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PERSONAL INFORMATION

Birth date 11/19/1968.
Address: 50, avenue du Clos Prieur, 77150 Férolles-Attilly, France.
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EMPLOYMENT AND CURSUS

2009- : Director of CERMICS.
1998- : Research position at CERMICS, École Nationale des Ponts et Chaussées.
2006: Invited Professor (April-June), Univ. of California San-Diego (USA).
2005: Invited Researcher (October-December), Univ. British Columbia (Canada).
2003: Univ. Paris VI “Habilitation à diriger des recherches”: *Some properties of the superprocesses*.
1997-1998: Postdoc position at M.S.R.I. (Mathematical Sciences Research Institute), Berkeley (California).
1994-1997: Univ. Paris VI PhD thesis: *Some properties of the superprocesses*. Under the supervision of Jean-François Le Gall. Mention “très honorable” and highly commended.
1991-1994: École Nationale des Ponts et Chaussées.
D.E.A. de Probabilités, Université de Paris VI, mention “très bien”.
1988-1991: École Polytechnique.

SCIENTIFIC ANIMATION

2013: Head of Scientific Committee for the Conference SMAI 2013.
2009-2012: In charge of the ANR program “Random trees and Applications”.
2007-2010: In charge of the group MAS (Stochastic Models and Statistics) of the French Société Savante SMAI.
2006-2007: Vice-Director of CERMICS.
2005-2012: In charge at Ecole des Ponts of the Master Degree Mathematics and Applications (Mathematical Finance) from Université Paris-Est Marne La Vallée.
Industrial partnership: SITA (2003-2004), PSA (2004-2006), EADS Foundation (2005-2008), EDF (2012-2016).

SUPERVISING

PostDoc.

- Hui He, 2009-2010 (with R. Abraham): Explosion of growing Galton-Watson trees.

PhD.

- Julien Guyon, defended on July 2006: Probabilistic models in finance and biology. Limit theorems and applications. ENPC Thesis Prize.
- A. Siri-Jegousse, defended on 2009 (with J.-S. Dhersin): Study of coalescent trees.
- O. Hénard, defended in 2012: Genealogy and Q-process.
- P. Hoscheit, defended in 2012 (with R. Abraham): Continuum random tree valued process.
- H. Bi, visiting PhD student (1 year, 2012-2013).
- C. Smadi, defended in 2015 (with S. Méléard): Branching process in cell division.
- H. Guo, visiting PhD student (1 year, 2014-2015).
- R. Fischer, defended in 2016 (with C. Butucea and A. Dutfoy): Copula under constraints.
- M. Sciauveau, starting in 2015 (with J.-S. Dhersin): Cost functionals for large trees.
- G. Emprin, starting in 2015 (with R. Abraham): Evolving continuum random trees.

CURRENT TEACHING

- 2008:** “Processes with jumps and applications to energy market”. Master of Applied Mathematics from Univ. de Marne La Vallée and Ecole des Ponts (with B. Jourdain, N. Oudjane and X. Warrin).
- 2006:** Professor at École Polytechnique.
- 2015:** “Markov chains, martingale and Brownian motion”. 2nd year at Ecole des Ponts.

PUBLICATIONS

Books.

- (1) *Introduction aux Probabilités et aux Statistiques. Problèmes, exercices et corrigés* (Introduction to probabilities and statistics. Problems, exercises and solutions). Presses de l'ENSTA, 2012 (2013 2ème éd., 2015 3ème éd.).
- (2) *Introduction aux Probabilités et aux Statistiques* (Introduction to probabilities and statistics). Presses de l'ENSTA, 2010 (2013 2ème éd.).
- (3) *Modèles aléatoires. Applications aux sciences de l'ingénieur et du vivant* (Stochastic models. Applications to ingeneer sciences and

biology), with B. Jourdain. Vol. 57, *Mathématiques et Applications*, Springer, 2006.

Publications in international journals with review committee.

