

# Evelyne Smith-Roberge

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<b>CURRENT POSITION</b>	<b>Visiting Assistant Professor</b> Georgia Institute of Technology, School of Mathematics	2022-2025
<b>EDUCATION</b>	<b>PhD: Combinatorics and Optimization</b> <b>Supervisor:</b> Luke Postle <b>Thesis title:</b> Local Perspectives on Planar Colouring University of Waterloo, Waterloo, Ontario	August 2022
	<b>Master of Mathematics: Combinatorics and Optimization</b> <b>Supervisor:</b> Luke Postle <b>Thesis title:</b> Density and Structure of Homomorphism-Critical Graphs University of Waterloo, Waterloo, Ontario	August 2018
	<b>Bachelor of Science (Major: Mathematics)</b> McGill University, Montreal, Quebec	May 2016
<b>COURSES TAUGHT/TAd</b>	<b>Instructor</b> Georgia Institute of Technology, School of Mathematics <ul style="list-style-type: none"><li>MATH 4022: Introduction to Graph Theory</li><li>MATH 3012: Applied Combinatorics</li></ul> University of Waterloo, Faculty of Mathematics <ul style="list-style-type: none"><li>MATH 239: Introduction to Combinatorics</li></ul> <b>Teaching Assistant</b> University of Waterloo, Faculty of Mathematics <ul style="list-style-type: none"><li>MATH 239: Introduction to Combinatorics</li><li>CO 687: Applied Cryptography</li><li>MATH 674: Special Topics in Mathematical Connections</li><li>MATH 342: Introduction to Graph Theory</li><li>MATH 104: Introductory Calculus for Arts and Social Science</li><li>ECE 103: Discrete Mathematics</li><li>MATH 116: Calculus 1 for Engineering</li></ul>	Fall 2023 Fall 2022, Spring 2023  Fall 2021  six terms, 2017-2021 one term, 2021 one term, 2020 two terms, 2019-2020 one term, 2018 one term, 2017 one term, 2016
<b>PAST EMPLOYMENT</b>	<b>Cryptography Intern</b> Communications Security Establishment, Government of Canada <ul style="list-style-type: none"><li>At the end of this internship, wrote a final report restricted to internal distribution.</li></ul> <b>Part-time Mechanical Engineering Intern</b> Siemens Canada, Energy Sector <ul style="list-style-type: none"><li>Continued work started at Rolls-Royce and the Harvard School of Engineering and Applied Science, designing zero-porosity auxetic structures for use in gas turbine hot-section components.</li></ul> <b>Visiting Research Scholar</b> Harvard School of Engineering and Applied Science	Summer 2020  2014-2015  Summer 2014

- Studied macroscopic material instability and its application in the design of new metamaterials. Using Python, Abaqus, and Matlab, designed, modeled and optimized a structure with tunable Poisson ratio for use in the aerospace industry.

**Part-time Mechanical Engineering Intern**

2013-2014

Research and Technology, Energy Sector, Rolls-Royce Canada

- I and another student were the first ever undergraduate mathematics students to be hired as part of the engineering internship program.
- Employed optimization techniques to create a new tool for material and process selection.
- Using finite element analysis, studied buckling-induced pattern transformation and its application to metallic aerospace structures.

**PUBLICATIONS  
& PREPRINTS**

- L. Postle, **E. Smith-Roberge**. *Exponentially Many Correspondence Colourings of Planar and Locally Planar Graphs*. Submitted, 2023.
- S. Mies, B. Moore, and **E. Smith-Roberge**. *Beyond the Pseudoforest Strong Nine Dragon Tree Theorem*. Submitted, 2023.
- L. Postle, **E. Smith-Roberge**. *Hyperbolicity Theorems for Correspondence Colouring*. Submitted, 2023.
- **E. Smith-Roberge**. *On the choosability with separation of planar graphs and its correspondence colouring analogue*. 2022. (arXiv:2203.13348v2) (Note: will not be submitted for publication, as the result was superseded by another paper uploaded to arXiv a few days later.)
- L. Postle, **E. Smith-Roberge**. *Local Choosability of Planar Graphs*. Advances in Combinatorics, December 2022. (arXiv:2108.03315)
- B. Moore, **E. Smith-Roberge**. *A Density Bound for Triangle-free 4-Critical Graphs*. 2020. Journal of Graph Theory 103 (1), 66-111. (arXiv:2012.01503)
- L. Postle, **E. Smith-Roberge**. *On the Density of  $C_7$ -Critical Graphs*. 2022. Combinatorica 42(2), 253-300. (arXiv:1903.04453)
- F. Javid, **E. Smith-Roberge**, M. Innes, J. Weaver, A. Shanian, K. Bertoldi. *Dimpled elastic sheets: a new class of non-porous negative Poisson's ratio materials*. 2015. Scientific Reports 5, Article number: 18373. doi:10.1038/srep18373.

