Matteo D'ACHILLE
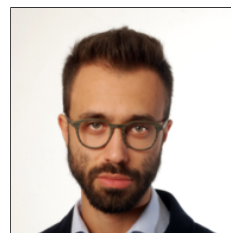
CURRICULUM VITÆ

Last updated: January 26, 2026 • matteodachille.github.io

Affiliation and contacts

🏛 Institut Élie Cartan de Lorraine - IECL (UMR 7502 CNRS)
UFR Mathématiques Informatique Mécanique
3, rue Augustin Fresnel, 57000 Metz, France

📞 (+33) 03 72 74 79 07

@ matteo.d-achille@univ-lorraine.fr

Research interests

Probability theory, random geometry, statistical mechanics, random assignment problems

Current position

01/09/2025 to present	Associate Professor (maître de conferences CNU 26), Institut Élie Cartan de Lorraine (Metz site). Member of the équipe Probability and Statistics

Previous employments

01/11/2023 to 31/08/2025	Member of the ERC Consolidator Grant "SuPerGRandMa" with Prof. Nicolas Curien (PI) and Prof. Jean-François Le Gall (Senior Researcher)
01/09/2022 to 31/08/2025	Postdoctoral Research Fellow, Laboratoire de Mathématiques d'Orsay, UMR 8628 CNRS, université Paris-Saclay. Funding (09/2022-10/2023): ANR "RanTanPlan", PI Prof. Nicolas Curien
01/10/2020 to 31/08/2022	Research and Teaching Assistant (ATER temps plein), Laboratoire d'Analyse et de Mathématiques Appliquées, UMR 8050 CNRS, Université Paris-Est Créteil. Host: Prof. Arnaud Le Ny

Education

2020 **Ph.D.** Paris–Saclay University, France

Title: *Statistical Properties of the Euclidean Random Assignment Problem*
Supervisors: Prof. William Jalby, Dr. Olivier Rivoire and Dr. Andrea Sportiello
Committee: Prof. Michel Ledoux (president), Dr. Charles Bordenave (referee),
Prof. Massimiliano Gubinelli (referee), Prof. Guilhem Semerjian (examiner), Prof. Lenka
Zdeborová (examiner), Prof. Sergio Caracciolo (invited member)
12/2019 to 12/2020: Associated Member, LIPN, Université Sorbonne Paris Nord.

2016 **M.Sc.** University of Milan, Italy

Title: *On two linear assignment problems: random assignment and Euclidean bipartite matching.*
Supervisor: Prof. Sergio Caracciolo, Asst. Supervisor: Prof. Gabriele Sicuro.
Final grade: 110/110 summa cum laude

2012 **B.Sc.** University of Milan, Italy
Title: *La Teoria di Schwartz-Christoffel e il biliardo quantistico poligonale*
Supervisor: Prof. Luca Guido Molinari. Final grade: 110/110

2009 High school scientific diploma, Liceo "Paolo Frisi", Monza, Italy
Student of a "Piano Nazionale Informatica" section

2004 Licenza media, Scuola Media "Sandro Pertini", Monza, Italy

2001 Licenza elementare, Scuola Primaria "Zara", Monza, Italy

Publications

2025: Vanishing uniqueness thresholds in Voronoi percolation on products, **M. D'Achille**, J. Grebík, A. Khezeli, K. Recke and A. Wilkens. arXiv: 2511.23317 [math.PR]

On minimal shapes and topological invariants in hyperbolic lattices, **M. D'Achille**, V. Jacquier and W. Ruszel. arXiv: 2504.14080 [math.CO]

2024: Ideal Poisson-Voronoi tessellations beyond hyperbolic spaces, **M. D'Achille** arXiv: 2412.00822 [math.PR]

Published in peer-reviewed journals

2025: Extremal Ising Gibbs States on Lobachevsky lattices, **M. D'Achille**, L. Coquille and A. Le Ny. Electronic Communications in Probability 30. DOI: 10.1214/25-ECP724

2024: Local limit of massive spanning forests on the complete graph, **M. D'Achille**, N. Enriquez and P. Melotti. arXiv: 2403.11740 [math.PR]. Accepted on Random Structures & Algorithms

2023: Ideal Poisson-Voronoi tessellations on hyperbolic spaces, **M. D'Achille**, N. Curien, N. Enriquez, R. Lyons and M. Ünel. arXiv: 2303.16831 [math.PR] . Accepted on Annals of Probability (link)

