

# Payman Eskandari

## Curriculum Vitae

University of Winnipeg  
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### Employment

2025 - ? Associate Professor, Department of Mathematics and Statistics, University of Winnipeg  
2022 - 2025 Assistant Professor, Department of Mathematics and Statistics, University of Winnipeg  
2016 - 2022 Postdoctoral Fellow, Department of Mathematics, University of Toronto

### Education

2010 - 2016 PhD in Mathematics, University of Toronto  
Advisor: Kumar Murty  
Thesis Title: Algebraic Cycles, Fundamental Group of a Punctured Curve, and Applications in Arithmetic  
2008 - 2010 MSc in Mathematics, University of Toronto  
2006 - 2008 MASc in Electrical Engineering, University of Toronto  
2002 - 2006 BSc in Electrical Engineering, Sharif University of Technology, Iran

### Visiting and adjunct positions

2025 - ? Adjunct Professor, Department of Mathematics and Statistics, University of Ottawa  
2019 - 2022 Visiting member, Fields Institute for Research in Mathematical Sciences

### Research interests

Algebraic geometry and number theory, in particular:

- Arithmetic and geometric aspects of mixed motives and applications to related number theoretic questions (periods; period conjectures; motivic Galois, Mumford-Tate and analogous groups; geometric constructions of extensions of motives; connections to irrationality proofs)
- Tannakian formalism and its applications in arithmetic geometry
- Algebraic cycles, transcendental algebraic geometry and Hodge theory

### Publications (including pre-publications)

1. An integrable connection on the configuration space of a Riemann surface of positive genus, *C. R. Math. Acad. Sci. Paris*, 356 (2018), No. 3, 312-315, [Journal link](#)
2. Quadratic periods of meromorphic forms on punctured Riemann surfaces, in *Geometry, Algebra,*

*Number Theory, and its Information Technology Applications*, Springer Proceedings in Mathematics and Statistics, 251 (2018), 183-205, [Journal link](#)

3. Algebraic cycles and the mixed Hodge structure on the fundamental group of a punctured curve, *Mathematische Annalen*, 375 (2019), no. 3-4, 1665–1719, [Journal link](#)
4. (with Kumar Murty) On the harmonic volume of Fermat curves, *Proceedings of the American Mathematical Society*, 149 (2021), no. 5, 1919-1928, [Journal link](#)
5. (with Kumar Murty) On Ceresa cycles of Fermat curves, *Journal of the Ramanujan Mathematical Society*, 36 (2021), no. 4, 363-382, [Journal link](#)
6. (with Kumar Murty) The fundamental group of an extension in a Tannakian category and the unipotent radical of the Mumford-Tate group of an open curve, *Pacific Journal of Mathematics*, 325 (2023), no. 2, 255–279, [Journal link](#)
7. (with Kumar Murty) On unipotent radicals of motivic Galois groups, *Algebra & Number Theory*, 17 (2023), no. 1, 165-215, [Journal link](#)
8. (with Kumar Murty) The unipotent radical of the Mumford-Tate group of a very general mixed Hodge structure with a fixed associated graded, preprint, [arXiv: 2201.05713](#)
9. On endomorphisms of extensions in tannakian categories, *Bulletin of the Australian Mathematical Society* 110 (2024), no. 1, 103–114, [Journal link](#)
10. On blended extensions in filtered abelian categories and motives with maximal unipotent radicals, *Documenta Mathematica* (2025), 57 pages, [Journal link](#)
11. Tannakian fundamental groups of blended extensions, submitted, [arXiv: 2407.01379](#)
12. A remark on Ext groups for motives with maximal unipotent radicals, to appear in *C. R. Math. Acad. Sci. Paris*, [arXiv: 2506.16540](#)
13. Depth one part of Tannakian groups of filtrations, submitted, [arXiv: 2507.11717](#)
14. (with Yusuke Nemoto) The modified diagonal cycles of Hypergeometric curves, submitted, [arXiv: 2508.06008](#)
15. (with Kumar Murty and Yusuke Nemoto) Mixed motives and linear forms in the Catalan constant, submitted, [arXiv: 2510.20648](#)