- (1) Total length of the genealogical tree for quadratic stationary continuous-state branching, with H. Bi. *Ann. Inst. H. Poincaré*, Vol. 52(3), pp. 1321-1350, 2016.
- (2) Exit times for an increasing Lévy tree-valued process, with R. Abraham and P. Hoscheit. *Probab. Theor. Rel. Fields*, Vol. 159(1), pp. 357-403, 2014.
- (3) A construction of a beta-coalescent via the pruning of Binary Trees, with R. Abraham. *Journal of Applied Probability*, Vol. 50-3, pp. 772-790, 2013.
- (4) A Williams' decomposition for spatially dependent superprocesses, with O. Hénard. *Elect. Journ. of Probab.*, Vol. 18 (37), pp. 1-43, 2013.
- (5) Record process on the Continuum Random Tree, with R. Abraham. *ALEA, Lat. Am. J. Probab. Math. Stat.*, Vol. 10 (1), pp. 225-251, 2013.
- (6) The forest associated with the record process on a Lévy tree, with R. Abraham. *Stoch. Proc. and Appl.*, Vol 123, pp. 3497-3517, 2013.
- (7) A note on Gromov-Hausdorff-Prokhorov distance between (locally) compact measure spaces, with R. Abraham and P. Hoscheit. *Elect. Journ. of Probab.*, Vol. 18 (14), pp. 1-21, 2013.
- (8) Smaller population size at the MRCA time for stationary branching processes, with Y.-T. Chen. *Ann. of Probab.*, Vol. 40(5), pp. 2034-2068, 2012.
- (9) Pruning Galton-Watson Trees and Tree-valued Markov Processes, with R. Abraham and H. He. *Annales de l'Institut Henri Poincaré*, Vol. 48(3), pp. 688-705, 2012.
- (10) A continuum-tree-valued Markov process, with R. Abraham. *Ann. of Probab.*, Vol. 40(3), pp. 1167-1211, 2012.
- (11) Limit theorems for Markov processes indexed by continuous time Galton-Watson trees, with V. Bansaye, L. Marsalle, V. C. Tran. *Ann. of App. Probab.*, Vol 21, pp. 2263-2314, 2011.
- (12) Pruning a Lévy continuum random tree, with R. Abraham and G. Voisin. *Elect. Journ. of Probab.*, Vol. 15 (46), pp. 1429-1473, 2010.
- (13) Detection of cellular aging in a Galton-Watson process, with L. Marsalle. *Stoch. Proc. Appl.*, Vol. 120, pp. 2495-2519, 2010.
- (14) On the two oldest families for the Wright-Fisher process, with J.S. Dhersin and A. Siri-Jégousse. *Elect. Journ. of Probab.*, Vol. 15 (26), pp. 776-800, 4 June 2010.
- (15) Does waste-recycling really improve Metropolis-Hastings Monte Carlo algorithm, with B. Jourdain. *Journal of Applied Probability*, Vol. 46-4, pp. 938-959, 2009.

- (16) Changing the branching mechanism of a continuous state branching process using immigration, with R. Abraham. *Ann. Inst. H. Poincaré*, Vol. 45-1, pp. 226-238, 2009.
- (17) Williams' decomposition of the Lévy continuous random tree and simultaneous extinction probability for populations with neutral mutations, with R. Abraham. *Stoch. Proc. and Appl.*, Vol. 119, pp. 1124-1143, 2009.
- (18) Asymptotic results on the length of a coalescent tree, with J.-S. Dhersin and A. Siri-Jegousse. *Ann. of App. Probab.*, Vol. 18, pp. 997-1025, 2008.
- (19) Fragmentation associated to Lévy processes using snake, with R. Abraham. *Probab. Theor. Rel. Fields*, Vol. 141, pp. 113-154, 2008.
- (20) Height process for super-critical continuous state branching process. To appear in *Markov Proc. and Rel. Fields*, 2008.
- (21) Asymptotics for the small fragments of the fragmentation at nodes, with R. Abraham. *Bernoulli*, Vol. 13, Issue 1, pp. 211-228, 2007.
- (22) Fragmentation at height associated to Lévy processes. *Stoch. Proc. Appl.*, Vol. 117, Issue 3, pp. 297-311, 2007.
- (23) Feller property and infinitesimal generator of the exploration process, with R. Abraham. *J. of Theor. Prob.*, Vol. 20, Issue 3, pp. 355-370, 2007.
- (24) Non linear Neumann's condition for the heat equation: a probabilistic representation using catalytic super Brownian motion, with P. Vogt. *Annales de l'Inst. H. Poincaré*, Vol. 41 (5), pp. 817-849, 2005.
- (25) Solutions of $\Delta u = u^2$ with Neumann's condition using the Brownian snake, with R. Abraham. *Probab. Theor. Rel. Fields*, Vol 128, pp. 475-516, 2004.
- (26) Computation of moments for the length of the one dimensional ISE support. *Elect. Journ. of Probab.* Vol. 8 (17), pp. 1-15, 23 Sept. 2003.
- (27) Super Brownian motion with interactions, with J.-S. Dhersin. *Stoch. Proc. Appl.*, Vol. 107, pp. 301-325, 2003.
- (28) Some properties of the exit measure of the super Brownian motion, with R. Abraham. *Probab. Theor. Rel. Fields*, Vol. 122, pp. 71-107, 2002.
- (29) On the hot spots of a catalytic super Brownian motion, with K. Fleischmann. *Probab. Theor. Rel. Fields*, Vol. 121, pp 389-421, 2001.
- (30) Kolmogorov's test for the Brownian snake, with J.-S. Dhersin, *Annals of Prob.*, Vol. 29, pp. 305-316, 2001.
- (31) Some properties of the range of super-Brownian motion. *Probab. Theor. Rel. Fields*, Vol. 114, pp 505-547, 1999.
- (32) Path properties of superprocesses with a general branching mechanism. *Annals of Prob.*, Vol. 27, pp. 1099-1134, 1999.

