Avery St. Dizier | CV
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Education

- **Ph.D. in Mathematics**
  - *Cornell University*  
    - *Expected May 2020*

- **M.S. in Mathematics**
  - *Cornell University*  
    - *May 2018*

- **B.S. in Mathematics**
  - *Louisiana State University*  
    - *May 2015*

Preprints and Publications

- **Degrees of symmetric Grothendieck polynomials and Castelnuovo-Mumford regularity**
  - with Jenna Rajchgot, Yi Ren, Colleen Robichaux, and Anna Weigandt
  - *arXiv:1912.04477*

- **Logarithmic concavity of Schur and related polynomials**
  - with June Huh, Jacob Matherne, and Karola Mészáros
  - submitted to *Crelle’s Journal*
  - *arxiv1906.09633*

- **Zero-One Schubert polynomials**
  - with Alex Fink and Karola Mészáros
  - submitted to *Mathematische Zeitschrift*
  - *arXiv:1903.10332*

- **Gelfand-Tsetlin polytopes: a story of flow and order polytopes**
  - with Ricky Ini Liu and Karola Mészáros
  - to appear in *SIAM Journal on Discrete Mathematics*
  - *arXiv:1903.08275*

- **Schubert polynomials as projections of Minkowski sums of Gelfand-Tsetlin polytopes**
  - with Ricky Ini Liu and Karola Mészáros
  - submitted to *Journal of Combinatorial Theory Series A*
  - *arXiv:1903.05548*

- **Schubert polynomials as integer point transforms of generalized permutahedra**
  - with Alex Fink and Karola Mészáros
  - *Advances in Mathematics, 332: 465–475, 2018*

- **From generalized permutahedra to Grothendieck polynomials via flow polytopes**
  - with Karola Mészáros
  - submitted to *Algebraic Combinatorics*
  - *arXiv:1705.02418*
Awards and Honors

- NSF Graduate Research Fellowship Program: Honorable Mention  
  March 2017
- Robert John Bättig Graduate Prize  
  December 2019
  - Awarded by Cornell Mathematics Department for excellence and promise in mathematics

Research Presentations

Conference Talks
- AMS Special Session on Oriented Matroids and Related Topics,  
  Fall Eastern Sectional Meeting, Binghamton University  
  October 2019
- AMS Special Session on Combinatorial Commutative Algebra and Polyhedral Geometry,  
  Spring Eastern Sectional Meeting, University of Connecticut  
  April 2019
- The 30th International Conference on Formal Power Series and Algebraic Combinatorics,  
  Dartmouth University  
  July 2018
- Graduate Student Combinatorics Conference, University of Kansas  
  April 2017

Invited Seminar Talks
- Binghamton University, Combinatorics Seminar  
  April 2019
- University of Illinois Urbana-Champaign, Algebra-Geometry-Combinatorics Seminar  
  October 2018

Poster Presentations
- The 6th Encuentro Colombiano de Combinatoria,  
  Universidad del Norte, Barranquilla, Colombia  
  June 2018

Programming Experience

Mathematica
- I make frequent use of Mathematica in my research for exploring problems and testing hypotheses.
- A Mathematica package for working with Schubert polynomials and related objects:  
  https://github.com/avstdi/Schubert-Polynomial-Package
- Code for testing conjectures made in Logarithmic Concavity of Schur and Related Polynomials:  
  https://github.com/avstdi/Lorentzian-Polynomials

Python
- Due to the lack of polytopal functions in Mathematica, I also frequently rely on the Sage libraries in Python.

Volunteering and Outreach

REU Student Mentor
- Cornell University, Ithaca, NY  
  Summer 2018
- Mentored several undergraduate researchers in original research projects in finite group theory. Held daily meetings to discuss their progress and issues, and to debug and improve their code. Taught math presentation guidelines and skills including the use of LaTeX.
GRASSHOPPER

Cornell University, Ithaca, NY April 2018
Co-wrote and ran a three class minicourse at Ithaca High School titled *Graph Coloring and Applications*, designed to specifically engage students who previously struggled with math.

**Expanding Your Horizons Presenter**

Cornell University, Ithaca, NY April 2017, April 2018
Assisted in running a math education group activity for middle school and high school girls and their parents during a one-day, university-wide conference.

**JHU Center for Talented Youth Workshop Presenter/Designer**

Cornell University, Ithaca, NY November 2016
Led multiple activity sessions for middle school and early high school students at the local conference sponsored by CTY and hosted by Cornell University.

**“What is...” Seminar Organizer**

Cornell University, Ithaca, NY Fall 2015, Spring 2016
Organized a biweekly seminar aimed at connecting new graduate students to professors seeking students. Prepared poster announcements, scheduled speakers, and arranged catering.

**Teaching Experience**

Cornell University

- Grader for Math 4370 - Computational Algebra Fall 2019
- Instructor for Math 1110 - Calculus I Spring 2019
- Grader for Math 6310 - Algebra I Fall 2018
- Grader for Math 4410 - Combinatorics I Spring 2018
- Instruction TA for Math 1300 - Mathematical Explorations Fall 2017
- Grader for Math 1920 - Multivariable Calculus for Engineers Summer 2017
- Recitation TA for Math 2310 - Linear Algebra with Applications Spring 2017
- Grader for Math 4130 - Honors Analysis I Fall 2016
- Recitation TA for Math 2940 - Linear Algebra for Engineers Spring 2016
- Recitation TA for Math 2940 - Linear Algebra for Engineers Fall 2015