Payman Eskandari

Curriculum Vitae

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Employment

- Assistant Professor, Department of Mathematics and Statistics, University of Winnipeg, from July 2022
- Postdoctoral Fellow, Department of Mathematics, University of Toronto, July 2016 - June 2022
  Visiting member, Fields Institute, July 2019 - June 2022

Education

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

Research Interests

Algebraic geometry and number theory, in particular:
- Motivic Galois and Mumford-Tate groups
- Periods of motives
- Tannakian formalism
- Algebraic cycles
- Transcendental algebraic geometry and Hodge theory

Publications

1. An integrable connection on the configuration space of a Riemann surface of positive genus, C. R. Math. Acad. Sci. Paris, Vol. 356, No. 3, pages 312-315 (2018)

2. Quadratic periods of meromorphic forms on punctured Riemann surfaces, in Geometry, Algebra, Number Theory, and Their Information Technology Applications, edited by A. Akbary and S. Gun, Springer Proceedings in Mathematics and Statistics, Vol. 251, pages 183-205 (2018)

3. Algebraic cycles and the mixed Hodge structure on the fundamental group of a punctured curve, Math. Annalen, Vol. 375, pp 1665–1719 (2019)

4. (with V. Kumar Murty) On the harmonic volume of Fermat curves, Proceedings of the AMS, Volume 149, Number 5, May 2021, Pages 1919-1928

5. (with V. Kumar Murty) On Ceresa cycles of Fermat curves, Journal of Ramanujan Mathematical Society, Volume 36, No. 4 (2021) 363-382

6. (with V. 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, to appear in the Pacific Journal of Math.

7. (with V. Kumar Murty) On unipotent radicals of motivic Galois groups, Algebra & Number Theory, Vol. 17 (2023), No. 1, 165-215

8. (with V. 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 (2022)

9. On endomorphisms of extensions in tannakian categories, preprint, arXiv:2306.06817 (2023), 10 pp

10. On blended extensions in filtered tannakian categories and mixed motives with maximal unipotent radicals, preprint, arXiv:2307.15487 (2023), 63 pp

Invited Talks

- Prairies Mathematics Colloquium, Winter 2023
- PIMS-UBC Rising Star Colloquium, University of British Columbia, Fall 2022
- Number Theory Seminar, University of British Columbia, Fall 2022
- Departmental Colloquium, University of Winnipeg, Winter 2022
- Postdoctoral Colloquium, Fields Institute, Winter 2022
- Geometry Seminar, University of Kansas, Fall 2021
- Geometry, Physics and Representation Theory Seminar, Northeastern University, Fall 2021
- Geometry, Arithmetic and Differential Equations of Periods (GADEPs) Seminar, IMPA (Brazil), Fall 2021
- Number Theory/Representation Theory Seminar, University of Toronto, Fall 2021
- Theta Series Conference in honour of Steve Kudla's 70th birthday, Fields Institute, Summer 2021
- Fields Number Theory Seminar, Fields Institute, Toronto, Winter 2021
- Fields Number Theory Seminar, Fields Institute, Toronto, Summer 2020
- Toronto-Montreal Number Theory Workshop, CRM, Montreal, Spring 2019
- Number Theory Seminar, Queen's University, Fall 2018
- Toronto-Montreal Number Theory Workshop, CRM, Montreal, Winter 2018

Teaching Experience

University of Winnipeg

- MATH-1103 Calculus I, Falls 2022 and 2023
- 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 (taught one lecture section out of several)
- MAT134 Calculus for Life Sciences, Summer 2014 (Mississauga campus, taught and co-coordinated with a co-instructor)

Undergraduate supervision

- Thomas Czyzowicz, Undergraduate NSERC USRA project supervision (topic: Special values of L-functions), Summer 2023, University of Winnipeg
- Shaydel Parcell, Undergraduate research project supervision (topic: Galois theory), Fall 2022, University of Winnipeg
- Jarod Palubisky, Reading course on elliptic curves, Winter 2022, University of Toronto
- Maria Perepechaenko, Reading project on abstract algebra (topic: Ring theory), unofficial supervision, Summer 2017, University of Toronto

Other Relevant Experience and Recognition

Seminars (Co)-organized

- Fields Number Theory Seminar, Fields Institute, Spring 2021 - present, Current page:
`http://www.fields.utoronto.ca/activities/22-23/fields-number-theory`
- Colloquium Seminar, Department of Math and Stats, University of Winnipeg, 2022-2023
- GANITA (Geometry, Algebra, Number theory, and their Information Technology Applications) Seminar, University of Toronto, 2020 - June 2022

Outreach

- Served as a Winnipeg District High School Science Fair judge, April 2023
- Participation in the mentorship program for undergraduate students, Department of Mathematics, University of Toronto, 2016-2017
- Participation in the mentorship program for high school students, Department of Mathematics, University of Toronto, 2012-2013

Awards

- F. V. Atkinson Teaching Award for Postdoctoral Fellows, University of Toronto, 2017
- Ida Bulat Teaching Award for Graduate Students, University of Toronto, 2016

References

Research

- Kumar Murty (murty@math.utoronto.ca) (PhD advisor)
- Henri Darmon (henri.darmon@mcgill.ca)
- Stephen Kudla (skudla@math.utoronto.ca)
- Hélène Esnault (esnault@math.fu-berlin.de)

Teaching

- Israel Michael Sigal (im.sigal@utoronto.ca)
- Joe Repka (repka@math.toronto.edu)
- Dror Bar-Natan (drorbn@math.utoronto.ca)

Personal

Citizenship: Canadian, Iranian