- (33) Characterization of G-regularity for super-Brownian motion and consequences for parabolic P.D.E., with J.-S. Dhersin. *Annals of Prob.*, Vol. 27, pp. 731-750, 1999.
- (34) Super-mouvement brownien avec catalyse. *Stoch. and Stoch. Rep.*, Vol 58, pp. 307-347, 1996.

Preprint.

- (1) Pruning of CRT-sub-trees, with R. Abraham and H. He.
- (2) β -coalescents and stable Galton-Watson trees, with R. Abraham.
- (3) Local limits of conditioned Galton-Watson trees I: the infinite spine case, with R. Abraham.
- (4) A population model with non-neutral mutations using branching processes with immigration, with H. Bi.
- (5) Local limits of conditioned Galton-Watson trees II: the condensation case, with R. Abraham.
- (6) Maximum entropy copula with given diagonal section, with C. Butucea, A. Dutfoy and R. Fischer.
- (7) An introduction to Galton-Watson trees and their local limits, with R. Abraham.
- (8) Local limits of Galton-Watson trees conditioned on the number of protected nodes, with R. Abraham and A. Bouaziz.
- (9) Critical multi-type Galton-Watson trees conditioned to be large, with R. Abraham and H. Guo.
- (10) Optimal exponential bounds for aggregation of estimators for the Kullback-Leibler loss, with C. Butucea, A. Dutfoy and R. Fischer.
- (11) Fast adaptive estimation of log-additive exponential models in Kullback-Leibler divergence, with C. Butucea, A. Dutfoy and R. Fischer.
- (12) Cost functionals for large (uniform and simply generated) random trees, with J.-S. Dhersin and M. Sciaudeau.

Communications.

- (1) Statistical Study of Cellular Aging, with J. Guyon, A. Bize, G. Paul, E. Stewart and F. Taddéi. *ESAIM Proceedings*, Vol. 14, pp. 124-155, 2005.
- (2) Modeling environmental impacts of plankton reservoirs on cholera population dynamics, with G. Constantin de Magny, C. Paroissin, B. Cazelles, M. de Lara, J.-F. Guégan. *ESAIM Proceedings*, Vol. 14, pp. 156-173, 2005.

SELECTED LECTURES SINCE 2008

Courses.

- “Chaines de Markov et Applications”, Univ. of Franceville (Gabon), 17 February-3 March 2011.

Lectures.

