

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). arXiv:2412.16820, 2025.
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
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USC

2022 Spring	Math 040: Basic Mathematical Skills
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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

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