Curriculum vitae

Born April 16, 1958 in Paris, France.

Education

1976	Baccalauréat C, Paris.
1976-78	Mathématiques supérieures et spéciales, Paris.
1978-80	Maîtrise de Mathématiques Pures, Université Paris VI.
1981	Agrégation de Mathématiques.
1983	Thèse de 3ème cycle supervised by N. Varopoulos, Université Paris VI: "Opérateurs pseudo-différentiels sur un corps local".
1989	Doctorat d'État, Université Paris VI: "Analyse harmonique et analyse réelle sur les groupes".

Academic Positions

1981-85	Professeur agrégé (High school teacher).
1985-88	Professeur agrégé at Université Paris VI (Lecturer).
1988-1993	Chargé de recherche, C.N.R.S., at Université Paris VI.
1990-91	Visiting scholar, Massachusetts Institute of Technology, joint fellowship from N.S.F. and C.N.R.S..
1993-2005	Directeur de recherche, C.N.R.S., at Université Paul Sabatier, Toulouse, France.
1998—	Professor of Mathematics, Cornell University, NY, USA.
2009-2015	Chair, Department of Mathematics, Cornell University, NY, USA.
2017—	Abram R. Bullis Professor of Mathematics, Cornell University, NY, USA.

Awards and distinctions

Rollo Davidson Award, 1994
Guggenheim Fellow, 2006-07
Fellow of the Institute of Mathematical Statistics (2011)
Fellow of the American Academy of Arts and Sciences (2011)
Fellow of the American Mathematical Society (2012-inaugural class)

External funding

1995–1997 Principal investigator, NATO Collaborative Research Grant 950686 ($8000), Analysis and Geometry of Finite Markov Chains (with Persi Diaconis).

1997–1998 Renewal of Nato Collaborative Research Grant 950686 ($5500)

1999-2001 NSF Grant DMS-9802855, Analysis and geometry of certain Markov chains and processes.

2001-2006 NSF Grant DMS-0102126, Analysis and geometry of Markov chains and diffusion processes.

2003-2008 NSF Infrastructure Grant 0306194 (Co-PI). Graduate and Postdoctoral Training in Probability Theory and its Applications.

2006-2009 NSF Grant DMS-0603886 Markov Processes in Geometric Environments.

2008-2016 NSF Grant EMSW21-RTG 0739164 (Co-PI; PI starting in July 2010). Interdisciplinary Training in the Applications of Probability.

2009-2010 NSF Grant DMS-085587 Travel Grant US Participants, SPA Berlin 2009, 33rd Conference on Stochastic Processes and their Applications.

2010-2014 NSF Grant DMS-1004771 Heat kernel estimates and applications.

2013-2014 NSF Grant DMS-1344959 US participant support for the Institute Henri Poincar program "Random Walks and the Asymptotic Geometry of Groups".

2014-2017 NSF Grant DMS-1404435 Random walks, diffusions, semigroups, and associated geometries.

2014-2017 NSF Grant DMS-1406599 Asymptotically Efficient and Efficiently Computable Bayesian Estimation (Former PI: Dawn Woodard, ORIE; Current PI: Laurent Saloff-Coste; Co-PI: Pierre Patie, ORIE; Former PI left academia).

2017-2021 NSF Grant DMS-1645643 Research Training Group: Dynamics, Probability, and Partial Differential Equations in Pure and Applied Mathematics; PI: Steve Strogatz; Co-PIs: T. Healey, L. Saloff-Coste, G. Samorodnitsky, A. Vladimirsky.

2017-2020 NSF Grant DMS- Random walks and diffusions, and their geometries.

Visiting Positions

Visiting scholar, Massachusetts Institute of Technology (MIT).
October 1988—January 1989 and October 1989—January 1990
These visits were financed by MIT, the NSF and the CNRS.

Invited Professor, Wrocław University, Poland. November—December 1991.
Financed by the European program TEMPUS.

Invited Professor, The Flinders University, Adelaïde and University of New South Wales, Sydney, Australia. March—April 1992.

Visiting scholar, Stanford University August 1992.

