Shiyun Wang

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Curriculum Vitae

Employment

2023-now	Dunham Jackson Assistant Professor, University of Minnesota (UMN), USA
	Advisor: Pavlo Pylyavskyy

Education

2018-2023	Ph.D. in Mathematics, University of Southern California (USC), USA
	Advisor: Greta Panova
2015-2018	M.S. in Mathematics, California State University Long Beach (CSULB), USA
	Advisor: Joshua Sack
2012-2014	Master of Public Administration, USC, USA
2008-2012	B.A. in Management, Central South University (CSU), China

Research Interests

Algebraic and enumerative combinatorics. Tableaux combinatorics. Symmetric functions and quasisymmetric functions with relation to representation theory. Hopf algebra. 0-Hecke algebra. Dual equivalence graph. Crystal graphs. Kostant partition function. Quiver representations.

Papers

1. *Kirillov-Reshetikhin dual equivalence graphs* (with J. McDonough, P. Pylyavskyy). arXiv: 2510.24490, 2025.
2. *The support of Kostant's weight multiplicity formula is an order ideal in the weak Bruhat order* (with P. Anderson, E. Banaian, M. Ferreri, O. Goff, K. Hadaway, P. Harris, K. Harry, N. Mayers, A. Wilson). To appear in the Journal of Combinatorics, 2026.
3. *The Stanley-Stembridge Conjecture for 2+1+1-avoiding unit interval orders: a diagrammatic proof* (with J. McDonough, P. Pylyavskyy). arXiv:2404.07280, 2024.
4. *0-Hecke modules for row-strict dual immaculate functions* (with E. Niese, S. Sundaram, S. van Willigenburg, J. Vega). Trans. Amer. Math. Soc. 377, 2525-2582, 2024.
5. *Pieri rules for skew dual immaculate functions* (with E. Niese, S. Sundaram, S. van Willigenburg). Canadian Mathematical Bulletin. 67(4):902–914, 2024.
6. *Row-strict dual immaculate functions* (with E. Niese, S. Sundaram, S. van Willigenburg, J. Vega). Advances in Applied Mathematics. 149: 102540, 2023.
7. *The e-positivity of the chromatic symmetric functions and the inverse Kostka matrix.* arXiv:2210.07567, 2022.
8. *Row-strict dual immaculate functions and 0-Hecke modules* (with E. Niese, S. Sundaram, S. van Willigenburg, J. Vega). Poster presentation at FPSAC 2022. Extended abstract published in *Sém. Lothar. Combin*, 86B, Art. #6, 12 pp, 2022.
9. *Connection between graphical potential games and Markov random fields with an extension to Bayesian networks.* Master thesis at CSULB, 2018.

Research in Progress

- Varieties of Quiver representations and juggling sequences (with P. Anderson, E. Banaian, M. Ferreri, N. Mayers, A. Wilson).
- The q-analog of the Kostant multiplicity formula and the independence systems of the Weyl alternation set (with P. Anderson, E. Banaian, M. Ferreri, O. Goff, K. Hadaway, P. Harris, K. Harry, N. Mayers, A. Wilson).
- The characters of the Kirillov-Reshetikhin dual equivalence graphs (with J. McDonough, P. Pylyavskyy).
- The Bernstein–Sato polynomials for elementary symmetric functions (with S. Dasher, I. Bailly-Hall, N. Parenteau, V. Reiner, U. Walther, S. Zhang).

Conference and Seminar Talks

2025 May	CanaDAM in Ottawa, contributed minisymposia: Recent Advances in Enumerative and Geometric Combinatorics on Graphs
2025 May	CanaDAM in Ottawa, invited minisymposia: Algebraic Combinatorics
2024 Apr	SoCalDM at UCLA
2024 Mar	UMN Combinatorics Seminar
2023 Jun	CanaDAM in Winnipeg, Manitoba: Special Session on Generalizations of the Chromatic Polynomial
2023 May	UMN Combinatorics Seminar
2023 Apr	CSULB Mathematics Colloquium
2023 Jan	University of British Columbia Discrete Math Seminar
2023 Jan	JMM in Boston: AMS Special Session on Research Community in Algebraic Combinatorics
2022 Nov	USC Combinatorics Seminar
2022 Nov	USC Graduate Colloquium
2018 Jan	JMM in San Diego: AMS Special Session on Research in Mathematics by Early Career Graduate Students
2017 Nov	CSULB Graduate Research Conference

Teaching Experience

Instructor:

UMN

2025 Fall	MATH 4707: Introduction to Combinatorics and Graph Theory
2025 Spring	MATH 4707: Introduction to Combinatorics and Graph Theory
2024 Fall	MATH 4281: Modern Algebra
2024 Spring	MATH 5251: Error-Correcting Codes, Finite Fields, Algebraic Curves
2023 Fall	MATH 4707: Introduction to Combinatorics and Graph Theory
2023 Fall	MATH 5251: Error-Correcting Codes, Finite Fields, Algebraic Curves

UCLA

2022 Summer	S1stem2: Introduction to Mathematics for Business and Economics

USC

2022 Spring	Math 040: Basic Mathematical Skills

Mentor:
 UMN
 2024 Summer   REU Program in Combinatorics and Algebra

Mentees: Serena An, Katherine Tung, Yuchong Zhang

Preprints:

1. Newton polytopes of dual Schubert polynomials (arXiv: 2411.16654).

2. Postnikov-Stanley polynomials are Lorentzian (arXiv: 2412.02051).

Teaching Assistant:
 USC

2022 Fall	Math 225: Linear Algebra and Linear Differential Equations
2022 Summer	Math 126: Calculus 2
2021 Fall	Math 225: Linear Algebra and Linear Differential Equations
2021 Spring	Math 125: Calculus 1
2020 Fall	Math 125: Calculus 1
2020 Spring	Math 118: Fundamental Principles of Calculus
2019 Spring	Math 108: Contemporary Precalculus
2018 Fall	Math 117: Introduction to Mathematics for Business and Economics

Fellowships & Awards

2023-2025	UMN Math Postdoc Professional Travel Funds
2023	AMS Graduate Student Travel Grants
2022	Workshop Fellowship at the Institute for Computational and Experimental Research in Mathematics, Brown University
2022	Graduate School Summer Research and Writing Grants, USC
2018-2023	Dornsife College Graduate Merit Fellowship, USC
2018	Graduate Dean's List of University Scholars and Artists, CSULB
2014	Academic Celebration Student Exhibition Award, USC
2009-2012	Second-Class Scholarship and Outstanding Student, CSU
2008	First Prize in the National Piano Competition, Tsinghua University

Professional Activities

Refereeing:	Advances in Applied Mathematics
	Electronic Journal of Combinatorics
	Combinatorial Theory
	The Australasian Journal of Combinatorics
Panel:	UMN Gender Minorities in Mathematics (GeMM) Professional Development
Others:	
2015	Chartered Financial Analyst (CFA) Level III Candidate
2014-2015	Finance Associate, 54 Reckless LLC, Los Angeles, CA

Other Information

Programming Skills: Stata, Matlab, Mathematica, Sage