

Curriculum vitæ

Laurent Miclo

born December 2^d 1966 at Sélestat, French

Current position

Senior researcher for the CNRS (French Scientific Research Agency) at the Toulouse Mathematical Institute

Address

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1 Professional career

1.1 Positions

September 2009 - today : Senior researcher for the CNRS at the Toulouse Mathematical Institute.

September 2004 - August 2009 : Senior researcher for the CNRS at the Laboratoire d'Analyse, Topologie, Probabilités (University of Marseille).

July 2001 - August 2004 : Junior researcher for the CNRS at the Laboratoire de Statistique et Probabilités (University of Toulouse).

July 2000 - June 2001 : Invited researcher at the Instituto de Matemática Pura e Aplicada, Rio de Janeiro.

October 1994 - June 2000 : Junior researcher for the CNRS at the Laboratoire de Statistique et Probabilités (University of Toulouse).

December 1991 - September 1994 : Junior researcher for the CNRS at the Institut de Recherche Mathématique Avancée (University of Strasbourg).

1.2 Invitations

- Visits to other mathematical departments (since 2007):

January 2018, four months and half : Cornell University

March 2017, one week : University of Nancy.

November 2016, one month and half : Institut Mittag-Leffler (Stockholm).

March 2016, one week : University of Nancy.

October 2015, one week : University Paris 6.

June 2015, one week : University Paris 6.

November 2014, two weeks : Beijing Normal University.

December 2013, one week : Imperial College London.

September 2013, one week : Swansea University.

October 2012, one week : Leipzig University.

March 2012, one week : University of Poitiers.

February 2010, one week : Tehran Mathematics Institute.

October 2009, one month : Stanford University.

January 2007, six months : University of Nice-Sophia Antipolis, with several one-month visits from de September 2007 to June 2009.

- Talks at conferences and seminars (since 2012, outside Toulouse): Atlanta (May 2018), Cornell (February 2018), Bordeaux (October 2017), Krakow (July 2017), Marseille (April 2017), Pau (April 2017), Nancy (March 2017), Bordeaux (February 2017), Orléans (October 2016), Lyon (April 2016), Lyon (April 2016), Paris (October 2015), Marseille (October 2015), Paris (June 2015), Krakow (June 2015), Grenoble (March 2015), Bordeaux (October 2014), Lyon (September 2014), Bangalore (July 2014), Paris (October 2013), Berkeley (September 2013), Krakow (July 2013), Paris (June 2013), Rennes (May 2013), Bordeaux (May 2013), Nantes (April 2013), Marseille (March 2013), Paris (January 2013), Grenoble (December 2012), Krakow (July 2012), Roscoff (June 2012).

1.3 University studies

19 December 2001 : Habilitation thesis attended at the University of Toulouse,

director: Michel Ledoux

title: Quelques considérations relatives à l'évolution des processus markoviens [Some considerations about the evolution of Markov processes]

15 February 1991 : Phd thesis attended at the University of Paris 6,

director: Halim Doss

title: Evolution de l'énergie libre. Applications à l'étude de la convergence des algorithmes du recuit simulé [Evolution of free energy. Applications to the study of the convergence of simulated annealing algorithms].

September 1990 - August 1991 : Grant-holder at the Institut de Recherche Mathématique Avancé (University of Strasbourg)

September 1986 - August 1990 : Student at the Ecole Normale Supérieure (Paris) and at the University of Paris 6: licence and maîtrise (86/87), agrégation of mathematics and DEA of probability (87/88) and beginning of phd thesis (88/90).

September 1984 - June 1986 : Preparatory classes at the Lycée Kléber (Strasbourg).

2 Research

2.1 Thematics

My favorite research subject are Markov processes, from a theoretical point of view as well as for the modeling of random evolutions.

- Quantitative convergence to equilibrium of reversible and non-reversible processes, intertwining relations, strong stationary times.
- Spectral analysis of Markov operators and generators, nodal domains of their eigenfunctions, higher order Cheeger inequalities and state space reduction.
- Functional inequalities: Poincaré's and logarithmic Sobolev's inequalities, hyperbounded semi-groups.
- Stochastic algorithms: simulated annealing, genetic algorithms, interacting particle systems for mean field approximations, algorithms finding Fréchet means on manifolds and graphs.
- Modeling via higher order Markov processes: kinetic equations, speculative dynamics...

