Lucas Gagnon

Contact

USC Department of Mathematics	Email: lgagnon@usc.edu
KAP Building, 3620 South Vermont Ave.	Web: https://sites.google.com/view/lucas-gagnon/
Los Angeles, CA 90089	

Education

Aug. 2022	Ph.D. in Mathematics, University of Colorado Boulder
	"Advances in the combinatorics of the unipotent upper triangular groups," sup. Nat Thiem
2019	M.A. in Mathematics, University of Colorado Boulder
2016	B.A. in Mathematics, Macalester College
	Attended Budapest Semester in Mathematics Fall 2014

Teaching Credentials

(exp.) 2024	Certificate in College Teaching, University of Colorado Boulder
2023	Instructional Skills Intensive Workshop, York University

Academic Employment

2025-2028	RTPC Assistant Professor, University of Southern California
	Mentored by Sami Assaf
2022-2025	Postdoctoral Visitor, York University
	Mentored by Nantel Bergeron

Papers

Conventions: authors are always listed alphabetically by last name, and authors who were undergraduate (resp. grad.) students at the time of research are distinguished with an $*$ (resp. $**$).

In preparation

L. Colmenarejo, L. Gagnon, and A. Ram. *A box-by-box formula for Koornwinder polynomials.* In preparation.
A. Abram$**$ and L. Gagnon. *The combinatorics of excedance classes.* In preparation.

L. Gagnon. *Lustig varieties over matrix Schubert varieties.* In preparation.

Submitted preprints

N. Bergeron, L. Gagnon, P. Nadeau, H. Spink, and V. Tewari. *The quasisymmetric flag variety: a toric complex on noncrossing partitions.* arXiv:2508.12171

N. Andrews$*$, L. Gagnon, F. Gelinas$**$, E. Schlums$*$, and M. Zabrocki. *When are Hopf algebras determined by integer sequences?* arXiv:2505.06941.

N. Bergeron, L. Gagnon, P. Nadeau, H. Spink, and V. Tewari. *Equivariant quasisymmetry and noncrossing partitions.* arXiv:2504.15234.

Refereed conference proceedings

N. Bergeron and L. Gagnon. Extended Abstract: *Excedance quotients, Quasisymmetric Varieties, and Temperley–Lieb algebras*. Sém. Loth. Comb. 91B: FPASC Proceedings (2024), Paper No. 67.

L. Gagnon. Extended Abstract: *A unipotent realization of the chromatic quasisymmetric function*. Sém. Loth. Comb. 89B: FPASC Proceedings (2023), Paper No. 72.

Published articles

N. Bergeron and L. Gagnon. *The excedance quotient of the Bruhat order, Quasisymmetric Varieties and Temperley–Lieb algebras*. Journal of the London Mathematical Society 110-4 (2024). arXiv:2302.10814

L. Gagnon. *A unipotent realization of the chromatic quasisymmetric function*. Algebra & Number Theory 18-9 (2024), 1737–1766. arXiv:2211.06981

L. Gagnon. *A $\mathrm{GL}(\mathbb{F}_q)$-compatible Hopf algebra of unitriangular class functions*. Journal of Algebra 632 (2023), 426–461. arXiv:2211.05960

L. Gagnon. *The combinatorics of normal subgroups in the unipotent upper triangular group*. Combinatorial Theory 1 (2021), Paper No. 15. arXiv:2012.00108.

Undergraduate Research Mentorship

Summer Project Summer 2024	*Using machine learning to find combiantorial bijections*, with Inderpreet Ganda and Eniola Ogunjimi. Jointly advised with M. Zabrocki at York.
Summer Project Summer 2024	*Catalan Hopf subalgebras of* NCSym, with Nicholas Andrews and Eric Schlums. Jointly advised with M. Zabrocki at York.
Honors Thesis AYs 2020–2022	*Motivating a q-version of the embedding between the categories* Heis *and* $\mathrm{Par}(t)$, by Theodore Gonzales. Jointly advised with T. Xu at CU Boulder.
REU Mentor Summer 2020	*Rewiring matrices using combinatorial tools*, with Jacob Gaiter, Juliet Hawkes, Tom Kauffman, Adam Nelson. Supervised by N. Thiem at CU Boulder.

Courses Taught

University of Southern California

Precalculus for Business and Economics (Fall 2025)

York University

Abstract Linear Algebra (Spring 2025)

Mathematics for Life Sciences I (Spring 2024)

Conjecture, Theorem, and Proof (Spring 2023)

University of Colorado Boulder

Assistant Course Coordinator for Multivariable Calculus (Fall 2021, Spring 2022)

SASC Calculus Coseminar (Spring 2020, Fall 2020, Spring 2021)

Differential Calculus (Instructor of Record: Fall 2019, Recitation TA: Fall 2017)

Integral Calculus (Instructor of Record: Fall 2018, Spring 2019, Recitation TA: Spring 2019)

Fellowships and Awards

W. J. Thron Mathematics Fellowship, University of Colorado Boulder, 2021.

Graduate School Summer Fellowship, University of Colorado Boulder, 2020.

Konhauser Award for Mathematical Achievement, Macalester College, 2016.

Selected Presentations

Workshop on recent perspectives on non-crossing partitions through algebra, combinatorics, and probability, Erwin Schrödinger Institute, Feb. 17-21, 2025.

Bay Area Discrete Math Day, UC Berkeley, Dec. 7, 2024.

Algebra & discrete mathematics seminar, UC Davis, Dec. 6 2024.

Combinatorics seminar, Stanford University, Dec. 5 2024.

Séminaire du LACIM, Université du Québec à Montréal, Nov. 22, 2024.

Discrete geometry and combinatorics seminar, Cornell University, Nov. 11 2024.

Poster presentation, 33nd international conference on formal power series and algebraic combinatorics (FPSAC), Ruhr-Universität Bochum, July 22-26, 2024.

Special session on groups and representations, AMS Spring Western Sectional Meeting, San Francisco State University, May 4-5, 2024.

Scientific session on algebraic and enumerative combinatorics, CMS Winter Meetings, Montreal, Dec. 3, 2023.

Special session on combinatorial and categorical techniques in representation theory, AMS Fall Eastern Sectional Meeting, the University at Buffalo, Sept. 9, 2023.

Poster presentation, 32nd international conference on formal power series and algebraic combinatorics (FPSAC), UC Davis, July 20, 2023.

Service

Event Organization

2022–2025	Applied Algebra Seminar York University
June 7-8 2023	"Many perspectives on Hopf Algebras in Combinatorics" Contributed Minisymposium, Canadian Discrete and Algorithmic Mathematics Conference.
April 19 2022	Structured conversation on "Discussing the Campus Culture Survey" University of Colorado Department of Mathematics
2018–2020	Graduate Student Seminar University of Colorado Department of Mathematics

Departmental Service

2021–2022	Diversity Committee University of Colorado Department of Mathematics

2019–2021   Undergraduate Committee
                       University of Colorado Department of Mathematics

Journal Review

Algebraic Combinatorics; Communications in Algebra; Electronic Journal of Combinatorics; Forum of Mathematics, Sigma.