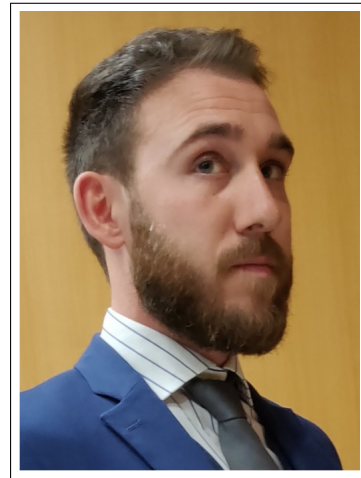# Matteo Bordignon

Università degli Studi di Milano
Department of Mathematics
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Born: April 26, 1991—Sesto San Giovanni, MI, Italy
Nationality: Italian

Areas of specialization

Analytic Number Theory, with a keen interest in:

- Equidistribution, pair correlation and other fine statistics. I started focusing on this topic during my stay in Stockholm at KTH working with Pär Kurlberg

- Statistical properties of the standard Gauss Circle Problem and generalizations to hyperbolic settings. I started working on this topic during my stay in Stockholm at KTH working with Pär Kurlberg

- Modular forms and in specific application to universal quadratic forms. I started working on this topic during my stay in Prague at Charles University working with Vita Kala

- Multiplicative functions (general multiplicative functions, Dirichlet characters, …)

Education

2025-2026	POST DOC, Department of Mathematics, Università degli Studi di Milano, Milan (Italy) Supervisor: Giuseppe Molteni
2023-2025	POST DOC, Department of Mathematics, KTH, Stockholm (Sweden) Supervisor: Pär Kurlberg
2022-2023	POST DOC, School of Mathematics, Charles University, Prague (Czech Republic) Supervisor: Vita Kala The Post Doc was supported by the OP RDE project No. CZ.02.2.69/0.0/0.0/18_053/0016976

International mobility of research, technical and administrative staff at the Charles University, European Structural and Investment Funds, Operational Programme Research, Development and Education

2018–2021 PhD in Mathematics, University of New South Wales, ACT, Canberra (Australia)
Supervisor: Tim Trudgian
Thesis title: An explicit version of Chen's theorem
Graduation date: 25 November 2021

2014–2017 Masters Degree in Mathematics, Universita degli Studi di Milano, Milan (Italy)
110/110 Summa cum laude
Thesis title: On bounded gaps between primes in the recent papers of J. Maynard and D. H. J. Polymath
Thesis supervisor: Giuseppe Molteni

2010–2014 Bachelors Degree in Mathematics, Universita degli Studi di Milano, Milan (Italy)

Work Experience

2017–2018 Information Risk Management consultant in KPMG, Milan (Italy)
Skills acquired:

- Expertise in information/systems security

- Management of multiple activities

- Effective collaboration

Publications

In Preparation (near completion)

2025 Bordignon M., Kurlberg P., Wigman I., We introduce and study an outstanding Poincaré map associated with the horizontal horocycle flow, where the return times are given by the intersections with the border of the fundamental domain associated to the projective special linear group. This allow us to compute some specific statistics associated to the area of the fundamental domains intersecting the hyperbolic circle and study the spacing distribution for the roots of reducible polynomials of degree two.

2025 Bordignon M., Kurlberg P., We prove a variation of Lester-Wigman Vanishing Correlation Conjecture related to areas statistics of the squares intersecting a circle and thus to the Gauss circle problem

Submitted Articles

2025 Bettin S., Bordignon M., Fazzari A., *On products of sets of natural density one*, Submitted,
https://arxiv.org/abs/2504.01665

2024 Bordignon M., Cherubini G., *Coprime-Universal Quadratic Forms*, Submitted,
https://arxiv.org/abs/2406.01533

2022 Bordignon M., Lee E., *Explicit upper bounds for the number of primes simultaneously representable by any set of irreducible polynomials*, Submitted,
https://arxiv.org/abs/2211.11012

