

Curriculum Vitae

Lev A. Borisov

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Personal

Born in 1971 in Minsk, Belarus
US citizen

Education

5/96	PhD in mathematics, University of Michigan Advisor: Igor Dolgachev. Thesis title: <i>A finiteness theorem for subgroups of $Sp(4, \mathbb{Z})$</i>
6/92	BS in mathematics Moscow State University, Russia

Professional Experience

Since 7/09	Professor I Rutgers University
Since 7/17	graduate program director Rutgers University
9/16-5/17	Member Institute for Advanced Study
4/08-7/09	Professor University of Wisconsin, Madison
7/04-3/08	Associate Professor University of Wisconsin, Madison
7/02-6/04	Assistant Professor University of Wisconsin, Madison
9/97-6/02	Ritt Assistant Professor Columbia University
8/96-7/97	Postdoctoral Fellow Mathematical Sciences Research Institute Berkeley, California
1/94-5/95	Teaching Assistant University of Michigan

Research specialty

Algebraic geometry and related areas

Awards

11/17	AMS fellow, class of 2018, for contributions to algebraic geometry and mirror symmetry
9/16-12/16	Simons Foundation Fellowship
9/16-8/19	NSF grant DMS-1601907
5/12-4/15	NSF grant DMS-1201466
5/08-4/11	NSF grant DMS-0758480
5/05-4/08	NSF grant DMS-0456801
4/02-3/05	NSF grant DMS-0140172
8/96-7/97	MSRI Postdoctoral Research Fellowship
9/95-5/96	Alfred P. Sloan Doctoral Dissertation Fellowship
7/87	First prize at the International Math Olympiad

Graduate Student Advising

Michael Rose, PhD defended Summer 2007
Zheng Hua, PhD defended Spring 2009
Hanjun Kim, PhD defended Summer 2009
Zhan Li, PhD defended Spring 2014
Howard Nuer, PhD defended Spring 2016

Publications

- , *Class of the affine line is a zero divisor in the Grothendieck ring, to appear in J. Alg. Geom.*
- , Z. Li, *On Clifford double mirrors of toric complete intersections, Adv. Math. 328 (2018), 300-355.*
- , P. Neff, S. Sra, C. Thiel, *The sum of squared logarithms inequality in arbitrary dimensions, Linear Algebra Appl. 528 (2017), 124-146.*
- , H. Nuer, *On $(2, 4)$ complete intersection threefolds that contain an Enriques surface, Math. Z. 284 (2016), no. 3-4, 853-876.*
- , *Classical algebraic geometry: a modern view [book review]. Bull. Amer. Math. Soc. (N.S.) 52 (2015), no. 1, 129-134.*
- , P. Horja, *Applications of homological mirror symmetry to hypergeometric systems: duality conjectures, Adv. Math. 271 (2015), 153-187.*
- , Z. Li, *On complete intersections with trivial canonical class, Adv. Math. 268 (2015), 339-349.*
- , *On stringy cohomology spaces, Duke Math. J. 163 (2014), no. 6, 1105-1126.*
- , P. Gunnells, *On Hilbert modular threefolds of discriminant 49, Selecta Math. (N.S.) 19 (2013), no. 4, 923-947.*

