Pierre-Loïc MÉLIOT

Born: 18th December 1985 – Saint-Saulve (France).
Nationality: French. Married, with two children.

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Work experience

Assistant professor. 2013-
University Paris-Sud, Institute of Mathematics of Orsay.

Postdoctoral research fellow. 2011-2013
Institute of Mathematics of the University of Zürich (Switzerland).

Research interests

My research domain is probability theory, and my works focus on the two following subjects:

- asymptotic behavior of random models: mod-Gaussian and mod-ϕ convergence, central limit theorem, large deviations, speed of convergence and concentration inequalities. These results hold for models of random matrices and random graphs, and for models stemming from number theory, from combinatorics or from statistical mechanics.

- random objects on Lie groups or symmetric spaces: technics of harmonic analysis and representation theory applied to random processes (speed of convergence, cut-off) and random graphs (geometry, spectrum) drawn on symmetric spaces.

Education

Habilitation to supervise researches. 2018
University Paris-Sud. Techniques of harmonic analysis and asymptotic results in probability theory.

Ph.D. in Mathematics. 2007-2010
University Paris-Est. Random partitions and asymptotic theory of symmetric groups, Hecke algebras and finite Chevalley groups, under the supervision of Philippe Biane.

M.Sc. in Mathematics. 2005-2007
University Paris 6, option: Probability and stochastic processes.

Undergraduate courses to prepare nationwide competitive exams in sciences. Graduate studies at École Normale Supérieure (Paris). 2002-2008

Teaching experience

Agrégation in Mathematics (highest teaching degree in France, national competitive exam; ranked 3rd).		2006
Teachings as an assistant professor (192 hours per year).		2013-
M.Sc.2 Math	Lectures on *Random Permutations and Representations of* $\mathfrak{S}(n)$.	2020-
M.Sc.2 Math	Lectures on *Convergence of Measures, Poisson and Lévy Processes.*	2016-2020
M.Sc.2 Math	Preparation of students for the *Agrégation and CAPES of mathematics (competitive exams for teaching degrees).*	2013-
M.Sc.1 Math	Lectures and tutorials on *Markov Chains.*	2015-
M.Sc.1 Math	Lectures of *Introduction to Representation Theory.*	2014
B.Sc.3 Math	Lectures and tutorials on *Probabilistic Models.*	2022-
B.Sc.3 Math	Lectures and tutorials on *Algebra and Symbolic Computation.*	2017-2022
B.Sc.3 Engineer	Lectures *Mathematics for Engineers.*	2015-2016
B.Sc.2 Biology	Lectures on *Statistical Tests for Biologists.*	2019-
B.Sc.2 Biology	Lectures on *Probability.*	2013-2015
B.Sc.2 Math	Tutorials of *Calculus and Algebra.*	2015-2018
B.Sc.1 Math	Tutorials of *Calculus.*	2013-2014
Teachings during my postdoctoral stay in Zürich (36 hours per year).		2011-2013
M.Sc.	*Convergence of Random Variables and Large Deviations.*	2013
M.Sc.	*Random Permutations and Representations of Symmetric Groups.*	2012
Teachings during my graduate studies (384 hours).		2005-2011
B.Sc.2	Tutorials of *Combinatorics, Mathematical Logic.*	2009-2011
B.Sc.1/2	Tutorials of *Calculus and Algebra.*	2008-2011
B.Sc.1	Weekly examinations of undergraduate students in sciences.	2005-2008

Publications

- *On the precise deviations of the characteristic polynomial of a random matrix*, with Ashkan Nikeghbali. To appear in Random Matrices Theory and Applications.
- *A determinantal point process approach to scaling and local limits of random Young tableaux*, with Jacopo Borga, Cédric Boutillier and Valentin Féray. Annals of Probability, 53(1):299-354, 2025.
- *Fluctuations of the Gromov-Hausdorff sample model*, with Jacques De Catelan. Electronic Journal of Probability, 26(65):1-37, 2021.
- *Mod-ϕ convergence: Approximation of discrete measures and harmonic analysis on the torus*, with Reda Chhaibi, Freddy Delbaen and Ashkan Nikeghbali. Ann. Inst. Fourier., 70(3):1115-1197, 2020.

