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. Erdős, 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 Preprint, (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