

# Spencer Daugherty

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## Experience

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**Burnett Meyer Postdoctoral Fellow** ..... Aug 2024

University of Colorado Boulder. Mentor: Nat Thiem.

## Education

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**Ph.D. Mathematics** ..... May 2024

North Carolina State University. Advisors: Laura Colmenarejo, Sarah Mason.

Thesis: Schur-like Bases and their Colored Generalizations.

Winston-Rose Award for Research. Maltbie Award for Teaching. Graduate Student Association Teaching Award.

**B.A. Mathematics** ..... 2019

Mount Holyoke College. Minor Computer Science. Cum Laude.

## Research Interests

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**Algebraic and Enumerative Combinatorics.** Symmetric functions and their generalizations, combinatorial Hopf algebras, tableaux combinatorics, Catalan combinatorics, Tamari lattice generalizations, parking functions.

## Publications and Preprints

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**Lexical tableaux and quasisymmetric functions** ..... 2025

J. M. Campbell, S. Daugherty. arXiv:2511.00713

**Structure and geometry of the tableaux algebra** ..... 2025

S. Daugherty, N. González, B. Muniz, P. Ocal, J. Pan, J. Torres. arXiv:2510.27209

**Dimensions of toggleability spaces** ..... 2025

B. Adenbaum, S. Daugherty, N. Mayers arXiv:2508.14974

**A Hopf algebra generalization of the symmetric functions in partially commutative variables** ..... 2024

S. Daugherty. arXiv:2412.11013

**Metered Parking Functions** ..... 2025

S. Daugherty, P. Harris, I. Klein, M. McClinton. arXiv:2406.12941. INTEGERS.

**Extended Schur Functions and Bases Related by Involutions** ..... 2024

S. Daugherty. arXiv:2401.02502. Advances in Applied Mathematics. FPSAC 2024.

**Combinatorics of Generalized Parking Function Polytopes** ..... 2025

M. Bayer, S. Borgwardt, T. Chambers, S. Daugherty, A. Dawkins, D. Deligeorgaki, H. Liao, T. McAllister, A. Morrison, G. Nelson, A. Vindas-Meléndez. arXiv:2403.07387. Discrete & Computational Geometry.

**A Generalization of the Dual Immaculate Functions in Partially Commutative Variables** ..... 2024

S. Daugherty. arXiv:2309.08518. Electronic Journal of Combinatorics.

**Nimber Sequences of Node-Kayles Games** ..... 2020

S. Brown, S. Daugherty, E. Fiorini, B. Maldonado, S. Rainville, R. Waechter, T. Wong. Journal of Integer Sequences.

## Current Projects

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- Combinatorial Statistics and the  $q, t$ -Catalan Numbers** ..... with J. Lentfer
- Stable Tamari Lattices** ..... with S. Grate, J. C. Martínez Mori, A. Pun
- Shuffle-compatibility of words, parking functions, and set partitions** ..... with Jinting Liang

## Teaching

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- Instructor of Record** CU Boulder ..... 2024-2026  
Discrete math. Linear algebra for non-math majors. 4 semesters, 30-40 students per class.
- Instructor of Record** NCSU ..... 2020-2024  
Applied Differential Equations, Finite Math, Calculus II, Calculus III. 6 semesters total, 60-180 students per class.
- Preparing the Professoriate Fellow** NCSU ..... 2023-2024  
Professional development that gives doctoral students mentoring, teaching, and future faculty preparation experience.
- Math Instructor** NC Governor's School East ..... 2022  
Graph Theory. Four-week long course for gifted high school students.
- Teaching Assistant** NCSU ..... 2019-2020  
Calculus I, Calculus II, Applied Differential Equations. 3 semesters total.

## Talks and Posters

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### Shuffle-compatibility for words, parking functions, and set partitions

- UC Berkeley Combinatorics Seminar talk ..... Mar 18, 2026
- CU Boulder Algebraic Lie Theory Seminar talk ..... Mar 10, 2026
- IAS Collaborative Workshop in Algebraic Combinatorics Lightning talk ..... June 2, 2025

### Properties of the stable Tamari lattice

- AMS Western Sectional GEMS of Combinatorics Special Session talk ..... Oct 27, 2025

### Dimensions of toggleability spaces

- University of South Carolina Combinatorics Seminar talk ..... Sep 12, 2025

### Metered parking functions

- JMM Spectra Special Session talk ..... Jan 10, 2025
- AMS Sectional Riverside: Special Session on Gender Equity in Combinatorics talk ..... Oct 27, 2024
- Mount Holyoke College talk ..... Sep 26, 2024

### Introduction to parking functions (expository talk)

- Mount Holyoke College talk ..... Sep 26, 2024

### Combinatorics of generalized parking function polytopes

- JMM AMS Special Session on work from the Graduate Research Workshop in Combinatorics talk ..... Jan 8, 2024
- NCSU Pure Graduate Student Seminar talk ..... Apr 15, 2024
- University of North Carolina Wilmington Seminar talk ..... Mar 15, 2024

## Colored Schur-like bases and generalizations of the symmetric functions

- CU Boulder Algebraic Lie Theory Seminar talk ..... Sep 17, 2024  
Michigan State University Virtual Seminar talk ..... Apr 3, 2024

## Extended Schur functions and bases related By involutions

- Formal Power Series and Algebraic Combinatorics Bochum Poster ..... July 25, 2024  
Mid-Atlantic Algebra, Geometry, and Combinatorics Workshop Poster ..... Dec 2, 2023  
University of Waterloo Seminar talk ..... Nov 9, 2023

## A partially commutative generalization of the dual immaculate functions

- Okinawa Institute of Science and Technology talk ..... Feb 9, 2024  
UAlbany Women in Algebra and Combinatorics Poster ..... Apr 29, 2023  
AlGeCom XIII Poster ..... Apr 15, 2023  
NCSU Pure Graduate Seminar talk ..... Nov 21, 2022

## Schur-like Bases of NSym and QSym: Properties of the Shin Functions

- Wake Forest Colloquium talk ..... Oct 19, 2023  
NCSU Algebra and Combinatorics Seminar talk ..... Oct 18, 2023  
CAGE Seminar talk ..... Sep 19, 2023

## Chromatic Symmetric Functions of Trees

- Triangle Area Graduate Math Conference talk ..... Sep 30, 2023

## Combinatorial Statistics and $q, t$ -Catalan Numbers

- NCSU Pure Graduate Student Seminar talk ..... Sep 18, 2023

## Organizing and Service

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JMM Special Session for the MRC in Algebraic Combinatorics Seattle, Washington ..... Jan 9, 2025

CU Boulder Algebraic Lie Theory Seminar Boulder, Colorado ..... 2024-2026

**Reviewer:** Discrete Mathematics & Theoretical Computer Science, Electronic Journal of Combinatorics, American Journal of Combinatorics, Discrete Mathematics

## Workshop and Program Participation

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Collaborate@ICERM ..... July 2025

IAS Summer Workshop in Algebraic Combinatorics ..... June 2025

Summer School in Algebraic Combinatorics Leipzig, Germany ..... July 2024

MRC in Algebraic Combinatorics Java, New York ..... June 2024

AlCoVR Workshop in Dynamical Algebraic Combinatorics Virtual Reality ..... May 2024

Graduate Research Workshop in Combinatorics Laramie, Wyoming ..... July 2023