Aram Dermenjian

Curriculum vitae

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Research Interests

My area of interest lies primarily in combinatorics and discrete geometry where I study objects such as Coxeter groups, hyperplane arrangements, oriented matroids, and polytopes. My main research lies in looking at discrete geometric structures through an order theoretic lens. This includes structures in Euclidean, affine and hyperbolic spaces.

Education

- **Ph.D. in Mathematics**, *2015 - 2019*,
  Université du Québec à Montréal, Montreal, Canada
  Supervisors: Christophe Hohlweg (Université du Québec à Montréal, Montreal, Canada) and Vincent Pilaud (École Polytechnique, Paris, France)
  Thesis: Facial weak order, Coxeter groups and oriented matroids

- **M. Sc. Pure Mathematics and Mathematical Logic**, *2013 - 2014*,
  University of Manchester, Manchester, UK
  Dissertation: Non-crossing partitions of Coxeter groups

- **Bachelor of Science Mathematics**, *2004 - 2008*,
  University of California, Davis, CA
  - The final year (2007-2008) was completed at Leeds University, Leeds, United Kingdom, under a study abroad program.

Academic Work Experience

- **Heilbronn Fellow in Mathematics**, *Oct 2021 - Sep 2023*,
  University of Manchester, Manchester, UK

- **Postdoctoral Fellow**, *Sep 2019 - Aug 2021*,
  York University, Toronto, Canada

Research Visits

- **Visiting Researcher**, *Apr 2024 - Present*,
  Arizona State University, Phoenix, Arizona, USA

- **Visiting Researcher**, *Nov 2022 - Nov 2022*,
  University of Crete, Crete, Greece

- **Visiting Researcher**, *May 2015 - Jun 2015*,
  Université du Québec à Montréal (LACIM), Montreal, Canada

- **Visiting Researcher**, *Feb 2015 - Apr 2015*,
  L'École Polytechnique (LIX), Paris, France

- **Lecturer**,
  University of Manchester, Manchester, UK
  | Sem. 2 of 2022/2023 | MATH20222 Introduction to Geometry (taught in English - Coteacher) |
  | | **Class type:** (Hybrid) Lectures – 150 students, undergraduate course |

- **Lecturer**,
  York University, Toronto, Canada
Summer 2021	MATH2030A Elementary Probability (taught in English)
	Class type: (Online) Lectures – 250 students, undergraduate course
Sem. 2 of 2019/2020	MATH1013M Applied Calculus I (taught in English)
	Class type: Lectures – 250 students, undergraduate course

- **Lecturer**,
  Université du Québec à Montréal, Montreal, Canada
Sem. 1 of 2018/2019	MAT0344 Integration Calculus (taught in French)
	Class type: Lectures – 13 students, undergraduate course
Sem. 1 of 2017/2018	MAT1600 Matrix Algebra - for computer scientists (taught in French)
	Class type: Lectures – 80 students, undergraduate course

- **Teaching Assistant**,
  Université du Québec à Montréal, Montreal, Canada
Sem. 2 of 2016/2017	INF1130 Discrete Mathematics (taught in French)
	Class type: Tutorials – 60 students, undergraduate course
Sem. 2 of 2016/2017	ANG3005 English Language and Literature I (taught in English)
	Class type: Tutorials – 30 students, undergraduate course
Sem. 1 of 2016/2017	INF1130 Discrete Mathematics (taught in French)
	Class type: Tutorials – 60 students, undergraduate course
Sem. 1 of 2016/2017	ANG4152 Pronunciation III (taught in English)
	Class type: Tutorials – 30 students, undergraduate course
Sem. 1 of 2016/2017	ANG3052 Speaking II (taught in English)
	Class type: Tutorials – 30 students, undergraduate course

Research Contributions

Articles in Preparation

- K. Calvert, A. Dermenjian, A. Fink, B. Smith *Quadratic exchange equations for Coxeter matroids* (2025)

