Benoit Dagallier

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Research interests

Probability/analysis in connection with statistical mechanics, especially out of equilibrium.

Keywords: out of equilibrium dynamics, scaling limits, renormalisation, functional inequalities, mixing.

Positions and training

2024 –	**Marie Curie postdoctoral fellow,** *CEREMADE, Université Paris-Dauphine-PSL*, funding via MIGP cofund.
2023 – 2024	**Courant instructor,** *Courant Institute of Mathematical Sciences, New York University*.
2021 – 2023	**Research associate,** *DPMMS, Cambridge University*, supervised by Roland Bauerschmidt.
2018 – 2021	**Ph.D. thesis,** *CMAP (Centre de Mathématiques APpliquées), Ecole Polytechnique*, title : "Large deviations in interacting particle systems: out of equilibrium correlations and interface dynamics", supervised by Thierry Bodineau. Defended 13 September 2021.
2017 – 2018	**Master 2 "Mathématiques de l'aléatoire" (Mathematics of randomness),** *Université Paris Sud, Orsay, France*.
2015 – 2017	**Master ICFP (International Centre for Fundamental Physics),** *Ecole normale supérieure, Paris, France*, (Master 1 and 2 in physics).
2014 – 2015	**Bachelor in mathematics and physics,** *Ecole normale supérieure, Paris, France*.
2014 – 2018	**Student in Ecole normale supérieure,** *Ecole normale supérieure, Paris, France*.

Research articles

Oct. 2023	**Fluctuations and correlations in the weakly asymmetric simple exclusion process on a ring subject to an atypical current**, accepted in Annals of Probability. Arxiv preprint: `https://arxiv.org/abs/2310.16793`
Oct. 2023	**Kawasaki dynamics beyond the uniqueness threshold,** *with Roland Bauerschmidt and Thierry Bodineau*, published in Probability Theory and Related Fields (2024). `https://doi.org/10.1007/s00440-024-01326-9` (36p, presently only published online). Arxiv preprint: `https://arxiv.org/abs/2310.04609`
July 2023	**Stochastic dynamics and the Polchinski equation: an introduction,** *with Roland Bauerschmidt and Thierry Bodineau*, published in Probability Surveys 21: 200-290 (2024). `https://doi.org/10.1214/24-PS27`.

Dec. 2022	**Large deviations for out of equilibrium correlations in the symmetric simple exclusion process,** *with Thierry Bodineau,* published in Electronic Journal of Probability 29: 1-96 (2024). `https://doi.org/10.1214/24-EJP1121`.
Feb. 2022	**Log-Sobolev inequality for near critical Ising models,** *with Roland Bauerschmidt,* published in Communications in Pure and Applied Mathematics, 77: 2568-2576 `https://doi.org/10.1002/cpa.22172`.
Feb. 2022	**Log-Sobolev inequality for the φ_2^4 and φ_3^4 measures,** *with Roland Bauerschmidt,* published in Communications in Pure and Applied Mathematics, 77: 2579-2612 `https://doi.org/10.1002/cpa.22173`.
May 2020	**Motion by curvature and large deviations for an interface dynamics on $\mathbb{Z}^2$,** published in Probability and Mathematical Physics, Vol. 5 (2024), No. 3, 609–734 `https://doi.org/10.2140/pmp.2024.5.609`. Open access version available at `https://arxiv.org/abs/2005.12581`

