
General Information

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Positions

2024–Current **Assistant Professor**, *University of Arizona*
2021–2024 **Research Fellow**, *Princeton Center for Theoretical Sciences (PCTS) and Department of Mathematics*
2021 **Postdoc**, *IST Austria*, Erdős Group

Education

2021 **PhD student**, *IST Austria*, Erdős Group
PhD Thesis Advisor: Prof. László Erdős
Title: Fluctuations in the spectrum of random matrices
2017 **Master Degree**, *Univeristy of Rome Tor Vergata*, Dept. of Mathematics, Rome
Master Thesis Advisor: Prof. Carlangelo Liverani
Title: Deterministic walks
Grade: 110/110 Summa cum laude
2015 **Bachelor's Degree**, *Univeristy of Rome Tor Vergata*, Dept. of Mathematics, Rome
Thesis Advisor: Prof. Carlo Sinestrari
Title: Equazioni di Hamilton-Jacobi e problemi di controllo ottimale
Grade: 110/110 Summa cum laude
2012 **High School Diploma**, *Liceo Scientifico M. Vitruvio Pollione*, Avezzano, Italy
Grade: 100/100

Publications

1. **Fluctuations for differences of linear eigenvalue statistics for sample covariance matrices** with László Erdős.
Random Matrices: Theory and Applications Vol. 9, No. 3 (2020).
arXiv version: [arXiv:1806.08751](https://arxiv.org/abs/1806.08751).
2. **Cusp universality for random matrices II: The real symmetric case** with László Erdős, Torben Krüger, and Dominik Schröder.

- Pure Appl. Anal. Vol. 1, No. 4, 615–707 (2019).
arXiv version: arXiv:1811.04055.
3. **Edge Universality for non-Hermitian Random Matrices**
 with László Erdős, and Dominik Schröder.
 Probab. Theory and Related Fields, Vol. 179, 1–28 (2021).
arXiv version: arXiv:1908.00969.
 4. **Optimal Lower Bound on the Least Singular Value of the Shifted Ginibre Ensemble**
 with László Erdős, and Dominik Schröder.
 Prob. Math. Physics Vol. 1, No. 1, 101–146 (2020).
arXiv version: arXiv:1908.01653.
 5. **Central Limit Theorem for Linear Eigenvalue Statistics of non-Hermitian Random Matrices**
 with László Erdős, and Dominik Schröder.
 Comm. Pure Appl. Math., Vol. 76, Iss. 5, 946–1034 (2023).
arXiv version: arXiv:1912.04100.
 6. **Fluctuation Around the Circular Law for Random Matrices with Real Entries**
 with László Erdős, and Dominik Schröder.
 Electron. J. Probab., Vol. 26, 1–61 (2021).
arXiv version: arXiv:2002.02438.
 7. **Eigenstate Thermalization Hypothesis for Wigner Matrices**
 with László Erdős, and Dominik Schröder.
 Comm. Math. Phys., Vol. 388, 1005–1048 (2021).
arXiv version: arXiv:2012.13215.
 8. **Functional Central Limit Theorems for Wigner Matrices**
 with László Erdős, and Dominik Schröder.
 Ann. Appl. Probab., Vol. 33, No. 1, 447–489 (2023).
arXiv version: arXiv:2012.13218.
 9. **Thermalisation for Wigner matrices**
 with László Erdős, and Dominik Schröder.
 J. Funct. Anal., Vol. 282, Iss. 8 (2022).
arXiv version: arXiv:2102.09975.
 10. **Normal fluctuation in quantum ergodicity for Wigner matrices**
 with László Erdős, and Dominik Schröder.
 Ann. Probab. Vol. 50, No. 3, 984–1012 (2022).
arXiv version: arXiv:2103.06730.
 11. **On the condition number of the shifted real Ginibre ensemble**
 with László Erdős, and Dominik Schröder.
 SIAM Journal on Matrix Analysis and Applications Vol. 43, Iss. 3, 1469–1487 (2022).
arXiv version: arXiv:2105.13719.
 12. **Density of small singular values of the shifted real Ginibre ensemble**
 with László Erdős, and Dominik Schröder.
 Ann. Henri Poincaré. Vol. 23, No. 11, 3981–4002 (2022).
arXiv version: arXiv:2105.13720.
 13. **Quenched universality for deformed Wigner matrices**
 with László Erdős, and Dominik Schröder.
 Probab. Theory and Related Fields, Vol.185, 1183–1218 (2023).
arXiv version: arXiv:2106.10200.
 14. **On the Spectral Form Factor for Random Matrices**
 with László Erdős, and Dominik Schröder.