Preprints and submitted articles

- A. Dermenjian *Thin MC left regular bands* (2024) 18pp. arXiv: 2410.13130

- A. Dermenjian, A. Evetts *Conjugacy class growth in virtually abelian groups* (2023) 11pp. arXiv: 2309.06144

- A. Dermenjian, E. Flight, T. Tanasa *The* `OrientedMatroids` *package for* `SageMath` (2024)

Publications

- A. Dermenjian, E. Tzanaki *Enumerating regions of Shi arrangements per Weyl Cone* European J. Combin. **122** (2024) 37pp. DOI: `https://doi.org/10.1016/j.ejc.2024.104002`

- A. Dermenjian *Maximal degree subposets of ν-Tamari lattices* Electron. J. Combin. **30**, 2 (2023) 40 pp. DOI: `https://doi.org/10.37236/11571`

- A. Dermenjian, C. Hohlweg, T. McConville, V. Pilaud. *The facial weak order on hyperplane arrangements* Disc. Comp. Geo. **39** (2021), 34 pp. DOI: `https://doi.org/10.1007/s00454-021-00312-5`

- N. Bergeron, A. Dermenjian, J. Machacek. *Sign variation and descents* Electron. J. Combin. **27**, 4 (2020), 11 pp. DOI: `https://doi.org/10.37236/9801`

- A. Dermenjian, C. Hohlweg, V. Pilaud. *The facial weak order and its lattice quotients* Trans. Amer. Math. Soc. **370** (2018), 1469-1507 DOI: `https://doi.org/10.1090/tran/7307`

Conference Proceedings

- N. Bergeron, A. Dermenjian, J. Machacek. *Sign variation and descents*, Proceedings of the 33rd FPSAC, Séminaire Lotharingien de Combinatoire - FPSAC 2021. **85B** (Ramat Gan, January 2021) 12pp.

- A. Dermenjian, C. Hohlweg, T. McConville, V. Pilaud. *The facial weak order on hyperplane arrangements*, Proceedings of the 32nd FPSAC, Séminaire Lotharingien de Combinatoire - FPSAC 2020. **84B** (Online, July 2020) 11pp.

- A. Dermenjian, C. Hohlweg, V. Pilaud. *The facial weak order in finite Coxeter groups*, Proceedings of the 28th FPSAC (Vancouver, July 2016) 12pp.

Thesis

- Aram Dermenjian, *Facial weak order, Coxeter groups and oriented matroids*, Thesis, Université du Québec à Montréal, October 2019, 200 pages.

Research Funds

- **Focused Research Grant**, *Heilbronn Institute for Mathematical Research*, £1,500, (2023)

- **International Internship**, *Fonds de recherche du Québec – Nature et technologies*, CA$15,000, (2018)

- **Merit scholarship program for foreign students**, *Fonds de recherche du Québec – Nature et technologies*, CA$26,667, (2017)

- **International Scholarship**, *Armenian General Benevolent Union*, CA$1,900, (2017)

- **ISM Graduate Scholarship**, *Institute of Mathematical Sciences*, CA$12,833, (2016)

- **Fee exemption Scholarship**, *UQAM*, (2015)

- **ISM Graduate Scholarship**, *Institute of Mathematical Sciences*, CA$14,000, (2015)

Awards and Recognitions

- Received the *Research Staff Excellence Award* for best outstanding contribution to the research staff environment in the faculty of science and engineering at the University of Manchester in the 2022/2023 academic year.

- Recognized and highlighted as one of 30 LGBTQ+ mathematicians on a poster made by Spectra (the LGBTQ+ organization for mathematicians around the world) at the joint math meeting of the American Mathematical Society in 2022.

- Rated one of the top three lecturers by students in the mathematics department at York university in Summer 2021.