Invited Professor, Rome and Milan Universities, Italy. April—May 1994.
Financed by the C.N.R., Italy.

Visiting scholar, Stanford University July 1994.

Visiting scholar, Stanford University, and MSRI, Berkeley. July-August 1995.
Organizer and main speaker with Persi Diaconis of MSRI summer graduate program: Random Walk and Geometry.

Invited Professor, Saint Flour 1996 Summer School in Probability.

Visiting scholar, Cornell University, October 1997.

Visiting Professor, Centre Emile Borel, Heat kernel trimester, Spring 2002.

Visiting Professor, Graz Technical University, January 2003.

Visiting Scholar, RIMS-Kyoto University, June-July 2003.

Visiting Professor, Université Paris XI (Orsay), June-July 2008.

Editorial Activities

1994–2000 Associate Editor, The Annals of Probability.

1996–2001 Associate Editor, Annales de la faculté des sciences de Toulouse.

1999–2005 Associate Editor, Stochastic Processes and their Applications.

2001–2005 Associate Editor, ESAIM: Probability and Statistics.

2001–2011 Editor, Mathematische Zeitschrift.

2011–2016 Editor, Annales Scientifiques de L'École Normale Supérieure.

2003–present Editor, Probability Theory and Related Fields.

2003–present Editor, Journal of Theoretical Probability.

2005–present, Advisory board, Frontier in Mathematics, Birkhäuser.

2006–present Editor, Potential Analysis (Chief Editor, 2006–2015).

2012–present Editor, Probability Surveys (Chief Editor 2012–2014).

2013-present Editor, Journal of Functional Analysis.

Service at Cornell

2001–2004 Faculty Senate.

2001–2004 Academic Integrity Hearing Board-College of Arts and Sciences.

2002–2004 Grievance Committee-College of Arts and Sciences.

2017–2020 Nominating Committee-College of Arts and Sciences.

2017–2018 Faculty Admissions Committee-College of Arts and Sciences.

2017–2018 Search Committee for the position of Dean of College of Arts and Sciences.

2018–2019 Faculty Admissions Committee-College of Arts and Sciences.

2018–2019 ECE search Committee-College of Engineering (Representative for the Centre for Applied Mathematics).

2019–2020 Faculty Admissions Committee-College of Arts and Sciences.

Other Professional Activities

1996–1999 Member of the scientific committee, Centre International de Rencontres Mathématiques (CIRM), Luminy, Marseille.

1996–1998 Groupe d'experts DSPT1, Mathématiques et leurs applications, Ministère de l'Education Nationale, de l'Enseignement Supérieur et de la Recherche.

1997–1998 Director of graduate studies, Dept. Math., Université Paul Sabatier, Toulouse.

2006–2007 Chair of the review committee for the "Laboratoire Jean Leray" (CNRS), Université de Nantes, France (December 2006–January 2007).

2011-2012 American Mathematical Society, Eastern Section Program Committee, (2012, Chair).

2013 (spring) External Review Committee, Department of Applied Mathematics and Statistics, The Johns Hopkins University.

2018 (January-March) Chair, External Review Committee, Fusion of Laboratoire de Probabilités et Modèles Aléatoires (UMR 7599) and Laboratoire de Statistique Théorique et Appliquée , Council for Evaluation of Research and Higher Education (HCERES), France.

