

# ALICE LACAZE-MASMONTEIL

## PERSONAL INFORMATION

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NATIONALITIES: Canadian and French  
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## EDUCATION

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University of Ottawa, Ottawa, ON, Canada 2020 -  
Doctorate of Philosophy  
Expected completion date: September 2024  
Supervisor: Mateja Šajna  
Thesis title: Certain resolvable directed cycle decompositions

Acadia University, Wolfville, NS, Canada 2017 - 2019  
Master's of Science  
Supervisor: Nancy E. Clarke  
Thesis title: Some problems on the game of Ambush Cops and Robbers

Acadia University, Wolfville, NS, Canada 2012 - 2017  
Bachelor of Pure and Applied Sciences with Honours  
Supervisor: Nancy E. Clarke  
Thesis title: Cordial labeling of some new and existing classes of graphs

## PUBLICATIONS

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### Journal Articles

- [1] A. Lacaze-Masmonteil, Completing the solution of the directed Oberwolfach problem with cycles of uniform length, *Journal of Combinatorial Designs*, **32** (2024), 5-30.

### Articles Under Review

- [2] D. Horsley and A. Lacaze-Masmonteil, Completing the solution of the directed Oberwolfach problem with two tables, submitted on August 2024.

## PRESENTATIONS

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### Invited Presentations

*Resolution of the directed Oberwolfach problem with cycles of uniform length*, June 2023  
10th Slovenian Conference on Graph Theory: Combinatorial Designs and their Applications Mini Symposium, Kranjska Gora, Slovenia

- Resolution of the directed Oberwolfach problem with cycles of uniform length*, 2023 Canadian Mathematical Society Summer Meeting: Design Theory and Graph Decomposition Session, Ottawa, ON, Canada June 2023
- Resolvable directed cycle decompositions of the complete symmetric digraph*, 2022 Canadian Mathematical Society Summer Meeting: Design Theory and Graph Decomposition Session, St. John's, NL, Canada June 2022

## Contributed Presentations

- Hamiltonian decompositions of the wreath product of two hamiltonian decomposable directed graphs*, Women in Combinatorics Virtual Conference, Online July 2024
- On the directed Oberwolfach problem with two tables*, 45th Australasian Combinatorics Conference, Perth, WA, Australia Dec. 2023
- Resolution of the directed Oberwolfach problem with cycles of uniform length*, 27th Ontario Combinatorics Workshop, Ottawa, ON, Canada May 2023
- Resolvable directed cycle decompositions of the complete symmetric digraph*, 26th Ontario Combinatorics Workshop, Waterloo, ON, Canada May 2022
- The game of Ambush Cops and Robbers played on chordal graphs and outerplanar graphs*, 25th Ontario Combinatorics Workshop, Online May 2021
- The game of Ambush Cops and Robbers played on the products of graphs*, 2018 Canadian Mathematical Society Winter Meeting: Student Committee Research Session, Vancouver, BC, Canada Dec. 2018
- The game of Ambush Cops and Robbers played on the products of graphs*, Acadia's 5th Annual Student Research and Innovation Conference, Wolfville, NS, Canada Feb. 2018
- On the cordiality of various unions of complete graphs*, 12th East Coast Combinatorics Conference, Saint John, NB, Canada Jul. 2017
- On the cordiality of various unions of complete graphs*, Annual Conference for Science Atlantic Mathematics, Statistics and Computer Science, Sydney, NS, Canada Oct. 2016
- Cordial labeling of closed chains of cycles and turtles*, Annual Conference for Science Atlantic Mathematics, Statistics and Computer Science, Wolfville, NS, Canada Oct. 2015

## Seminar Presentations

- On the directed Oberwolfach problem*, Monash University Discrete Mathematics Seminar, Melbourne, VIC, Australia Oct. 2023