- Comm. Math. Phys., Vol. 401, 1665–1700 (2023).
arXiv version: arXiv:2109.06712.
15. **Optimal multi-resolvent local laws for Wigner matrices**
 with László Erdős, and Dominik Schröder.
 Electron. J. Probab., Vol. 27, 1–38 (2022).
arXiv version: arXiv:2112.13693.
 16. **Rank-uniform local law for Wigner matrices**
 with László Erdős, and Dominik Schröder.
 Forum of Mathematics, Sigma. Vol. 10 (2022).
arXiv version: arXiv:2203.01861.
 17. **Directional Extremal Statistics for Ginibre Eigenvalues**
 with László Erdős, Dominik Schröder, and Yuanyuan Xu.
 J. Math. Phys., Vol. 63, Iss. 10 (2022). Editor's Pick.
arXiv version: arXiv:2206.04443.
 18. **On the rightmost eigenvalue of non-Hermitian random matrices**
 with László Erdős, Dominik Schröder, and Yuanyuan Xu.
 Ann. Probab., Vol. 51, No. 6, 2192–2242 (2023).
arXiv version: arXiv:2206.04448.
 19. **Dynamical Localization for Random Band Matrices up to $W \ll N^{1/4}$**
 with Ron Peled, Jeffrey Schenker, and Jacob Shapiro.
 Comm. Math. Phys., Vol. 405, No. 82 (2024).
arXiv version: arXiv:2206.05545.
 20. **Entanglement Entropy of Non-Hermitian Eigenstates and the Ginibre Ensemble**
 with Jonah Kudler-Flam.
 Phys. Rev. Lett., Vol.130, Iss. 1 (2023).
arXiv version: arXiv:2206.12438.
 21. **Ruminations on Matrix Convexity and the Strong Subadditivity of Quantum Entropy**
 with Michael Aizenman.
 Lett. Math. Phys., Vol. 113, No. 103 (2023).
 Erratum & Addendum in Lett. Math. Phys., Vol. 114, No. 18 (2024).
arXiv version: arXiv:2210.10729.
 22. **Mesoscopic Central Limit Theorem for non-Hermitian Random Matrices**
 with László Erdős, and Dominik Schröder.
 Probab. Theory and Related Fields, Vol. 188, 1131–1182 (2024).
arXiv version: arXiv:2210.12060.
 23. **Precise asymptotics for the spectral radius of a large random matrix**
 with László Erdős, and Yuanyuan Xu.
 J. Math. Phys., Vol. 65, Iss. 6 (2024).
arXiv version: arXiv:2210.15643.
 24. **Fluctuations of eigenvector overlaps and the Berry conjecture for Wigner matrices**
 with Lucas Benigni.
 Electron. J. Probab., Vol. 29, 1–19 (2024).
arXiv version: arXiv:2212.10694.
 25. **Optimal Lower Bound on Eigenvector Overlaps for non-Hermitian Random Matrices**
 with László Erdős, Joscha Henheik, and Dominik Schröder.
 J. Func. Anal., Vol. 287, Iss. 4 (2024).
arXiv version: arXiv:2301.03549.
 26. **Gaussian fluctuations in the Equipartition Principle for Wigner matrices**