PUBLISHED/ACCEPTED ARTICLES

2024   Bordignon M., Bortolotto C., Kerr B., ***Weyl sums with multiplicative coefficients and joint equidistribution***, Algebra and Number Theory, accepted,
https://arxiv.org/abs/2303.03768

2024   Bordignon M. and Francis F., ***Explicit improvements to the Burgess bound via Pólya–Vinogradov***, Integers 24, Paper No. A66, 23 pp.
https://math.colgate.edu/~integers/y66/y66.pdf

2024   Bordignon M., Johnston D., Starichkova V., ***An explicit version of Chen's theorem***, IJNT, accepted,
https://arxiv.org/abs/2207.09452

2024   Bordignon M., Starichkova V., ***An explicit version of Chen's theorem assuming the Generalized Riemann Hypothesis***, Ramanujan J., Volume 64, 1213–1242
https://doi.org/10.1007/s11139-024-00866-x

2022   Bordignon M., ***Partial Gaussian sums and the Pólya–Vinogradov inequality for primitive characters***, Rev. Mat. Iberoam. 38, no. 4, 1101–1127
https://doi.org/10.4171/rmi/1328

2022   Bordignon M., ***An explicit version of Chen's theorem***, Bull. Aust. Math. Soc. 105, no. 2, 344–346
https://doi.org/10.1017/S0004972721001301

2021   Bordignon M., ***Medium-sized values for the Prime Number Theorem for primes in arithmetic progression*** , New York J. Math. 27, 1415–1438
https://nyjm.albany.edu/j/2021/27-54.html

2020   Bordignon M., ***A Pólya–Vinogradov inequality for short character sums***, Canadian Mathematical Bulletin, vol. 64 , issue 4 , pp. 906-910,
https://doi.org/10.4153/S0008439520000934

2020   Bordignon M., Kerr B., ***An explicit Pólya–Vinogradov inequality via partial Gaussian sums***, Transactions of the American Mathematical Society, vol. 373, pp. 6503-6527,
https://doi.org/10.1090/tran/8138

2019   Bordignon M., ***Explicit bounds on exceptional zeroes of Dirichlet L-functions II***, Journal of Number Theory, vol. 210, pp. 481 – 487,
https://doi.org/10.1016/j.jnt.2019.10.011

2019   Bordignon M., ***Explicit bounds on exceptional zeros of Dirichlet L-functions***, Journal of Number Theory, vol. 201, pp. 68 - 76,
http://dx.doi.org/10.1016/j.jnt.2019.02.003

Visits & Conferences & Seminars

VISITS

2024   KING'S COLLEGE LONDON, 27-29 May

2021   MAX PLANCK INSTITUTE FOR MATHEMATICS, 15-19 November

CONFERENCES

2024   ANALYTIC NUMBER THEORY, Institute Mittag-Leffler, Stockholm, Sweden, 17 January-26 April

2023   1ST ANALYTIC NUMBER THEORY AND AUTOMORPHIC FORMS CONFERENCE IN PATRAS, Patras, Greece, 17-21 July

Contribution: Talk

2023 RHB70 - To Honour the 70th Birthday of Roger Heath-Brown, Mathematical Institute, University of Oxford, UK, 10–14 July

2023 Random Matrices from Quantum Chaos to the Riemann Zeta Function - A Celebration in Honour of Jon Keating's 60th Birthday, School of Mathematics, University of Bristol, UK, 5–7 July

2022 Workshop: Number Theory And Physics, Simons Center for Geometry and Physics, Stony Brook NY, USA, 24–28 October

2022 THE SECOND JNT BIENNIAL CONFERENCE, Grand Hotel San Michele Cetraro, Italy, 18–22 July

2022 Number Theory and Algebraic Geometry ICM sectional workshop, ETH, Zurich, Switzerland, 11–14 July

2022 ICM2022 Down Under, Sydney Mathematical Research Institute, Sydney, Australia, 6—8 July

2022 50 Years of Number Theory and Random Matrix Theory Conference, Institute for Advanced Studies, Princeton, USA , 21-24 June

2022 Spring school Department of Algebra, Hotel and restaurant Vyhlídka, Tábor hill by Lomnice nad Popelkou, Czech Republic , 13–17 May
Contribution: Talk

