

Tianyi Yu

CONTACT INFORMATION	<p><b>LACIM</b>            Université du Québec à Montréal            Montréal, QC, Canada</p>	<p><i>E-mail:</i> <a href="mailto:yu.tianyi@uqam.ca">yu.tianyi@uqam.ca</a>  <i>Website:</i> <a href="https://tianyi-math.github.io/">https://tianyi-math.github.io/</a></p>
EDUCATION	<p><b>University of California, San Diego</b>, La Jolla, CA, USA            PhD in Mathematics, Advisor: <b>Brendon Rhoades</b></p>	2020 - 2024
	<p><b>University of California, San Diego</b>, La Jolla, CA, USA            Bachelor of Science in Mathematics &amp; Bachelor of Science in Computer Science</p>	2016 - 2020
EMPLOYMENT	<p><b>Laboratoire d'Algèbre, de Combinatoire et d'Informatique Mathématique</b>,            Montréal, QC, Canada  <b>CRM-ISM Postdoctoral Fellow</b>,            Mentors: François Bergeron, Jake Levinson, Alejandro Morales, Hugh Thomas, and Franco Saliola</p>	2024 - 2026
RESEARCH INTERESTS	Algebraic combinatorics: Schubert calculus, Lascoux polynomials, Grothendieck polynomials, bumpless pipe dreams, crystal operators, coinvariant algebra.	
PREPRINTS	<p>[1] <i>A positive combinatorial formula for the double Edelman–Greene coefficients</i>, with Chou, C.            Preprint <a href="#">arXiv:2512.12185</a></p> <p>[2] <i>Grothendieck positivity for normal square root crystals</i>, with Marberg, E. &amp; Tong, K.H.            Preprint <a href="#">arXiv:2501.16640</a></p> <p>[3] <i>Tableau formula for vexillary double Edelman–Greene coefficients</i>,            with Gregory, A. &amp; Hamaker, Z. Preprint <a href="#">arXiv:2412.20615</a>; In revision, <i>Selecta Mathematica</i></p> <p>[4] <i>Lascoux expansion of Lascoux times stable Grothendieck</i>, with Orelowitz, G.            Preprint <a href="#">arXiv:2312.01647</a>; In revision, <i>Combinatorial Theory</i>.</p>	
PUBLICATIONS	<p>[5] <i>Embedding bumpless pipedreams as Bruhat chains</i>.  <i>International Mathematics Research Notices</i> (2025).</p> <p>[6] <i>Marked bumpless pipedreams and compatible pairs</i>, with Huang, D. &amp; Shimozone, M.  <i>Combinatorial Theory</i> (Accepted).</p> <p>[7] <i>Connection between Schubert polynomials and top Lascoux polynomials</i>.  <i>Algebraic Combinatorics</i> (2025).</p> <p>[8] <i>Grothendieck polynomials of inverse fireworks permutations</i>, with Chou, C.  <i>European Journal of Combinatorics</i> (2025).</p> <p>[9] <i>Constructing a Gröbner basis of Griffin’s ideal</i>. <i>Mathematische Zeitschrift</i> (2024).</p> <p>[10] <i>Constructing maximal pipedreams of double Grothendieck polynomials</i>, with Chou, C.  <i>The Electronic Journal of Combinatorics</i> (2024).</p>	

- [11] *A row analogue of Hecke column insertion*, with Huang, D. & Shimozono, M.  
[Combinatorial Theory](#) (2024).
- [12] *A Bijection between K-Kohnert Diagrams and Reverse Set-Valued Tableaux*, with Pan, J.  
[The Electronic Journal of Combinatorics](#) (2023).
- [13] *Top-degree components of Grothendieck and Lascoux polynomials*, with Pan, J.  
[Algebraic Combinatorics](#) (2023).
- [14] *Set-valued tableaux rule for Lascoux polynomials*. [Combinatorial Theory](#) (2023).
- [15] *Grothendieck to Lascoux expansions*, with Shimozono, M.  
[Transactions of the American Mathematical Society](#) (2023).
- [16] *Harmonic bases for generalized coinvariant algebras*, with Rhoades, B. & Zhao, Z.  
[The Electronic Journal of Combinatorics](#) (2020).

#### CONFERENCE PROCEEDINGS

- [17] *Marked bumpless pipedreams and compatible pairs*, with Huang, D. & Shimozono, M.  
Proceedings of the 37<sup>th</sup> Conference on Formal Power Series and Algebraic Combinatorics,  
[extended abstract of \[6\]](#).
- [18] *Analogues of two classical pipedream results on bumpless pipedreams*.  
Proceedings of the 36<sup>th</sup> Conference on Formal Power Series and Algebraic Combinatorics,  
[extended abstract of \[5\]](#).
- [19] *Grothendieck to Lascoux expansions*, with Shimozono, M.  
Proceedings of the 34<sup>th</sup> Conference on Formal Power Series and Algebraic Combinatorics,  
[extended abstract of \[15\]](#).
- [20] *Harmonic bases for generalized coinvariant algebras*, with Rhoades, B. & Zhao, Z.  
Proceedings of the 33<sup>rd</sup> Conference on Formal Power Series and Algebraic Combinatorics,  
[extended abstract of \[16\]](#).