## RESEARCH EXPERIENCE

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- University of Regina, Regina, SK, Canada 2024-  
*PIMS-CNRS Post-doctoral fellow*  
 In collaboration with Karen Meagher, I am presently studying Erdős-Ko-Rado type theorems for latin squares. Our objective is to further our understanding of properties of the derangement graph of the symmetric group.
- Monash University, Melbourne, VIC, Australia 2023  
*Visiting PhD student*  
 In collaboration with Professor Daniel Horsley, I completed the solution to the two-table case of the directed Oberwolfach problem.
- University of Ottawa, Ottawa, ON, Canada 2020-  
*Doctoral thesis*  
 I resolved the last open case of the directed Oberwolfach problem with cycles of uniform length. I also investigated directed cycle decompositions of products of directed graphs. Namely, I made significant progress on a conjecture of Alspach et al. (1990) which states that the lexicographic product of two Hamiltonian decomposable directed graphs is also Hamiltonian decomposable.
- Acadia University, Wolfville, NS, Canada 2017 - 2019  
*Master's thesis*  
 I investigated a variation of the pursuit-evasion game of Cops and Robbers (C&R) played on graphs dubbed Ambush C&R. In this variation, we applied a restriction on the cops' ability to move on the graph. My objective was to develop winning strategies for the cops on several classes of graphs. I first conducted a literature review in which I studied various winning strategies from the original game of C&R and then adapted these strategies to the game of Ambush C&R. Winning strategies were defined on outerplanar graphs, chordal graphs, and graph products.
- Acadia University, Wolfville, NS, Canada 2015 - 2016  
*Honour's thesis*  
 I conducted original research on a type of graph labeling known as cordial labeling. I determined when several classes of graphs admit a cordial labeling. To do so, I solved a set of diophantine inequalities and showed that the existence of a cordial labeling for certain classes of graphs was equivalent to the existence of a solution to these inequalities.

## FELLOWSHIPS, SCHOLARSHIPS, AND PRIZES

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All monetary values are in Canadian dollars (CAD).

*Pacific Institute for the Mathematical Sciences (PIMS) - Centre National de Recherche Scientifique (CNRS) Postdoctoral Fellowship* 2024 - 2026

Valued at \$30,000 per year for two years with a top-up from the University of Regina of at least \$25,000 per year. Held under the supervision of Professor Karen Meagher.

*University of Ottawa Department of Mathematics and Statistics André Dabrowski Scholarship Fund* 2023

Valued at \$1,400. Awarded annually to a student who has demonstrated qualities of leadership.

*University of Ottawa Department of Mathematics and Statistics Outstanding Student Paper Prize* 2023

This prize is awarded annually by the Departmental Teaching Personnel Committee to the best paper published by a student.

*Peter Rodney Memorial Book Prize* 2023

Awarded to the best student talk given at the 27th Ontario Combinatorics Workshop.

*Natural Sciences and Engineering Research Council of Canada (NSERC) Michael Smith Foreign Study Supplement* 2023

Valued at \$6,000. Awarded to fund research visit to Monash University in Melbourne Australia.

*NSERC Canada Graduate Scholarship - Doctoral* 2021 - 2024

Valued at \$35,000 per year for a duration of three years.

*University of Ottawa Doctoral Admission Scholarship* 2020 - 2024

Valued at \$9,000 per year for a duration of four years.

*Catherine Stanley Memorial Scholarship* 2018

Valued at \$1,000. Awarded to a student that has demonstrated excellence and enthusiasm as a department teaching assistant.

*NSERC Canada Graduate Scholarship - Master's* 2017 - 2018

Valued at \$17,500 for a duration of one year.

*Acadia Undergraduate Mathematics Competition: Best Paper* 2016

## TEACHING EXPERIENCE

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University of Regina, Regina, SK, Canada Fall 2024

*Sessional Instructor*

Courses (taught in English): Introduction to Linear Algebra 1 (MATH 122: 55 students).

- Prepared course notes, laboratory exercises, and in-semester assessments.
- Collaborated with other instructors to draft final exam.

University of Ottawa, Ottawa, ON, Canada Winter 2023

*Part-time professor*

Courses (taught in French): Introduction to Linear Algebra (MATH 1741: 170 students).

- Prepared course notes and material for directed discussion groups.
- Collaborated with other instructors to draft all course assessments.