Invited talks and research visits

Sep. 2025	**Interacting particle systems and related fields,** *CIRM, Marseille, France.*
Sep. 2025	**Workshop Large Scale Stochastic Dynamics,** *Oberwolfach, Germany.*
May 2025	**Workshop "Stochastic equations and particle systems",** *La Sapienza, Roma, Italy.*
May 2025	**Analysis Seminar at Bielefeld university,** *Bielefeld, Germany.*
Apr. 2025	**Probability Seminar at Münster university,** *Münster, Germany.*
Mar./Apr. 2025	**UK Easter probability meeting,** *Durham, United Kingdom.*
Mar. 2025	**Probability seminar at LPSM** *Paris, France*
Mar. 2025	**Analysis and PDE seminar at ENS Lyon** *Lyon, France*
Feb. 2025	**Probability seminar at Warwick university,** *Coventry, United Kingdom*
Nov. 2024	**"Markov" working group** *Jussieu, Paris.*
Nov. 2024	**"Spectral problems in mathematical physics" seminar,** *IHP, Paris.*
Oct. 2024	**Research visit at Münster university,** *Münster, Germany,* invited by Hendrik Weber.
Sep./Oct. 2024	**Invited lecture at School and Miniconference on Metric Measure Spaces, Ricci Curvature, and Optimal Transport,** *Lake Como, Italy.*
Sep. 2024	**Workshop: "Large scale behaviour of interacting diffusions: from stochastic control to functional inequalities",** *Padova, Italy.*
Aug. 2024	**IMS conference,** *Bochum, Allemagne.*
1 June – 15 July 2024	**Research visit at IHES,** *Bures sur Yvette, France.*
June 2024	**Probability seminar,** *Rennes, France.*
Feb. 2024	**Probability seminar,** *UW Madison, USA (online).*
Jan. 2024	**Probability and dynamical systems seminar,** *Rouen, France.*
18–22 Dec. 2023	**Oberwolfach Arbeitsgemeinschaft: QFT and Stochastic PDEs,** *Oberwolfach, Germany.*
Nov. 2023	**Cornell probability seminar,** *Cornell university, Ithaca, USA.*

Sep. 2023	**Probability and mathematical physics seminar,** *Courant institute of mathematical sciences, New York, USA.*
Jul. 2023	**Stochastic Processes and their applications,** *Lisbon, Portugal.*
Mar. 2023	**Seminar SPMES** *(online).*
6–10 Feb. 2023	**Research visit and 2h lecture on renormalisation method for log-Sobolev inequalities,** *Ecole normale supérieure and Université Paris Dauphine,* invited by Cristina Toninelli.
23–27 Jan. 2023	**Research visit in Vienna,** *TU Wien, Austria,* invited by Fabio Toninelli.
Dec. 2022	**Séminaire de probabilités Lyon 1 - ENS de Lyon,** *Lyon, France.*
24–28 Sep. 2022	**Mathematical physics seminar and visit to Université de Genève,** *Genève, Suisse*
Sep. 2022	**Short talk in research workshop,** *Oberwolfach, Germany,* (25 minutes talk).
July 2022	**Short talk in research workshop,** *Oberwolfach, Germany,* (25 minutes talk).
June 2022	**IMS conference,** *London, United Kingdom.*
May 2022	**Bath probability seminar,** *Bath, United Kingdom.*
Mar.–May 2022	**Participation and talk during "Probability and PDE" thematic semester,** *CRM, Montréal, Canada.*
Jan. 2022	**5th colloquium on interacting particle systems,** *Técnico Lisboa,* online talk.
Oct. 2021	**Rencontres de probabilité,** *Probability conference in Rouen, France.*
Aug. 2020	**Bernoulli-IMS One World Symposium 2020,** online talk.

Teaching

2024-2025	**Lecturer at Université Paris-Dauphine-PSL** M2 course on large deviation theory, 15h.
2023-2024	**Lecturer at Courant institute** ○ Fall 2023: Calculus II (4h/week), mostly for first year undergraduates. ○ Spring 2024: Ordinary differential equations (2h30/week), first ODE class for second-third year undergraduates.
2018-2021	**Teaching assistant at Ecole polytechnique** ○ Exercise classes in probability theory for 2nd year bachelor students for the course by Giovanni Conforti. ○ Exercise classes for the course "Theory of stochastic processes" for Master 2 students in the MSV master (Mathématiques et Sciences du Vivant), course by Sylvie Méléard. ○ Computational linear algebra exercise classes for 2nd year bachelor students for the course by Teddy Pichard.
Jan. 2020	**Outreach course within Parimaths** *(association organising outreach mathematics courses for highly motivated voluntary high-school and middle school students).*
2014 – 2015	**Mathematics "Colles"** *MPSI classe préparatoire, lycée Chaptal, Paris,* Teaching assistant for maths undergraduate.