Plenary Lectures

–3ème Cycle Romand de Mathématiques, Champoussin, Switzerland, 1994
–Integral inequalities and Applications, Cortona, Italy, 1999
–Stochastic Analysis, Durham Research Symposium, Durham, UK, 1999
–Year 2000 Seminar on Stochastic Processes, Salt Lake City, USA, 2000
–Function theory: a conference in honor of W. Hayman, Imperial College, London, 2001
–Heat kernel and analysis on manifolds, IHP, Paris, 2002
–Oberwolfach Seminar: Finite Markov Chains, May 2002 (with J. Fill)
–Journée Hypathie, Finite Markov Chains, Marseille, France, 2003 (with M. Jerrum)
–Potential Theory and Analysis on Metric Spaces, RIMS, Kyoto, 2003
–Northeast Probability Seminar, New-York, 2004
–54th Midwest PDE Seminar, Detroit, 2004
–Rencontre Mathématiques de l'UMPA 6-7 janvier 2006 (with M. Benaim)
–MSJ-SI Probabilistic approach to Geometry, Kyoto, July-August 2008
–Birnbaum Lecturer at the Pacific Northwest Probability Seminar, October 2008
–Plenary Lecture, Canadian Mathematical Society Winter Meeting, Ottawa, December 2008
–Plenary Lecturer, Period on Partial Differential Equations, Milan and Pavia, May-June 2009
–Plenary Lecture, Stochastic Processes and their Applications, Berlin, July, 2009
–Invited Address. AMS Regional Meeting, Penn State, University Park, October 2009
–Journée d'Analyse Harmonique, Orsay, Januray 2011
–Plenary Lecture, 5th Int. Conf. on Stochastic Analysis and its Applications, Bonn, September 2011
–Plenary lecture, Lehigh Geometry and Topology Conference, May 2012
–Plenary Lecture, 65th British Mathematical Colloquium, Sheffield, UK, March 2013
–The Duncan Lectures, Johns Hopkins University (Applied Mathematics and Statistics), April 2014
–36th Midwest Probability Colloquium, Evanston, October 2014.
–Kai-Lai Chung Memorial Lecture, Department of Mathematics, Stanford University, March 2017.
–LMS-EPSRC Durham Symposium "Markov Processes, Mixing Times and Cut-off", July 2017.

–PIMS Distinguish Colloquium Speaker, October 2019, University of British Columbia.

Invited lectures at conferences

–Analyse et probabilités, Delphes, Greece, 1987
–Summer conference on stochastic Analysis, Lisbon, Portugal, 1989
–Heat diffusion semigroups, Montréal, Canada, 1990.
–Random walks and boundary theory, Montréal, Canada, 1992.
–Differential operators on Lie groups, Tuczno, Poland, 1993.
–Randomness and computation, workshop, Edinburgh, Scotland, 1993
–Journées de Probabilités, Toulouse, France, 1993
–Potential theory and second order differential operators, Parma, Italy, 1994
–Highly structured stochastic systems, Cortona, Italy, 1994
–Diffusion theory and analysis, Evanston, USA, 1994
–Probability on groups, Oberwolfach, Germany, 1994
–Differential operator on Lie groups, Tuczno, Pologne, 1995
–21st European meeting of statisticians, Aarhus, Danemark, 1995
–3rd SEMSTAT, Toulouse, 1996
–Journée d'Analyse Fonctionnelle, Marne la Vallée, 1997.
–European network "Stochastic", Paris, 1998.
–Harmonic analysis on homogeneous real and complex manifolds, Poland, 1999
–Geometric Stochastic Analysis, Oberwolfach, Germany, 2000
–Journée Inégalités de Sobolev, Cergy-Pontoise, France, 2000
–Real and complex analysis related to homogeneous manifolds, Poland, 2001
–Random walks; The E. Schrödinger Intern. Inst. for Mathematical Physics, Vienna, 2001
–Probability on geometrical structures, CIRM, Luminy, France, 2001
–First joint mathematical international meeting AMS-SMF, Lyon, France, 2001
–Probability and geometry, Dijon, France, 2001
–Analyse globale sur les variétés non compactes, Montpellier, France, 2002
–AMS Regional Meeting, Binghamton, session on Probability, 2003
–IX CLAPEM, Uruguay, 2004
–Analytic and Geometric Aspects of Stochastic Processes, Banff, 2004
–AIM workshop: Sharp Thresholds for Mixing Times, Palo-Alto, 2004
–The Mathematics of Persi Diaconis, San Diego, 2005
–Harnack Inequalities and Positivity, Cortona, 2005
–Geom. and Probab. Methods in Group Theory and Dynamical Syst., College Station, 2005
–AIM workshop: Phase Transitions in Physics, CS, Combin. and Probab. Theory, Palo-Alto, 2006
–Géométrie de Groupes, CIRM, 2007
–Spectral Analysis in Geometry and Number Theory, in Honor of T. Sunada, Nagoya, 2007
–Analysis and Probability, Nice, 2008
–Conference in honor of Noel Lohoué, Orsay, July 2008
–Geometry and Probability on Groups, Orsay, January 2009
–Analysis and Probability, Nice, June 2009
–Cornell Probility Summer School, July 2010
–Embeddings workshop, Discrete Analysis program, Newton Institute, January 2011
–Groups, graphs and stochastic processes, BIRS, Banff, Canada, June 2011
–Columbia-Princeton Probability Day, March 2012
–Southeastern Probability Conference, Duke University, May 2012
–Discrete Geometric Analysis, RIMS, Tokyo, August 2012