Scientific Activity

Invited Lectures

- **Enumerative Combinatorics Summer School**, *Jul 2023,*
  Summer school, Arusha, Tanzania
  - ○ Turned down invitation
- **Encuentro Colombiano de Combinatoria**, *Jun 2022,*
  Summer school, Bogota, Colombia
  - ○ Sage Sessions

Invited/Contributed Talks

- Enumerating Weyl Cones of Shi Arrangements
  - ○ Three talks in Combinatorics, Barcelona Spain (Jan 2024)
  - ○ 89th Séminaire Lotharingien de Combinatoire, Bertinoro, Italy (Mar 2023)
  - ○ Various Guises of Reflection Arrangements, Edinburgh, UK (Mar 2023)

- Conjugacy class growth in affine Coxeter groups
  - ○ 90th Séminaire Lotharingien de Combinatoire, Bad Boll, Germany (Sep 2023)

- The facial weak order in simplicial hyperplane arrangements
  - ○ Flags, galleries and reflection groups, Sydney, Australia (Aug 2019)
  - ○ 7th Canadian Discrete and Algorithmic Mathematics Conference, Vancouver, Canada (May 2019)
  - ○ Graduate students in combinatorics conference 2019, Philadelphia, PA, USA (Apr 2019)

- The facial weak order in finite Coxeter groups
  - ○ 10th Ottawa Mathematics Conference, Ottawa, Canada (June 2017)
  - ○ FPSAC 2016, Vancouver, Canada (Jul 2016)
  - ○ 2016 CMS Summer Meeting, Edmonton, Canada (Jun 2016)
  - ○ 19th Panquebec student colloquium of the ISM, Montréal, Canada (May 2016)

- The facial weak order and its lattice quotients
  - ○ AMS Sectional Meeting - Cluster algebras and related topics, Hartford, CT, USA (Apr 2019)
  - ○ Algebraic Combinatorics and Group Actions, Herstmonceux Castle, UK (Jul 2016)
  - ○ Séminaire Lotharingien de Combinatoire, Strasbourg, France (Apr 2016)

- Introduction to Python
  - ○ Sage Days 78: Combinatorics, Vancouver, BC, Canada (Jun 2016)

Seminar Talks

- Enumerating Weyl Cones of Shi Arrangements
  - ○ Discrete Math Seminar, Arizona State University, Phoenix, AZ, USA (Apr 2024)

- Maximal degree subposets of ν-Tamari lattices
  - ○ Algebra Seminar, Leeds University, Leeds, UK (Nov 2022)

- The importance of being *straight*
  - ○ Dalhousie University Honours Seminar, Online (Jan 2022)
  - ○ Graduate Online Combinatorics Colloquium, Online (Apr 2021)

- Sign variations and descents
  - Discrete Geometry Seminar, FU Berlin, Online (Jun 2021)
  - Algebra, Geometry and Combinatorics Online Seminar, Online (Jan 2021)
  - Algebra and Discrete Mathematics Seminar, University of California, Davis, Online (Jan 2021)
  - Combinatorics Seminar, University of Minnesota, Online (Dec 2020)
  - Combinatorics Seminar, University of Copenhagen, Online (Nov 2020)
  - Discrete Math Seminar, University of Massachusetts, Amherst, Online (Nov 2020)
  - Algebra and representation theory seminar, University of Oklahoma, Online (Oct 2020)
  - Algebraic (and enumerative) combinatorics seminar, University of Waterloo, Online (Sep 2020)
  - Rocky Mountain Algebraic Combinatorics Seminar, Colorado State University, Online (Sep 2020)
- The facial weak order in simplicial hyperplane arrangements
  - Algebra Seminar, University of Manchester, Manchester, UK (Mar 2022)
  - University of Queensland seminar, Brisbane, Australia (Aug 2019)
  - Algebra and discrete mathematics seminar, UC Davis, Davis, CA, USA (Jun 2019)
  - University of Minnesota seminar, Minneapolis, MN, USA (May 2019)
  - Algebra and combinatorics seminair, North Carolina State University, Raleigh, NC, USA (Apr 2019)
  - Applied Algebra Seminar, York University, Toronto, Canada(Nov 2018)
- The facial weak order in finite Coxeter groups
  - Séminaire du LaCIM, UQAM, Montréal, Canada(Nov 2016)

