

GEORGE H. SEELINGER—CV

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RESEARCH INTERESTS

Algebraic combinatorics: symmetric functions, Schubert calculus, Macdonald polynomials

APPOINTMENTS

University of Michigan

Postdoctoral Assistant Professor and Research Fellow

Ann Arbor, Michigan

August 2021–current

EDUCATION

Doctor of Philosophy, Mathematics

Advisor: Jennifer Morse

Dissertation title: *K-theoretic Catalan functions*

University of Virginia, Charlottesville, Virginia

May 2021

Master of Science, Mathematics

Loyola University Chicago, Chicago, Illinois

August 2015

Bachelor of Science, summa cum laude

Major: Mathematics and Computer Science

Interdisciplinary Honors

Loyola University Chicago, Chicago, Illinois

May 2015

PUBLICATIONS

Dens, nests, and the Loehr-Warrington Conjecture

Joint with J. Blasiak, M. Haiman, J. Morse, and A. Pun

arxiv:2112.07070

· Preprint available on arXiv.org

LLT polynomials in the Schiffmann algebra

Joint with J. Blasiak, M. Haiman, J. Morse, and A. Pun

arxiv:2112.07063

· Preprint available on arXiv.org

A proof of the Extended Delta Conjecture

Joint with J. Blasiak, M. Haiman, J. Morse, and A. Pun

arxiv:2102.08815

· Submitted (2021). Preprint available on arXiv.org

A shuffle theorem for paths under any line

Joint with J. Blasiak, M. Haiman, J. Morse, and A. Pun

arxiv:2102.07931

· Submitted (2021). Preprint available on arXiv.org

K-theoretic Catalan functions

Joint with Jonah Blasiak and Jennifer Morse

arxiv:2010.01759

· Accepted in *Advances in Mathematics* (2021). Preprint available on arXiv.org.

Canonical idempotents of multiplicity-free families of algebras

Joint with Stephen Doty and Aaron Lauve

arxiv:1606.08900

· *L'Enseignement Mathématique*, **64** (2018) 23–63.

RESEARCH TALKS

- 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** Fall 2021
Seminar on diagonal harmonics, link homology, and cluster algebras
· The shuffle theorem
- 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 417: Matrix Algebra *Winter 2022*
- Math 115: Calculus I *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

- 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 Algebra Combinatorics** Fall 2021
- **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

- **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 ATTENDED

- 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, Drexel University May 3–4, 2019
- Triangle Lectures in Combinatorics, Wake Forest University March 30, 2019
- Combinatorics and beyond: the many facets of Sergey Fomin's mathematics, University of Michigan November 8–11, 2018
- Workshop on Representation Theory, Combinatorics, and Geometry, University of Virginia October 19–21, 2018
- 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, Institute for Mathematics and its Applications at University of Minnesota July 9–13, 2012
- 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