Jorge Mello

Oakland University, Michigan, United States
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Education

PhD, Federal University of Rio de Janeiro.
PhD thesis: *"Canonical Heights, Arithmetical Degrees, and Dynamical Degrees on Varieties with Systems of Maps."*

Research Interests: Arithmetic Dynamics, Canonical Height Functions, Rational and Integral Points on Varieties, elliptic curves.

Current Position

Aug 2022- Present

Visiting Assistant Professor, Oakland University, Michigan.

Previous Positions

Feb 2022- May 2022

Postdoc, Max Planck Institute for Mathematics, Bonn, Germany.

Jan 2021- Feb 2022

Postdoc, Department of Mathematics and Statistics, York University, Toronto, Canada. Supervisor: Patrick Ingram.

Feb 2019- Dez 2020

Postdoc, School of Mathematics and Statistics, UNSW, Sydney, Australia. Supervisors: Igor Shparlinski and Alina Ostafe.

Teaching Activities

At Oakland University, Michigan.

Fall 2024: Calculus 1, Calculus 2

Summer 2024: Precalculus

Winter 2024: Calculus 1, Calculus 1

Fall 2023: Calculus 2, Calculus 2.

Summer 2023: Precalculus, Intermediate Algebra,
Introduction to logics for the OU Mathcorps program

Winter 2023: Calculus 1, Calculus 2

Fall 2022: Calculus 2, Linear Algebra.

At York University, Canada.

Winter 2021: Introduction to the Mathematics of Cryptography.

Fall 2021: Introduction to number theory.

At State University of Minas Gerais, Brazil.

2018 : Calculus 1; Introduction to Logics; Integral Calculus.

At Federal University of Rio de Janeiro, Brazil.

2016-2017: Differential Calculus; Linear Algebra II.

Undergrad project supervision

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

Assessor of Honour Thesis

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

Grants Obtained

2023/2024 Oakland University BFA Grant.

Journal Reviewer

Discrete and Continuous Dynamical Systems.

Preoceedings of the American mathematical Society

Research Talks

Winter 2024 Department Colloquium: Oakland University.

Winter 2024 Department Seminar: Howard University, D.C.

Fall 2023 Algebraic geometry North-east 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 .

06/2022 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.

04/2021- 2022 Regular talks on the reading 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

07/2024 Diversity in finite fields Workshop: IMPA, RJ, Brazil.

07/2024 Mordell Conjecture:100 years. Massachussets 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.

04/2022 Diophantische Approximationen: MFO Oberwolfach Workshop 2216.

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.

Refereed Journal Articles

1. P. Ingram, D. Jaramillo, J. Mello, “An asymptotic for sums of Lyapunov exponents in families.” Proceedings of the American Mathematical Society, accepted (2024).

2. 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).

3. A. Bérczes, Y. Bugeaud, K. Gyory, J. Mello, A. Ostafe and M. Sha “Explicit bounds for the solutions of superellitic equations over number fields.”Forum Mathematicum, (2024).

4. 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.

5. 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)

6. 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).

7. 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) DOI: 10.7169/facm/2022

8. 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).

9. 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).

10. J. Mello, “On semigroup orbits of polynomials in subgroups”. Monatshefte für Mathematik. Vol. 197, 177-191 (2022).

11. 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).

12. J. Mello, “On the maximum modulus of integers in Kummer extensions”. Acta Mathematica Hungarica, vol. 164, pp. 66 - 84 (2021).

13. J. Mello, “On intersections of polynomial semigroups orbits with plane lines”, Canadian Mathematical Bulletin. Vol. 64, Issue 2, pp. 442 - 451 (2020).

14. J. Mello. “On variation of dynamical canonical heights for semigroups of morphisms”, Journal of Pure and Applied Algebra, 224, 1195-1204 (2020).

15. J. Mello. “On quantitative estimates for quasiintegral points in orbits of semigroups of rational maps”, New York Journal of Mathematics, 25, 1091-1111 (2019).

16. J. Mello. “The Dynamical and Arithmetic Degrees for Eigensystems of Rational Selfmaps”, Bulletin of the Brazilian Mathematical Society, vol. 51, pp. 569 – 596 (2019).

17. J. Mello, “On semigroup orbits of polynomials and multiplicative orders”, Bulletin of the Australian Mathematical Society, 102(3) 365-373 (2020) .

18. 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

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