–Potential Theory and its Related Fields, RIMS, Kyoto, September 2012

–AMS Regional Meeting, Probability Session, RIT, September 2012

–Lecturer, Luminy Introductory School, IHP trimester Random Walks and Asymptotic Geometry of Groups, January 2014

–Talking Across Fields, Toulouse, March, 2014.

–Groups, Graphs, and Random Walks, Cortona, Italy, June 2014

–When Dominique Bakry is sixty, Toulouse, France, December 2014

–Conference in Stochastic Analysis and Related Topics, Purdue University, May 2015.

–Heat Kernels and Analysis on Manifolds and Fractals, Bielefeld University, July 2016

–Geometry and Probability, Research Institute for Mathematical Sciences, Kyoto, October 2016

–Finger Lakes Proability seminar 2017, Syracuse University, April 2017.

–Spring Probability Workshop, Institute of Mathematics, Academia Sinica, Taipei, Taiwan, June 2018.

–International Conference on Analysis and PDEs on Manifolds and Fractals, September 2019, Nankai University, Tianjin, China.

–Geometry and Probability 2019, September 2019, Osaka University, Japan.

Co-organized the following mathematical meetings

–Inégalités de Sobolev, Cergy, June 1996 (with T. Coulhon).

–Congrès MAS (special session: spectral analysis of Markov chains), Toulouse, Sept. 1996.

–Random Walks and Discrete Potential Theory, Cortona, It., June 1997 (with V. Kaimanovich, M. Picardello and W. Woess).

–Journées de Probabilités, Toulouse, Sept. 1997. (With D. Bakry, M. Ledoux, G. Letac).

–Geometric Methods in Analysis, International Workshop, Haifa, Is., Dec. 1997 (with R. Brooks)

–Special quarter on Logarithmic Sobolev Inequalities, Statistical Mechanics and Large Deviations, Centre Emile Borel, Paris. April-June 1998 (with G. Ben Arous, F. Comets, L. Gross, D. Stroock)

–Oberwolfach Seminar: Finite Markov Chains, May 2002 (with J. Fill).

–Geometric Group Theory, Random Walks, and Harmonic Analysis June 13-18, 2004, Cortona, Italy (with T. Ceccherini Silberstein, M. Salvatori, T. Smirnova-Nagnibeda, W. Woess).

–Finite Markov Chains and Random Algorithms, Workshop, Cornell, May 8-11 20004.

–AMS-DMV-OeMG joint meeting, Session, "Stochastic Analysis on Metric Spaces", Mainz, Germany, June 2005 (with K.T. Sturm and W. Woess).

–Property RD, ARCC Workshop, AIM, Palo-Alto, January 23-27 2006 (with I. Chatterji).

–Random Matrices, Workshop, Cornell, June 2-5 2007 (With Alice Guionnet).

–Summer School in Probability, Cornell, June 18-29 2007 (with R. Durrett).

–Recent Developments in Random Walks, Durham, UK, July 2-12 2007 (with B. Hambly and P. Tarres).

–Summer School in Probability, Cornell, July 18-30 2010 (with R. Durrett).

–Summer School in Probability, Cornell, July 11-22 2011 (with R. Durrett).

–Probability meeting in honor of Harry Kesten's 89th birthday, Cornell, November 2102, supported by NSF and ESF (with G. Grimmett and V. Sidoravicuius).

–Summer School in Probability, Cornell, July 11-22 2012 (with R. Durrett).

