Dominik **Schröder**

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Education

Maria-Theresia-Gymnasium — *Munich*

Abitur / A-levels — *2001 – 2010*

ETH Zurich — *Zurich*

Mathematics & Physics — *2010 – 2011*

LMU Munich — *Munich*

Mathematics & Physics — *2011 – 2014*

- **BSc in Mathematics.** Final grade *1.08*
  Thesis "The Integrated Density of States of Random Schrödinger Operators" supervised by Peter Müller.
- **MSc in Theoretical and Mathematical Physics.** Final grade *1.0 with distinction*
  Thesis "Phase Transition in the Density of States of Quantum Spin Glasses" supervised by László Erdős.

University of Cambridge — *Cambridge*

Mathematics — *2014 – 2015*

- **MASt in Mathematics.** Final grade *distinction*
  Essay "Interlacing Families and the Kadison-Singer Problem" supervised by Timothy Gowers.

IST Austria — *Vienna*

Mathematics — *Sep 2015 – Mar 2019*

- **PhD in Mathematics** supervised by László Erdős.

Positions

Bosch Center for Artificial Intelligence — *Renningen*

Industry Sabbatical — *Apr 2018 – Aug 2018*

IST Austria — *Vienna*

Postdoc — *Mar 2019 – Sep 2019*

ETH Institute for Theoretical Studies — *Zurich*

Junior Fellow — *Oct 2019 – Aug 2022*

ETH Zurich — *Zurich*

SNSF Ambizione Fellow — *from Sep 2022*

Publications

Phase transition in the density of states of quantum spin glasses — *2014*

L. Erdős and D. Schröder

***Math. Phys. Anal. Geom.*, 17**, *441–464, (2014)*

`arXiv:1407.1552`, `MR3291938`, `10.1007/s11040-014-9164-3`.

Fluctuations of rectangular Young diagrams of interlacing Wigner eigenvalues — *2016*

L. Erdős and D. Schröder

***Int. Math. Res. Not. IMRN**, 3255–3298, (2018)*

`arXiv:1608.05163`, `MR3805203`, `10.1093/imrn/rnw330`.

Fluctuations of functions of Wigner matrices *2016*

L. Erdős and D. Schröder

Electron. Commun. Probab.*, *21*, *Paper no. 86, 15, (2016)

arXiv:1610.07084, MR3600514, 10.1214/16-ECP38.

Random matrices with slow correlation decay *2017*

L. Erdős, T. Krüger, and D. Schröder

Forum Math. Sigma*, *7*, *Paper No. e8, 89, (2019)

arXiv:1705.10661, MR3941370, 10.1017/fms.2019.2.

Correlated random matrices: band rigidity and edge universality *2018*

J. Alt, L. Erdős, T. Krüger, and D. Schröder

Ann. Probab.*, *48*, *963–1001, (2020)

arXiv:1804.07744, MR4089499, 10.1214/19-AOP1379.

Cusp universality for random matrices I: local law and the complex Hermitian case *2018*

L. Erdős, T. Krüger, and D. Schröder

Comm. Math. Phys.*, *378*, *1203–1278, (2020)

arXiv:1809.03971, MR4134946, 10.1007/s00220-019-03657-4.

Cusp universality for random matrices, II: The real symmetric case *2018*

G. Cipolloni, L. Erdős, T. Krüger, and D. Schröder

Pure Appl. Anal.*, *1*, *615–707, (2019)

arXiv:1811.04055, MR4026551, 10.2140/paa.2019.1.615.

Edge universality for non-Hermitian random matrices *2019*

G. Cipolloni, L. Erdős, and D. Schröder

Probab. Theory Related Fields, 179*, *1–28, (2021)

arXiv:1908.00969, MR4221653, 10.1007/s00440-020-01003-7.

Optimal lower bound on the least singular value of the shifted Ginibre ensemble *2019*

G. Cipolloni, L. Erdős, and D. Schröder

Probab. Math. Phys.*, *1*, *101–146, (2020)

arXiv:1908.01653, MR4408004, 10.2140/pmp.2020.1.101.

Central limit theorem for linear eigenvalue statistics of non-Hermitian random matrices *2019*

G. Cipolloni, L. Erdős, and D. Schröder

Comm. Pure Appl. Math.*, *76*, *946–1034, (2023)

arXiv:1912.04100, MR4569609, 10.1002/cpa.22028.

Fluctuation around the circular law for random matrices with real entries *2020*

G. Cipolloni, L. Erdős, and D. Schröder

Electron. J. Probab.*, *26*, *Paper No. 24, 61, (2021)

arXiv:2002.02438, MR4235475, 10.1214/21-EJP591.

Eigenstate thermalization hypothesis for Wigner matrices *2020*

G. Cipolloni, L. Erdős, and D. Schröder

Comm. Math. Phys.*, *388*, *1005–1048, (2021)

arXiv:2012.13215, MR4334253, 10.1007/s00220-021-04239-z.

Function Central Limit Theorems for Wigner Matrices *2020*

G. Cipolloni, L. Erdos, and D. Schröder

Ann. Appl. Probab.*, *33*, *448–489, (2023)

arXiv:2012.13218, 10.1214/22-AAP1820.

Thermalisation for Wigner matrices *2021*

G. Cipolloni, L. Erdős, and D. Schröder

***J. Funct. Anal.*, 282**, *Paper No. 109394, 37, (2022)*

arXiv:2102.09975, MR4372147, 10.1016/j.jfa.2022.109394.

