GEORGE H. SEELINGER—CV

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RESEARCH INTERESTS

Algebraic combinatorics: symmetric functions, Schubert calculus, Macdonald polynomials

APPOINTMENTS

University of Michigan   Ann Arbor, Michigan
Postdoctoral Assistant Professor and Research Fellow   *August 2021–current*

EDUCATION

Doctor of Philosophy, Mathematics   University of Virginia, Charlottesville, Virginia
Advisor: Jennifer Morse   *May 2021*
Dissertation title: *K-theoretic Catalan functions*

Master of Science, Mathematics   Loyola University Chicago, Chicago, Illinois
                                                                              August 2015

Bachelor of Science, summa cum laude   Loyola University Chicago, Chicago, Illinois
Major: Mathematics and Computer Science   *May 2015*
Interdisciplinary Honors

PUBLICATIONS

Dens, nests, and the Loehr-Warrington Conjecture   arxiv:2112.07070
Joint with J. Blasiak, M. Haiman, J. Morse, and A. Pun

· Submitted (2022). Preprint available on arXiv.org

LLT polynomials in the Schiffmann algebra   arxiv:2112.07063
Joint with J. Blasiak, M. Haiman, J. Morse, and A. Pun

· Submitted (2022). Preprint available on arXiv.org

A proof of the Extended Delta Conjecture   arxiv:2102.08815
Joint with J. Blasiak, M. Haiman, J. Morse, and A. Pun

· Forum of Mathematics, Pi, Volume 11 (2023).

A shuffle theorem for paths under any line   arxiv:2102.07931
Joint with J. Blasiak, M. Haiman, J. Morse, and A. Pun

· Forum of Mathematics, Pi, Volume 11 (2023).

K-theoretic Catalan functions   arxiv:2010.01759
Joint with Jonah Blasiak and Jennifer Morse

· Advances in Mathematics, Volume 404, Part B (2022).

Canonical idempotents of multiplicity-free families of algebras   arxiv:1606.08900
Joint with Stephen Doty and Aaron Lauve

· L'Enseignment Mathematique, **64** (2018) 23–63.

RESEARCH TALKS

University of Michigan Combinatorics Seminar   March 27, 2023
University of Michigan

· Title: *Dens, nests, and Catalanimals: a walk through the zoo of shuffle theorems*

Illinois State University Algebra Seminar   October 27, 2022
Illinois State University

· Title: *Diagonal Harmonics and Shuffle Theorems*

University of Michigan Combinatorics Seminar   February 4, 2022
University of Michigan

· Title: *A raising operator formula for nabla on an LLT polynomial*

OIST Representation Theory Seminar   October 25, 2021
Okinawa Institute of Science and Technology

· Title: *Diagonal harmonics and shuffle theorems*

University of Virginia Algebra Seminar   April 5, 2021
University of Virginia

· Title: *K-theoretic Catalan functions*

LACIM Seminar   March 19, 2021
Université du Québec à Montréal

· Title: *K-theoretic Catalan functions*

Junior Mathematician Research Archive   December 1, 2020

· Title: *K-theoretic Catalan functions*

Philadelphia Area Combinatorics and Algebraic Geometry Seminar   February 6, 2020
University of Pennsylvania

· Title: *K-theoretic Catalan functions*

Garsiafest 90: Future Directions in Algebraic Combinatorics   June 18, 2019
The Scripps Seaside Forum, San Diego, CA. Lightning Talk

· Title: *Raising operators in Schubert calculus*

Mid-Atlantic Algebra, Combinatorics, and Geometry Workshop   May 4, 2019
Drexel University. Poster

· Title: *K-theoretic Catalan functions*

Sage Days 65   June 11, 2015
Loyola University Chicago

· Title: *Orthogonal idempotents in semisimple Brauer algebras*

EXPOSITORY TALKS

University of Michigan Algebraic Combinatorics Reading Seminar   2021–2023
Seminar on topics including diagonal harmonics, link homology, cluster algebras, dimer models, and Schubert calculus

· Divided difference operators to pipe dreams	Winter 2023
· Producing a Poisson cluster variety using dimer models	Fall 2022
· Braid Varieties and Positroids	Winter 2022

· Torus Knot Link Homology	Fall 2021
· The shuffle theorem	Fall 2021

University of Virginia Representation Theory Reading Seminar 2016 – 2020
Seminar talks on various topics; selected titles listed

· k-Schur functions as Schubert representatives for the affine Grassmannian	Spring 2020
· Introduction to the affine Grassmannian	Spring 2020
· Chern class computations, flag manifolds, and the Grassmannian	Spring 2019
· Schur-Q functions and related combinatorics	Fall 2018
· Applications of the Jacobson-Morozov Theorem	Fall 2017
· The principal, subregular, and minimal nilpotent orbits	Fall 2016

University of Virginia Integrable Probability and Combinatorics Seminar 2019
Seminar talks on various topics

· Multispecies ASEP and nonsymmetric Macdonald polynomials	Fall 2019
· A q-analogue of de Finetti's theorem	Spring 2019
· Extreme characters of $U(\infty)$	Spring 2019

Undergraduate Math Club
University of Virginia

· A Window into Symmetric Function Theory	March 2, 2021
· Generating functions: a mathematical link	October 2, 2018