2022: Decimations for Two Dimensional Ising and Rotator Models II: Continuous versus Discrete Symmetries, **M. D'Achille**, A. van Enter and A. Le Ny, Journal of Mathematical Physics 63, 123506. DOI: 10.1063/5.0103163

Decimations for Two-dimensional Ising and Rotator Models, **M. D'Achille**, A. van Enter and A. Le Ny, Journal of Mathematical Physics 63, 033506. DOI: 10.1063/5.0057174

Almost Gibbsian Measures on a Cayley Tree, **M. D'Achille** and A. Le Ny, Markov Processes and Related Fields 28, pp. 245–273. arXiv: 2105.05767 [math-ph]

2021: Random Assignment Problems on $2d$ Manifolds, with D. Benedetto, E. Caglioti, S. Caracciolo, **M. D'Achille**, G. Sicuro and A. Sportiello, Journal of Statis-

tical Physics 183 (34). DOI: [10.1007/s10955-021-02768-4](10.1007/s10955-021-02768-4)

2020:   The Dyck bound in the concave 1-dimensional random assignment model, S. Caracciolo, **M. D'Achille**, V. Erba and A. Sportiello, Journal of Physics A: Mathematical and Theoretical 53 (6), 064001. DOI: [10.1088/1751-8121/ab4a34](10.1088/1751-8121/ab4a34)

2018:   Anomalous scaling of the optimal cost in the one-dimensional random assignment problem, with S. Caracciolo, **M. D'Achille** and G. Sicuro, Journal of Statistical Physics 174 (4), 846–864. DOI: [10.1007/s10955-018-2212-9](10.1007/s10955-018-2212-9)

2017:   Random Euclidean matching problems in one dimension, S. Caracciolo, **M. D'Achille** and G. Sicuro, Physical Review E 96 (4), 42102. DOI: 10.1103/PhysRevE.96.042102

Finite-size corrections in the random assignment problem, with S. Caracciolo, **M. D'Achille**, E.M. Malatesta and G. Sicuro, Physical Review E 95 (5), 52129. DOI: 10.1103/PhysRevE.95.052129

Talks

44 research talks, including **4** at international conferences and **6** at national conferences or workshops, see details below.

Legend: ❶ : talk detail   ▶ : recording (if available)
       P : in presence   V: online   I: invited   C: contributed

2026:   29/01 • GdT Probabilités et Statistique, IECL, Metz site, FR ❶   I P
           08/01 • Séminaire Géométrie et Topologie, IMJ-PRG, Paris, FR ❶   I P

2025:   01/12 • Séminaire commun de géométrie, IECL, Nancy site, FR ❶   I P
           21/11 • Séminaire EDP, Analyse et Applications, IECL, Metz site, FR ❶   I P
           20/11 • $M \cup \Phi$ internal seminar, KU Leuven, BE ❶   I P
           11/11 • Kirchhoff forests on graphs: recent developments, CIRM, FR ❶   I P
           14/10 • Journée de rentrée de l'IECL, Nancy site, FR ❶   I P
           02/10 • Séminaire Probabilités et Statistique, IECL, Nancy site, FR ❶   I P
           26/09 • YMCN school: Probability & dynamics on groups, Münster, DE ❶ I P
           20/06 • Rencontres de Mathématiques de l'Université de Rouen, FR ❶   I P

07/04 • WORDS 2025, Groningen, NL ℹ️   I V

29/01 • Conference annuelle du GDR branchement, Orsay, FR ℹ️   I P

27/01 • Séminaire Mathnets, INRIA et ENS, FR ℹ️   I P

17/01 • Les probas du vendredi, LPSM, Sorbonne Université, FR ℹ️   I P

2024:

12/12 • Séminaire de Proba et Math. Fi., LaMME, Evry, FR ℹ️   I P

13/11 • Probability Oberseminar, University of Münster, DE ℹ️   I P

14/08 • Bernoulli-*ims* 11th World Congress, Bochum, DE ℹ️   C P

19/06 • Stat-Mech in Créteil 2024-II: Random Systems, Créteil, FR ℹ️   I P

30/04 • Séminaire CALIN, LIPN, Université Sorbonne Paris Nord, FR ℹ️ I P

19/02 • Séminaire de Probabilités, LAREMA, Angers, FR ℹ️   I P

30/01 • Séminaire de Probabilités, Institut Fourier, Grenoble, FR ℹ️   I P

2023:

21/11 • Séminaire Analyse-Proba, CEREMADE, Dauphine, FR ℹ️   I P

21/09 • Rencontres de Probabilités 2023, LMRS, Rouen, FR ℹ️   I P

20/09 • Seminário de Probabilidade e Mecânica Estatística, IMPA, BR ▶️ I V

28/06 • Journée Cartes, IRIF, Université Paris-Cité, FR ℹ️   I P

13/06 • Franco-Dutch Workshop: Stat-Mech in Créteil 2023, Créteil, FR ℹ️ I P

24/01 • PizzaMa Seminar, LMO, Université Paris-Saclay, Orsay, FR   C P

17/01 • Random Geometry - Géométrie Aléatoire, CIRM Luminy, FR ℹ️   I P

2022:

06/12 • Sémin. ProbaStat, LAGA, Université Sorbonne Paris Nord, FR ℹ️   I P

22/09 • Probastat back-to-school day of, Université Paris-Saclay, Orsay, FR   I P

06/09 • Optimal Transport & Uncertainty - 2nd Edition, Naples, IT ℹ️   I P

20/06 • DYOGENE Seminar, INRIA and ENS, Paris, FR ℹ️   I P

08/03 • Séminaire de probabilité de Créteil, UPEC, FR ℹ️   I P

18/02 • Les probas du vendredi, LPSM, Sorbonne Université, Paris, FR ℹ️   I P

2021:

26/11 • Optimal Transport & Uncertainty, Pisa, IT ℹ️   I P

14/09 • SPOR Seminar, EURANDOM, TU/E, Eindhoven, NL ℹ️   I P

07/07 • Franco-Dutch meeting, CNRS IRP, IHP, Paris, FR ℹ️   I P

23/06 • 1st Italian Society of Statistical Physics conference, Parma, IT ▶️ C V

21/06 • Journées de Probabilités 2021, Guidel Plages, FR ℹ️   I P

18/03 • ALÉA Days 2021, CIRM Luminy, FR ⓘ		C V
21/02 • Laboratoire Painlevé, Lille, FR ⓘ		I V
2020:	10/11 • Probability and Statistics Seminar, Créteil, FR ⓘ	I P
	16/10 • PhD Thesis Defense, Université Paris-Saclay, FR	V
	14/01 • Séminair CALIN, LIPN, Université Sorbonne Paris Nord, FR ⓘ	I P

Invited Research School

29/07/2024 to 04/08/2024

Probability with / on random graphs: trees, networks, dimers, assignments, AESIM-CIMPA Summer School, Nesin Mathematics Village, Şirince, Turkey.

Course: An Invitation to random assignment problems ⓘ

Referee activity in peer-reviewed journals

1/10/2017– present

15 reports for 8 journals in probability, general mathematics, statistical mechanics, numerical methods, theoretical physics and information theory. Number of reports to the right. Source: Web of Science 🔗 .

- Annales de l'Institut Henri Poincaré, Probabilités et Statistiques (IMS) 1
- Electronic Communications in Probability (IMS) 1
- Electronic Journal of Probability (IMS) 1
- Probability Theory and Related Fields (Springer) 1
- Random Structures & Algorithms (Wiley) 1
- IEEE Transactions on Information Theory (IEEE) 1
- Chaos (AIP) 8
- Physical Review X (APS) 1

Personal grants

15/11/2023– 31/08/2025

2.25k€ in various grants from the Fondation Mathématique Jacques Hadamard (FMJH)

Scientific invitations abroad

2025:	Two days (19/11-20/11), Department of Physics and Astronomy, KU Leuven BE Host: Prof. Alessio Lerose.
2024:	Six days (24/11-30/11), Mathematics Department, Utrecht University NL Host: Prof. Wioletta Ruszel.
	One week (12/11-19/11), Mathematics Department, University of Münster DE Host: Prof. Anna Gusakova.
2021:	One week (22/11-29/11), Mathematics Department, University of Pisa IT Host: Prof. Dario Trevisan.
	Two weeks (09/09-24/09), CASA, TU/E, Eindhoven NL Host: Prof. Oliver T.S. Tse.
2018:	Two weeks (18/02-04/03), Banach Center, IMPAN, Warsaw PL Host: Prof. Jacek Miękisz.

Invited stays in France

2025:	21/10-24/10, Institut Fourier, Grenoble. Host: Prof. Loren Coquille.
2024:	3/06-5/06, Institut Fourier, Grenoble. Host: Prof. Loren Coquille.
	18/02-19/02, LAREMA, Angers. Host: Prof. Loïc Chaumont.
	29/01-30/01, Institut Fourier, Grenoble. Hosts: Prof. Loren Coquille and Dr. Hugo Vanneuville.

