

# Romain Panis

French; born 4 July 1996

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## RESEARCH INTERESTS

Probability and more specifically its application to statistical mechanics, with a particular interest in the study of the critical behaviour spin models (Ising model, discrete  $\varphi^4$  model, XY model) and percolation models.

## EMPLOYMENT

2024 – present      **Institut Camille Jordan** Postdoc funded by the SNSF in the group of Christophe Garban

2020 – 2024      **Université de Genève**, Ph.D Student, mentor: Hugo Duminil-Copin

## EDUCATION

2017 – 2020      **École Normale Supérieure de Paris**

2019 – 2020      **Université Paris XI**, Master 2  
Master thesis supervised by Hugo Duminil-Copin.

2018 – 2019      **École Normale Supérieure de Paris and Université Paris VII**, Master 1  
Research internship at Columbia University (New York) supervised by Ivan Corwin.

2017 – 2018      **École Normale Supérieure de Paris and Université Paris VII**, Licence de Mathématiques (BS)  
BS thesis supervised by Raphaël Cerf.

2014 – 2017      **Lycée Marcelin Berthelot, Saint-Maur des Fossés**, MPSI/MP\* (Preparatory classes)

## DISTINCTIONS

2024      SwissMAP Junior Researcher Prize

2024      Henri Fehr Prize

2024      SNSF Postdoc.Mobility grant

- 2025
- 14. Sharp bounds on the half-space two-point function for high-dimensional Bernoulli percolation**  
 With Bruno Schapira  
 Preprint arXiv:2512.13624 (15 pages)
- 13. One-arm exponents of the high-dimensional Ising model**  
 With Diederik van Engelenburg, Christophe Garban, and Franco Severo  
 Preprint arXiv:2510.23423 (55 pages)
- 12. One-arm exponents of high-dimensional percolation revisited**  
 With Diederik van Engelenburg, Christophe Garban, and Franco Severo  
 Preprint arXiv:2510.21595 (16 pages)
- 11. The supercritical phase of the  $\varphi^4$  model is well behaved**  
 With Trishen S. Gunaratnam, Christoforos Panagiotis, and Franco Severo  
 Preprint arXiv:2501.05353 (79 pages)
- 2024
- 10. An alternative approach for the mean-field behaviour of spread-out Bernoulli percolation in dimensions  $d > 6$**   
 With Hugo Duminil-Copin  
 In *Probability Theory and Related Fields (Special volume in honour of G. Grimmett)* (2025)
- 9. An alternative approach for the mean-field behaviour of weakly self-avoiding walks in dimensions  $d > 4$**   
 With Hugo Duminil-Copin  
 In *Probability Theory and Related Fields (Special volume in honour of G. Grimmett)* (2025)
- 8. The incipient infinite cluster of the FK-Ising model in dimensions  $d \geq 3$  and the susceptibility of the high-dimensional Ising model**  
 In *Probability Theory and Related Fields* (2025)
- 7. The torus plateau for the high-dimensional Ising model**  
 With Yucheng Liu and Gordon Slade  
 In *Communications in Mathematical Physics* (2025)
- 6. New lower bounds for the (near) critical Ising and  $\varphi^4$  models' two-point functions**  
 With Hugo Duminil-Copin  
 In *Communications in Mathematical Physics* (2025)
- 2023
- 5. Exact cube-root fluctuations in an area-constrained random walk model**  
 With Lucas D'Alimonte  
 Preprint arXiv:2311.12780 (48 pages)
- 4. Scaling limit of the cluster size distribution for the random current measure on the complete graph**  
 With Dmitrii Krachun and Christoforos Panagiotis  
 In *Electronic Journal of Probability* (2024)
- 3. Triviality of the scaling limits of critical Ising and  $\varphi^4$  models with effective dimension at least four**  
 To appear in *The Annals of Probability*
- 2. Emergence of fractional Gaussian free field correlations in subcritical long-range Ising models**  
 With Trishen S. Gunaratnam  
 In *Annales de l'Institut Henri Poincaré (B)* (2025)

2022

**1. Random tangled currents for  $\varphi^4$ : translation invariant Gibbs measures and continuity of the phase transition**

With Trishen S. Gunaratnam, Christoforos Panagiotis, and Franco Severo  
In *Journal of the European Mathematical Society* (2025)

INVITED TALKS

March 2026	ICTS Bangalore (Conference: Geometric methods in Percolation and Spin models)
January 2026	Vienna Probability Seminar
November 2025	RIMS, Kyoto (Workshop: Rigorous Statistical Mechanics and Related Topics VI)
October, 2025	EPFL, Lausanne (Probability and Stochastic Analysis Seminar)
September 2025	University of Victoria (Probability and Dynamics seminar)
June 2025	ICMS, Edinburgh (Conference: Random Walks, Percolation and Mixing Times)
May 2025	Institut Mathématique de Toulouse (Séminaire de Probabilités)
April 2025	NYU Shanghai (Symposium: Critical Exponents, Scaling Limits and Universality)
March 2025	Princeton University (Probability seminar)
March 2025	University of British Columbia (UBC Probability seminar)
February 2025	Les Diablerets (Workshop on Mathematical Physics)
January 2025	Université de Genève (Workshop on Statistical Physics)
January 2025	Les Diablerets (Winter School in Mathematical Physics)
December 2024	Orsay (Séminaire SuPerGrandMa)
November 2024	Oberwolfach (Mini-Workshop: Critical Phenomena of the XY Model)
November 2024	Institut Camille Jordan (Séminaire de Probabilités commun ICJ/UMPA)
November 2024	Percolation Today
June 2024	ETH Zürich (Percolation and random fields)
April 2024	University of Münster (Probability seminar)
April 2024	Bath University (Probability seminar)
February 2024	Les Diablerets (Workshop on Mathematical Physics)
January 2024	Université de Genève (Workshop Criblam on lattice models)
August 2023	CIRM, Marseille (Workshop on Percolation and Interactions)
March 2023	Institut des Hautes Études Scientifiques (Probability and Analysis informal seminar)
February 2023	Les Diablerets (Workshop on Mathematical Physics)
January 2023	Imperial College, London (Stochastic Analysis seminar)
December 2022	Percolation Today
November 2022	Institut Fourier, Grenoble (Lyon-Grenoble-Genève Probability Day)
May 2022	Université de Genève (Maths-Physics seminar)

ADMINISTRATIVE DUTY

2022 – 2024	Co-organisation of Geneva's weekly Maths-Physics seminar with Trishen S. Gunaratnam and Alexis Prevost.
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#### SUPERVISION

2025 – 2026	Siddhesh Tushar, master student at the Indian Institute of Science (jointly with Trishen S. Gunaratnam).
2023 – 2024	Aman Markar, master student at the University of Geneva (jointly with Hugo Duminil-Copin).

#### TEACHING

2021 – 2024	TA for the class “Probability and Statistics”
2022 – 2024	TA for the class “Introduction to Logic and Set Theory”
2022	TA for the class “Introduction to Percolation Theory”
2017 – 2020	Oral examiner in MPSI/MP*, Lycée Marcelin Berthelot
2017 – 2019	Lecturer in Club Parimaths, a mathematics club for high school students who enjoy mathematics. Sessions are organised each week at the ENS Paris.