TEACHING EXPERIENCE

Instructor of Record	University of Michigan
· Math 566: Combinatorial Theory (Algebraic Combinatorics)	*Winter 2023*
· Math 215: Multivariable and Vector Calculus	*Fall 2022*
· Math 417: Matrix Algebra	*Winter 2022*
· Math 115: Calculus I (flipped classroom)	*Fall 2021*

Instructor of Record	University of Virginia
· MATH 1310: Calculus I (flipped classroom)	*Fall 2019*
· MATH 1220: Survey of Calculus II	*Spring 2018*
· MATH 1210: Survey of Calculus I	*Fall 2017*

HONORS, AWARDS, AND FELLOWSHIPS

- · NSF Postdoctoral Fellowship, 2023–2026
- · AMS-Simons Travel Grant, $5000, 2022–2023
- · Dorothy M. Batten Jefferson Fellowship, 2016–2021, by the Jefferson Scholars Foundation, UVa
- · Phi Beta Kappa Honor Society, inducted May 7, 2015
- · Alpha Sigma Nu Honor Society, inducted October 14, 2014

SERVICE AND OUTREACH

Department

· **Co-organizer, Learning Seminar in Algebraic Combinatorics**	Fall 2021–present
· **Member and Webmaster, Association for Women in Mathematics**	Fall 2018–Spring 2021

Help maintain the UVa AWM chapter's website and developed a blog for other members to post content.

· **Mentor, Directed Reading Program at University of Virginia** Fall 2018
Guided my undergraduate DRP mentee, Dylan Hunt, through a machine learning textbook and helped him prepare for a presentation at UVa's Math Club.
· **UVa Math Ambassador** Fall 2017– Spring 2019
UVa's Mathematics outreach program to Albemarle County and Charlottesville city schools.
· **Panelist, Prospective Graduate Student Open House** Spring 2018

Professional

· **Reviewer for Algebraic Combinatorics** Spring 2022
· **TA for ICERM Workshop session on Affine Schubert Calculus** February 3, 2021
· **Organizing committee, Mid-Atlantic Algebra, Geometry, and Combinatorics Workshop** Spring, 2020
Cancelled due to Covid-19
· **Contributor, SageMath (Open-Source Computer Algebra Software)** 2013, 2015, 2018

University

· **Jefferson Scholar Selection Weekend Seminar Planner and Leader, Jefferson Scholars Foundation, UVa** Spring 2020
Cancelled due to Covid-19
· **Jefferson Scholar Selection Weekend Seminar Planner, Jefferson Scholars Foundation, UVa** Spring 2019
· **Panelist, Institute for Leadership and Citizenship Graduate School Panel Jefferson Scholars Foundation, UVa** Summer 2018
· **Member, Sujack Teaching Award Committee, Loyola University Chicago** Spring 2015

MATHEMATICAL SOFTWARE CONTRIBUTIONS

Contributions to SageMath http://sagemath.org

· Implementation of Young's Raising Operators (ticket #26939) Fall 2018
· Implement Jucys-Murphys elements for Brauer algebra (ticket #18798) Summer 2015
· Major improvement to usability of diagram algebras (tickets #18707,18720,18762) Summer 2015
· Initial implementation of diagram algebras (ticket #14234) Spring 2013

k-Combinat for Sage https://github.com/MareoRaft/k_combinat_for_sage/

· Maintain and improve code relating to Catalan functions

CONFERENCES AND WORKSHOPS ATTENDED

· Interactions between Hessenberg Varieties, Chromatic Functions, and LLT Polynomials
Banff International Research Station October 16—21, 2022
· Open Problems in Algebraic Combinatorics May 16—20, 2022
University of Minnesota
· ICERM Geometry and Combinatorics from Root Systems March 22–26, 2021
· ICERM Introductory Workshop: Combinatorial Algebraic Geometry February 1–5, 2021
· Hilbert schemes, categorification, and combinatorics, UC Davis June 19–23, 2019
· Garsiafest, Scripps Seaside Forum, San Diego, CA June 17–20, 2019
· Algebra, Geometry and Combinatorics Day, Loyola University Chicago May 25, 2019
· Mid-Atlantic Algebra, Geometry, and Combinatorics (MAAGC) Workshop, May 3–4, 2019
Drexel University
· Triangle Lectures in Combinatorics, Wake Forest University March 30, 2019

- Combinatorics and beyond: the many facets of Sergey Fomin's mathematics,   November 8–11, 2018
University of Michigan
- Workshop on Representation Theory, Combinatorics, and Geometry,   October 19–21, 2018
University of Virginia
- Women's Intellectual Network Research Symposium, University of Virginia   September 15, 2018
- Joint Mathematics Meetings, San Diego, CA   January 10–13, 2018
- AMS Fall Central Sectional Meeting, Loyola University Chicago   October 2–4, 2015
- Sage Days 65, Loyola University Chicago   June 8–12, 2015
- AMS Spring Western Sectional Meeting, University of Colorado Boulder   April 13–14, 2013
- Sage-Combinat Days 40,   July 9–13, 2012
Institute for Mathematics and its Applications at University of Minnesota
- Sage Days 38, Centre de Recherches Mathématique, Montreal   May 7–11, 2012

TECHNICAL STRENGTHS

Computer Languages	Proficiency with: Python, Sage, Java and Scala.
	Experience with: Mathematica, R and C/C++.
Languages	Fluent: English
	Elementary Proficiency: French, Italian