Organization of seminars and conferences

16/11/2021–present	**Seed Seminar of Mathematics and Physics**. Regular events at IHP, IHES & online. Seed is an international activity of CNRS–Mathématiques. Website: https://seedseminar.apps.math.cnrs.fr/
2024:	Bernoulli-IMS 11th World Congress in Probability and Statistics, 12-16/08, Bochum, DE. Contributed Session: *Randomness on Trees and Random Trees* bernoulli-ims-worldcongress2024.org/Randomness on Trees and Random Trees
13/10/2023–present	

SuperGRandMa weekly seminar, LMO, Orsay.
Website: https://www.imo.universite-paris-saclay.fr/~nicolas.curien/ERC.html

1/10/2022–
present
Les Probabilités de Demain, Institut Henri-Poincaré, Paris.
Website: https://indico.math.cnrs.fr/category/618/

2022:
The many facets of Statistical Field Theory, SISSA, Trieste, IT.
Conference in honor of Prof. Sergio Caracciolo's 70th birthday
https://sites.google.com/view/the-many-facets-of-sft - YouTube channel

Membership of Scientific Societies

2022	Société de Mathématiques Appliquées et Industrielles (SMAI)	voting member
2019	Italian Society of Statistical Physics (SIFS)	voting member
2017	European Physical Society (EPS)	individual member
2013	Italian Physical Society (SIF)	voting member

Students supervision

15 students in Mathematics in M2, M1 or L3 in Orsay (LMO, université Paris-Saclay) and Créteil (LAMA, université Paris-Est). **1** M2 research internship (with stipend), **5** M1 TER projects and **5** L3 TER projects.

See below for details: defense date • student(s) name(s), *manuscript title*, class.

2026:
TBA

2025:
08.10 • Thomas Quarck, *Random assignment problems for satellite data acquisition*
M2 Mathématiques et Applications, Probabilités et Modèles Aléatoires, Sorbonne Université (jointly with J.Levillain)

03.07 • Justin Carrion, Tristan Schweiss,, *Matching de nuages de points aléatoires : étude combinatoire, probabiliste et informationnelle*
M1 TER project, Master Mathématiques fondamentales, Orsay, université Paris–Saclay (jointly with L.Ganassali)

2024:
10.07 • Marino Azzola, *Study of the local limit of massive spanning forests on K_n*
M1 TER project, Master Jacques Hadamard, Orsay, université Paris–Saclay

9.07 • Zhuowei Yao, *Étude de la perturbation diagonale des zéros de Yang-Lee de la matrice J_n*, M1 TER project, Master Mathématiques fondamentales, Orsay, université Paris–Saclay

16.05 • Mathys Brugier, Tony Hajjar, Theotime Niault, Simon Objois, Adam R. *Répulsion de zéros de Yang-Lee aléatoires*, L3 TER project, licence Mathématiques MAG, Orsay, université Paris–Saclay

2022:

2.09 • Yuqi Liu, *Comparison of different Euclidean Random Assignment Problems* M2 research stage, Master Mathématiques et Applications, université Paris–Est Créteil. Yuqi's stage has been funded by a 3 months stipend from UPEC (from 11/04 to 11/07)

19.05 • Mouad Haï, Yilun Li, *Équations de Mathieu & ERAPs sur des domaines elliptiques à $p = 2$*, M1 TER, Master Mathématiques et Applications, université Paris-Est Créteil

2021:

17.05 • Moustapha Mouhamadou Ba, Yuqi Liu, Issa Konate Sy, *Universalité dans le problème d'assignation aléatoire euclidienne en dimension $d = 1$*, M1 TER, Master Mathématiques et Applications, université Paris-Est Créteil

Regular teaching activities

499h eqTD, including **CM** (course) and **TD** (tutorial) and **TP** (computer-based practical exercises) in real analysis, probability theory, statistics and dynamical systems for bachelor students in the French University system (M2, M1 level and L1, L2, L3 level). See details below.

01/09/2025– present

Associate Professor of Mathematics, UFR Mathématiques, Informatique et Mécanique, Université de Lorraine. $\sim$192h eqTD per year for Master and Bachelor students in Mathematics at all levels.

Fall Term 25: **L1 Analysis 1** CM/TD
Program: Basic vocabulary for studying real functions of real variables, usual maps, common primitives, linear differential equations.

