

# Thibaut Lemoine

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## Education & Professional Experience

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### CRISTAL, CNRS & Université de Lille

Villeneuve-d'Ascq (France)

POSTDOC

2022 - en cours

- Subject: determinantal point processes and applications
- Mentor: Rémi Bardenet

### IRMA, Université de Strasbourg

Strasbourg (France)

POSTDOC

2020 - 2022

- Subject: geometric aspects of the quantum Hall effect
- Mentor: Semyon Klevtsov

### LPSM, Sorbonne Université

Paris (France)

PHD IN MATHEMATICS

2016 - 2020

- Title: Asymptotic representation theory and applications to Yang–Mills theory
- Advisor: Thierry Lévy

### Sorbonne Université

Paris (France)

MSC IN MATHEMATICS

2014 - 2016

- Specialization in “probability and random models”

### EDHEC Business School

Lille, Nice (France)

BUSINESS SCHOOL DIPLOMA

2010 - 2014

- Specialization in “financial markets”

## Papers

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### PUBLICATIONS

2024. Antoine Dahlqvist, Thibaut Lemoine, *Large  $N$  limit of the Yang–Mills measure on compact surfaces II: Makeenko–Migdal equations and planar master field*, arXiv:2201.05886. Accepted in *Forum of Mathematics, Sigma*

2023. Antoine Dahlqvist, Thibaut Lemoine, *Large  $N$  limit of Yang–Mills partition function and Wilson loops on compact surfaces*, Probab. Math. Phys. 4, 849–890

2021. Thibaut Lemoine, *Large  $N$  behaviour of the two-dimensional Yang–Mills partition function*, Combinatorics, Probability and Computing, 1-22

### PREPRINTS

2024. Thibaut Lemoine, Rémi Bardenet, *Monte Carlo methods on compact complex manifolds using Bergman kernels*, arXiv: 2405.09203

2024. Thibaut Lemoine, Mylène Maïda, *Gaussian measure on the dual of  $U(N)$ , random partitions, and topological expansion of the partition function*, arXiv:2405.08393

2023. Thibaut Lemoine, *Almost flat highest weights and application to Wilson loops on compact surfaces*, arXiv:2303.11286

2022. Thibaut Lemoine, *Determinantal point processes associated with Bergman kernels: construction and limit theorems*, arXiv:2211.06955

## Talks

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2024. *Améliorer l'intégration numérique en utilisant les processus ponctuels déterminantaux*. Séminaire de probabilités et statistique, LMA, Poitiers (France)
2024. *Améliorer l'intégration numérique en utilisant les processus ponctuels déterminantaux*. Séminaire de mathématiques de Vannes, LMBA, Vannes (France)
2024. *From unitary integrals to random ramified coverings*. Conference “algebraic aspects of random matrices”, CIRM, Marseille (France)
2024. *From random partitions to gauge/string duality*. International Conference of Mathematical Physics, Strasbourg (France)
2024. *Les partitions aléatoires au secours du développement topologique d'intégrales unitaires*. Probabilités du Vendredi, LPSM, Paris (France)
2024. *Aspects asymptotiques de l'effet Hall quantique entier sur des variétés complexes*. Séminaire de Physique Mathématique, Lyon (France)
2024. *Variables aléatoires gaussiennes discrètes, partitions aléatoires et développement topologique*. Séminaire de probabilité, physique mathématique et analyse, Angers (France)
2024. *Variables aléatoires gaussiennes discrètes, partitions aléatoires et développement topologique*. Séminaire “matrices et graphes aléatoires”, Paris (France)
2023. *Le champ maître sur des surfaces compactes*. Séminaire d'analyse harmonique, Orsay (France)
2023. *Monte Carlo methods on complex manifolds using determinantal point processes*. Autumn School of Bayesian Statistics, CIRM, Marseille (France)
2023. *Méthodes de Monte Carlo sur des variétés complexes via les processus déterminantaux*. Séminaire de calcul stochastique, Strasbourg (France)
2023. *Processus ponctuels déterminantaux sur des variétés complexes*. Journées de probabilités, Angers (France)
2023. *Integer Quantum Hall effect on complex manifolds: a probabilistic view*. Geometric and analytic aspects of QHE – SwissMAP Research Station, Les Diablerets (Switzerland)
2023. *Determinantal point processes associated with Bergman kernels: construction and asymptotics*. Seminar in mathematical modelling and analysis, Umeå (Sweden)
2022. *Effet Hall quantique, une approche probabiliste*. GDT “processus ponctuels”, Laboratoire Painlevé, Lille (France)
2022. *Grandes déviations de mesures empiriques de mesures de Gibbs sur une surface de Riemann compacte*. GDT “Une approche probabiliste des métriques de Kähler–Einstein”, IRMA, Strasbourg (France)
2022. *Large  $N$  Limit of Yang–Mills partition function*. Spectra/moduli seminar, Durham (UK)
2022. *The master field on the torus*. 14e rencontres du GDR Dynamique Quantique, IMT, Toulouse (France)
2021. *Introduction aux probabilités non-commutatives*. Séminaire de calcul stochastique, IRMA, Strasbourg (France)
2020. *Noncommutative harmonic analysis of  $U(N)$  and application to 2D Yang–Mills theory*. Séminaire d'analyse, IRMA, Strasbourg (France)
2020. *Asymptotics of two-dimensional Yang–Mills partition function*. Bernoulli-IMS One World Symposium
2018. *Calcul stochastique libre par rapport au  $q$ -mouvement Brownien*. GDT “probabilités non-commutatives et chemins rugueux”, LPSM, Sorbonne Université, Paris (France)
2017. *L'algorithme RSK appliqué aux permutations aléatoires*. GDT “Combinatorics and random matrix theory”, Université Paris 7, Paris (France)

## Teaching

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2024 - 2025 **Masterclass on two-dimensional Yang–Mills theory (M1)**, École Normale Supérieure - PSL, Paris (France)

2024 - 2025 **Tutoring for a course on the spectrum of random hyperbolic surfaces (M1-M2)**, École Normale Supérieure - PSL, Paris (France)

2019 - 2020 **Tutoring in Probability (L3)**, Sorbonne Université, Paris (France)

2019 - 2020 **Tutoring in Probability (1st year)**, ISUP, Paris (France)

2019 - 2020 **Tutoring in General Mathematics (L1)**, Sorbonne Université, Paris (France)

2016 - 2019 **Tutoring in C++ Programming for mathematicians (M1)**, Sorbonne Université, Paris (France)

2016 - 2018 **Tutoring in Vector calculus (L2)**, Polytech' Paris, Paris (France)

## Other Activities

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### SCIENTIFIC DUTIES

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|------|---|----------------------------|
| 2025 | <b>Colloquium “géométries aléatoires et application”</b> , Organization of a colloquium at Collège de France for the chair of spectral geometry                   | <i>Paris (France)</i>      |
| 2023 | <b>GDT “théorie de jauge et surfaces aléatoires”</b> , Organization of a <a href="#">reading group</a> bringing together probabilists and mathematical physicists | <i>Lille (France)</i>      |
| 2022 | <b>Conference on quantum Hall effect and topological phases</b> , Co-organization of the conference and making of the <a href="#">website</a>                     | <i>Strasbourg (France)</i> |

### EXTRACURRICULAR ACTIVITIES

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| Since 2015 | <b>Volunteer Firefighter</b> , Rank : sergeant-chief | <i>Magny (France)</i> |
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### SKILLS

Languages: Franch (native), English (fluent), German (read and written)

Computer Science: C++,  $\text{\LaTeX}$ , Python, Excel/VBA, Matlab/Scilab, Maple