African Futures Mentorship Program Faculty Application

Professor: **Frederi Viens, Chair, Department of Statistics and Probability**

Project: **Africa's Great Oasis: Attribution of Lake Chad's Variability to Human & Environmental Factors**

Subject Areas: **Computational Bayesian statistics, environmental science, agro-ecosystem services, policy recommendations**

Project Description:

Prof. Viens has been leading a group of scholars and students since 2013 to understand interactions between the complex hydrology of Lake Chad in the Eastern Sahel, its potential for ecosystem services, the impact of smallholder farmer irrigation in its basin, and the possible connections to global climate change. A short broad-audience summary of the current state of his research can be found in the recently published edited article in The Conversation:

https://theconversation.com/data-statistics-and-hydrology-can-reveal-key-truths-about-lake-chad-110907

Pending peer-reviewed publication, Viens's team has already established that there is no evidence suggesting that global change is directly responsible for variability in Lake Chad's hydrology. They also find preliminary evidence that farmer irrigation activities are very unlikely to have any negative consequence on the lake; more work should be done in this direction to solidify the conclusion, and provide policy recommendations on agriculture development in the basin. Many hypotheses remain to be tested. One is whether the lake in a relatively low state provides an optimal set of ecosystem services to fishermen, pastoralists, and farmers. Another is whether population growth and economic gains in the region may drive the lake's resources into unsustainability in the coming decades. The African Futures early-career scholar would engage with Viens and colleagues on all these research aspects, and would help coordinate work by undergraduate, MS, and Ph.D. students at MSU and other institutions.

The project's main analytical tool is computational Bayesian statistics, a form of supervised machine learning. It originates from an idea by the English vicar Thomas Bayes in the 18th century, but only in the last 20 years have modern computers become fast enough to handle the computations needed in most contexts. Any scientific scholar with mathematical training at the level of an undergraduate degree, and with some programming experience, will be capable of mastering the basic data science tools. This includes classical linear Bayesian hierarchical modeling, and its numerical implementation using the so-called Gibbs sampler, one of an array of so-called Markov-Chain Monte-Carlo techniques. At the same time, the Bayesian paradigm leaves open a number of theoretical questions, about statistical uncertainty quantification, which are relevant to Viens's Lake Chad project, and which would satisfy the desires of a mathematical scientist to dig deep into theory, if that is a desired direction.

The AAP priority areas covered by this project include: 1. Agri-food systems; 2. Water, energy and environment; 6. Nutrition and health. Other priority areas could also be included, if needed.

Beyond the computational data analysis and coordination work summarized above, the early-career researcher will also help Viens with writing publications as a co-author, composing grant applications, and will have opportunities to participate in other Africa-centric data-science activities.

Frederi G. Viens

Professor and Chair

Department of Statistics and Probability, Michigan State University
619 Red Cedar Rd., East Lansing, MI 48824
viens@msu.edu +1 (517) 353 3233
http://www.stt.msu.edu/~viens/

Education

Maîtrise de Mathématiques Pures	Université de Paris VII, France, Oct 1991
Master in Mathematics	University of California, Irvine, Dec 1991
Ph.D. in Mathematics	University of California, Irvine, June 1996

Previous and present positions

1997-2000. Assistant Professor (tenure track)	University of North Texas, Department of Mathematics.
2000-2003. Assistant Professor (tenure track)	Purdue University, Dept. Statistics, Dept. Mathematics.
2003-2008. Associate Professor (with tenure)	Purdue University, Dept. Statistics, Dept. Mathematics.
2008-2015. Professor (with tenure)	Purdue University, Dept. Statistics, Dept. Mathematics.
2015-2016. Program Director	National Science Foundation, Div. Mathematical Sciences.
2016-pres. Professor & Chair (with tenure)	Michigan State University, Dept. Statistics & Probability.
2017-pres. Interim Director	Michigan State University, BS in Actuarial Science
2018-pres. Interim Adjunct Director	Center for Statistical Training and Consulting (MSU)