01/10/2020 to 31/08/2022

Teaching Assistant in Mathematics (ATER à temps plein), Université Paris-Est Créteil $\sim$192h eqTD for 2nd-3rd year Bachelor students in Economics

Spring Term 22: **Statistical Inference** CM/TD
Program: point estimators, confidence interval estimators, statistical tests, least squares.

Fall Term 21: **Mathematics for Dynamical Systems** TD
Program: sequences, 1st and 2nd order recurrent equations, 1st and 2nd order ODEs, higher order ODEs, recurrent systems.

Fall Term 21: **Probability** CM/TD
Program: introduction to probability, discrete and continuous random variables, convergence of random variables, limit theorems.

Spring Term 21: **Statistical Inference** CM/TD
Program: point estimators, confidence interval estimators, statistical tests, least squares.

Fall Term 20: **Mathematics for Dynamical Systems**" TD
Program: dynamical systems in discrete time dynamical systems in continuous time, applications to models in Economics.

01/11/2019 to 01/06/2020	*Lecturer in Mathematics*, Paris-Saclay University, Orsay

~15h eqTD for 1st year Bachelor students in Mathematics, Physics and Informatics

<u>Spring Term 20</u>: **Remédiation en Mathématiques (OuiSi)** TD
Program: basic operations, Euclidean geometry, trigonometry, functions, complex numbers, mean value theorem, integral calculus.

01/11/2018 to 01/06/2019	*Tutor in Mathematics*, Paris-Saclay University (Orsay)

~ 65 hours for 1st year Bachelor students in Mathematics, Physics and Informatics, and dual Bachelor "Physico-Chimie"

<u>Spring Term 19</u>: **Remédiation en Mathématiques (OuiSi)** TD
Program: basic operations, Euclidean geometry, trigonometry, functions, complex numbers, mean value theorem, integral calculus.

<u>Fall Term 18</u>: **Calculus Math 151** TD
Program: functions, limits and continuity, Taylor expansion, derivative, parametric curves, functions over a closed and bounded interval, Taylor expansion of order ≥ 2, ODEs, primitives and integrals, functions of several variables.

Participation to research schools, conferences, etc. (selection)

2025: Hyperbolic meets Stochastic Geometry, Oberwolfach, Germany (reporter) ⓘ - Kirchhoff forests on graphs: recent developments, CIRM Luminy, France ⓘ - YMCN autumn school: Probability and dynamics on groups, Münster, Germany ⓘ - Conférence annuelle du GDR branchement, Orsay, France ⓘ

2024: Self-similar Markov trees in random geometry, CIRM Luminy ⓘ - Two Dimensional Random Geometry, IMSI, Chicago ⓘ - Journée cartes à Nanterre ⓘ - ALEA Days - Journées ALEA, CIRM Luminy ⓘ - French Japanese Conference on Probability & Interactions, IHES ⓘ

2023: 11e séminaire ITZYKSON, IHES ⓘ - Probability and Geometry in, on and of non-Euclidean space, CIRM Luminy ⓘ - Dimers2023 : DIMERS ANR final conference, LPSM, Sorbonne Université ⓘ - ALEA Days - Journées ALEA, CIRM Luminy ⓘ

2022: Journée cartes, ENS Lyon ⓘ - Journées MAS 2022, Rouen ⓘ - Random Point Processes in Statistical Physics, Harnack-Haus, Berlin ⓘ - 100 (102!) Years of the Ising Model, IHES ⓘ - Random matrices meet random permutations, Lille ⓘ - ALEA Days - Journées ALEA, CIRM Luminy ⓘ

2021: Stochastic Geometry Days, Dunkerque ⓘ - Franco-Dutch meeting "Bézout-Eurandom", IHP ⓘ - Theory of Probability and Its Applications: P.L. Chebyshev - 200, Moscow ⓘ - Inhomo-

geneous Random Systems, IHP ⓘ

2020: Integrable Probability Summer School, Clay Institute & Heilbronn Institute, online ⓘ

2016: Optimal Transport and Applications, Scuola Normale Superiore, Pisa ⓘ

2014: Mathematical Physics, Analysis and Stochastics, Heidelberg ⓘ

Languages

Italian (native), French (mastery), English (mastery), Spanish (beginner)

Programming languages and computer skills of everyday use

C++, Python, R, Wolfram Language™, LaTeX, HTML, CSS, JavaScript, Markdown, YAML, Bash