Posters

- Sign Variation and Descents
  - FPSAC 2021, Online (Jan 2022)

- The facial weak order on hyperplane arrangements
  - FPSAC 2020, Online (Jul 2020)
  - Summer school on geometric and algebraic combinatorics, Paris, France (Jun 2019)

- The facial weak order in finite Coxeter groups
  - Journées Nationales 2018 du GDR Informatique Mathématique, Paris, France (Apr 2018)

Community Services

Conference organization

- Queer and Trans Mathematicians in Combinatorics, London, UK (Jul 2023)
  Lead organizer - Organizing committee

- Matroids, Ordered structures, Arrangements in Combinatorics, Manchester, UK (Jul 2022)
  Organizing committee

- Queer and Trans Mathematicians in Combinatorics, Toronto, Canada (Jun 2021)
  Lead organizer - Organizing committee

- Student research session at the 2017 CMS Winter Meeting, Waterloo, Canada (Dec 2017)
  Co-organizer

- Student research session at the 2017 Mathematical Congress of the Americas, Montreal, Canada (Jul 2017)
  Co-organizer

Seminar Organization

- Organizer of the Applied Algebra seminar at York University. (2020-2021)
- Organizer of the Algebraic Combinatorics seminar at the Fields Institute. (2020-2021)
- Organiser of the Postgraduate student seminar in mathematics at UQAM. (2015 - 2017)
- Organiser of the summer mathematics seminar at UQAM. (2015 - 2017)

Referee

- Algebra Universalis, Annals of Combinatorics, Asian-European Journal of Mathematics, Combinatorial Theory, International Journal of Applied and Computational Mathematics, Journal of Combinatorics

Mentorship

- Two undergraduate students at the University of Manchester with the "Summer Experience Internships" program.
  Project title: "Integrating mathematics with programming using open source software"
  - Tudor Tanasa (3rd year)
  - Elizabeth Flight (2nd year)
- A Masters student at the University of Manchester under the "Maths Mentoring Scheme for Women and Minority Gender students".

Panels

- Panelist - *Maintaining Mathematical Community* - Spectra LGBTQ+ Mathematics Conference 2023 (Sep 2023)
- Panelist - *Academic Panel* - Manchester Interdisciplinary Mathematics Undergraduate Conference (Mar 2023)

Other

- Core member of the equality, diversity, inclusion and accessibility group in the mathematics department at the University of Manchester (2021 - 2023)
- Stonewall Workplace Equality liason at the University of Manchester (2021 - 2022)
- Co-chair of the Canadian Mathematical Society Student Committee. (2016 - 2018)
- Representative in postgraduate program committee for mathematics at UQAM. (2015 - 2017)
- Treasurer for postgraduate students in mathematics association at UQAM. (2015 - 2016)
- Volunteer for the environmental committee of the science student association at UQAM. (2015 - 2018)
- Represented the pure mathematics students as a representative on the postgrad student staff liaison board at the University of Manchester.

Languages

English	C2 *Primary language.*		Catalan	A2 *Basic Level.*
French	C1 *Advanced Level.*		Armenian	B2 *Mother tongue.*
Spanish	B2 *Intermediate Level.*			

References

- **Nantel Bergeron**, *Professor*, Department of mathematics and statistics, York University
  bergeron@yorku.ca

- **Eleni Tzanaki**, *Assistant Professor*, Department of mathematics and applied mathematics, University of Crete
  etzanaki@uoc.gr

- **Christophe Hohlweg**, *Professor*, Département de mathématiques, Université du Québec à Montréal
  hohlweg.christophe@uqam.ca