

Curriculum Vitae

Rémi Rhodes

Date of birth : 30/01/1979 in Marseille

Citizenship : french

Section CNU : 26

Positions

Professor in Aix-Marseille university since 2018

Professional address :

I2M-Université Aix-Marseille

Office R326

Email : remi.rhodes@univ-amu.fr

Centre de Mathématiques et Informatique (CMI)

Technopôle Château-Gombert

39, rue F. Joliot Curie

13453 Marseille Cedex 13

Web page : <http://www.i2m.univ-amu.fr/perso/remi.rhodes/>

Professor in university Paris-Est Marne la Vallée 2014/2018

Maître de conférences in Ceremade, university Paris-Dauphine, 2007/2014

Background

2012 : Habilitation thesis in university Paris-Dauphine (France), defended on december the 3rd

Title : *Chaos multiplicatif et applications*

Coordinator : S. Olla

Referees : I. Benjamini, F. Comets, A. Kupiainen

Examinators : J. Barral, T. Bodineau.

2003/2006 : Allocataire Moniteur Normalien. PhD thesis in university of Provence (France), defended on june 2006 the 22th.

Title : *Homogénéisation en milieu aléatoire*

Advisor : É. Pardoux (Univ. de Provence)

Referees : T. Komorowski et S.R.S. Varadhan,

Examinators : F. Castell, S. Olla, A. Piatnitski.

Scientific activities

Grants

- 2018/now : member of GDR TRAG.
2015/2018 : Member of the ANR project LIOUVILLE.
2011/2014 : Member of the ANR project CHAMU.
2014/2018 : member of GDR Analyse multifractale

Distinctions

- Bernoulli prize of the Bernoulli Society
"Editors' pick from the Annals of Probability" 2014/2018 in 2018 IMS Annual Meeting.

Advisor of PhD

- 2015/2018 : Co-advisor with Vincent Vargas of Guillaume Rémy's thesis
Boundary Liouville Conformal Field Theory
2013/2017 : Co-advisor with Vincent Vargas of Yichao Huang's thesis
Gaussian multiplicative chaos and applications to 2D quantum gravity
2010/2013 : Co-advisor with Vincent Vargas of Romain Allez' thesis
Gaussian multiplicative chaos, random matrix theory and applications

Organization of conferences

- 2019 june : co-organiser with C. Garban and V. Vargas "Probability and quantum field theory : discrete models, CFT, SLE and constructive aspects"
2016 september : Director of the summer school "Quantum integrable systems, conformal field theories and stochastic processes". Co-organizers : J.Bouttier, I.Corwin, V.Vargas.
2014 juillet : organization of an invited session to the conference « Stochastic Processes and Applications », Buenos Aires, Argentina.
2006 : coorganisateur avec F. Delarue et E. Pardoux de la conférence « Numerical methods for FBSDE ».
2006 : coorganisateur avec E.Pardoux, S.Olla et T.Souganidis de la conférence « Homogenization in random media ».

Publications

Preprints :

- [PR46] H. LACOIN, R. RHODES, V. VARGAS : Path integral for quantum Mabuchi K-energy, arXiv 2018.
[PR45] R. RHODES, V. VARGAS : The Tail expansion of Gaussian multiplicative chaos and the Liouville reflection coefficient, arXiv 2017.
[PR44] A. KUPIAINEN, R. RHODES, V. VARGAS : Integrability of Liouville theory : proof of the DOZZ Formula, arXiv 2017.
[PR43] C. GUILLARMOU, R. RHODES, V. VARGAS : Polyakov's formulation of $2d$ string theory, arXiv 2016.
[PR42] R. RHODES, V. VARGAS : Lecture notes on Gaussian multiplicative chaos and Liouville Quantum Gravity, arXiv 2016.

- [PR41] T. MADAULE, R. RHODES, V. VARGAS, *Continuity estimates for the complex cascade model on the phase boundary*, arXiv 2015.
- [PR40] J.C. DOMENGE, R. RHODES, V. VARGAS : Forecasting volatility in the presence of leverage effect, arXiv 2011.