- with László Erdős, Joscha Henheik, and Oleksii Kolupaiev.
Forum of Mathematics, Sigma, Vol. 11 (2023).
arXiv version: arXiv:2301.05181.
27. **Non-Hermitian Hamiltonians Violate the Eigenstate Thermalization Hypothesis**
with Jonah Kudler-Flam.
Phys. Rev. B, Vol. 109 (2024). Editor's pick.
arXiv version: arXiv:2303.03448.
 28. **The Dissipative Spectral Form Factor for I.I.D. Matrices**
with Nicolás Grometto (2023).
J. Stat. Phys., Vol. 191, No. 21 (2024).
arXiv version: arXiv:2306.16262.
 29. **Eigenstate thermalisation at the edge for Wigner matrices**
with László Erdős, and Joscha Henheik.
Accepted to Ann. inst. Henri Poincaré (B) Probab. Stat. (2025).
Preprint: arXiv:2309.05488.
 30. **Universality of extremal eigenvalues of large random matrices**
with László Erdős, and Yuanyuan Xu (2023).
Preprint: arXiv:2312.08325.
 31. **Out-of-time-ordered correlators for Wigner matrices**
with László Erdős, and Joscha Henheik.
Adv. Theor. Math. Phys., Vol. 28, 2025-2083 (2024).
arXiv version: arXiv:2402.17609.
 32. **On the spectral edge of non-Hermitian random matrices**
with Andrew Campbell, László Erdős, and Hong Chang Ji.
Accepted to Ann. Probab. (2025).
Preprint: arXiv:2404.17512.
 33. **Maximum of the Characteristic Polynomial of I.I.D. Matrices**
with Benjamin Landon.
Accepted to Comm. Pure Appl. Math. (2025).
Preprint: arXiv:2405.05045.
 34. **Matrix Concentration Inequalities and Free Probability II. Two-sided Bounds and Applications**
with Afonso S. Bandeira, Dominik Schröder, and Ramon Van Handel (2024).
Preprint: arXiv:2406.11453.
 35. **Fluctuations for non-Hermitian dynamics**
with Paul Bourgade, Jiaoyang Huang (2024).
Preprint: arXiv:2409.02902.
 36. **Non-Hermitian spectral universality at critical points**
with László Erdős, and Hong Chang Ji.
Accepted to Probab. Theory and Related Fields (2025).
Preprint: arXiv:2409.17030.
 37. **Eigenvector decorrelation for random matrices**
with László Erdős, Joscha Henheik, and Oleksii Kolupaiev (2024).
Preprint: arXiv:2410.10718.
 38. **Optimal decay of eigenvector overlap for non-Hermitian random matrices**
with László Erdős, and Yuanyuan Xu (2024).
Preprint: arXiv:2411.16572.
 39. **Decorrelation transition in the Wigner minor process**
with Zhigang Bao, László Erdős, Joscha Henheik, and Oleksii Kolupaiev (2025).

Preprint: arXiv:2503.06549.

40. **Law of fractional logarithm for random matrices**
with Zhigang Bao, László Erdős, Joscha Henheik, and Oleksii Kolupaiev (2025).
Preprint: arXiv:2503.18922.

Proceedings

1. **Edge Universality for non-Hermitian Random Matrices**
Oberwolfach Rep. 16 (2019), no. 4, pp. 3480–3481.
2. **Fluctuations in the Spectrum of non-Hermitian i.i.d. Matrices**
J. Math. Phys. 63, 053503 (2022).

Grants, awards, and habilitations

- 2024 **Italian National Habilitation for Associate Professor in Mathematical Physics**
(ASN, Settore concorsuale: 01/A4)
- 2024 **Italian National Habilitation for Associate Professor in Analysis, Probability, and Mathematical Statistics** (ASN, Settore concorsuale: 01/A3)
- 2017-2019 **Marie Skłodowska-Curie scholarship**
- 2018 **Prize for outstanding master thesis in Mathematics**, *University of Rome Tor Vergata*
- 2013-2015 **Prize for outstanding students**, *University of Rome Tor Vergata*

Professional Memberships

- Since 2025 **Member of the International Association of Mathematical Physics (IAMP)**

Supervision

- 2025 **Supervised 1 Undergraduate Student (Van Carlos Higgs)**, *University of Arizona*
- 2022-2023 **Co-supervised 1 PhD student (Nicoló Grometto)**, *Princeton University*

Talks

Invited talks at conferences and workshops

- 2025 **Minicourse at Random Matrix Theory and Numerical Linear Algebra**, *University of Washington*
- 2024 **XX Brunel-Bielefeld Workshop on Random Matrix Theory**, *Brunel University, London*
- 2024 **Random Matrices and Scaling Limits**, *Institute Mittag-Leffler, Djursholm, Sweden*
- 2024 **Recent developments in disordered systems**, *Hausdorff Center for Mathematics, Bonn*
- 2024 **Random Matrices and Related Topics in Jeju**, *Jeju Island, South Korea*
- 2024 **American Mathematical Society Meeting, Session "Spectral Theory and Quantum Systems"**, *Washington DC*
- 2023 **Canadian Mathematical Society Meeting, Session "The many facets of random matrix theory"**, *Montreal*
- 2023 **High Dimensional Statistics and Random Matrices**, *Island of Porquerolles, France*
- 2021 **Matrices et graphes aléatoires (MEGA)**, *Institute Henri Poincaré (Online)*