2.2 Publications

2.2.1 Ten most relevant publications in the last five years

- [1] Laurent Miclo. On hyperboundedness and spectrum of Markov operators. *Invent. Math.*, 200(1):311–343, 2015.
- [2] Laurent Miclo. Strong stationary times for one-dimensional diffusions. *Ann. Inst. Henri Poincaré Probab. Stat.*, 53(2):957–996, 2017.
- [3] Marc Arnaudon and Laurent Miclo. A stochastic algorithm finding generalized means on compact manifolds. *Stochastic Processes and their Applications*, 124:3463–3479, 2014.
- [4] Asma Hassannezhad and Laurent Miclo. Higher order Cheeger inequalities for Steklov eigenvalues. *ArXiv e-prints*, May 2017.
- [5] Persi Diaconis and Laurent Miclo. On quantitative convergence to quasi-stationarity. *Ann. Fac. Sci. Toulouse Math. (6)*, 24(4):973–1016, 2015.
- [6] Daniel Bump, Persi Diaconis, Angela Hicks, Laurent Miclo, and Harold Widom. Useful bounds on the extreme eigenvalues and vectors of matrices for Harper's operators. In *Large truncated Toeplitz matrices, Toeplitz operators, and related topics*, volume 259 of *Oper. Theory Adv. Appl.*, pages 235–265. Birkhäuser/Springer, Cham, 2017.
- [7] Vivek Borkar and Laurent Miclo. On the fastest finite Markov processes. *ArXiv e-prints*, August 2016.
- [8] Laurent Miclo. Duality and hypoellipticity: one-dimensional case studies. *Electron. J. Probab.*, 22:Paper No. 91, 32, 2017.
- [9] Emmanuel Boissard, Patrick Cattiaux, Arnaud Guillin, and Laurent Miclo. Ornstein-Uhlenbeck pinball: I. Poincaré inequalities in a punctured domain. September 2013. Available as a *HAL e-print*.
- [10] Sébastien Gadat and Laurent Miclo. Spectral decompositions and \mathbb{L}^2 -operator norms of toy hypocoercive semi-groups. *Kinet. Relat. Models*, 6(2):317–372, 2013.

2.2.2 Published papers

- [1.69] Laurent Miclo. Duality and hypoellipticity: one-dimensional case studies. *Electron. J. Probab.*, 22:Paper No. 91, 32, 2017.
- [1.68] Laurent Miclo. On the hypergroup property. *Ann. Fac. Sci. Toulouse Math. (6)*, 26(2):417–435, 2017.
- [1.67] Daniel Bump, Persi Diaconis, Angela Hicks, Laurent Miclo, and Harold Widom. Useful bounds on the extreme eigenvalues and vectors of matrices for Harper’s operators. In *Large truncated Toeplitz matrices, Toeplitz operators, and related topics*, volume 259 of *Oper. Theory Adv. Appl.*, pages 235–265. Birkhäuser/Springer, Cham, 2017.
- [1.66] Daniel Bump, Persi Diaconis, Angela Hicks, Laurent Miclo, and Harold Widom. An exercise(?) in Fourier analysis on the Heisenberg group. *Ann. Fac. Sci. Toulouse Math. (6)*, 26(2):263–288, 2017.
- [1.65] Shui Feng, Laurent Miclo, and Feng-Yu Wang. Poincaré inequality for Dirichlet distributions and infinite-dimensional generalizations. *ALEA Lat. Am. J. Probab. Math. Stat.*, 14(1):361–380, 2017.
- [1.64] Laurent Miclo. Strong stationary times for one-dimensional diffusions. *Ann. Inst. Henri Poincaré Probab. Stat.*, 53(2):957–996, 2017.
- [1.63] Laurent Miclo. On ergodic diffusions on continuous graphs whose centered resolvent admits a trace. *J. Math. Anal. Appl.*, 437(2):737–753, 2016.
- [1.62] Marc Arnaudon and Laurent Miclo. A stochastic algorithm finding p -means on the circle. *Bernoulli*, 22(4):2237–2300, 2016.
- [1.61] Persi Diaconis and Laurent Miclo. Estimates on the amplitude of the first Dirichlet eigenvector in discrete frameworks. *Sci. China Math.*, 59(2):205–226, 2016.
- [1.60] Persi Diaconis and Laurent Miclo. On quantitative convergence to quasi-stationarity. *Ann. Fac. Sci. Toulouse Math. (6)*, 24(4):973–1016, 2015.
- [1.59] Laurent Miclo. An absorbing eigentime identity. *Markov Process. Related Fields*, 21(2):249–262, 2015.
- [1.58] Sébastien Gadat, Laurent Miclo, and Fabien Panloup. A stochastic model for speculative dynamics. *ALEA Lat. Am. J. Probab. Math. Stat.*, 12(1):491–532, 2015.
- [1.57] Laurent Miclo. On hyperboundedness and spectrum of Markov operators. *Invent. Math.*, 200(1):311–343, 2015.
- [1.56] Marc Arnaudon and Laurent Miclo. A stochastic algorithm finding generalized means on compact manifolds. *Stochastic Processes and their Applications*, 124:3463–3479, 2014.
- [1.55] Marc Arnaudon and Laurent Miclo. Means in complete manifolds: uniqueness and approximation. *ESAIM: Probability and Statistics*, 18:185–206, 2014.
- [1.54] Miclo, Laurent and Monmarché, Pierre, Étude spectrale minutieuse de processus moins indécis que les autres. Lecture Notes in Mathematics 2078. *Séminaire de Probabilités XLV*, Springer, Berlin, 459–481 (2013).
- [1.53] Sébastien Gadat and Laurent Miclo. Spectral decompositions and \mathbb{L}^2 -operator norms of toy hypocoercive semi-groups. *Kinet. Relat. Models*, 6(2):317–372, 2013.