Awards and honors

1992-1996	**National Defense Science and Engineering Graduate Fellow**, U.C. Irvine
1996	U.C. Irvine Connely Award for best Mathematics teaching assistant
1996	Honorary Fellow, University of Wisconsin, Probability Internship Program
1996-1997	**NSF International Opportunities Fellow**, Universitat de Barcelona, Spain
1997-2000	UNT Faculty Research Award Grants (Internal)
1998-1999	**NSF-NATO Postdoctoral Fellow**, Université de Paris VI, France
2001,05,06,08,10,11,14	Purdue Research Foundation International Travel Grants (Internal)
2002	Purdue Research Foundation Summer Faculty Grant (Internal)
2002,04,08,13	Purdue Research Foundation Graduate Research Assistantship (Internal)
2002-2006	**NSF Standard Grant** (Program in Probability), summer salary and travel
2004	**Fulbright Scholar**, Research and Lecturing grant, U. de Paris XIII, France
2006-2010	**NSF Standard Grant** (Program in Probability), salary, travel, grad support
2005,07,08,09,11,13	NSF Conference Grants (Proba, Applied Math), travel for speakers and students
2008	Purdue College of Science Graduate Student Mentoring Award
2008-2012	**NSERC Grant Selection Committee member**, Math and Stat, Canada
2009-2013	**NSF Standard Grant** (Program in Probability), salary, travel, consultants.
2010-2011	**Franklin Fellow**, U.S. Department of State, Washington DC, Science Adviser
2011-2012	**NSERC Grant Selection Committee Chair**, Pure Mathematics, Canada
2012	Purdue College of Science Team Award, for the Computational Finance Program
2013-2014	**MEC Competition,** Ministry of Education, Science and Technology, Chile
2013	Sigma Xi, The Scientific Research Society, member
2013	**Institute of Mathematical Statistics, Fellow**
2013	**Purdue College of Science Research Award**, inaugural year
2013	**Seminar on Stochastic Processes,** Scientific committee long-term member
2014-2015	Purdue Faculty Fellowship for Study in a Second Discipline (Agricultural Economics)
2014-2018	**NSF Standard Grant** (Program in Probability), salary, travel, consultants.
2017-present	**Seminar on Stochastic Processes,** Scientific committee moderator
2018-2021	**ONR Standard Grant (recommended for funding)**, salary, travel, grad support.

Research interests

Probability Theory and Stochastic Analysis:

Stochastic PDEs
Malliavin Calculus
Regularity of Random Fields
Fractional Brownian Motion
Stochastic Volatility
Monte-Carlo and particle methods
Nonlinear Stochastic Filtering
Products of Random Matrices
Stochastic control

Other Fields:

Quantitative Finance
Actuarial Science
Climate Science
Spin Glasses
Parameter estimation
Bayesian statistics
Time Series
Land use, food security
Hydrology
Nuclear physics
Human medicine

Professional membership

- *American Mathematical Society* (AMS)
- *Institute of Mathematical Statistics* (IMS)
- *Sigma Xi, the Scientific Research Society*

Teaching experience

Undergrad lower division: College algebra, Matrix algebra, Calculus, Business calculus, Probability, Statistics.

Undergrad upper division: Discrete mathematics, Linear Algebra, Intermediate probability and statistics, Real Analysis, Actuarial Models (life contingencies, loss models, Black-Scholes theory).

Graduate, MS / First year Ph.D. level: Probability theory, Mathematical Statistics, first course in Stochastic processes, Numerical methods for stochastic processes, Mathematics of finance, Advanced probability and financial options, with numerical methods.

Graduate, Advanced Ph.D. level: Stochastic PDEs, Lyapunov exponents, Fractional Brownian motion, Advanced course in Stochastic Processes, Stochastic Analysis, Malliavin Calculus.

Curriculum development

MSU programs in Actuarial Science and in Quantitative Risk Analytics: developer and Interim Director. Professional BS, mathematics, statistics, and computational training for the insurance industry.

New two-semester sequence: *Probability theory and mathematical statistics for non-Stat MS and Ph.D. students.*

New course: *Numerical Methods for Stochastic Processes*, with applications to problems in finance, filtering, and fluid dynamics, via particle methods.

New two-semester sequence: *Mathematics of Finance*, including the Stochastics of Option Pricing, Stochastic Interest rate models, American options, and their Numerical Methods.

New course: *Introduction to Investment Science*, an introduction to financial engineering for math and stat graduate students, covering CAPM theory, VaR, Mean-Variance Portfolio Management, Credit Risk, Volatility estimation...

Purdue Computational Finance Program: Developer and Director. Restructured the program, designing the MS requirements, coordinating courses in Math, Stat, Mgmt, IE, Econ, advising CF MS students in Math, Stat, Engineering, Econ, AgEcon, and organizing the **2000-2003 Computational Finance seminar.**

New course: *Stochastic Partial Differential Equations*, A Ph.D.-research-level course on the Infinite-Dimensional Stochastic Analysis approach to SPDEs, including Gaussian regularity theory, almost-sure Lyapunov exponents, and other topics.

New course: *Stochastic PDEs and Fractional Brownian Motion*, continuation of previous course, including a complete introduction to Skorohod and pathwise integration w.r.t. fractional Brownian noise.