–Heat Kernels, Stochastic Processes and Functional Inequalities, Oberwolfach, May 2103 (with M. Gordina, T. Kumagai, K. Sturm).

–Summer School in Probability, Cornell, July 11-22 2013 (with L. Levine).

–IHP trimester on random walks and asymptotic geometry of groups, January–March 2014, Paris (with I. Chatterji, A. Erschler and V. Kaimanovich).

–Summer School in Probability, Cornell, July 14-25 2014 (with L. Levine).

–Heat Kernels, Stochastic Processes and Functional Inequalities, Oberwolfach, November 2106 (with M. Gordina, T. Kumagai, K. Sturm).
–2019 Finger lakes Probability Seminar, April 19-20 2019 (With Pierre Patie).
–Summer School in Probability, Cornell, June 10-20 2019 (with Lionel Levine and Phil Sosoe).
–Heat Kernels, Stochastic Processes and Functional Inequalities, Oberwolfach, November 2109 (with M. Gordina, T. Kumagai, K. Sturm).

Courses taught

1981-1985: High school classes.
1985-1988: Undergraduate classes (continuing education for high school teachers).
1987-1988: Graduate course; Analysis on nilpotent Lie groups, Univ. Paris 6. (With Th. Coulhon).
Nov. 1991: Graduate course; Geometry and Analysis on Lie Groups, Wroclaw University, Poland, European program TEMPUS.
1994-1995: Graduate course; Discrete Markov Chains, Toulouse University.
July 1995: Summer Graduate Student Program in Random Walk and Geometry, MSRI, Berkeley (with P. Diaconis).
1995-1996: Graduate course; Discrete Markov Chains, Toulouse University.
1996-1997: Graduate course; Random Walks on Finitely Generated Groups, Toulouse University.
Aug. 1996: Saint Flour Summer School on Probability, Lectures on Finite Markov Chains.
1998-1999: Undergraduate courses, Math 471 (Probability Theory), Math 222 (Multivariate Calculus); Graduate course, Math 711 (Sobolev inequalities on manifolds).
1999-2000: Undergraduate course, Math 222; Graduates courses, Math 715 (Harmonic Analysis), Math 672 (Probability Theory).
2000-2001: Undergraduate courses, Math 121, Math 122; Graduate course, Math 778 (Stochastic Processes: Random walks on finitely generated groups).
2001-2002: Undergraduate courses, Math 413, Math 106; Graduate course, Math 711 (Heat kernel analysis)
2002-2003: Undergraduate course, Math 105; Graduate course, Math 777 (Finite Markov Chains)
2003-2004: Undergraduate courses, Math 105, Math 471; Graduate course Math 614 (Analysis on metric spaces)
2004-2005: Undergraduate courses, Math 105, math 471; Graduate course Math 614 (Heat kernel analysis).
2005-2006: Undergraduate course, Math 192; Graduate course: 778 Random walks on finitely generated groups.
2006-2007: Graduate course Math 614, Heat kernel on Lie groups.
2007-2008: Undergraduate Course, Math 192, Graduate course Math 778, Stochastic Processes.
2008-2009: Graduate Course Math 613, Dirichlet forms and Geometry.
2015-2016: Graduate Course Math 6200, Partial Differential Equations.
2017-2018: Linear Algebra for Engineers, Math 2940; Graduate Course Math 7720,Topics in Stochastic Processes (Random walks on groups).
2018-2019: Linear Algebra for Engineers, Math 2940; Math 4710, Basic Probability.
2019-2020: Math 3110, Introduction to Analysis; Math 4710, Basic Probability.

Outreach

Mathematics Conference: The Common Core & More, BOCES, Ithaca, March 2011.
Probability Workshop for Secondary Teachers, Cornell, December 2012.

Former Graduate Students

Andrzej Zuk, 1994-1997. Sur certaines propriétés spectrales du Laplacien sur les graphes. Professor, University Paris VII.

Pascal Lezaud, 1995-1998. Études quantitatives des chaînes de Markov par perturbation de leur noyau. Research position DSNA Toulouse (French Civil Aviation).