- [1.52] Persi Diaconis and Laurent Miclo. On the spectral analysis of second-order Markov chains. *Ann. Fac. Sci. Toulouse Math. (6)*, 22(3):573–621, 2013.
- [1.51] Nicolas Champagnat, Persi Diaconis, and Laurent Miclo. On Dirichlet eigenvectors for neutral two-dimensional Markov chains. *Electron. J. Probab.*, 17:no. 63, 41, 2012.
- [1.50] Amir Daneshgar, Ramin Javadi, and Laurent Miclo. On nodal domains of finite reversible Markov processes and spectral decomposition of cycles. *Stochastic Processes and Applications*, 122(4):1748–1776, 2012.
- [1.49] André Galligo, and Laurent Miclo. On the cut-off phenomenon for the transitivity of randomly generated subgroups. *Random Structures Algorithms*, 40(2):182–219, 2012.
- [1.48] Persi Diaconis, and Laurent Miclo. On barycentric subdivision. *Combin. Probab. Comput.*, 20(2):213–237, 2011.
- [1.47] Laurent Miclo. On absorption times and Dirichlet eigenvalues. *ESAIM Probab. Stat.*, 14:117–150, 2010.
- [1.46] Pierre Del Moral, Laurent Miclo, Frédéric Patras, and Sylvain Rubenthaler. The convergence to equilibrium of neutral genetic models. *Stoch. Anal. Appl.*, 28(1):123–143, 2010.
- [1.45] Persi Diaconis, and Laurent Miclo. On characterizations of Metropolis type algorithms in continuous time. *ALEA Lat. Am. J. Probab. Math. Stat.*, 6:199–238, 2009.
- [1.44] Persi Diaconis, and Laurent Miclo. On times to quasi-stationarity for birth and death processes. *J. Theoret. Probab.*, 22(3):558–586, 2009.
- [1.43] Laurent Miclo. Une condition asymptotique pour le calcul de constantes de Sobolev logarithmiques sur la droite. *Ann. Inst. Henri Poincaré Probab. Stat.*, 45(1):146–156, 2009.
- [1.42] Laurent Miclo. Monotonicity of the extremal functions for one-dimensional inequalities of logarithmic Sobolev type. In *Séminaire de probabilités XLII*, volume 1979 of *Lecture Notes in Math.*, pages 103–130. Springer, Berlin, 2009.
- [1.41] Laurent Miclo. Quand est-ce que des bornes de Hardy permettent de calculer une constante de Poincaré exacte sur la droite? *Ann. Fac. Sci. Toulouse Math. (6)*, 17(1):121–192, 2008.
- [1.40] Laurent Miclo. On eigenfunctions of Markov processes on trees. *Probab. Theory Related Fields*, 142(3-4):561–594, 2008.
- [1.39] Ivan Gentil, Arnaud Guillin, and Laurent Miclo. Modified logarithmic Sobolev inequalities in null curvature. *Rev. Mat. Iberoam.*, 23(1):235–258, 2007.
- [1.38] Pierre Del Moral, and Laurent Miclo. Strong propagations of chaos in Moran’s type particle interpretations of Feynman-Kac measures. *Stoch. Anal. Appl.*, 25(3):519–575, 2007.
- [1.37] Pierre Del Moral, and Laurent Miclo. Dynamiques recuites de type Feynman-Kac: résultats précis et conjectures. *ESAIM Probab. Stat.*, 10:76–140 (electronic), 2006.
- [1.36] Pierre Del Moral, and Laurent Miclo. Self-interacting Markov chains. *Stoch. Anal. Appl.*, 24(3):615–660, 2006.
- [1.35] Ivan Gentil, Arnaud Guillin, and Laurent Miclo. Modified logarithmic Sobolev inequalities and transportation inequalities. *Probab. Theory Related Fields*, 133(3):409–436, 2005.