- *Graphons, permutons and the Thoma simplex: three mod-Gaussian moduli spaces*, with Valentin Féray and Ashkan Nikeghbali. Proc. London Math. Soc, 121(4):876-926, 2020.
- *Asymptotic representation theory and the spectrum of a random geometric graph on a compact Lie group.* Electronic Journal of Probability, 24(43):1-85, 2019.
- *Local limit theorems and mod-ϕ convergence*, with Martina dal Borgo and Ashkan Nikeghbali. Latin American Journal of Probability and Mathematical Statistics, 16(1):817-853, 2019.
- *Mod-ϕ convergence, II: Estimates on the speed of convergence*, with Valentin Féray and Ashkan Nikeghbali. Séminaire de Probabilités L, 405-478, LNM 2252, Springer-Verlag, 2019.
- *Representation Theory of Symmetric Groups.* Discrete Mathematics and Applications, 666+xvi p., CRC Press, 2017.
- *Mod-ϕ convergence: Normality Zones and Precise Deviations*, with Valentin Féray and Ashkan Nikeghbali. Springer Briefs in Probability and Mathematical Statistics, 152+xii p., Springer-Verlag, 2016.
- *Mod-Gaussian convergence and its applications for models of statistical mechanics*, with Ashkan Nikeghbali. In Memoriam Marc Yor – Séminaire de Probabilités XLVII, 369-425, LNM 2137, Springer-Verlag, 2015.
- *The cut-off phenomenon for Brownian motions on compact symmetric spaces*, Potential Analysis, 40(4):427-509, 2014.
- *Partial isomorphisms over finite fields*, Journal of Algebraic Combinatorics, 40(1):83-136, 2014.
- *Fluctuations of central measures on partitions*, Proceedings of the 24th International Conference on Formal Power Series and Algebraic Combinatorics (Nagoya, Japan), p. 387-398, 2012.
- *Asymptotics of q-Plancherel measures*, with Valentin Féray. Probability Theory and Related Fields, 152(3-4):589-624, 2012
- *Kerov's central limit theorem for Schur-Weyl and Gelfand measures,* Proceedings of the 23rd International Conference on Formal Power Series and Algebraic Combinatorics (Reykjavík, Iceland), p. 669-680, 2011.
- *Products of Geck-Rouquier conjugacy classes and the algebra of composed permutations*, Proceedings of the 22nd International Conference on Formal Power Series and Algebraic Combinatorics (San Francisco, USA), p. 789-800, 2010.

Supervision of students

Ph.D.	Shengjun Zhang *Asymptotic study of random trees under the Plancherel measure.*	2025-
Ph.D.	Jacques de Catelan *Mod-Gaussian convergence of models from combinatorics, random matrix theory and dynamics* (did not finish).	2017-2020

M.Sc.	Roman Gambelin *Harmonic analysis for random walks on finite groups.*	2018-2019
M.Sc.	Kévin Marchand *Mod-Gaussian convergence for functionals of the Brownian motion on a compact Lie group.*	2017-2018
M.Sc.	Jacques de Catelan *Stein's method and applications in random matrix theory.*	2016-2017
M.Sc.	Andreas Scheuss *Zeroes of random analytic functions.*	2012-2013

Organisation of conferences and seminars

Coorganisation of the seminar Probability and Statistics of the Institute of Mathematics of Orsay.	2018-2020
Coorganisation of an international workshop on Asymptotic Representation Theory, at Institut Henri-Poincaré.	2017

Skills / miscellaneous

Languages	French, English: fluent. German, Spanish, Japanese: notions.
Computer	Python, Sage, HTML/CSS, LaTeX, TikZ.
Hobbies	Cycling, series (k-drama, horror, sci-fi), gaming, lego, gunpla.