

CURRICULUM VITAE

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Born: May 21, 1987, Kharkiv, Ukraine
Citizenship: Ukraine, US permanent resident

Research Interests • Representation theory and its connection to Algebraic geometry

Employment

- Assistant Professor
Purdue University 2020–present
- Gibbs Assistant Professor
Yale University 2017–2020
- Research Assistant Professor
Simons Center for Geometry and Physics 2014–2017

Education

- PhD in Mathematics, Massachusetts Institute of Technology 2009–2014
Thesis title: *The affine Yangian of \mathfrak{gl}_1 and the infinitesimal Cherednik algebras*
Thesis advisor: Prof. P.I. Etingof
- MS in Mathematics, Moscow State University (summa cum laude) 2004–2009
Thesis title: *Heisenberg action in the equivariant K -theory of Hilbert schemes via shuffle algebra*
Thesis advisor: Prof. E.B. Vinberg
- MS in Mathematics, Independent University of Moscow 2004–2009
Thesis title: *Quantum affine Gelfand-Tsetlin bases and quantum toroidal algebra via K -theory of affine Laumon spaces*
Thesis advisor: Prof. B.L. Feigin

Research Visits

- Institut des Hautes Études Scientifiques (IHES) May–July 2020
Bures-sur-Yvette, France *Cancelled due to COVID-19*
- Institut des Hautes Études Scientifiques (IHES) June–July 2019
Bures-sur-Yvette, France
- Kavli Institute for the Physics and Mathematics of the Universe (IPMU) and Research Institute for Mathematical Sciences (RIMS) August 2018
Kashiwa and Kyoto, Japan
- Max Planck Institut für Mathematik (MPIM) July 2018
Bonn, Germany
- Institut des Hautes Études Scientifiques (IHES) June–July 2017
Bures-sur-Yvette, France
- Max Planck Institut für Mathematik (MPIM) June–July 2016
Bonn, Germany
- Max Planck Institut für Mathematik (MPIM) June 2015
Bonn, Germany

- Research Institute for Mathematical Sciences (RIMS) January 2015
Kyoto, Japan
 - Hebrew University of Jerusalem Fall 2010
Jerusalem, Israel
- Grants, Awards and Fellowships**
- NSF grant DMS-2001247 (changed to DMS-2037602 in 2020) 2020–2023
 - Yale Travel Grant 2019–2020
 - Yale Travel Grant 2018–2019
 - NSF grant DMS-1502497 (changed to DMS-1821185 in 2017) 2015–2019
 - SUNY Individual Development Award 2015–2016
 - JSPS Fellowship for Foreign Researchers Winter 2015
 - Akamai Presidential Fellowship, MIT 2009–2010
 - Dobrushin Fellowship, Independent University of Moscow Fall 2008
 - Dobrushin Fellowship, Independent University of Moscow Spring 2008
 - Dobrushin Fellowship, Independent University of Moscow Spring 2007
 - Silver Medal at the 45th International Mathematical Olympiad July 2004

Publication List

- *Lax matrices from antidominantly shifted Yangians and quantum affine algebras*
joint with R. Frassek and V. Pestun
Submitted; arXiv:2001.04929 (54pp, last update on 01/14/2020)
- *Shuffle algebra realizations of type A super Yangians and quantum affine superalgebras for all Cartan data*
Letters in Mathematical Physics (2020), 29pp
DOI: 10.1007/s11005-020-01287-9
- *Duality of Lusztig and RTT integral forms of $U_v(\mathcal{L}\mathfrak{sl}_n)$*
Journal of Pure and Applied Algebra (2020), 14pp
DOI: 10.1016/j.jpaa.2020.106469
- *Shifted quantum affine algebras: integral forms in type A*,
joint with M. Finkelberg (with appendices joint with A. Weekes)
Arnold Mathematical Journal 5 (2019), no. 2, 197–283
- *PBWD bases and shuffle algebra realizations for $U_v(\mathcal{L}\mathfrak{sl}_n)$, $U_{v_1, v_2}(\mathcal{L}\mathfrak{sl}_n)$, $U_v(\mathcal{L}\mathfrak{sl}(m|n))$ and their integral forms*
Submitted; arXiv:1808.09536 (31pp, last update on 05/20/2019)
- *On Sevostyanov’s construction of quantum difference Toda lattices*,
joint with R. Gonin
International Mathematics Research Notices (2019), 61pp
DOI: 10.1093/imrn/rnz083
- *Multiplicative slices, relativistic Toda and shifted quantum affine algebras*,
joint with M. Finkelberg
Representations and Nilpotent Orbits of Lie Algebraic Systems
(special volume in honour of the 75th birthday of Tony Joseph)
Progress in Mathematics 330 (2019), 133–304

