

Jorge Mello

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Research Interests

Arithmetic dynamics and diophantine geometry. Heights, rational/integral points on varieties/elliptic curves and finite fields.

Work Experience

- 2022-Present **Assistant Professor**, *Oakland University*, Michigan, USA, .
- 2022 **Postdoctoral researcher**, *Max Planck Institute of Mathematics*, Bonn, Germany, .
- 2021 **Postdoctoral researcher**, *York University*, Toronto, Canada, .
- 2019-2020 **Postdoctoral researcher**, *University of New South Wales*, Sydney, Australia, .
- 2018 **Lecturer**, *Minas Gerais State University*, Brazil, .

Education

- 2017 **PhD in Mathematics**, *Federal University of Rio de Janeiro*, .
Title: Canonical Heights, Arithmetical Degrees, and Dynamical Degrees on Varieties with Systems of Maps

Teaching

- Winter 2026 **Calculus I, Calculus II**, *Oakland University*.
- Fall 2025 **Calculus I, Math/Science in the Modern World**, *Oakland University*.
- Winter 2025 **Calculus I, Calculus II**, *Oakland University*.
- Fall 2024 **Calculus I, Calculus II**, *Oakland University*.
- Summer 2024 **Precalculus**, *Oakland University*.
- Winter 2024 **Calculus I, Calculus I**, *Oakland University*.
- Fall 2023 **Calculus II, Calculus II**, *Oakland University*.
- Summer 2023 **Precalculus, Intermediate Algebra**, *Oakland University*.
- Winter 2023 **Calculus I, Calculus II**, *Oakland University*.
- Fall 2022 **Linear Algebra, Calculus II**, *Oakland University*.
- Fall 2021 **Introduction to Number Theory**, *York University*.
- Winter 2021 **Introduction to the Mathematics of Cryptography**, *York University*.
- Summer 2018 **Introduction to Logics for computer science, Differential/Integral Calculus**, *Minas Gerais State University*.
- During PhD **Linear Algebra, Differential Equations/Calculus I/II, Intro to Abstract Algebra**, *Federal University of Rio de Janeiro*.

Community Outreach

Summer 2023 **Introduction to logics in the Mathcorps summer camp for high school and middle school students**, *Oakland University*.

Publications/Preprints

Articles

- 22 P. Ingram, D. Jaramillo, J. Mello, “**An asymptotic for sums of Lyapunov exponents in families.**” Proceedings of the American Mathematical Society, accepted (2024).
- 21 J. Cullinan, S. Dobson, L. Frey, A. Hamakiotes, R. Hernandez, N. Kaplan, J. Mello, G. Scullard, “**The probability of non-isomorphic group structures of isogenous elliptic curves in finite field extensions, II.**” Journal of Number Theory (2024).
- 20 A. Bérczes, Y. Bugeaud, K. Gyory, J. Mello, A. Ostafe and M. Sha “**Explicit bounds for the solutions of superelliptic equations over number fields.**” Forum Mathematicum, (2024).
- 19 A. Bérczes, Y. Bugeaud, K. Gyory, J. Mello, A. Ostafe and M. Sha, “**Multiplicative dependence of rational values modulo approximate finitely generated groups.**” Mathematical Proceedings of the Cambridge Philosophical Society, 2024.
- 18 J. Mello, “**On effective ϵ -integrality in orbits of rational maps over function fields and multiplicative dependence.**” European Journal of Mathematics , vol. 9, 112 (2023)
- 17 B. Kerr, J. Mello, I. Shparlinski, “**An effective local-global principle for algebraic varieties and the sum product problem in finite fields**”, Journal d’Analyse Mathématique, (July, 2023).
- 16 J. Mello, “**Cyclotomic preperiodic points for morphisms in affine spaces and preperiodic points with bounded house and height.**”, Functiones et Approximatio, Comentarii Mathematici, pp. 1-21 (2022)
- 15 B. Kerr, J. Mello, I. Shparlinski, “**On elements of large order of elliptic curves and multiplicative dependent images of rational functions over finite fields**”, Illinois Journal of Mathematics. 65 (2) (2021).
- 12 J. Mello; M. Sha, “**On the properties of Northcott and Narkiewicz for elliptic curves**”, International Journal of Number Theory. Vol. 18, Issue 10, pp. 2129-2144 (2022).
- 11 J. Mello, “**On semigroup orbits of polynomials in subgroups**”. Monatshefte für Mathematik. Vol. 197, 177-191 (2022).
- 12 J. Mello, “**On abelian points of varieties intersecting subgroups in a torus**”. Journal de Theorie de Nombres de Bourdeaux. Vol.34, no. 1, pp. 309-322 (2022).
- 11 J. Mello, “**On the maximum modulus of integers in Kummer extensions**”. Acta Mathematica Hungarica, vol. 164, pp. 66 - 84 (2021).
- 10 J. Mello, “**On intersections of polynomial semigroups orbits with plane lines**”, Canadian Mathematical Bulletin. Vol. 64, Issue 2, pp. 442 - 451 (2020)

- 9 J. Mello. “**On variation of dynamical canonical heights for semigroups of morphisms**”, Journal of Pure and Applied Algebra, 224, 1195-1204 (2020).
- 8 J. Mello. “**On quantitative estimates for quasiintegral points in orbits of semigroups of rational maps**”, New York Journal of Mathematics, 25, 1091-1111 (2019).
- 7 J. Mello. “**The Dynamical and Arithmetic Degrees for Eigensystems of Rational Selfmaps**”, Bulletin of the Brazilian Mathematical Society, vol. 51, pp. 569 – 596 (2019).
- 6 J. Mello, “**On semigroup orbits of polynomials and multiplicative orders**”, Bulletin of the Australian Mathematical Society, 102(3) 365-373 (2020).
- 5 J. Mello. “**Canonical Heights and Monomial Maps: On effective lower bounds for points with dense orbit**”, Journal of Number Theory, 205, 321-339 (2019).

