Curriculum Vitae

Grégory Schehr

Citizenship : French
Date of birth : March 29, 1977

Current position

Senior Researcher (DR2) at CNRS in Theoretical Physics.

Professional address

Laboratoire de Physique Théorique et Modèles Statistiques (LPTMS)
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University training

2011 : Habilitation to conduct research thesis from University Orsay-Paris Sud, *From disordered elastic systems to the statistics of rare events*

2000-2003 : Physics department of the Ecole Normale Supérieure (LPTENS)
PhD Thesis in theoretical physics, Advisor : P. Le Doussal
Thermodynamics and out-of-equilibrium dynamics of disordered elastic systems (with highest honor)

1999-2000 : Ecole Normale Supérieure (ENS), Paris
Master's degree in Theoretical Physics

1996-1999 : Ecole Centrale des Arts et Manufactures de Paris
(one of the most prestigious french "grandes écoles")

Professional experience

2006-2016 : Junior Scientist (CR2-CR1) at CNRS in Theoretical Physics
2003-2006 : Post-Doc at Saarland University (Germany)

Honors and awards

2014 : CNRS award for scientific excellence
2010 : CNRS bronze medal for theoretical physics (there is one recipient per year in theoretical physics)
2010 : CNRS award for scientific excellence

Teaching activities

2010 - : Part time adjunct professor in mathematics at ESPCI (24 hours/year)
2006 - : Part time adjunct professor in Statistical Physics and Quantum Mechanics at Ecole Centrale Paris ($\simeq$ 50 hours/year)

Supervision of students and postdocs

3 PhD students, 9 Master students and 4 postdocs.

Organization of conferences and seminars

2015 : principal organizer of a summer school in Les Houches (one month) on *Stochastic processes and random matrices*
2014 : co-organizer of a conference in honor of A. Comtet on *Disordered systems and stochastic processes*
2011 : co-organizer of the Conférence "Journées Itzykson" in Saclay, on *Extremes and Records*
2011 : co-organizer of a school in Les Houches, *Vicious walkers and Random matrices* (2 weeks)
2008 - : co-organizer of a working group on *Stochastics Processes and non-equilibrium systems*
2008 - : co-organizer of a monthly colloquim on statistical physics

Referee of journals

Referee for Nature, Physical Review Letters, Annals of Probability, Europhysics Letters, Physical Review E, Physical Review X, Physical Review B, Journal of Statistical Physics, Journal of Statistical Mechanics (JSTAT), Journal of Physics A, Journal of Mathematical Physics, Journal of Applied Probability, Physica A, Annales Henri Poincaré, Chaos Solitons and Fractals, Entropy, European Physical Journal B, Philosophical Magazine.

Publications

Publications in peer reviewed journals : **88**
Number of citations : **1613** (Scholar Google) / **1062** (ISI Web of Science) on 18/07/2016
H Index : **23** (Scholar Google)/**17** (ISI Web of Science) on 18/07/2016

Peer reviewed journals	Number of publications
Proceedings of the National Academy of Sciences (PNAS)	1
Advances in Physics	1
Physical Review Letters	18
Physical Review E (Rapid)	3
Physical Review E	15
Physical Review B	3
Europhysics Letters	7
Nuclear Physics B	2
Journal of Statistical Physics	7
Journal of Mathematical Physics	1
Journal of Statistical Mechanics : Theory and Experiments	17
Journal of Physics A (Fast Track)	2
Journal of Physics A	3
European Physical Journal B	1
Physica A	1
Chaos, Solitons and Fractals	1
Quantitative Finance	1
Zeitschrift für Physikalische Chemie	1
Acta Physica Polonica B	1
Random Matrices : Theory and Applications	1
Total	**88**

Seminars, conferences and workshops

Since 2003, I gave around 60 seminars in different laboratories in France (including in Grenoble, Lyon, Nice or Paris) and abroad (including in Cologne, Oxford, Tokyo

or more recently in Warwick, invited by M. Hairer, who won the Fields Medal in 2014). I gave talks in more than 60 workshops and conferences, **and in 43 of them as an invited speaker** :

1. Paris, Mai 2007 : Workshop on Random Matrices at Institut Henri Poincaré
2. Lyon, November 2007 : Meeting of the Working Group (GdR) Phénix/Isis
3. Brunel, December 2007 : Workshop on Random Matrices
4. Moscou, August 2009 : Workshop *Stochastic processes in physics and in biology*
5. Sydney, July 2010 : Conference *Dynamics-Days of Asia Pacific 6* (DDAP 6)
6. Saarbrücken, September 2010 : Workshop *Structure formation and transport in complex systems*
7. Stockholm, November 2010 : Workshop *Random Geometry and Applications*
8. Leiden, July 2011 : Workshop on *Extreme Value Statistics in Mathematics, Physics and Beyond*
9. Budapest, July 2011 : Conference *Foundations of Computational Mathematics*
10. Moscou, September 2011 : Conference *Random Processes, Conformal Field Theory and Integrable Systems*
11. Paris, January 2012 : Meeting ANR *Boole*
12. Bangalore, January 2012 : Conference *Random matrix theory and applications*
13. Marseille, March 2012 : Conference *Aléa 2012*
14. Warwick, April 2012 : Workshop *Interacting particle systems, growth models and random matrices*
15. Seoul (KIAS), July 2012 : Conference *Non-equilibrium statistical physics of complex systems*
16. Banff, September 2012 : Workshop *Integrable systems, growth processes and KPZ universality*
17. Lille, September 2012 : Workshop *Persistence probabilities*
18. Venise, October 2012 : Conference *Fluctuations in small complex systems*
19. Cargèse, June 2013 : Conference *Search and Exploration III*
20. Ann Arbor, June 2013 : Workshop *Random Matrices and Applications*
21. Princeton (IAS) : November 2013, Workshop *Non-equilibrium Dynamics and Random Matrices*
22. Sydney : January 2014, Workshop *Sydney Random Matrix Theory Workshop*
23. Florence : May 2014, Workshop *Advances in Non-Equilibrium Statistical Mechanics*
24. Dresden : June 2014, Workshop *Physical origins of correlated extreme events*
25. Cracovie, July 2014 : Conference on *Random Matrix Theory : Foundations and Applications*
26. Darmstadt, July 2014 : Workshop on *Persistence probabilities and related fields.*