- [1.34] Pierre Del Moral, and Laurent Miclo. On convergence of chains with occupational self-interactions. *Proc. R. Soc. Lond. Ser. A Math. Phys. Eng. Sci.*, 460(2041):325–346, 2004. Stochastic analysis with applications to mathematical finance.
- [1.33] Laurent Miclo. Notes on the speed of entropic convergence in the central limit theorem. In *Stochastic inequalities and applications*, volume 56 of *Progr. Probab.*, pages 129–156. Birkhäuser, Basel, 2003.
- [1.32] Pierre Del Moral, and Laurent Miclo. Annealed Feynman-Kac models. *Comm. Math. Phys.*, 235(2):191–214, 2003.
- [1.31] Pierre Del Moral, Michel Ledoux, and Laurent Miclo. On contraction properties of Markov kernels. *Probab. Theory Related Fields*, 126(3):395–420, 2003.
- [1.30] Pierre Del Moral, and Laurent Miclo. Particle approximations of Lyapunov exponents connected to Schrödinger operators and Feynman-Kac semigroups. *ESAIM Probab. Stat.*, 7:171–208, 2003.
- [1.29] Laurent Miclo. Sur l’inégalité de Sobolev logarithmique des opérateurs de Laguerre à petit paramètre. In *Séminaire de Probabilités, XXXVI*, pages 222–229. Springer, Berlin, 2003.
- [1.28] Laurent Miclo. About projections of logarithmic Sobolev inequalities. In *Séminaire de Probabilités, XXXVI*, pages 201–221. Springer, Berlin, 2003.
- [1.27] Pierre Del Moral, and Laurent Miclo. On the stability of nonlinear Feynman-Kac semigroups. *Ann. Fac. Sci. Toulouse Math. (6)*, 11(2):135–175, 2002.
- [1.26] Laurent Miclo. About relaxation time of finite generalized Metropolis algorithms. *Ann. Appl. Probab.*, 12(4):1492–1515, 2002.
- [1.25] Pierre Del Moral, and Laurent Miclo. Genealogies and increasing propagation of chaos for Feynman-Kac and genetic models. *Ann. Appl. Probab.*, 11(4):1166–1198, 2001.
- [1.24] Pierre Del Moral, Michael A. Kouritzin, and Laurent Miclo. On a class of discrete generation interacting particle systems. *Electronic Journal of Probability*, 6(16):1–26, 2001.
- [1.23] Pierre Del Moral, and Laurent Miclo. Asymptotic results for genetic algorithms with applications to nonlinear estimation. In L. Kallel, B. Naudts and A. Rogers, editors, *Theoretical Aspects of Evolutionary Computing*, Natural Computing Series. Springer-Verlag, 2001.
- [1.22] Pierre Del Moral, and Laurent Miclo. Branching and interacting particle systems approximations of Feynman-Kac formulae with applications to non-linear filtering. In *Séminaire de Probabilités, XXXIV*, pages 1–145. Springer, Berlin, 2000.
- [1.21] Pierre Del Moral, and Laurent Miclo. A Moran particle system approximation of Feynman-Kac formulae. *Stochastic Process. Appl.*, 86(2):193–216, 2000.
- [1.20] Laurent Miclo, and Cyril Roberto. Trous spectraux pour certains algorithmes de Métropolis sur \mathbf{R} . In *Séminaire de Probabilités, XXXIV*, pages 336–352. Springer, Berlin, 2000.
- [1.19] Laurent Miclo. An example of application of discrete Hardy’s inequalities. *Markov Processes and Related Fields*, 5(3):319–330, 1999.
- [1.18] Laurent Miclo. Relations entre isopérimétrie et trou spectral pour les chaînes de Markov finies. *Probability Theory and Related Fields*, 114:431–485, 1999.