University of Ottawa, Ottawa, ON, Canada 2020 - 2021

*Teaching assistant*

Courses (taught in French): Advanced Linear Algebra, Introduction to Linear Algebra, and Mathematical Reasoning and Proofs.

- Marked assignments and taught directed discussion groups.
- Tutored students at the Mathematics and Statistics Help Center.

Acadia University, Wolfville, NS, Canada 2013 - 2018

*Teaching assistant*

Courses (taught in English): Introduction to Linear Algebra, Linear Algebra 2, Introductory Calculus I and II, Matrix Algebra, Introduction to Differential Equations, Applied Statistics for Life Sciences I and II, and Applied Probability for Science and Engineering.

- Marked assignments and assisted professors with facilitating directed discussion groups.
- Tutored students at the Mathematics and Statistics Help Center.

## ACADEMIC SERVICE

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Referee for the following journals and publications:

- *Discussiones Mathematicae Graph Theory*.
- *Bulletin of the Institute of Combinatorics and its Applications*.
- *Springer Proceedings in Mathematics & Statistics*.

Women in Combinatorics Virtual Conference 2024

*Combinatorial Designs Session co-organizer*

- Participated in organizational activities that included choosing and inviting speakers, and scheduling and chairing talks.

2023 Canadian Mathematical Society (CMS) Summer Meeting 2023

*Design Theory and Graph Decomposition Session co-organizer*

- Participated in organizational activities that included choosing and inviting speakers, and scheduling and chairing talks.

Canadian Mathematical Society Student Committee 2022 - 2024

*Chair*

- Assigned tasks and provided support and supervision to committee members.
- Chaired biannual committee meetings.
- Co-organized a student social event and the Student Committee Research Session at the 2023 CMS Summer Meeting.
- Co-organized the AARMS-CMS Student Poster Session at the 2022 CMS Winter Meeting.
- Evaluated funding applications for academic events from student groups from across Canada.

University of Ottawa Mathematics and Statistics Graduate Student Association Executive 2022 - 2023  
*President*

- Supervised a team of seven members.
- Chaired monthly executive meetings.
- Co-organized social and educational events for graduate students in mathematics and statistics.

16th Ottawa Mathematics and Statistics Conference Organizing Committee 2022 - 2023  
*Chair*

- Chaired committee meetings, applied for funding, and invited keynote speakers.
- Assigned tasks and provided support and supervision to committee members.
- Chaired several sessions of contributed talks.

27th Ontario Combinatorics Workshop Organizing Committee 2022 - 2023  
*Member*

- Applied for and obtained funding from the University of Ottawa department of Mathematics and Statistics.
- Participated in organizational activities that included selecting keynote speakers, and scheduling and chairing talks.

Canadian Mathematical Society Student Committee 2021 - 2022  
*Member*

- Co-organized the Student Committee Research Session at the 2021 CMS Winter Meeting and 2022 CMS Summer Meeting.
- Evaluated funding applications for academic events from student groups from across Canada.

14th and 15th Ottawa Mathematics and Statistics Conference Organizing Committee 2020 - 2022  
*Member*

- Participated in organizational activities that included selecting keynote speakers, scheduling and chairing talks, and advertising.

University of Ottawa Mathematics and Statistics Graduate Student Association Executive 2020 - 2022

*Vice-president external*

- Represented all graduate students in mathematics and statistics on the Board of Governor of the University of Ottawa Graduate Student Association.

Acadia's 5th Student Research and Innovation Conference Organizing Committee 2017 - 2018

*Member*

- Applied for and obtained funding from various departments.
- Participated in organizational activities that included selecting keynote speakers, scheduling and chairing talks, and advertising.

Acadia Graduate Student Association Executive Committee 2017 - 2018

*Science representative*

- Co-organized social and educational events.
- Represented all graduate students from the faculty of science on the Acadia Senate Committee on Graduate Studies in matters pertaining to funding allocations, admissions, and thesis defenses.

Acadia Math Outreach 2016 - 2018

*Student volunteer*

- Facilitated over 10 sessions for participants aged 10-17. Each session was designed to allow participants to explore a particular topic in mathematics.