

# Spencer Daugherty

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## Experience

**Burnett Meyer Postdoctoral Fellow** ..... Aug 2024 -  
University of Colorado Boulder. Advisor: Nat Thiem.

## Education

**Ph.D. Mathematics** ..... May 2024  
North Carolina State University. Advisors: Laura Colmenarejo, Sarah Mason.  
Thesis: Schur-like Bases and their Colored Generalizations.

**B.A. Mathematics** ..... 2019  
Mount Holyoke College.

## Research Interests

**Algebraic and Enumerative Combinatorics.** I am interested in problems on the quasisymmetric and noncommutative symmetric functions, specifically those surrounding Schur-like bases and combinatorial Hopf algebras. I also work on chromatic symmetric functions,  $q, t$ -Catalan numbers, and parking functions.

## Publications and Preprints

**Extended Schur Functions and Bases Related by Involutions** ..... 2024  
S. Daugherty. arXiv:2401.02502. Extended abstract to appear in the proceedings of FPSAC 2024.

**Combinatorics of Generalized Parking Function Polytopes** ..... 2024  
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. Submitted.

**A Generalization of the Dual Immaculate Functions in Partially Commutative Variables.** ..... 2023  
S. Daugherty. arXiv:2309.08518. To appear in the 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.

## In Preparation

**Stembridge Codes and  $e$ -positivity of Chromatic Symmetric Functions** ..... with K. Celano, S. Sundaram  
**Combinatorial Statistics and the  $q, t$ -Catalan Numbers** ..... with J. Lentfer

## Teaching

**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.

## Talks and Posters

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### Colored Hopf Algebras and Symmetric Function Generalizations

Michigan State University Virtual Seminar Talk ..... April 3, 2024

### Extended Schur Functions and Bases Related By Involutions

Formal Power Series and Algebraic Combinatorics (Bochum) Poster ..... July 2024

Mid-Atlantic Algebra, Geometry, and Combinatorics Workshop Poster ..... Dec 2, 2023

University of Waterloo Seminar Talk ..... Nov 9, 2023

### Combinatorics of Generalize Parking Function Polytopes

University of North Carolina Wilmington Seminar Talk ..... Mar 15, 2024

### 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 ..... Sept 18, 2023

## Workshop and Program Participation

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

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

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