- *National Chiao Tung University* (Taiwan), January 2008: How to detect aging for E. coli cells.
- *National Tsing Hua University* (Taiwan), January 2008: Length of coalescent trees.
- *University of Orsay* (France), January 2008: Pruning and immigration of continuous random tree.
- *University of Lille* (France), May 2008: General pruning and immigration for continuous random tree.
- *Second Canada France congress* (Montréal), June 2008: Immigration and pruning for continuum random trees
- *Centre d'Alembert, Université d'Orsay* (France), January 2009: Risk measure in finance.
- *Université Paris 6* (France), February 2009: Growing trees.
- *Selfsimilar processes and their applications*, Angers (France), July 2009: A continuum-tree valued Markov process.
- *Stochastic processes and their applications*, Berlin (Allemagne), July 2009: A continuum-tree valued Markov process.
- *Ecole Polytechnique, Chaire Modélisation Mathématique et Biodiversité*, (France), January 2010: MRCA and bottleneck in a simple size-varying population model.
- *Colloquium de l'Université Paris 5*, (France), January 2010: Aging for E. coli cells and Bifurcating Markov Chains.
- *Rhein-Main-Stochastics Kolloquium, Frankfurt*, (Allemagne), February 2010: MRCA and bottleneck in a simple size-varying population model.
- *Univ. Paris 13*, (France), March 2010: MRCA and bottleneck in a simple size-varying population model.
- *7th workshop on Markov Processes*, Beijing (China), Juillet 2010: A continuum tree-valued Markov process.
- *Paris-Bath, Branching Structures meeting*, Bath (England), September 2010: MRCA and bottleneck in a simple size-varying population model.
- *Univ. Paris 13*, (France), March 2011: Pruning at nodes of Galton-Watson trees.
- *Workshop on branching processes and coalescent processes*, Beijing (China), April 2011: Number of cuts for CRT subtrees.
- *Peking Univ.*, Beijing (China), April 2011: MRCA and bottleneck in a simple size-varying population model.
- *Beijing Normal Univ.*, Beijing (China), May 2011: MRCA and bottleneck in a simple size-varying population model.
- *Univ. Orléans*, (France), December 2011: Number of cuts for CRT subtrees.

- *Beijing Normal Univ.*, Beijing (China), April 2012: Record process on a Lévy forest.
- *Workshop MANEGE*, CIRM Marseilles (France), June 2012: Record on Lévy trees and paradox on advantageous mutations.
- *Workshop A3*, CIRM Marseilles (France), September 2012: The forest associated with the record process on a Lévy tree.
- *Seminar Univ. Angers*, Angers (France), January 2013: Detection of aging cell.
- *Seminar UPEMLV*, Marne La Vallée (France), January 2013: Detection of aging cell.
- *Combinatorial Probability and Statistical Mechanics Workshop*, Londres (GB), February 2013: Beta-coalescents in continuum Lévy trees.
- *Random Measures and Measure-Valued Processes*, Banff (Canada), September 2013: Large Galton-Watson trees.
- *Stochastic Models in Ecology, Evolution and Genetics*, Angers (France), December 2013: Models for population with non neutral immigration.
- *Stochastic models in biology*, Montpellier (France), January 2014: Models for population with non neutral immigration.
- *Univ. Paris 13*, (France), January 2014: Local limits for Galton-Watson trees.
- *Workshop ANR Presage*, Marne-La-Vallée (France), January 2014: Condensation for Galton-Watson trees.
- *Univ. Paris 13*, (France), November 2014: Total length of genealogical tree in stationary quadratic branching process.
- *Harmonic Analysis, Probability Theory and their interactions*, Hammamet (Tunisia), December 2014: Galton-Watson trees.
- *University of Zurich*, (Suisse), Mars 2015: On the genealogical tree of a stationary (quadratic) branching process.
- *III Workshop on branching processes and their applications*, Badajoz (Espagne), April 2015: On the genealogical tree of a stationary (quadratic) branching process.
- *ANR GRAAL*, IHES (France), April 2015: Beta-coalescents and stable Lévy trees.
- *Univ. Toulouse*, (France), May 2016: Cost functionals for large random trees.
- *Random Trees and Maps*, CIRM (France), June 2016: Genealogical tree for stationary quadratic branching process.
- *27th Aofa*, Krakow (Poland), July 2016: Cost functionals for large random trees.
- *World Congress in Probability and Statistics*, Toronto (Canada), July 2016: Cost functionals for large random trees.

Discussion.

- *Fête de la science*, Paris (France), October 2012: Table ronde organisée par RTE: Les enjeux de la recherche scientifique pour le réseau de demain.