**PRESENTATIONS Conferences**

- *Counting 5-Correspondence Colourings of Planar Graphs*. Presented at CanaDAM 2023. June 2023
- *Counting Correspondence Colourings of Planar Graphs*. Presented at AMS Special Session on Recent progress in Chromatic Graph Theory. April 2023.
- *Unifying and localizing two planar list colouring results of Thomassen*. Presented at the AWM Special Session on Women in Graph Theory at JMM 2023. January 2023.
- *Planar graphs are local girth choosable*. Presented at the CMS Summer Sessions 2022. June 2022.
- *Local Choosability of Planar Graphs*. Presented at CanaDAM 2021. May 2021.
- *Density of  $C_7$ -Critical Graphs*. Presented at Eurocomb 2019. August 2019.
- *Density of  $C_7$ -Critical Graphs*. Presented at the SIAM Conference in Discrete Mathematics. June 2018.

**Seminars**

- *Hyperbolicity and Counting Correspondence Colourings*. Graph Theory Seminar, Georgia Tech. November 2023.
- *Hyperbolicity and Counting Correspondence Colourings*. Discrete Math Seminar, Illinois Tech. November 2023.

- *Counting 5-correspondence colourings of planar graphs*. Discrete Math and Combinatorics Seminar, University of South Carolina. March 2023.
- *Local Choosability for Planar Graphs*, Graph Theory Seminar, University of Amsterdam. November 2022.
- *Unifying and localizing two planar list colouring results of Thomassen*. Graph Theory Seminar, Georgia Tech. September 2022.
- *Planar graphs are local girth choosable*. Discrete Maths Seminar, University of Victoria. March 2022.
- *A Local Choosability Theorem for Planar Graphs*. Graphs and Matroids Seminar, University of Waterloo. September 2021.
- *Density and Structure of Odd-Cycle-Critical Graphs*. Graphs and Optimization Seminar, LaBRI, Bordeaux, France. November 2018.
- *Density and Structure of Homomorphism-Critical Graphs*. Graphs and Matroids Seminar, University of Waterloo. August 2018.
- *Ramsey Theory: a Quick and Painless Introduction*. Presented at the Seminars in Undergraduate Mathematics in Montreal. January 2016.

## PATENTS

**Inventors:** F. Javid, K. Bertoldi, M. Taylor, C. Booth-Morrison, C. Carlson, M. Farhangi, M. Gerendas, T. Gillespie, M. Innes, F. Jette, M. Q. Pham, F. Sanchez, T. Scarinci, M. Schaezner, A. Shanian, **E. Smith-Roberge**, B. Villien.

- Hybrid dimple-and-void auxetic structures with engineered patterns for customized NPR behavior. *WO 2016112367 A3*. 2016.
- Zero-porosity NPR structure and tuning of NPR structure for particular localities. *US 2018009257 A1*. 2016.
- Negative Poisson's ratio waffle structures. *WO 2016112366 A1*. 2016.
- Multi-layer NPR structures. *WO 2016112365 A1*. 2016.
- Auxetic structures with distorted projection slots in engineered patterns to provide NPR behavior and improved stress performance. *WO 2016112369 A1*. 2016.
- Auxetic structures with angled slots in engineered patterns for customized NPR behavior and improved cooling performance. *WO 2016112368 A1*. 2016.

## AWARDS

### University of Waterloo

- |  |           |
|--|-----------|
| • NSERC (CGSD-3) (\$105 000) (declined in last year)         | 2020-2023 |
| • Outstanding TA Award (Departmental award)                  | fall 2020 |
| • President's Graduate Scholarship (\$ 10 000)               | 2020-2021 |
| • Mathematics Domestic Doctoral Scholarship (\$ 2 500 )      | 2019-2020 |
| • Math Provost Doctoral Entrance Award for Women (\$ 5 000 ) | 2018-2019 |
| • Mathematics Domestic Doctoral Scholarship (\$ 5 000 )      | 2018-2019 |

## REFEREE ACTIVITY

- Journal of Combinatorial Theory, Series B (JCTB)
- SIAM Journal on Discrete Mathematics (SIDMA)
- European Journal of Combinatorics
- Discrete Mathematics
- Electronic Journal of Combinatorics

## SERVICE & OUTREACH

- **Co-organizer**, CanaDAM 2023 Contributed minisymposium titled *Flows, Colourings, and Decompositions* (June 2023)
- **Co-organizer**, Georgia Tech's High School Math Day 2023 (HSMD 2023): a day of mathematical exploration and competitions for high school students in the surrounding states. (Apr. 2023)

- **Co-organizer**, graduate student and postdoc poster session and lightning talk session. ACORN 2023, Georgia Institute of Technology. (Mar. 2023)
- **Grad Student Representative** for the U. of Waterloo's C&O Department. (Sept. 2020-Jan. 2022)
- **C&O Director for the Maths Grad Student Association at the University of Waterloo**. Represented the interests of the C&O grad students in the monthly MGSA meetings. (Sept. 2020-Aug. 2021)
- **Speaker for *Math Circles***, a free weekly enrichment activity for grade 6 to 12 students organized by the Faculty of Mathematics of the U. of Waterloo. Presented various topics including continued fractions, introductory graph theory, introductory Ramsey theory, etc. (2016-2017)
- **VP Communications** for McGill's Society of Undergraduate Maths students (SUMS). (2015-2016)