Normal fluctuation in quantum ergodicity for Wigner matrices *2021*

G. Cipolloni, L. Erdős, and D. Schröder

***Ann. Probab.*, 50**, *984–1012, (2022)*

arXiv:2103.06730, MR4413210, 10.1214/21-aop1552.

Analysis of one-hidden-layer neural networks via the resolvent method *2021*

V. Piccolo and D. Schröder

Advances in neural information processing systems, *Vol. 34, pp. 5225–5235, (2021)*

arXiv:2105.05115.

On the condition number of the shifted real Ginibre ensemble *2021*

G. Cipolloni, L. Erdős, and D. Schröder

***SIAM J. Matrix Anal. Appl.*, 43**, *1469–1487, (2022)*

arXiv:2105.13719, MR4474380, 10.1137/21M1424408.

Density of Small Singular Values of the Shifted Real Ginibre Ensemble *2021*

G. Cipolloni, L. Erdős, and D. Schröder

***Ann. Henri Poincaré*, 23**, *3981–4002, (2022)*

arXiv:2105.13720, MR4496598, 10.1007/s00023-022-01188-8.

Quenched universality for deformed Wigner matrices *2021*

G. Cipolloni, L. Erdős, and D. Schröder

***Probab. Theory Related Fields*, 185**, *1183–1218, (2023)*

arXiv:2106.10200, MR4556290, 10.1007/s00440-022-01156-7.

On the Spectral Form Factor for Random Matrices *2021*

G. Cipolloni, L. Erdős, and D. Schröder

***Commun. Math. Phys.*, 401**, *1665–1700, (2023)*

arXiv:2109.06712, 10.1007/s00220-023-04692-y.

Optimal multi-resolvent local laws for Wigner matrices *2021*

G. Cipolloni, L. Erdős, and D. Schröder

***Electron. J. Probab.*, 27**, *Paper No. 117, 38, (2022)*

arXiv:2112.13693, MR4479913, 10.1214/22-ejp838.

Rank-uniform local law for Wigner matrices *2022*

G. Cipolloni, L. Erdős, and D. Schröder

***Forum Math. Sigma*, 10**, *Paper No. e96, 43, (2022)*

arXiv:2203.01861, MR4502022, 10.1017/fms.2022.86.

Directional extremal statistics for Ginibre eigenvalues *2022*

G. Cipolloni, L. Erdős, D. Schröder, and Y. Xu

***J. Math. Phys.*, 63**, *Paper No. 103303, 11, (2022)*

arXiv:2206.04443, MR4496015, 10.1063/5.0104290.

On the rightmost eigenvalue of non-Hermitian random matrices *2022*

G. Cipolloni, L. Erdős, D. Schröder, and Y. Xu

Preprint, *(2022)*

arXiv:2206.04448.

Mesoscopic central limit theorem for non-Hermitian random matrices *2022*

G. Cipolloni, L. Erdős, and D. Schröder

***Probab. Theory Relat. Fields**, (2023)*

arXiv:2210.12060, 10.1007/s00440-023-01229-1.

Optimal Lower Bound on Eigenvector Overlaps for non-Hermitian Random Matrices *2023*

G. Cipolloni, L. Erdős, J. Henheik, and D. Schröder

***Preprint**, (2023)*

arXiv:2301.03549.

Deterministic equivalent and error universality of deep random features learning *2023*

D. Schröder, H. Cui, D. Dmitriev, and B. Loureiro

***ICML**, (2023)*

arXiv:2302.00401.

Invited talks

IAS Park City Mathematics Institute *Park City*

PCMI Summer School. Poster presentation *2017*

University of Warwick *Warwick*

Probability Seminar *2017*

TU Munich *Munich*

Seminar *Analysis and Zufall* *2018*

University of Vienna *Vienna*

Probability Seminar *2018*

University of Basel *Basel*

Probability Seminar *2018*

Random Physical Systems *Puerto Natales, Chile*

Conference *2018*

University of Geneva *Les Diablerets, Switzerland*

Workshop on Statistical Mechanics *2019*

Institut Henri Poincaré *Paris*

Working group on random matrices and graphs *2019*

KTH Royal Institute of Technology *Stockholm*

Random Matrix Theory Seminar *2019*

QMath14 *Aarhus*

Random Systems Session *2019*

University of Geneva *Geneva*

Mathematical Physics Seminar *2019*

University of Erlangen *Erlangen*

Mathematical Physics Seminar *2019*

MFO Oberwolfach *Oberwolfach*

Workshop Random Matrices *2019*

University of Melbourne *Melbourne*

Random matrix theory seminar *2020*

Universität Basel, Schweiz *Basel*

Machine learning seminar *2020*

ICMP (International Congress on Mathematical Physics) *Geneva*

Contributed Talk, Session Probability & Random Structures *2021*

ICTP Trieste *Trieste*

Youth in High Dimesions *2022*

Teaching experience

Teaching assistant *LMU Munich*

Analysis, Measure theory, Probability, Functional Analysis, Statistical Physics *2012 – 2015*

Teaching assistant *IST Austria*

Random matrix theory *2017 – 2018*

Supervision of master and semester theses *ETH Zurich*

Machine learning, Random matrix theory *since 2020*

Lecture *ETH Zurich*

Probability theory *Fall 2022*

Grants & Awards

2010 – 2015 **German National Academic Foundation,** Scholarship

2015 **Horne Prizes for Physical Sciences,** Clare College *University of Cambridge*

2015 – 2017 **IST Austria Excellence Scholarship** *IST Austria*

2022 – 2026 **SNSF Ambizione Fellowship** *SNSF*

Language skills

German Mother tongue

English Fluent

French Basic

Spanish Basic