BORIS TSVELIKHOVSKIY

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University of Pittsburgh, Department of Mathematics, Pittsburgh, PA, 15213 (857)-364-7982

EDUCATION

Northeastern University, Boston, USA *Jan 2015 - Jul 2020*
PhD in Mathematics
Thesis title: On Categories $\mathcal{O}$ of quiver varieties overlying the bouquet graphs
Thesis advisor: Ivan Losev
Academic advisor: Gordana Todorov

National Research University Higher School of Economics, Moscow, Russia *Sep 2012 - Jul 2014*
M.Sc. in Mathematics
Thesis title: Shuffle algebras with two shifts and Catalan numbers
Thesis advisor: Boris Feigin

TECHNICAL SKILLS

Programming: C#, Python
Languages: English, German, Russian

PROJECTS (AVAILABLE IN GITHUB)

Voting Manipulability
- We provide and explain the codes used for finding the share of manipulable outcomes for scoring voting rules with different weights.

WORK EXPERIENCE

Postdoctoral researcher, University of Pittsburgh *August 2020 -*

Research Assistant, International Laboratory of Representation Theory and Math. Physics *September 2013 - August 2015*

Research Assistant, International Laboratory of Decision Choice and Analysis *September 2012 - August 2014*

PUBLICATIONS AND PREPRINTS

1. (with K. Kaveh and C. Manon) *Toric vector bundles over a discrete valuation ring and Bruhat-Tits buildings*, arXiv:2208.04299
2. *The universe inside Hall algebras of coherent sheaves on toric resolutions*, arXiv:2201.07847
3. *On categories $\mathcal{O}$ of quiver varieties overlying the bouquet graphs*, arXiv:1911.08463, to appear in Represent. Theory, Amer. Math. Soc.
4. *On Poincare polynomials of shuffle algebra representations*, arXiv:1911.11115
5. *Nontrivial Topological Quandles*, arXiv:1811.00886, to appear in Arnold Mathematical Journal
6. (with M. Elhamdadi and N. Fernando) *Ring theoretic aspects of quandles*, Journal of Algebra, **526** (2019), pages 166-187, arXiv:1805.05908
7. (with M. Diss) *Manipulable outcomes within the class of scoring voting rules*, Mathematical Social Sciences, **111** (2021), pages 11-18, arXiv:1911.09173
8. (with D. Matvieievskyi) *Soergel's* **V** *and the Kazhdan-Lusztig conjecture*, chapter in Introduction to Soergel bimodules, RSME Springer Series, **5** (2020)

TEACHING

I have served as an instructor for Algebra I, Precalculus, Calculus I-III and Calculus for Business classes in Northeastern University, University of Pittsburgh and Suffolk University on multiple occasions. I have developed the programs and served as an instructor for

- Quantum Information Theory

  https://sites.pitt.edu/ bdt18/StatisticsAndStochasticProcesses

- Introduction to Cryptography

  https://sites.pitt.edu/ bdt18/IntrotoCryptography.html

- Statistics and Stochastic Processes

  https://sites.pitt.edu/ bdt18/StatisticsAndStochasticProcesses.html

SEMINARS ORGANIZED

In Fall 2021 I have served as an organizer of a learning seminar on affine Grassmannians. The materials can be found at https://sites.pitt.edu/ bdt18/AffineGrassmannian.html

RESEARCH INTERESTS

1. Representation theory and its interactions with algebraic geometry and combinatorics.
2. Cryptography and quantum information theory.
3. Machine Learning.

PRESENTATIONS AND TALKS

2022 Images of skyscraper sheaves on toric resolutions: cohomology distribution, Algebra, Combinatorics and Geometry seminar, University of Pittsburgh

2021 Nakajima quiver varieties & affine Grassmannians, Seminar on Affine Grassmanians, University of Pittsburgh

2021 Mirkovic-Vilonen cycles and polytopes, Seminar on Affine Grassmanians, University of Pittsburgh

2021 Introduction to affine Grassmannians, Seminar on Affine Grassmanians, University of Pittsburgh

2021 On G-Hilbert schemes and McKay Correspondence, Algebra, Combinatorics and Geometry seminar, University of Pittsburgh

2020 On categories $\mathcal{O}$ of quiver varieties overlying the bouquet graphs, Representation theory seminar, University of Massachusetts, Amherst

2020 On G-Hilbert schemes and McKay Correspondence, GASG seminar, Northeastern University

2019 On categories $\mathcal{O}$ for conical symplectic resolutions, GASG seminar, Northeastern University

2018 Ring theoretic aspects of quandles, University of South Florida, Tampa, FL, USA

2017 Soergel bimodules, Hecke algebras, and Kazhdan-Lusztig basis, MIT-NEU graduate seminar on category $\mathcal{O}$ and Soergel bimodules

2017 Shuffle algebras vs Elliptic Hall Algebras, MIT-NEU graduate seminar on Double Affine Hecke Algebras and Elliptic Hall Algebras

2016 A geometric Littlewood-Richardson rule, NEU graduate seminar

2015 Gieseker moduli space of sheaves on $\mathbb{P}^2$ as a Nakajima quiver variety, MIT-NEU graduate seminar on quiver varieties