- [1.17] Laurent Miclo. Une variante de l'inégalité de Cheeger pour les chaînes de Markov finies. *ESAIM: P&S*, 2:1–21, March 1998.
- [1.16] Laurent Miclo. Trous spectraux à basse température: un contre-exemple à un comportement asymptotique escompté. In J. Azéma, M. Emery, M. Ledoux and M. Yor, editors, *Séminaire de Probabilités XXXII*, Lecture Notes in Mathematics 1686, pages 36–55. Springer-Verlag, Berlin, 1998.
- [1.15] Laurent Miclo. Une majoration sous-exponentielle pour la convergence de l'entropie des chaînes de Markov à trou spectral. *Ann. Inst. H. Poincaré Probab. Statist.*, 35(3):261–311, 1999.
- [1.14] Laurent Miclo. Remarques sur l'hypercontractivité et l'évolution de l'entropie pour des chaînes de Markov finies. In J. Azéma, M. Emery and M. Yor, editors, *Séminaire de Probabilités XXXI*, Lecture Notes in Mathematics 1655, pages 136–167. Springer-Verlag, Berlin, 1997.
- [1.13] Pierre Del Moral, and Laurent Miclo. On the convergence and the applications of the generalized simulated annealing. *SIAM Journal on Control and Optimization*, 37(4):1222–1250, 1999.
- [1.12] Laurent Miclo. Sur les temps d'occupations des processus de Markov finis inhomogènes à basse température. *Stochastics Stochastics Rep.*, 63(1-2):65–137, 1998.
- [1.11] Laurent Miclo. Sur les problèmes de sortie discrets inhomogènes. *The Annals of Applied Probability*, 6(4):1112–1156, 1996.
- [1.10] Laurent Miclo. Remarques sur l'ergodicité des algorithmes de recuit simulé sur un graphe. *Stochastic Processes and their Applications*, 58:329–360, 1995.
- [1.9] Laurent Miclo. Comportement de spectres d'opérateurs de Schrödinger à basse température. *Bulletin des sciences mathématiques*, 119:529–553, 1995.
- [1.8] Laurent Miclo. Une étude des algorithmes de recuit simulé sous-admissibles. *Annales de la Faculté des sciences de Toulouse*, 4:819–877, 1995.
- [1.7] Laurent Miclo. Recuit simulé partiel. *Stochastic Processes and their Applications*, 65:281–298, 1996.
- [1.6] Laurent Miclo. Un algorithme de recuit simulé couplé avec une diffusion. *Stochastics and Stochastics Reports*, 46:193–268, 1994.
- [1.5] Laurent Miclo. Recuit simulé sans potentiel sur une variété riemannienne compacte. *Stochastics and Stochastics Reports*, 41:23–56, 1992.
- [1.4] Laurent Miclo. Recuit simulé sans potentiel sur un ensemble fini. In J. Azéma, P.A. Meyer and M. Yor, editors, *Séminaire de Probabilités XXVI*, Lecture Notes in Mathematics 1526, pages 47–60. Springer-Verlag, 1992.
- [1.3] Laurent Miclo. Comportement asymptotique de l'énergie libre spécifique. Application à l'ergodicité et au recuit simulé en dimension infinie. *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques*, 28(2):195–234, 1992.
- [1.2] Laurent Miclo. Recuit simulé sur \mathbb{R}^n . Etude de l'évolution de l'énergie libre. *Annales de l'Institut Henri Poincaré, Probabilités et Statistiques*, 28(2):235–266, 1992.
- [1.1] Laurent Miclo. Recuit simulé sur \mathbb{R}^n . *Comptes rendus de l'Académie des Sciences de Paris, série I*, 310:783–786, 1990.