Published manuscripts

- [R39] A. KUPIAINEN, R. RHODES, V. VARGAS : Local Conformal Structure of Liouville Quantum Gravity, *Commun. Math. Phys.* online first.
- [R38] L. CHEVILLARD, C. GARBAN, R. RHODES, V. VARGAS : On a skewed and multifractal unidimensional random field, as a probabilistic representation of Kolmogorov's views on turbulence, to appear in *Annales Henri Poincaré*.
- [R37] A. KUPIAINEN, R. RHODES, V. VARGAS : The DOZZ Formula from the Path Integral , *J. High Energ. Phys.* (2018) 2018 : 94.
- [R36] F. DAVID, A. KUPIAINEN, R. RHODES, V. VARGAS : Renormalizability of Liouville Quantum Gravity at the Seiberg bound, *Electron. J. Probab.* Volume 22 (2017), paper no. 93, 26 pp.
- [R35] H. LACOIN, R. RHODES, V. VARGAS : Semiclassical limit of Liouville Field Theory, *Journal of Functional Analysis*, vol 273, Issue 3, 1 2017, Pages 875-916.
- [R34] F. DAVID, R. RHODES, V. VARGAS : Liouville Quantum Gravity on complex tori, *Journal of Mathematical Physics* 57, 022302 (2016).
- [R33] F. DAVID, A. KUPIAINEN, R. RHODES, V. VARGAS : Liouville Quantum Gravity on the Riemann sphere, *Commun. Math. Phys.* (2016) 342 : 869.
- [R32] N. BERESTYCKI, C. GARBAN, R. RHODES, V. VARGAS : KPZ formula derived from Liouville heat kernel, *Journal of London Mathematical Society* (2016) 94 (1) : 186-208.
- [R31] P. MAILLARD, R. RHODES, V. VARGAS, O. ZEITOUNI : Liouville heat kernel : regularity and bounds, *Ann. Inst. H. Poincaré Probab. Statist.* Volume 52, Number 3 (2016), 1281-1320.
- [R30] C. GARBAN, R. RHODES, V. VARGAS : Liouville Brownian motion, *Ann. Probab.* vol 44, Num 4 (2016), 3076-3110.
- [R29] T. MADAULE, R. RHODES, V. VARGAS : The glassy phase and freezing of log-correlated Gaussian potentials, *Ann. Appl. Probab.* 26 (2016), no. 2, 643-690.
- [R28] R. RHODES, V. VARGAS : Liouville Brownian motion at criticality, *Potential Analysis* 43 (2) 149 (2015).
- [R27] H. LACOIN, R. RHODES, V. VARGAS : Complex Gaussian multiplicative chaos, *Commun. Math. Phys.* (2015) 337 : 569.
- [R26] B. DUPLANTIER, R. RHODES, S. SHEFFIELD, V. VARGAS : Log-correlated Gaussian fields : an overview, *volume in honor of Jean-Michel Bismut 65th Anniversary*.
- [R25] T. MADAULE, R. RHODES, V. VARGAS : The glassy phase of complex branching Brownian motions, *Commun. Math. Phys.* (2015) 334 : 1157.
- [R24] T. MADAULE, R. RHODES, V. VARGAS : The glassy phase and freezing of log-correlated Gaussian potentials, *Ann. Appl. Probab.* 26 (2016), no. 2, 643-690.
- [R23] R. ALLEZ, R. RHODES, V. VARGAS : Marchenko Pastur type theorem for independent MRW processes : convergence of the empirical spectral measure, *ESAIM Probability and Statistics* 19 : p. 327-360 (2015).
- [R22] R. RHODES, V. VARGAS : Gaussian multiplicative chaos : a review, *Probab. Surveys* 11 (2014), p. 315-392.
- [R21] C. GARBAN, R. RHODES, V. VARGAS : On the heat kernel and Dirichlet form of Liouville Brownian motion, *Electron. J. Probab.* 19 (2014), paper no. 96, 25 pp.
- [R20] R. RHODES, V. VARGAS : Spectral dimension of $2d$ -Liouville quantum gravity, *Ann. Henri Poincaré* (2014) 15 : 2281.

