

Evelyne Smith-Roberge

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EDUCATION ***PhD in Combinatorics and Optimization*** September 2018-present
Supervisor: Luke Postle
University of Waterloo, Waterloo, Ontario

Master of Mathematics: Combinatorics and Optimization August 2018
Supervisor: Luke Postle
Thesis title: Density and Structure of Homomorphism-Critical Graphs
University of Waterloo, Waterloo, Ontario

Bachelor of Science (Major: Mathematics) May 2016
McGill University, Montreal, Quebec

EMPLOYMENT HISTORY ***Graduate Research Assistant***
University of Waterloo, Faculty of Mathematics
• Research in structural graph theory and graph colouring. 2016-present

Graduate Teaching Assistant
University of Waterloo, Faculty of Mathematics
• MATH 239: Introduction to Combinatorics four terms, 2017-2018
• MATH 104: Introductory Calculus for Arts and Social Science one term, 2018
• ECE 103: Discrete Mathematics one term, 2017
• MATH 116: Calculus 1 for Engineering one term, 2016

Part-time Industrial Researcher 2014-2015
Siemens Canada, Energy Sector
• 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.

Visiting Research Scholar Summer 2014
Harvard School of Engineering and Applied Science
• 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 Industrial Researcher 2013-2014
Research and Technology, Energy Sector, Rolls-Royce Canada
• Applied optimization tools to material and process selection.
• Using finite element analysis, studied buckling-induced pattern transformation and its application to metallic aerospace structures.

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.*

PUBLICATIONS

- F. Javid, **E. Smith-Roberge**, M. Innes, J. Weaver, A. Shanian, K. Bertoldi. *Dimpled elastic sheets: a new class of non-porous negative Poissons ratio materials.* Scientific Reports 5, Article number: 18373 (2015). doi:10.1038/srep18373.

PRESENTATIONS **Conferences**

- *Density of C_7 -Critical Graphs.* Presented at the SIAM Conference in Discrete Mathematics. June 2018.
- *Ramsey Theory: a Quick and Painless Introduction.* Presented at the Seminars in Undergraduate Mathematics in Montreal. January 2016.
- **F. Javid**, E. Smith-Roberge, M. Innes, A. Shanian, K. Bertoldi. *Non-porous Elastic Sheets with Negative Poisson's Ratio.* Presented at an American Physical Society Meeting, San Antonio, Texas. March 2015.

Seminars

- *Density and Structure of Homomorphism-Critical Graphs.* Graphs and Matroids Seminar, University of Waterloo. August 2018.
- *Density and Structure of Odd-Cycle-Critical Graphs.* Graphs and Optimization Seminar, LaBRI, Bordeaux, France. November 2018.

AWARDS

University of Waterloo

- Math Provost Doctoral Entrance Award for Women (\$ 5 000 value) 2018-2019
- Mathematics Domestic Doctoral Scholarship (\$ 5 000 value) 2018-2019
- Math Domestic Graduate Award (\$ 5 000 value) 2018-2019
- Math Domestic Graduate Award (\$ 3 000 value) 2017-2018
- Math Domestic Graduate Award (\$ 1 000 value) 2016-2017

REFEREE ACTIVITY

- Journal of Combinatorial Theory, Series B
- European Journal of Combinatorics
- Discrete Mathematics

SERVICE & OUTREACH

- **Speaker for the Centre of Education in Math and Computing's *Math Circles***, a free weekly enrichment activity for grade 6 to 12 students organized by the Faculty of Mathematics of the University 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)**. Assumed responsibility for social media and community outreach within the undergraduate mathematics community in Montreal. Represented SUMS on the Library Committee; participated in planning the renovation of the Rosenthal Maths Library at McGill. 2015-2016