Sandrine Roussel, 1995-1999. Marches aléatoires sur le groupe symétrique. Lecturer, INSA Toulouse.

Sebastien Blachère, 1997-2000. Agrégation limitée par diffusion interne et temps de coupure sur les groupes discrets à croissance polynomiale. On leave from Marseille University, Senior Researcher (Statistics and Reliability Engineer) at SKF B.V.

David Revelle, 1998-2002. Random Walks on Solvable Groups. (NSF Postdoc, UC Berkeley). The Infinite Actuary-Actuarial Exam Preparation.

Lee Gibson, 2001-2005. The number of sites visited by a random walk on an infinite graph. The Infinite Actuary-Actuarial Exam Preparation.

Sharad Goel, 2001-2005 (CAM). Estimating mixing times: techniques and applications. (Yahoo/Microsoft Research, New York). Assistant Professor, Stanford University (Management Science & Engineering).

Melanie Pivarski, 2001-2006. Heat kernels on Euclidean complexes. Associate Professor, Roosevelt University.

Evgueni Klebanov, 2002-2006. Asymptotic behavior of covolutions of centered density on Lie groups of polynomial volume growth. Financial/banking Industry.

Guan-Yu Chen, 2003-2006. The cutoff phenomenon for finite Markov chains. Associate Professor, National Chiao Tung University.

Pavel Gyrya, 2002-2007. Heat kernels estimates for inner uniform subsets of Harnack-type Dirichlet spaces. American Express (Risk Management).

Jessica Zúñiga. 2003-2008. Merging of some time homogeneous and inhomogeneous Markov chains. (NSF Postdoc, Stanford University). Data Science Manager at Stitch Fix.

Russ Thompson, 2005-2011. Random walks and subgroup geometry, (Texas A& , 3 years postdoc). Senior Research Scientist at Alexa Internet.

Santi Tasena, 2006-2011. Assistant Professor at Chiang Mai University, Thailand.

Janna Lierl, 2007-2012. Heat kernel estimates on inner uniform domains, Assistant Professor (tenure-track), University of Connecticut, Store.

Tianyi Zheng, 2008-2013. Random walks on some classes of solvable groups. Assistant Professor (tenure-track), UC San Diego.

Mathav Murugan, 2012-2015 (CAM). Random walks on metric measure spaces. Assistant Professor (tenure-track) at the University of British Columbia.

Evan Randles, 2011-2016. Convolution powers of complex-valued functions and related topics in partial differential equations. Assistant Professor (tenure-track) at Colby College.

Kelsey Houston-Edwards, 2013-2018. Discrete Heat Kernel Estimates in Inner Uniform Domains. Assistant Professor (tenure-track) at Olin College of Engineering.

Jingbo Liu, 2014-2019. Heat kernel estimate of the Schrodinger operator in uniform domains. Senior Data Scientist at Walmart eCommerce.

Qi Hou, 2012-2019. Rough Hypoellipticity for Local Weak Solutions to the Heat Equation in Dirichlet Spaces. Visiting Assistant Professor, Cornell.

Xuliang Li, 2014-15 Non-degree visiting student.

Current Graduate Students

Yuwen Wang, 2015-present. (expected 2020)
Emily Dautenhahn, 2018-present. (expected 2023)

Postdoctoral Associates (mentored)

2005-2006 Kazumasa Kuwada (Ph.D. Kyoto Univ., passed away in 2019)
2008-2009 Jérémie Brieussel (Ph.D. Univ. Paris VII, now maître de conference, Univ. Montpellier)
2009-2011 Jonathan Peterson (Ph.D. Univ. Minnesota, now Assossiate Professor, Purdue University)
2009-2013 Nate Eldredge (Ph.D. UC San Diego, now Assistant Professor, Univ. of Northern Colorado)
2010-2013 Benjamin Steinhurst (Ph.D. Univ. Connecticut, now Assistant Professor, McDaniel College)
2011-2014 Anastasia Raymer (Ph.D. UC Davis, Data Analyst, TDS Telecom, Madison, Wisconsin)
2012-2016 John Pike (Ph.D. Univ. Southern California, Assistant Prof., Bridgewater State University.)