- [R19] B. DUPLANTIER, R. RHODES, S. SHEFFIELD, V. VARGAS : Renormalization of Critical Gaussian Multiplicative Chaos and KPZ formula, *Commun. Math. Physics*, 2014, Vol 330, Issue 1, pp 283-330.
- [R18] B. DUPLANTIER, R. RHODES, S. SHEFFIELD, V. VARGAS : Critical Gaussian multiplicative chaos : convergence of the derivative martingale, *Ann. Probab.* (2014) vol 42 no 5 1769-1808.
- [R17] L.CHEVILLARD, R. RHODES, V. VARGAS : Gaussian multiplicative chaos for symmetric isotropic matrices, dans *Journal of Statistical Physics*, 2013, Volume 150, Issue 4, pp 678-703.
- [R16] J. BARRAL, X. JIN, R. RHODES, V. VARGAS : Gaussian multiplicative chaos and KPZ duality, *Communications in Mathematical Physics*, 2013, Volume 323, Issue 2, pp 451-485.
- [R15] R. RHODES, J. SOHIER, V. VARGAS : Levy multiplicative chaos and star scale invariant random measures, *Annals of Probability*, 2014, vol 42, 689-724.
- [R14] J. BARRAL, R. RHODES, V. VARGAS : Limiting laws of supercritical branching random walks, *Comptes rendus - Mathématique*, 2012, 350, pp. 535-538.
- [R13] R. ALLEZ, R. RHODES, V. VARGAS : Lognormal \star -scale invariant random measures, dans *Probability Theory and Related Fields*, 2013, Volume 155, Issue 3-4, pp 751-788.
- [R12] R. RHODES, V. VARGAS : Optimal transport for multifractal random measures and applications, dans *Annales de l'Institut Henri Poincaré PS*, 2013, Volume 49, Number 1, 119-137.
- [R11] R. RHODES, A.B. SOW : Critical homogenization of Itô-Lévy process driven SDEs in random medium, dans *Journal of Stochastic Analysis and Applications*, 2011, Volume 29, Issue 5, 838-859.
- [R10] R. RHODES, V. VARGAS : KPZ formula for log-infinitely divisible multifractal random measures, dans *ESAIM*, 2011, vol 15, 358-371.
- [R9] R. RHODES : Stochastic Homogenization of Reflected Stochastic Differential Equations, dans *Electronic Journal of Probability*, 2010, vol 15, 989-1023.
- [R8] R. RHODES, V. VARGAS : Multidimensional Multifractal Random Measures, dans *Electronic Journal of Probability*, 2010, vol 15, 241-258.
- [R7] R. RHODES, V. VARGAS : Scaling limits for symmetric Itô-Lévy processes in random medium, dans *Stochastic Processes and their Applications*, 2009, vol. 119, no12, pp. 4004-4033.
- [R6] E. PARDOUX, R. RHODES, B. SOW : Homogenization of periodic semilinear parabolic PDEs, *Annales de l'Institut Henri Poincaré ANL*, vol 26, No 3 (2009), p 979-998.
- [R5] F. DELARUE, R. RHODES : Stochastic Homogenization of Quasilinear PDEs with a Spatial Degeneracy, dans *Asymptotic Analysis*, vol 61, No 2 (2009), p 61-90.
- [R4] R. RHODES : Homogenization of locally ergodic diffusions with possibly degenerate diffusion matrix, dans *Annales de l'Institut Henri Poincaré PS*, 2009, Volume 45, Number 4, 981-1001.
- [R3] R. RHODES : Diffusion in a Locally Stationary Random Environment, dans *Probability Theory and Related Fields*, 2009, 143, no 3-4, 545-568.
- [R2] R. RHODES : Homogenization of space-time dependent random flows II, *Annales de l'Institut Henri Poincaré PS*, 44 (2008), no 4, 673-692.
- [R1] R. RHODES : Homogenization of space-time dependent random flows I, dans *Stochastic Processes and their Applications*, 117 (2007), 1561-1585.