2.2.3 Papers to be published

- [2.3] Laurent Miclo. Some drawbacks of finite modified logarithmic Sobolev inequalities. To appear in *Mathematica Scandinavica*. Available as a *HAL e-print*.
- [2.2] Laurent Miclo. On the Markov commutator. Available as a *ArXiv e-prints*, May 2015. To appear in the *Séminaire de Probabilités*.
- [2.1] E. Boissard, P. Cattiaux, A. Guillin, and Laurent Miclo. Ornstein-Uhlenbeck pinball: I. Poincaré inequalities in a punctured domain. September 2013. Available as a *HAL e-print*.

2.2.4 Submitted prepublications

- [3.5] Laurent Miclo. Complex intertwining and quantification of discrete free motions. *HAL e-print*, July 2017.
- [3.4] Asma Hassannezhad and Laurent Miclo. Higher order Cheeger inequalities for Steklov eigenvalues. *ArXiv e-prints*, May 2017.
- [3.3] Laurent Miclo. Isoperimetric stability of boundary barycenters in the plane. *HAL e-print*, November 2016.
- [3.2] Vivek Borkar and Laurent Miclo. On the fastest finite Markov processes. *ArXiv e-prints*, August 2016.
- [3.1] Laurent Miclo. On the Markov commutator. *HAL e-print*, April 2015.

2.2.5 Unpublished papers

- [4.3] Laurent Miclo. A singular large deviation phenomenon for some exit times. Prépublication, 2000.
- [4.2] Laurent Miclo. Problème de sortie discret et théorèmes limites pour les temps d'occupations du recuit simulé. Prépublication 08-96 du Laboratoire de Statistique et Probabilités, Université Toulouse III, France, 1995.
- [4.1] Laurent Miclo. Recuit simulé relativement à une famille de potentiels d'interactions de rang fini et invariante par translations. Prépublication, 1991.

2.3 Projects

Participation to French research projects (ANR):

- Functional inequalities; probability and partial differential equations: 2005-2008 (252 000 €).
- Dissipative Evolutions and Convergence to Equilibrium: 2009-2012 (250 000 €).
- Stability of asymptotic behavior of PDE, of stochastic processes and of their discretizations : 2013-2017 (179 000 €).

3 Teachings

3.1 Phd advisor

- Current Phd students:

Eyal Castiel : Etude du protocole CSMA-QB en télécommunication [Study of the protocol CSMA-QB in telcommunication], with Florian Simatos as co-advisor.

- Past Phd students:

Guillaume Copros : Temps forts de stationnarité sur des graphes continus [Strong stationary times on continuous graphs]. Guillaume Copros has a temporary research and teaching position at INSA Toulouse.

Sylvain Gibaud : Systèmes de particules avec interactions de type jeux [Particles systems with games interactions], with Jérôme Renault as co-advisor (I replaced Xavier Bressaud, on leave). Sylvain Gibaud is currently high school teacher.

Ioana Gavra : Algorithmes stochastiques de recherches de moyennes structurelles sur les graphes [Stochastic algorithms finding structural means on graphs], with Sébastien Gadat as co-advisor. Ioana Gavra has a temporary research and teaching position at the University of Toulouse.

Claire Delplancke : Comportements en temps long d'algorithmes stochastiques, commutations de semi-groupes et méthode de Stein [Long-time behaviors of stochastic algorithms, intertwining of semi-groups and Stein method], with Aldéric Joulin as co-advisor. Claire Delplancke is currently post-doc at the Center for Mathematical Modeling (Chile).

Pierre Monmarché : Hypocoercivité: approches alternatives et applications aux algorithmes stochastiques [Alternative approaches to hypocoercivity and applications to stochastic algorithms]. This Phd thesis was awarded the Prix de la Recherche Universitaire 2015 given by *Le Monde*. Pierre Monmarché is currently Assistant Professor at the University Paris 6.

Mathias Rousset : Méthodes population Monte-Carlo en temps continu pour la physique numérique [Monte-Carlo population methods in continuous time for numerical physics], with Pierre Del Moral as co-advisor. Mathias Rousset is currently junior reasercher for INRIA at the University of Rennes.

Cyril Roberto : Inégalités de Hardy et de Sobolev logarithmiques [Hardy and Sobolev logarithmic inequalities], with Michel Ledoux as co-advisor. Cyril Roberto is currently Professor at the University Paris Ouest.