- 2019 **Workshop on Random Matrices**, *MFO Oberwolfach*
- 2019 **From Many Body Problems to Random Matrices**, *BIRS Center, Banff*
- Invited seminars*
- 2025 **Probability Seminar**, *Politecnico di Milano*
- 2025 **Mathematical Physics Seminar**, *Politecnico di Milano*
- 2025 **Probability Seminar**, *Università la Sapienza*
- 2025 **Probability Seminar**, *University of Colorado Boulder*
- 2025 **Bielefeld–Melbourne–Seoul Random Matrix Seminar (Online)**
- 2025 **Probability Seminar**, *University of Edinburgh (Online)*
- 2024 **Probability Seminar**, *University of Warwick*
- 2024 **Probability Seminar**, *Duke University*
- 2024 **Probability and Statistical Mechanics Seminar**, *SPMES (Online)*
- 2024 **Mathematics Seminar Series**, *Great Bay University (Online)*
- 2024 **Probability and Mathematical Physics Seminar**, *University of Arizona*
- 2024 **High Energy Theory Seminar**, *City College, City University of New York*
- 2023 **Probability Seminar**, *HKUST, Hong Kong (Online)*
- 2023 **Probability and Analysis Seminar**, *Bilkent University, Ankara (Online)*
- 2023 **Mathematical Physics and Probability Seminar**, *Gran Sasso Science Institute (GSSI), L'Aquila*
- 2023 **Probability Seminar**, *University of Toronto*
- 2023 **Probability Seminar**, *Università di Roma Tre*
- 2023 **Mathematical Physics Seminar**, *SISSA, Trieste*
- 2023 **Probability Seminar**, *CMSA, Harvard University*
- 2023 **Probability Seminar**, *University of Minnesota/Leigh University (Online)*
- 2023 **Probability Seminar**, *Brown University*
- 2023 **High Energy Theory Seminar**, *Princeton University*
- 2023 **Probability Seminar**, *CUNY*
- 2022 **Probability Seminar**, *University of Erlangen*
- 2022 **Analysis, PDE & Probability Seminar**, *KIAS (Online)*
- 2022 **Mathematics Colloquium**, *Cornell University*
- 2022 **Mathematics Colloquium**, *University of Arizona*
- 2022 **Mathematics Colloquium**, *UT Austin (Online)*
- 2022 **Mathematics Colloquium**, *Rice University*
- 2022 **Mathematical Physics Seminar**, *UT Austin*
- 2022 **Probability Seminar**, *Courant Institute, New York University*
- 2022 **Probability Seminar**, *Cornell University*
- 2022 **Probability Seminar**, *University of California San Diego*
- 2022 **Probability Seminar**, *Tulane University*
- 2022 **Spectral Theory Seminar**, *Rice University*
- 2022 **Probability and Statistical Physics Seminar**, *University of Chicago*

- 2022 Penn/Temple Probability Seminar, *University of Pennsylvania*
- 2021 Probability Seminar, *Princeton University*
- 2021 Mathematical Physics Seminar, *Princeton University*
- 2021 Probability Seminar, *Università di Roma Tre*
- 2021 Queen Mary Postgraduate Seminar, *Queen Mary (Online)*
- 2021 Stanford Probability Seminar, *Stanford University (Online)*
- 2021 QLunch Seminar, *University of Copenhagen (Online)*
- 2020 Mathematical Physics Learning Seminar, *University of Connecticut (Online)*
- 2020 Disordered Systems Group Seminar, *King's College (Online)*
- 2020 Oberseminar Stochastics, *University of Bonn (Online)*
- 2020 Random Matrix Seminar, *KTH (Online)*
- 2020 Probability Seminar, *University of California Los Angeles (Online)*
- 2020 UniMelb-Bielefeld RMT Seminar (Online)
- 2017 Dynamical Systems seminar, *University of Vienna*
- [Contributed conference talks](#)
- 2024 ICMP (International Congress on Mathematical Physics), *Contributed Talk, Session Probability & Random Structures, Strasbourg*
- 2021 ICMP (International Congress on Mathematical Physics), *Contributed Talk, Session Probability & Random Structures, Geneva*
- 2019 Randomness in Physics and Mathematics: From Stochastic Processes to Networks, *ZiF Center, Bielefeld*

