (with G. Cerulli Irelli and M. Reineke).
27. *PBW-filtration over \mathbb{Z} and compatible bases for $V_{\mathbb{Z}}(\lambda)$ in type A_n and C_n* , Springer Proceedings in Mathematics & Statistics, Symmetries, Integrable Systems and Representations, 2013, pp. 35–63; arXiv:1204.1854 (with G. Fourier, P. Littelmann).
28. *Degenerate SL_n : representations and flag varieties*, Functional Analysis and Its Applications (2014), vol. 48, no. 1, pp. 59–71.
29. *The median Genocchi numbers, Q -analogues and continued fractions*, European Journal of Combinatorics 33 (2012), pp. 1913–1918.
30. *Quiver Grassmannians and degenerate flag varieties*, Algebra & Number Theory 6-1 (2012), 165–194 (with G. Cerulli Irelli and M. Reineke).
31. *Symplectic degenerate flag varieties*, Canadian Journal of Mathematics, vol. 66 (2014), no. 6 pp. 1250–1286 (with M.Finkelberg and P.Littelmann).
32. *Degenerate flag varieties of type A : Frobenius splitting and BWB theorem*, Mathematische Zeitschrift, vol. 275 (2013), no. 1–2, pp. 55–77 (with M.Finkelberg).
33. *Degenerate flag varieties and the median Genocchi numbers*, Mathematical Research Letters, 18 (2011), no. 6, pp. 1–16.
34. *PBW filtration and bases for symplectic Lie algebras*, International Mathematics Research Notices 2011 (24), pp. 5760–5784. (with G. Fourier, P. Littelmann).
35. \mathbb{G}_a^M *degeneration of flag varieties*, Selecta Mathematica: Volume 18, Issue 3 (2012), Page 513–537.
36. *Systems of correlation functions, coinvariants and the Verlinde algebra*, Funkts. Anal. Prilozh. 46 (2012), no. 1, pp. 49–64.
37. *Quantum continuous gl_{∞} : Tensor products of Fock modules and W_n characters*, Kyoto Journal of Mathematics, 51 (2011), no. 2. pp. 365–392 (with B. Feigin, M. Jimbo, T. Miwa, E. Mukhin).
38. *Quantum continuous gl_{∞} : Semi-infinite construction of representations*, Kyoto Journal of Mathematics, 51 (2011), no. 2, pp. 337–364, arXiv:1002.3100 (with B. Feigin, M. Jimbo, T. Miwa, E. Mukhin).
39. *PBW filtration and bases for irreducible modules in type A_n* , Transformation Groups: Volume 16, Issue 1 (2011), 71–89 (with G. Fourier, P. Littelmann).
40. *Zhu’s algebra and the C_2 -algebra in the symplectic and the orthogonal cases*, J. Phys. A: Math. Theor. 43 (2010) 135206 (with P. Littelmann).
41. *Zhu’s algebras, C_2 -algebras and abelian radicals*, Journal of Algebra 329 (2011) 130–146 (with B. Feigin, P. Littelmann).

42. *Givental symmetries of Frobenius manifolds and multi-component KP tau-functions*, Advances in Mathematics 224 (2010), pp. 1031-1056 (with J. van de Leur, S.Shadrin).
43. *Fermionic formulas for eigenfunctions of the difference Toda Hamiltonian*, arXiv:0812.2306, Letters in Mathematical Physics: Volume 88, Issue 1 (2009), pp.39-77 (with B. Feigin, M. Jimbo, T. Miwa, E. Mukhin).
44. *The PBW Filtration, Demazure Modules and Toroidal Current Algebras*, SIGMA 4 (2008), 070, 21 pages.
45. *$N = 1$ formal genus 0 Gromov-Witten theories and Givental's formalism*, Journal of Geometry and Physics 59 (2009) pp. 1127-1136.
46. *Principal $\widehat{sl}(3)$ subspaces and quantum Toda Hamiltonian*, Advances in Pure Mathematics 54, Algebraic Analysis and Around, pp. 109-166, 2009 (with B. Feigin, M. Jimbo, T. Miwa, E. Mukhin).
47. *Fermionic formulas for $(1,p)$ logarithmic model characters in $\Phi_{2,1}$ quasi-particle realization*, Advanced Studies in Pure Mathematics 61, 161–184 (2011) (with B.Feigin, I.Tipunin).
48. *The PBW filtration*, MPIM 2007-14, Represent. Theory 13 (2009), 165-181.
49. *Infinite fusion products and \widehat{sl}_2 cosets*, Journal of Lie Theory, vol. 17 (2007), pp. 145-161.
50. *Two dimensional current algebras and affine fusion product*, J. Algebra 313 (2007), no. 1, 176–198 (with B. Feigin).
51. *Bosonic formulas for affine branching functions*, Funktsional. Anal. i Prilozhen. 42 (2008), no. 1, 63–77, 96.
52. *A $\phi_{1,3}$ -filtration on the Virasoro minimal series $M(p, p')$ with $1 < p'/p < 2$* , Publ. Res. Inst. Math. Sci. 44 (2008), no. 2, 213–257 (with B. Feigin, M. Jimbo, T. Miwa, Y. Takeyama).
53. *Principal subspace for the bosonic vertex operator $\phi_{\sqrt{2m}}(z)$ and Jack polynomials*, Advances in Mathematics, Volume 206 (2006), Issue 2, pp. 307-328 (with B. Feigin).
54. *Homological realization of restricted Kostka polynomials*, Int. Math. Res. Not. 2005, no. 33, 1997–2029 (with B. Feigin).
55. *Schubert varieties and the fusion products: the general case*, Int. Math. Res. Not. 2004, no. 59, 3153-3175.
56. *Schubert varieties and the fusion products*, Publ. Res. Inst. Math. Sci. 40 (2004), no. 3, 625–668 (with B. Feigin).
57. *Integrable \widehat{sl}_2 -modules as infinite tensor products*, Fundamental mathematics today, O. Sheinman, S. Lando eds., 304–334, Independent University of Moscow, 2003 (in Russian) (with B. Feigin).
58. *Q -characters of the tensor products in sl_2 -case*, Mosc. Math. J. 2 (2002), no. 3, 567–588 (with B. Feigin).