- , *Berglund-Hübsch mirror symmetry via vertex algebras*, *Comm. Math. Phys.* 320 (2013), no. 1, 73-99.
- , R.P. Horja, *On the better behaved version of the GKZ hypergeometric system*, with R.P. Horja, *Math. Ann.* 357 (2013), no. 2, 585-603.
- , R. Kaufmann, *On CY-LG correspondence for (0,2) toric models*, *Adv. Math.* 230 (2012), no. 2, 531-551.
- , R. Jin, *Finding integral diagonal pairs in a two dimensional N-set*, *Proc. Amer. Math. Soc.* 139 (2011), no. 7, 2431-2434.
- , S. Salamon, J. Viaclovsky, *Twistor geometry and warped product orthogonal complex structures*, *Duke Math. Journal*, 156 (2011), no. 1, 125-166.
- , J. Viaclovsky, *Threefolds of order one in the six-quadric*, *Proceedings of the Steklov Institute of Mathematics*, 264 (2009), 18-29.
- , Z. Hua, *On the conjecture of King for smooth toric Deligne-Mumford stacks*, *Adv. Math.* 221 (2009), no. 1, 277-301.
- , Andrei Caldararu, *The Pfaffian-Grassmannian derived equivalence*, *J. Algebraic Geom.* 18 (2009), no. 2, 201-222.
- , A. Libgober, *Higher elliptic genera*, *Math. Res. Lett.* 15 (2008), no. 3, 511-520.
- , Z. Hua, *On Calabi-Yau threefolds with large nonabelian fundamental groups*, *Proc. Amer. Math. Soc.* 136 (2008), no. 5, 1549-1551.
- , R.P. Horja, *Mellin-Barnes integrals as Fourier-Mukai transforms*, *Adv. Math.* 207 (2006), no. 2, 876-927.
- , R.P. Horja, *On the K-theory of smooth toric DM stacks*, *Snowbird lectures on string geometry*, 21-42, *Contemp. Math.*, 401, Amer. Math. Soc., Providence, RI, 2006.
- , *On Wronskians of weight one Eisenstein series*, *J. Number Theory* 121 (2006), no. 1, 132-152.
- , *Holomorphic Eisenstein series with Jacobian twists*, *Algebraic geometry*, 1-15, *Contemp. Math.*, 422, Amer. Math. Soc., Providence, RI, 2007.
- , L. Chen, G. Smith, *The orbifold Chow ring of toric Deligne-Mumford stacks*, *J. Amer. Math. Soc.* 18 (2005), no. 1, 193-215.
- , A. Libgober, *McKay correspondence for elliptic genera*, *Annals of Math.* 161 (2005), No. 3, 1521-1569.
- , *Higher Stanley-Reisner rings and Toric Residues*, *Compositio Math.* 141 (2005), no. 1, 161-174.
- , *Chiral rings of vertex algebras of mirror symmetry*, *Math. Z.*, 248 (2004), 3, 567-591.
- , E. Mukhin, *Self-self-dual spaces of polynomials*, *Adv. Math.*, 190 (2004), no. 1, 77-118.
- , A. R. Mavlyutov, *String cohomology of Calabi-Yau hypersurfaces*

- via Mirror Symmetry, *Adv. Math.* 180 (2003), no. 1, 355-390.
- , P. E. Gunnells, Toric modular forms of higher weight, *J. Reine Angew. Math.* 560 (2003), 43-64.
- , A. Libgober, Elliptic genera of singular varieties, orbifold elliptic genus and chiral deRham complex, *Mirror symmetry, IV* (Montreal, QC, 2000), 325-342, *AMS/IP Stud. Adv. Math.*, 33, Amer. Math. Soc., Providence, RI, 2002.
- , A. Libgober, Elliptic genera of singular varieties, *Duke Math. J.* 116 (2003), no. 2, 319-351.
- , P. E. Gunnells, Wonderful blowups associated to group actions, *Selecta Math.* 8 (2002), no. 3, 373-379.
- , P. E. Gunnells, S. Popescu, Elliptic functions and equations of modular curves, *Math. Ann.* 321 (2001), no. 3, 553-568.
- , P. E. Gunnells, Toric modular forms and nonvanishing of L-functions, *J. Reine Angew. Math.* 539 (2001), 149-165.
- , P. E. Gunnells, Toric varieties and modular forms, *Invent. Math.* 144 (2001), no. 2, 297-325.
- , Vertex algebras and mirror symmetry, *Comm. Math. Phys.* 215 (2001), no. 3, 517-557.
- , A. Libgober, Elliptic genera of toric varieties and applications to mirror symmetry, *Invent. Math.* 140 (2000), no. 2, 453-485.
- , String cohomology of a toroidal singularity, *J. Algebraic Geom.* 9 (2000), no. 2, 289-300.
- , A finiteness theorem for subgroups of $\mathrm{Sp}(4, \mathbb{Z})$, *Algebraic geometry*, 9, *J. Math. Sci. (New York)* 94 (1999), no. 1, 1073-1099.
- , M. B. Halpern, C. Schweigert, Systematic approach to cyclic orbifolds, *Internat. J. Modern Phys. A* 13 (1998), no. 1, 125-168.
- V. V. Batyrev, —, Mirror duality and string-theoretic Hodge numbers, *Invent. Math.* 126 (1996), no. 1, 183-203.
- V. V. Batyrev, —, On Calabi-Yau complete intersections in toric varieties, *Higher-dimensional complex varieties* (Trento, 1994), 39-65, de Gruyter, Berlin, 1996.
- V. V. Batyrev, —, Dual cones and mirror symmetry for generalized Calabi-Yau manifolds, *Mirror symmetry, II*, 71-86, *AMS/IP Stud. Adv. Math.*, 1, Amer. Math. Soc., Providence, RI, 1997.
- A. A. Borisov, —, Singular toric Fano three-folds, *Russian Acad. Sci. Sb. Math.* 75 (1993), no. 1, 277-283.