## Grants

2024 - 2029	Discovery Grant, National Sciences and Engineering Research Council of Canada (NSERC), total of \$150,000
2024 - 2029	Discovery Launch Supplement, NSERC, \$12,500
2022 - 2025	Startup grant, University of Winnipeg, \$10,000

## Awards and recognition

2024	Merit, University of Winnipeg (in recognition of outstanding research performance during 2022-2023)
2017	F. V. Atkinson Teaching Award for outstanding teaching by a postdoctoral fellow, Department of Mathematics, University of Toronto
2016	Ida Bulat Teaching Award for outstanding teaching by a graduate student, Department of Mathematics, University of Toronto
2010 - 2016	Various Graduate Scholarships and Fellowships, University of Toronto

## Talks

2025 Séminaire de théorie des nombres de l'IMJ-PRG (joint Sorbonne University and Université Paris Cité)

2025 33èmes Journées Arithmétiques, University of Luxembourg

2025 Colloquium, Utah State University

2025 Number Theory Seminar, Utah State University

2024 Meeting of the Canadian Mathematical Society (Richmond, BC), session on Arithmetic Aspects of Galois Representations

2024 Geometry, Algebra, Number theory and Information Technology Applications (GANITA) seminar, University of Toronto

2024 The Ceresa cycle in Arithmetic and Geometry, conference at ICERM, Brown University

2024 Fields Number Theory Seminar, Fields Institute, Toronto, two talks

2023 Colloquium, University of Winnipeg

2023 Prairies Mathematics Colloquium (joint between universities in the Canadian provinces of Manitoba, Saskatchewan and Alberta)

2022 PIMS-UBC Rising Star Colloquium, University of British Columbia

2022 Number Theory Seminar, University of British Columbia

2022 Departmental Colloquium, University of Winnipeg

2022 Postdoctoral Colloquium, Fields Institute

2021 Geometry Seminar, University of Kansas

2021 Geometry, Physics and Representation Theory Seminar, Northeastern University

2021 Geometry, Arithmetic and Differential Equations of Periods (GADEPs) Seminar, IMPA (Brazil)

2021 Number Theory/Representation Theory Seminar, University of Toronto

2021 Theta Series Conference in honour of Steve Kudla's 70th birthday, Fields Institute

2021 Fields Number Theory Seminar, Fields Institute, Toronto

2020 Fields Number Theory Seminar, Fields Institute, Toronto

2019 Toronto-Montreal Number Theory Workshop, CRM, Montreal

2018 Number Theory Seminar, Queen's University

2018 Toronto-Montreal Number Theory Workshop, CRM, Montreal

2016 Number Theory/Representation Theory Seminar, University of Toronto

2015 Quebec-Vermont Number Theory Seminar, McGill University

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## Event (co)-organization

2027 Geometry, Algebra, Number theory, and their Information Technology Applications, Conference at the Fields Institute, 25-27 May 2027 (jointly organizing with Amir Akbary and Debanjana Kundu)

2021 - 2025 Fields Number Theory Seminar, Fields Institute (lead organizer)

2023 Number theory by early career researchers, a session in the 2023 Canadian Mathematical Society Winter Meeting, Montreal

2022 - 2023, Fall 2024 Math Colloquium Seminar, Department of Math and Stats, University of Winnipeg

2020 - 2022    Geometry, Algebra, Number theory, and their Information Technology Applications seminar, University of Toronto

## Supervision

Unless otherwise indicated, the supervisory role has been based at the University of Winnipeg.

### Postdoctoral

2025    Yusuke Nemoto

### Postgraduate

Sep 2025 - ?    Omer Avci, PhD Student, based at the University of Ottawa (joint co-supervision with Antonio Lei)

2024 - 2025    Omer Avci, Senior Research Assistant (topic: Galois cohomology, torsion subgroups of Mordeil-Weil groups of elliptic curves)

### Undergraduate

2024 - 2025    Mithuna Threz, Undergraduate Research Assistant (topic: Bounds on smallest primes in an arithmetic progressions using elementary approaches)

2024 - 2025    Jeel Vanjara, Undergraduate Research Assistant (topic: Bounds on smallest primes in an arithmetic progressions using elementary approaches)