- *Homomorphisms between different quantum toroidal and affine Yangian algebras*,
joint with M. Bershtein
Journal of Pure and Applied Algebra 223 (2019), no. 2, 867–899
- *Several realizations of Fock modules for toroidal $\ddot{U}_{q,d}(\mathfrak{sl}_n)$*
Algebras and Representation Theory 22 (2019), no. 1, 177–209
- *Classical limits of quantum toroidal and affine Yangian algebras*
Journal of Pure and Applied Algebra 221 (2017), no. 10, 2633–2646
- *The affine Yangian of \mathfrak{gl}_1 revisited*
Advances in Mathematics 304 (2017), 583–645
- *Bethe subalgebras of $U_q(\widehat{\mathfrak{gl}}_n)$ via shuffle algebras*,
joint with B. Feigin
Selecta Mathematica (New Series) 22 (2016), no. 2, 979–1011
- *Infinitesimal Hecke algebras of \mathfrak{so}_N*
Journal of Pure and Applied Algebra 219 (2015), no. 6, 2046–2061
- *Infinitesimal Cherednik algebras as W -algebras*,
joint with I. Losev
Transformation Groups 19 (2014), no. 2, 495–526
- *Representations of infinitesimal Cherednik algebras*,
joint with F. Ding
Representation Theory (electronic) 17 (2013), 557–583
- *Equivariant K -theory of Hilbert schemes via shuffle algebra*,
joint with B. Feigin
Kyoto Journal of Mathematics 51 (2011), no. 4, 831–854
- *Quantum affine Gelfand–Tsetlin bases and quantum toroidal algebra via K -theory of affine Laumon spaces*
Selecta Mathematica (New Series) 16 (2010), no. 2, 173–200

Teaching Experience

- Lecturer for *Calculus of Functions of Several Variables* (Yale) Fall 2019
- Lecturer for *Shuffle approach towards quantum toroidal algebras* (Crash-course, Tokyo University of Marine Science and Technology) March 2019
- Lecturer for *Infinite dimensional Lie algebras and applications* (Yale) Spring 2019
- Lecturer for *Introduction to Representation Theory* (Yale) Fall 2018
- Lecturer for *Calculus of Functions of Several Variables* (Yale) Fall 2018
- Lecturer for *Topics in Quantum Groups* (Yale) Spring 2018
- Lecturer for *Calculus of Functions of Several Variables* (Yale) Fall 2017
- Head instructor for *Mathematical Thinking* (Stony Brook) Fall 2016
- Lecturer for *Calculus B* (Stony Brook) Fall 2015
- Section leader for *Calculus IV with Applications* (Stony Brook) Fall 2014
- Teaching assistant for *Real Analysis* (MIT) Spring 2014
- Section leader for *Multivariable Calculus* (MIT) Fall 2012
- Grader for the following courses at MIT: 2011–2013
Real and Functional Analysis, Calculus, Commutative Algebra, Introduction to Arithmetic Geometry, Algebraic Groups

Mentoring Experience

- Mentor in the *Directed Reading Program* at MIT Winter 2014
- Mentor in the *MIT PRIMES* program for high school students 2011–2013
(With our project, F. Ding won the 4th Prize at 2012 Intel STS US national competition and became 2012 Davidson Fellow Laureate)