#### AWARDS AND GRANTS

##### **University of California, San Diego**

- Selma and Robert Silagi Award for Undergraduate Excellence (5000 USD)

#### TALKS

##### **An insertion algorithm for Schubert Cauchy identity via Pieri formula**

- Geometry Seminar. Texas A&M University. College Station, TX. Mar. 2025
- Combinatorics Seminar. University of California, San Diego. La Jolla, CA. Mar. 2025

##### **Grothendieck positivity for normal square root crystals**

- AMS Sectional Meeting. University of Kansas. Lawrence, KS. Mar. 2025
- Richard P. Stanley Seminar in Combinatorics. Harvard University. Cambridge, MA. Feb. 2025
- Combinatorics Seminar. University of Florida. Gainesville, FL. Jan. 2025
- Combinatorics Seminar. Laboratoire d'Algèbre, de Combinatoire et d'Informatique Mathématique. Montréal, QC, Canada. Dec. 2024

##### **K-theoretic analogue of Demazure crystal**

- Hong Kong University of Science and Technology. Hong Kong, China. Sep. 2024

##### **Three combinatorial formulas of Lascoux polynomials**

- Sun Yat-sen University. Guangzhou, China. Aug. 2024
- Guangdong Technion-Israel Institute of Technology. Shantou, China. Aug. 2024

##### **Embedding bumpless pipedreams as Bruhat chains**

- Formal Power Series and Algebraic Combinatorics conference. Bochum, Germany. Jul. 2024

- Center for Combinatorics, Nankai University. Tianjin, China. Jul. 2024
- Beijing International Center for Mathematical Research. Beijing, China. Jul. 2024
- Combinatorics And Representation Theory Seminar. Seoul, Korea (via zoom). (invited) Apr. 2024
- Graduate Student Combinatorics Conference. Pittsburgh, PA. Mar. 2024
- The CAGE (Combinatorics, Algebra, and Geometry) Seminar. Philadelphia, PA. Mar. 2024
- Combinatorics Seminar. University of Southern California. Los Angeles, CA. (invited) Jan. 2024
- Combinatorial Algebra meets Algebraic Combinatorics. Montréal, QC, Canada. Jan. 2024
- Combinatorics Seminar. Laboratoire d'Algèbre, de Combinatoire et d'Informatique Mathématique. Montréal, QC, Canada. Dec. 2023
- Combinatorics Seminar. University of California, San Diego. La Jolla, CA. Nov. 2023
- Algebra Seminar. Virginia Polytechnic Institute and State University. Blacksburg, VA. Nov. 2023
- Combinatorics Seminar. University of Waterloo. Waterloo, ON, Canada. Sep. 2023
- Algebraic Combinatorics Seminar. Fields Institute. Toronto, ON, Canada. Sep. 2023

### **Pipedreams, bumpless pipedreams and Bruhat chains**

- Schubert Seminar. Online. Nov. 2023

### **Top-degree components of Grothendieck and Lascoux polynomials**

- Sichuan University. Chengdu, China (via zoom). (invited) Nov. 2024
- Combinatorics Seminar. University of Michigan. Ann Arbor, MI. (invited) Mar. 2023
- Graduate Student Combinatorics Conference. St. Louis, MO. Mar. 2023
- Combinatorics Seminar. University of California, San Diego. La Jolla, CA. Jan. 2023
- Combinatorics Seminar. University of California, Los Angeles. Los Angeles, CA. Nov. 2022

### **A row analogue of Hecke column insertion**

- Combinatorics Seminar. University of Florida. Gainesville, FL. Nov. 2022
- Combinatorics Seminar. University of Minnesota. Minneapolis, MN. (invited) Sep. 2022
- Combinatorics Seminar. University of Illinois, Urbana-Champaign. Urbana, IL. Sep. 2022

### **Grothendieck to Lascoux expansions**

- Combinatorics and Geometry Seminar. University of Washington. Seattle, WA. Apr. 2022
- Graduate Student Combinatorics Conference. San Diego, CA (via zoom). Mar. 2022
- Algebra & Combinatorics Seminar. North Carolina State University. Raleigh, NC. (invited) Nov. 2021
- Algebra Seminar. Virginia Polytechnic Institute and State University. Blacksburg, VA. Nov. 2021
- Combinatorics Seminar. University of California, San Diego. La Jolla, CA. Oct. 2021
- Combinatorics Seminar. University of Waterloo. Waterloo, ON, Canada (via zoom). (invited) Sep. 2021
- Combinatorics Seminar. University of Illinois, Urbana-Champaign. Urbana, IL. (invited) Sep. 2021
- Combinatorics Seminar. University of Minnesota. Minneapolis, MN. Sep. 2021

### **Harmonic bases for generalized coinvariant algebras**

- Formal Power Series and Algebraic Combinatorics conference. Ramat-Gan, Israel (via zoom). Jan. 2022
- Combinatorics Seminar. University of California, San Diego. La Jolla, CA. Jun. 2021

TEACHING  
EXPERIENCE

### **Department of Mathematics, UCSD**

Teaching Assistant: Calculus, Mathematical Reasoning, Combinatorics, Algebraic Combinatorics.

### **Department of Computer Science and Engineering, UCSD**

Teaching Assistant: Discrete Mathematics, Design and Analysis of Algorithms, Theory of Computability.