Conferences and short stays

Invitations to conferences :

2019 : Natal (Brazil), Random geometries and multifractality in condensed matter and statistical mechanics,

- 2018 : Nice, Workshop 3eme rencontre niçoise de physique théorique et probabilités
Tianjin (China) Workshop on Conformal Field Theory
Cologne (Germany), Classical and quantum dynamics of interacting particle systems,
Cambridge (UK), Scaling limits, rough paths, quantum field theory,
Cambridge (UK), RGM Follow up,
Vilnius (Lituanie) 2018 IMS Annual Meeting on Probability and statistics
Seoul (South Korea), conference on Random Conformal Geometry and Related Fields
Lille, GDR "Mécanique quantique",
- 2017 : Columbia university (NY, USA), Workshop Log-correlated fields
Stockholm (Sweden), Fractal Geometry and Dynamics,
Porquerolle, GDR Analyse multifractale
Nice, Conference in honor of Krzysztof Gawedzky,
Lyon, Conference Statistical Mechanics, random planar geometry and interacting random walks,
Oberwolfach (Germany), Conference Stochastic Analysis : Geometry of Random Processes ,
- 2016 : Bristol (UK), Extrema of logarithmically correlated processes, characteristic polynomials, and the Riemann zeta function,
Montreal (Canada), Conference Probabilistic Methods in Spectral Geometry and PDE
- 2015 : Porquerolle, Conference « Fractals and Related Fields III
Nice, Conference 2nd meeting theoretical physics and probability
Cambridge (UK), Conformally invariant scaling limits,
CEA Saclay, Conference Itzykson,
Stony Brooke (USA), Conference Quantum Geometry, Stochastic Geometry, Random Geometry,
- 2014 : Berlin (Germany), Extrema of branching processes and Gaussian Free Fields,
Warwick (UK), Gradient random fields,
Bath (UK), Paris-Bath Branching Structures Meeting III,
- 2013 : Marseille CIRM, Branching diffusions and Gaussian free fields in Physics,
Université Paris 7, Journées cartes,
Marseille CIRM, Genetic models and quasi-stationarity,
- 2011 : -Moscow center for continuous mathematical education (Russia), « Random Processes, Conformal Field Theory and Integrable Systems »,
Saint Petersburg, Chebyshev laboratory (Russia), lecture at the school « Random Processes, Conformal Field Theory and Integrable Systems »,
UCL Louvain la Neuve (Belgium), « Rencontres d'analyse »,
Porquerolle, « Fractals and related fields II »,

Invitations for short stays :

- 2018 october : University of Cambridge, UK
- 2018 may : University of Helsinki, Finland
- 2018 january : IMPA, Rio de Janeiro, Brazil
- 2017 december : Massachussets Institute of Technology (MIT), Boston, USA
- 2017 september : Mittag-Leffler institute, Stockholm, Sweden
- 2015 may : University of Cambridge, UK
- 2015 january : University of Cambridge, UK
- 2014 may : University of Helsinki, Finland
- 2014 december : University of Cambridge, UK
- 2013 décembre : Weizman Institute , Tel-Aviv, Israel
- 2012 october : Massachusetts Institute of Technology (MIT), Boston, USA
- 2012 april : Massachusetts Institute of Technology (MIT), Boston, USA
- 2011 september : Chebyshev Laboratory, Saint Petersburg, Russia
- 2009 april : Université Gaston Berger, Saint-Louis, Senegal
- 2009 march : Courant Institute, New York, USA.