New course contents: *Stochastic Processes*: use of the Textbook by Daniel Revuz and Marc Yor on martingales and stochastic calculus; incorporation of advanced elements of Gaussian theory, including Skorohod integration.

New course: *Stochastic Processes II:* Stochastic Differential Equations, Gaussian regularity theory, Malliavin Calculus, Skorohod Stochastic Integration.

New course: *Design and Analysis of Financial Algorithms*: a numerical analysis and programming course for CF MS students, including state-of-the-art quant. finance programming languages and algorithms.

New course: *Actuarial Science II:* incorporation of Black-Scholes theory into Actuarial Science preparatory course for exams MLC and MFE.

New course: *Malliavin Calculus I and II:* including fractional Brownian motion & financial math.

New course: *Malliavin Calculus and Stein's method*: the analysis of Nourdin and Peccati.

Administative experience

Associate Director, Computational Finance (CF) MS Program, Purdue University, 2000-2003.

Program restructuring, Design of CF MS requirements, Advising all students in CF MS program, Co-ordination of courses with Colleges of Engineeering and Business, Organizating CF seminar.

Director, Computational Finance (CF) MS Program, Purdue University, 2003-2016.

Design and update of CF MS requirements, Advising all CF MS students, Administering all CF MS oral exams, Co-ordination of courses with Colleges of Engineeering and Business, Organizing CF-related research conferences, Mentoring CF faculty.

Associate Director, Actuarial Science Undergraduate Program, Purdue University, 2007-2010.

Design of Society of Actuaries (SOA) MFE Exam preparatory course (Financial Economics), advising undergraduate majors in Actuarial Science, monitoring and aiding actuarial students in their internal and external scholarship applications, co-developing strategy on Purdue's bid for SOA Center of Actuarial Excellence.

Science Adviser / Franklin Fellow, Bureau of African Affairs, US Department of State, Washington DC, 2010-2011.

Formal administrative role: liaison between Africa Bureau and Bureau of Global Change (climate change). Informal administrative roles included: developing a network of State Department and other federal agency stakeholders with Africa- and Science/Technology-based portfolios; developing and covering the environment, sustainability, and energy portfolio for the Africa Bureau.

Co-Chair for Pure Mathematics, Mathematics and Statistics Evaluation Group, Discovery Grants Program, NSERC (Canada), 2011-2012.

Co-managed budget for the Evaluation Group, managed the evaluation of approx. 150 pure mathematics proposals, worked as liaison between evaluation group members and NSERC staff and leadership.

Member, Purdue University Council on global and policy engagement, 2012-2015.

Participated in development of new projects to increase Purdue University's faculty engagement in international activities and impact on policy-making.

Member, Purdue College of Science Faculty Committee on Diversity, 2013-2015.

Discussed data-based strategies for changing attitudes about diversity in the sciences, increasing diversity of pools of qualified undergraduate, graduate, and faculty applicants.

Program Director, National Science Foundation, Division of Mathematical Sciences, 2015-2016.

Main director for Probability Program; other responsibilities included: joint panels with applied math, computational math, math bio, CAREER, FRG, MSII, INFEWS.

Chair, Department of Statistics and Probability, Michigan State University, 2016-present.

Interim Director, BS Program in Actuarial Science and Quantitative Risk Analytics, Michigan State University, 2017-present.

Publications

1. Small-time asymptotics for Gaussian self-similar stochastic volatility models. *Appl. Math. Optimization* (2018). `https://doi.org/10.1007/s00245-018-9497-6` . With Archil Gulisashvili, Xin Zhang.

2. Extreme-Strike Asymptotics for General Gaussian Stochastic Volatility Models. To appear in *Annals of Finance* (2018), 38 pages. `https://arxiv.org/abs/1502.05442` . With Archil Gulisashvili, Xin Zhang.

3. On the linkages in U.S. public R&D spending, knowledge capital and agricultural productivity growth: A Bayesian approach. To appear, *American J. Agricultural Economics* (2018), 49 pages + 16-page appendix. With Uris Lantz C. Baldos, Thomas Hertel, and Keith Fuglie.

4. Optimal robust reinsurance-investment strategies for insurers with mean reversion and mispricing. *Insurance: Mathematics and Economics* **80** (2018), 93-109. With Ailing Gu, Haixiang Yao.

5. Parameter Estimation of Gaussian Stationary Processes using the Generalized Method of Moments. *Electronic Journal of Statistics*, **11** (2017) 401-439. With Luis A. Barboza.

6. Asymptotic behavior of the Anderson polymer in a fractional Brownian environment. *Journal of Theoretical Probability* (2017), 1-40. With Kamran Kalbasi and Thomas Mountford.