Preprints

- , S.-K. Yeung, Explicit equations of the Cartwright-Steger surface, (16 pages), *arXiv:1804.00737*.
- , J. Keum, Explicit equations of a fake projective plane, (25 pages),

arXiv:1802.06333.

- , J. Keum, *Research announcement: equations of a fake projective plane*, (2 pages + 2 pages tables), *arXiv:1710.04501*.
- , A. Caldararu, A. Perry, *Intersections of two Grassmannians in \mathbb{P}^9* , (28 pages), *arXiv:1707.00534*.
- , A. Fischle, P. Neff, *Optimality of the relaxed polar factors by a characterization of the set of real square roots of real symmetric matrices*, (26 pages), *arXiv:1606.09085*.
- , H. Nuer, *Ulrich Bundles on Enriques Surfaces*, (12 pages), *arXiv:1606.01459*.
- , A. Libgober, *Stringy E-functions of Pfaffian-Grassmannian double mirrors*, (33 pages), *arXiv:1502.03702*.
- E. Bach, —, *Absorption Probabilities for the Two-Barrier Quantum Walk*, *arXiv:0901.4349*.
- , *Introduction to the vertex algebra approach to mirror symmetry*, *math.AG/9912195*.
- , *Towards the Mirror Symmetry for Calabi-Yau complete intersections in Gorenstein Toric Fano Varieties*, *math.AG/9310001*.

Seminar/colloquium talks

Columbia University, IAS, Massachusetts Institute of Technology, Northwestern University, Princeton University, Rutgers University, University of Illinois at Chicago, University of Illinois at Urbana-Champaign, University of Michigan at Ann Arbor, University of Wisconsin-Madison, Kansas State University, Boston University, McGill University, SUNY at Binghamton, SUNY at Stony Brook, University of Minnesota, University of Pennsylvania, Yale University, Indiana University-Purdue University Indianapolis, Oklahoma State University, University of Massachusetts at Amherst, University of Utah

Miscellaneous

- Co-organizer of AGNES conference at Rutgers, April 13-15, 2018*
- Co-organizer of Geometry, Symmetry and Physics seminar at Rutgers University*
- Co-organizer of algebraic geometry seminar at University of Wisconsin 9/2005–5/2009*
- Afternoon talk at Summer Institute in Algebraic Geometry*
- Talks at Oberwolfach, MSRI*
- Co-organizer of math/physics seminar at University of Wisconsin in 2002-2003 academic year*
- Co-organizer of a syzygies seminar at Columbia University in 2001-2002 academic year*

*Co-organizer of the algebraic geometry section of AMS meeting
at Columbia University in November of 2000
Reviewer for Mathematical Reviews, referee for various journals
Editor of the Proceedings of AMS, June 2010-January 2018*