Conference reports

- 4 J. Mello (joint with Yu Yasufuku). “**Integral points in orbits under finitely many morphisms**”, Oberwolfach report no. 21, 2022.

Preprints

- 3 J. Mello: “**Some sparsity results for quasiintegral points in orbits and correspondences with large pullback divisors**”(2025).arxiv
- 2 J. Bajpai, S. Das, K. S. Kedlaya, N. H. Le, M. Lee, A. Leudière, J. Mello: “**The exceptional set in Cassel’s theorem on small cyclotomic integers**”(2025).

Ongoing Projects

- 1 C. Araújo, L. Costa, B. Malmskog, J.Mello, E. Menezes, C. Salgado and . L. Vicino: “**Codes with hierarchy on surfaces**”(2024).

Journal Reviewer

Discrete and Continuous Dynamical Systems.
 Proceedings of the American Mathematical Society

Assessor of Honours Thesis defense

- 2019 Alexander Patterson, Polynomial Dynamics over number fields: irreducibility of iterates and powers in orbits (Honours Thesis). UNSW, Australia.

Undergrad project supervision

- 2024 Santiago Sartutun: Arithmetic functions and an elementary proof of the Prime Number Theorem

Grants Obtained

- 2023/2024 Oakland University BFA Grant

Conference talks/contributions

- Spring 2025 AMS Spring sectional Meeting: California Polytechnic, San Luis Obispo.

- Winter 2025 Sabanci University, Turkey.
- Winter 2025 Online Number Theory Seminar, University of Debrecen, Hungary
- Winter 2024 Department Colloquium: Oakland University.
- Winter 2024 Department Seminar: Howard University, D.C.
- Fall 2023 Algebraic geometry Northeast section (AGNES), University of Pennsylvania.
- Fall 2023 Poster Session of the Midwest Algebraic Geometry and Number Theory Session (MAGNTS), University of Michigan, Ann-Arbor.
- Summer 2023 Department Seminar, Dalhousie University, NS, Canada.
- Winter 2023 Department Colloquium, University of Michigan- Dearborn .
- Summer 2022 Equidistribution and Arithmetic Dynamics, Oklahoma State University, US.
- 05/2022 Number Theory Lunch Seminar, Max Planck Institute for Mathematics.
- 04/2022 Diophantische Approximationen: MFO Oberwolfach Workshop 2216.
- 2021 Regular talks on the seminar series of the York University Number Theory group
- 10/2020 Number Theory Down Under 8, University of Melbourne, Australia.
- 04/2020 ADIOS, Arithmetic Dynamics International Online Seminar.
- 12/2019 Bifurcation and Stability in complex dynamics, University of Kyoto, Kyoto, Japan.
- 10/2019 Number Theory Down Under 7, UNSW, Sydney, Australia.
- 04/2019 Pure Maths Seminar, UNSW, Sydney, Australia.
- 03/2019 Number Theory Seminar, UNSW, Sydney, Australia.
- 10/2015 Algebra Seminar, UFRJ, Rio de Janeiro, Brazil.

Other Conferences Attended

- 09/2025 Dynamics of Multiple Maps Workshop: AIM, Pasadena, US.
- 06/2025 Rethinking Number Theory 8, Online.
- 03/2025 Midwest Algebraic Geometry and Number Theory Session (MAGNTS): Ohio State University, US.
- 07/2024 Diversity in finite fields Workshop: IMPA, Rio, Brazil.
- 07/2024 Mordell Conjecture:100 years. Massachusetts Institute of Technology
- 03/2023 Arizona Winter School, University of Arizona, Tucson.
- 08/2022 Specialization and effectiveness in number theory (workshop), Banff International Research Station, Canada.
- 06/2022 Rethinking Number Theory Workshop, Online.
- 03/2022 Harmonic Analysis and Number Theory: A Math Symposium, ETH Zurich, Switzerland.
- 06/2021 Geometry via Arithmetic (workshop), Banff International Research Station, Canada.
- 11/2020 Algebraic Dynamics and its connections with Difference and Differential Equations (workshop), Banff International Research Station, Canada.
- 08/2020 International Webinar on Recent Developments in Number Theory, University of Bhubaneswar, India.

- 12/2019 Rational Points on Higher Dimensional Varieties, University of Kyoto, Japan.
- 11/2019 Mahler Lectures, Australian Universities.
- 09/2019 Topics in Rational and Integral Points, Basel, Switzerland.
- 06/2019 Dynamics and Number Theory, University of Sydney, Australia
- 07/2018 ICM Satellite Conference on Automorphic Forms, Galois Representations and L-functions, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil.
- 08/2016 24th Brazilian Algebra Meeting, UFVJM, Minas Gerais, Brazil.
- 12/2014 FoCM – Foundations of Computational Mathematics, Montevideo, Uruguay.
12/2014 School in Computational Algebra and Number Theory, Montevideo, Uruguay.