27. Moscow, September 2014 : Workshop on *Random geometry and physics*
28. Tokyo, October 2014 : Symposium on *Fluctuation and Correlation in Stochastic Systems*
29. Paris, November 2014 : Workshop on *Applications of Random Matrix Theory and Statistical Physics in Communications and Networks*
30. Montevideo, December 2014 : Conference of the series *Foundations of Computational Mathematics*
31. Paris, January 2015 : *Journées de Physique statistique* (plenary speaker)
32. Versailles, February 2015 : Conference *Matrices aléatoires et applications*
33. Singapour, May 2015 : Workshop *Stochastic Processes in Random Media*
34. Saarebruck, June 2015 : Workshop *Stochastic Processes in non-equilibrium and biological systems*
35. Villetaneuse, June 2015 : *Journées de Probabilités et Combinatoire*
36. Paris, November 2015 : Conference *Exact Results in Statistical Physics*
37. Bangalore, November 2015 : Workshop on *Non-Equilibrium Statistical Physics*
38. Bielefeld, December 2015 : Workshop on *Random matrices*
39. Santa-Barbara (Kavli Institute), February 2016 : Workshop on *New approaches to non-equilibrium and random systems*
40. Warwick, March 2016 : Workshop on *Random matrix theory and strongly correlated systems*
41. Paris, June 2016 : Workshop on *Optimal and Random Point Configurations : from Statistical Physics to Approximation Theory*
42. Seoul, June 2016 : Conference on *Nonequilibrium statistical physics of complex systems*
43. Macao, July 2016 : Workshop on *Random matrices Eurasia 2016*

In the following months, I will participate to several conferences or workshops as an invited speaker (including in Bangalore and Brown University).

Invited lectures

I have been invited several times to give lectures during summer schools, long-term programs or workshops :

1. Dresde, October 2015 : Lectures during a School on *Large Fluctuations and Extreme Events*
2. Bangalore, November 2015 : Lectures during the Workshop on *Non-Equilibrium Statistical Physics*
3. Lille, February 2016 : Lectures on *Random matrices* – part of a semester on probability theory

4. Ann Arbor, June 2016 : Lectures during the *Summer School on Random Matrices*

In 2017, I will give lectures at the Summer School on *Fundamental Problems in Statistical Physics*, to be held in Bruneck (Italy).

Main contributions

Non-equilibrium dynamics of disordered systems : during my PhD, I have obtained exact results for the exponents and scaling functions characterizing the non-equilibrium dynamics of the random field XY model in two-dimensions. This is one rare instance of disordered systems in finite dimensions, beyond mean-field approximations, where such an analytical approach is feasible.

Quantum disordered systems and dissipation : during my postdoc at Saarland University (Germany), I have worked on an analytic approach to the disordered Ising chain in a transverse field in presence of dissipation. This was the first quantitative approach to this problem, beyond phenomenological approximations which had lead to several controversies. This approach, based on a real space renormalization group, has then been used by several groups to study the interplay between disorder and dissipation in quantum systems.

Extreme value statistics of random walks and Brownian motions : since 2005 I started to work on extreme value statistics of such systems where I have obtained various exact results. These works constitute rare instances of strongly correlated systems where extreme statistics can be computed exactly. In particular, I have developed a novel method, based on path integrals, to study the extreme statistics of non-intersecting Brownian motions. These results were highlighted by a comment published in Nature-Physics. Among the exact results which I have obtained for this model, I would like to emphasize the unexpected connection, which we have found in collaboration with S. N. Majumdar and P. Forrester, between extreme statistics of non-intersecting Brownian motions and the partition function of two-dimensional Yang-Mills theory, which plays a fundamental role in the standard model of particle physics.

Exact results for the directed polymer in a random environment in 1+1 dimensions : I have obtained an exact expression for the joint probability distribution of the energy and the position of the endpoint of the directed polymer in a random environment. This is a quite important quantity, which had been studied during the past 20 years. In a subsequent work, in collaboration with mathematicians, J. Baik and K. Liechty, we have obtained a rigorous proof of my earlier derivation of this result, based on tools from theoretical physics. I have been invited to present these results during a workshop at IAS (Princeton) in November 2013.

Extreme and order statistics of the eigenvalues of random matrices : I have obtained exact results for the large deviations of the top eigenvalue of various matrix ensembles (including the so-called Cauchy ensemble). I have written a review article on this subject in 2013, published in the Proceedings of the international three-year conference in statistical physics, STATPHYS13, unveiling the deep

connection between the third order phase transition found in these important problems of probability theory and the one found in high-energy physics (the so-called Gross-Witten-Wadia transition in quantum chromodynamics).