Talks

- UMass Amherst, Representation Theory Seminar March 2020
- UC Berkeley, String-Math Seminar September 2019
- ETH, Conference “Representation Theory and Integrable Systems” August 2019
Zurich, Switzerland
- Yale University, Geometry, Symmetry and Physics Seminar March 2019
- Auburn University, Spring 2019 Southeast AMS meeting March 2019
Special session “Geometric Methods in Representation Theory”
- Tokyo University of Marine Science and Technology, 3 talks March 2019
Crash-course “Shuffle approach towards quantum toroidal algebras”
Tokyo, Japan
- Tokyo University, 2 talks at Workshop “Infinite Analysis 2019: March 2019
Quantum Symmetries and Integrable Systems”
Tokyo, Japan
- SCGP, Workshop “Vertex Algebras and Gauge Theory” December 2018
- Columbia University, Informal Mathematical Physics Seminar December 2018
- U. Wisconsin-Madison, Algebra and Algebraic Geometry Seminar October 2018
- MIT, Geometric Representation Theory Seminar September 2018
- RIMS, Representation Theory Seminar August 2018
Kyoto, Japan
- IPMU, Mathematics–String Theory Seminar August 2018
Kashiwa, Japan
- CIME School “Geometric Representation Theory and Gauge Theory” June 2018
Cetraro, Italy
- Fields Institute, Geometric Representation Theory Seminar April 2018
Toronto, Canada
- Yale University, Geometry, Symmetry and Physics Seminar November 2017
- Ohio State University, Representations and Lie algebras Seminar August 2017
- QGM, QGM weekly seminar June 2017
Aarhus, Denmark
- MIT, Geometric Representation Theory Seminar May 2017
- ESI, Conference “Geometry and Representation Theory” January 2017
Vienna, Austria
- UC Davis, Algebra and Discrete Mathematics Seminar November 2016
- Brown University, Theoretical Physics Seminar November 2016
- Uppsala Universitet, Representation Theory Conference 2016 June 2016
Uppsala, Sweden

- Northeastern University
Geometry, Physics, and Representation theory Seminar March 2016
- SCGP, Program “Geometric representation theory” January 2016
- Temple University, Algebra Seminar November 2015
- Yale University, Geometry, Symmetry and Physics Seminar April 2015
- Tokyo University, Infinite Analysis Seminar
Tokyo, Japan January 2015
- RIMS, Representation Theory Seminar
Kyoto, Japan January 2015
- CUNY, Representation Theory Seminar October 2014
- Northeastern University, Graduate student seminar April 2014
- MIT-NEU, Graduate seminar on
Quantum cohomology and Representation theory February 2014
- ETH Zurich, Talks in theoretical sciences
Zurich, Switzerland November 2013
- Northeastern University, Graduate student seminar April 2013
- Harvard-MIT, Graduate student seminar in
Geometric Representation theory April 2012
- Harvard-MIT, Graduate student seminar in
Geometric Representation theory September 2011
- Harvard-MIT, Graduate student seminar April 2011
- Harvard-MIT, Graduate student seminar February 2011
- Hebrew University, Representation theory Seminar
Jerusalem, Israel October 2010
- Boston University, Geometry Seminar April 2010
- MIT, Infinite Dimensional Algebra Seminar March 2010
- Clay Mathematics Institute
Workshop “Macdonald Polynomials and Geometry” March 2010

**Professional
Activities**

- **Editorial service**
Referee for the following journals:
 - Advances in Mathematics
 - Annales scientifiques de l’École normale supérieure
 - Communications in Mathematical Physics
 - International Mathematics Research Notices
 - Journal de l’École polytechnique–Mathématiques
 - Journal of Algebra
 - Journal of Algebra and its Applications
 - Letters in Mathematical Physics

- Moscow Mathematical Journal
- Publications Mathématiques de l’IHÉS
- Representation Theory (electronic journal of the AMS)
- Selecta Mathematica (New Series)
- SIGMA
- Transformation Groups

Reviewer for:

- Mathematical Reviews

- **Grant reviews**

Served on the NSF review panel 2016

- **Seminars**

– Organized *SCGP Postdoc* seminar 2015–2016

– Coorganizing Yale seminar *Geometry, Symmetry and Physics* 2017–2020

- **Conferences organized**

– Coorganized AMS Sectional Meeting at Purdue University April 4-5, 2020
Cancelled due to COVID-19