Teaching Experience

- 2025 Linear Algebra and its Applications (MATH 313, Section 6), *University of Arizona*
- 2025 Linear Algebra and its Applications (MATH 313, Section 5), *University of Arizona*
- 2024 The mystery of universality in random matrices, *GSSI, L'Aquila*
- 2023 Calculus (MAT103), *Princeton University*
- 2023 Linear Algebra (MAT202), *Princeton University*
- 2020-2021 Teaching assistant "Selected Topics in Analysis and Applications", *IST Austria*
- 2020 Teaching assistant "Random Matrices", *IST Austria*
- 2017 Teaching assistant "Calculus 2 for chemistry", *University of Rome Tor Vergata*

Participation in Conferences, Workshops, and Schools

- 2024 Universality and Integrability in KPZ, *Columbia University, New York*
- 2022 Random media & large deviations, *Courant Institute, New York University*
- 2022 Random Matrices and Random Landscapes, *Ascona*
- 2020 Random Matrices and Their Applications, *New York (Online)*
- 2019 Dynamical Systems: From Geometry to Mechanics, *Rome*
- 2018 XIX International Congress of Mathematical Physics, *Montreal*
- 2018 EMS-IAMP Summer School in Mathematical Physics, *Ischia*
- 2018 Budwiser Seminars, *Budapest*

- 2017 **Summer School in Mathematical Physics, Ravello**
 2016 **Summer School in Mathematical Physics, Ravello**

Service work

Editorial Activities

- 2025- Associate Editor for Journal of Mathematical Physics (JMP).

Reviewing activities:

Annales de l'Institut Henri Poincaré (B) Probabilités et Statistiques (AIHP), Annals of Applied Probability (AAP), Annales Henri Poincaré (AHPO), Annals of Probability (AoP), Annals of Statistics (AoS), Astérisque, Bernoulli Journal (BEJ), Communications in Mathematical Physics (CIMP), Electronic Communications in Probability (ECP), Electronic Journal of Probability (EJP), Journal of Algebra and its Applications (JAA), Journal of Functional Analysis (JFA), Journal of Mathematical Physics (JMP), Journal of Physics A: Mathematical and Theoretical, Journal of Statistical Physics (JSP), Mathematical Reviews, Nature Physics, Nature Communications, Letters in Mathematical Physics (LMP), Probability Theory and Related Fields (PTRF), Random Matrices: Theory and Applications (RMTA), Reports on Progress in Physics.

Invited grants reviews:

Europe Research Council, Swiss National Science Foundation.

Conference organizing:

- 1) "Mathematical Challenges in Quantum Mechanics", co-organized with Michael Aizenman, Bruno Nachtergaele, Simone Warzel, and Jacob Shapiro (Princeton University, 2023).
- 2) "Physics for Neural Networks", co-organized with William Bialek, Boris Hanin, and Francesca Mignacco (Princeton University, 2023).
- 3) "Random Physics", co-organized with Jonah Kudler-Flam, Samuel A. Leutheusser, Gautam Satishchandran, and Edward Witten (Princeton University, 2024).
- 4) "Facets of entanglement", co-organized with Michael Aizenman, Dmitry Abanin, Bruno Nachtergaele, Simone Warzel, and Jacob Shapiro (Princeton University, 2025).
- 5) "Random matrices and operators", co-organized with Paul Bourgade and Nathanaël Berestycki (tentatively at ESI Vienna, 2026).

Seminar organizing:

- 1) Princeton Center for Theoretical Science (PCTS) seminars (2022–2023).
- 2) Probability seminars at Princeton University (2023–2024).
- 3) Mathematical Physics seminars at Princeton University (2023–2024).
- 4) Probability and Mathematical Physics seminars at the University of Arizona (2024–).
- 5) Seminário de Probabilidade e Mecânica Estatística (Online) (2024–).

Outreach

- 2024 **Center of Recruitment and Retention of Mathematics Teachers Community Game Night, University of Arizona**
- 2024 **Research presentation (The mystery of Universality in Random Matrices) to senior undergraduates, Princeton University**
- 2023 **Mentorship Pair with undergraduate Sophia Huellstrunk, Princeton University**

2022 Interview for students' newspaper on working abroad, *Liceo Scientifico M. Vitruvio Pollione*, Avezzano (AQ)

Language Skills

- Italian Mother tongue
- English Fluent