Summer 2023    Thomas Czyzowicz, NSERC Undergraduate Summer Research Award (USRA) project supervision (topic: Techniques in analytic number theory)

Fall 2022    Shaydel Parcell, Undergraduate Research Assistant (topic: Galois theory)

Winter 2022    Jarod Palubinsky, Reading course on elliptic curves, University of Toronto

Summer 2016    Maria Perepechaenko, unofficial supervision (topic: Ring theory), University of Toronto

## Teaching

### University of Winnipeg

- MATH-4202 Rings and Fields, Winters 2024, 2025
- MATH-1104 Calculus II, Winter 2025
- MATH-1103 Calculus I, Falls 2022, 2023, 2024
- MATH-2202 Applied Algebra and Cryptography, Winter 2023
- MATH-4101 Complex Analysis, Winter 2023

### University of Toronto

- MAT329 Concepts in Elementary Mathematics, Fall/Winter 2020-21 and 2021-2022
- MATD01 Fields and Groups, Winter 2020, Scarborough campus
- MAT344 Introduction to Combinatorics, Winter 2020
- MAT334 Complex Variables, Fall 2019 and Summer 2015
- MAT135 Calculus I, Summer 2019

- MAT247 Algebra II (for Math Specialists/Honours students), Winter 2019
- MAT301 Groups and Symmetry, Fall 2018 and Winter 2017
- MAT224 Linear Algebra II, Summer 2018, Fall 2016, Summer 2016 (in Mississauga), Fall 2015
- MAT315 Introduction to Number Theory, Winter 2018 at main campus, Winters 2016 and 2015 at Mississauga campus)
- MAT327 Introduction to Topology, Fall 2017
- MAT401 Polynomial Equations and Fields, Summer 2016
- MAT223 Linear Algebra I, Fall 2014 (Mississauga campus, taught one lecture section out of two and co-coordinated)
- MAT188 Linear Algebra for Engineering Students, Fall 2014
- MAT134 Calculus for Life Sciences, Summer 2014 (Mississauga campus)

## Contributions to service

### Service at the University of Winnipeg

2024 - 2026 Department NSERC Representative and Research Committee Chair, Department of Mathematics and Statistics

2024 - 2025 Member of the Graduate Studies Committee, University Senate

2022 - 2025 Member of the Departmental Curriculum Committee, Department of Mathematics and Statistics

2024 - 2025 Member of the Faculty and Staff Award Committee, University Senate

2023 - 2024 Member of the Departmental Awards Committee, Department of Mathematics and Statistics

2022 - 2024 Member of NSERC USRA ranking team, Department of Mathematics and Statistics

2022 - 2023 Putnam contest representative, Department of Mathematics and Statistics

2022 - 2025 Academic Advising, Department of Mathematics and Statistics (one month each year, in line with the department tradition)

### Peer review

- Grant proposal external reviewer, National Science Centre, Poland
- Refereed articles for various journals
- Reviewer for Mathematical Reviews

## Outreach and Community Service

2025 A co-author of "Fact checking research claims about math education in Manitoba", available [here](#).

2025 Serving as a judge in the Manitoba School Science Fair

2024 Participation in the Department of Mathematics and Statistics Open House for high school students (University of Winnipeg)

2023, 2024 Serving as a judge in the Winnipeg School Division Science Fair

2016 - 2017      Participation in the mentorship program for undergraduate students, Department of Mathematics, University of Toronto

2012 - 2013      Participation in the mentorship program for high school students, Department of Mathematics, University of Toronto

## References

- Kumar Murty, University of Toronto (murty@math.utoronto.ca)
- Stephen Kudla, University of Toronto (skudla@math.utoronto.ca)
- Henri Darmon, McGill University (henri.darmon@mcgill.ca)
- Noriyuki Otsubo, Chiba University (otsubo@math.s.chiba-u.ac.jp)
- Vikraman Balaji, Chennai Mathematical Institute (balaji@cmi.ac.in)
- Jonathan Korman (for teaching), University of Toronto (jkorman@math.toronto.edu)

## Personal

Citizenship: Canadian