2021 65th Annual Meeting of the Australian Mathematical Society, University of Newcastle, Australia (Online), 7–10 December
Contribution: Talk

2021 Quarta giornata dei dottorandi in Teoria dei Numeri, Online, 1 June
Contribution: Talk

2021 Mid-Atlantic Seminar On Numbers V (MASON V), Online, 27–28 March
Contribution: Talk

2020 64rd Annual Meeting of the Australian Mathematical Society, University of New England, Australia (Online), 8–11 December
Contribution: Talk

2020 8th meeting of the annual Number Theory Down Under conference, NDTU-8, University of Melbourne, Australia (Online) 6–8 October
Contribution: Talk

2020 Number Theory Online Conference, University of Newcastle, Australia (Online), 3–5 June
Contribution: Talk

2019 63rd Annual Meeting of the Australian Mathematical Society, Monash University Clayton Campus, Melbourne, 3–6 December
Contribution: Talk

2019 7th meeting of the annual Number Theory Down Under conference, NTDU-7, University of New South Wales, Sydney, Australia, 30 September –3 October
Contribution: Talk

2019 Conference on distribution of values of zeta functions and L-functions (ZetaValue2019), RIKEN, Wako, Japan, 22–26 March
Contribution: Poster

2018 62nd Annual Meeting of the Australian Mathematical Society, University of Adelaide, North Terrace Campus, Adelaide, Australia, 4–7 December
Contribution: Talk

2018 6th meeting of the annual Number Theory Down Under conference, NDTU-6, Canberra campus of the University of New South Wales, ACT, Australia, 24–26 September

SEMINARS

2024	HEILBRONN NUMBER THEORY SEMINAR, University of Bristol, Bristol, 22 May
	Contribute: Talk
2023	NUMBER THEORY SEMINAR, KTH, Stockholm, 26 January
	Contribute: Talk
2022	NUMBER THEORY SEMINAR, Charles University, Prague, 16 November
	Contribute: Talk
2022	BROWNING GROUP Working Seminar, IST Austria, Vienna, 1 June
	Contribute: Talk
2022	ALGEBRA COLLOQUIUM, Charles University, Prague, 8 March
	Contribute: Talk
2021	NUMBER THEORY SEMINAR, Charles University, Prague, 14 December
	Contribute: Talk
2020	CANBERRA NUMBER THEORY DAY, ANU, Canberra, 29 January
	Contribute: Talk
2019	UNSW SYDNEY NUMBER THEORY SEMINARS, 19–20 June
	Contribute: Talk
2019	UNSW SYDNEY NUMBER THEORY SEMINARS, 17–18 April
2018	UNSW SYDNEY NUMBER THEORY SEMINARS, 22–23 August

Awards

2022	UNSW Dean's Prize for a top 10% thesis
2022	Kovalevskaya grant to attend ICM Down Under
	https://mathematical-research-institute.sydney.edu.au/news/icm2022-down-under/
2021	Australian Mathematical Society Lift-off Fellowship
	https://austms.org.au/awards-grants/awards/lift-off-fellowships/

Teaching

During my stay at KTH I enjoy a 20% teaching contract and have been the lecturer for the following courses:

2023	SF1690 HT23 Basic Course in Mathematics (50135)

During my stay at KTH I have been the tutor for the following courses:

2024	SF1627 HT24 Mathematics for Economists (50568)

I have tutored the following courses during my PhD candidature at UNSW Canberra:

2019	ZPEM2312-Fundamentals of Data Analysis [S1, 2019]
2019	ZPEM1301- Mathematics 1A [S1, 2019]
2019	ZPEM1304-Engineering Mathematics 2A [S2, 2019]

Supervising experience

2024

- Topic: Evaluating the Churn probability for account termination in private banking

- Type: Master degree thesis

- University: KTH

- Student: Samy Harafa

Training

2020 Graduate Teacher Training Program (Semester 2, 13 weeks, UNSW Canberra)

Programming language

- C++

- Sage (Python)

- Pari