3.2 Teachings

- Quantitative methods for finance risk management, Master Engineering course at Cornell University, 2018.
- From 2004 to 2015, I only gave mini-lectures at the doctorate level (except for freshman lectures in 2015):
 - On links between quantitative ergodicity and absorption, meeting of the ANR STAB, Paris 2015.
 - Stochastic algorithms for the estimation of Fréchet means, Indo-French Centre for Applied Mathematics, Bangladore 2014.
 - Convergence to equilibrium of non-reversible processes, CNRS-PAN Mathematics Summer Institute, Krakow 2012.
 - Higher order Cheeger inequalities, meeting of the ANR EVOL, Nantes 2011.

- Exit times and Dirichlet spectra, Nanterre-Potsdam doctoral college, Nanterre 2010.

- From 1990 to 2004, I was teaching a course almost every year, they had given me the opportunity to lecture at all the university levels.

3.3 Committees

- Referee of the Phd thesis of Sandro Franceschi (University Paris 6 / University Tours, December 8 2017) (July 1st 2016).
- Referee of the Phd thesis of Etienne Adam (Ecole Polytechnique, July 1st 2016).
- Referee of the Habilitation to supervise researches of Paul-Marie Samson (University Paris Est, May 27 2016).
- Member of the committee for the Habilitation to supervise researches of Florian Simatos (University Toulouse, May 10 2016).
- Member of the committee for the Habilitation to supervise researches of Mathias Rousset (ParisTech, November 27 2014).
- Member of the committee of the Agrégation de mathématiques, from 2002 to 2006.

4 Administration

4.1 Responsibilities

- Coordinator of the Fermat Prize 2015 and 2017.
- Co-leadership (with Fabrice Gamboa) of the statistics and probability team (70 people) and as a consequence, participation to the direction committee of the Institut de Mathématiques de Toulouse from January 2013 to December 2015.

4.2 Organization

- Co-organisation of the probability seminar of the Institut de Mathématiques de Toulouse, 2016/2017.
- Organization of two scientific days in honor of the laureates of the Fermat Prizes and of the French Science Academy Mathematical Prizes, March 22 and 23, 2016.
- Organization of a workshop on orthogonal polynomials, June 18 and 19, 2014.
- Organization of a conference on the convergence to equilibrium of Markov processes, March 24 to 28, 2014, followed by the edition of the proceedings in a special volume of the Annales de la Faculté des Sciences de Toulouse.
- Organization of the invitation on an excellence chair from the labex CIMI of Persi Diaconis to the Institut de Mathématiques de Toulouse, from January 2014 to June 2014.

4.3 Arbitrages

- Participation to the committees of the Fermat Prizes 2013, 2015 and 2017.
- Associate editor to the Annales de la Faculté des Sciences de Toulouse.
- Reports for assessment bodies: recruiting committees for the University of Marseille, for the University of Toulouse, for the FONDCYT (Chile), for the National Chiao Tung University (Taiwan) and for the Natural Sciences and Engineering Research Council (Canada).

- Referee for the journals:

Advances in Applied Probability, Advances in Mathematics, Annales de l'IHP, Annales de la Faculté des Sciences de Toulouse, Annals of Applied Probability, Annals of Probability, Applied Mathematics and Optimization, Bernoulli, Combinatorics Probability and Computing, CRAS Mathématiques, Electronic Communications in Probability, Electronic Journal of Probability, ESAIM Probability and Statistics, Frontiers of Mathematics in China, Geometric and Functional Analysis, Hacettepe Journal of Mathematics and Statistics, IMPA Publications, International Journal of Stochastic Analysis, International Mathematics Research Notices, Journal of Applied Probability, Journal of Functional Analysis, Journal of Inequalities in Pure and Applied Mathematics, Journal of Mathematical Analysis and Applications, Journal of Mathematical Physics, Journal of the American Mathematical Society, Journal of the European Mathematical Society, Journal of the London Mathematical Society, Journal of Theoretical Probability, Latin American Journal of Probability and Mathematical Statistics, Markov Processes and Related Fields, Memoirs of the American Mathematical Society, Physical Review E, Physical Review Letters, Potential Analysis, Probability in the Engineering and Informational Sciences Probability Theory and Related Fields, Random Structures and Algorithms, Séminaire de Probabilités (LNM), SIAM Journal on Control and Optimization, SIAM Journal on Scientific Computing, Statistics and Probability Letters, Stochastic Processes and their Applications, Stochastics, etc.

- 138 original reviews for MathSciNet.