7. Optimal reinsurance and investment strategies for insurers with mispricing and model ambiguity. *Insurance: Mathematics and Economics*, **72** (2017), 235-249. With Ailing Gu, Bo Yi.

8. Parameter estimation for a partially observed Ornstein-Uhlenbeck process with long-memory noise. *Stochastics*, **89** (2017), 431-468. With Brahim El Onsy, Khalifa Es-Sebaiy.

9. Discussion on temperature reconstruction with sediment core data in Ilvonen et al. *Environmetrics*, **27** (7) (2016), 428-430. With L. Barboza, B. Li, M. Tingley.

10. A third-moment theorem and precise asymptotics for stationary Gaussian sequences. *Latin American Journal of Probability and Math. Stat*, **13** (2016), 239-264. With L. Neufcourt.

11. Hawkes Processes and Their Applications to High-Frequency Data Modeling. In: *Handbook of High-Frequency Trading and Modeling in Finance*, 2016, pp.183-219. With Baron Law.

12. White Noise Analysis for the Canonical Levy Process. *Communications on Stochastic Analysis*, **9** (4) (2015), 553-577. With R. Navarro.

13. Dynamic portfolio selection with mispricing and model ambiguity. *Annals of Finance*, **11** (1) (2015), pp 37-75, `http://dx.doi.org/10.1007/s10436-014-0252-y`. With B. Yi, B. Law, Z. Li.

14. Quadratic variations for the fractional-colored stochastic heat equation. *Elect. Journ. Probability*, **19** (2014), article no. 76, 1-51.With S. Torres, C.A. Tudor.

15. Robust optimal strategies for an insurer with reinsurance and investment under benchmark and mean-variance criteria. *Scandinavian Actuarial Journal*, **8** (2015), 725-751. With B. Yi, Z. Li., Y. Zeng. `http://dx.doi.org/10.1080/03461238.2014.883085`.

16. Comparison inequalities on Wiener space. *Stochastic Processes and their Applications* **124** (4) (2014), 1566-1581. With I. Nourdin, G. Peccati.

17. Robust Optimal Control for an Insurer with Reinsurance and Investment under Heston's Stochastic Volatility Model. *Insurance: Mathematics and Economics* **53** (2013) 601-614. With B. Yi, Z. Li, and Y. Zeng.

18. Reconstructing past climate from natural proxies and estimated climate forcings using short and long-memory models. *Annals of Applied Statistics*, **8** no. 4 (2014), 1966-2001. With L. Barboza, B. Li, and M. Tingley.

19. Gaussian and non-Gaussian processes of zero power variation. *ESAIM-PS (Euro J. Appl. Indus. Math. Prob. Stat.)*, **19** (2015) 414-439. `http://dx.doi.org/10.1051/ps/2014031`. With F. Russo.

20. Two-dimensional stochastic Navier-Stokes equation with fractional Brownian noise. *Random Operators and Stochastic Equations*, **21** no. 2 (2013), 135-159. With L. Fang, P. Sundar.

21. General upper and lower tail estimates using Malliavin calculus and Stein's equations. In *Seminar on Stochastic Analysis, Random Fields and Applications VII*, R.C. Dalang, M. Dozzi, F. Russo editors, Progress in Probability **67,** 55-84, 2013. With R. Eden.

22. Stochastic volatility models with long-memory in discrete and continuous time. *Quantitative Finance*, **12** no. 4 (2012), 635-649. With A. Chronopoulou.

23. Estimation and pricing under long-memory stochastic volatility. *Annals of Finance*, **8** no. 2-3 (2012) 379-403. With A. Chronopoulou.

24. Portfolio optimization with discrete proportional transaction costs under stochastic volatility. *Annals of Finance*, **8** no. 2-3 (2012), 405-425. With H.-Y. Kim.

25. Arbitrage-free models in markets with transaction costs. *Electronic Communications in Probability,* **16** (2011), 614-622. With H. Sayit.

26. Self-similarity parameter estimation and reproduction property for non-Gaussian Hermite processes. *Communications on Stochastic Analysis*, **5** no. 1 (2011) 161-185. With A. Chronopoulou and C. Tudor.

27. Option pricing under a Gamma-modulated diffusion process. *Annals of Finance*, **7** no. 2 (2011), 199-219. With P. Iglesias, J. San Martín, S. Torres.

28. Stokes formula on the Wiener space and n-dimensional Nourdin-Peccati analysis. *Journal of Functional Analysis*, **258** no. 5 (2010), 1763-1783. With H. Airault and P. Malliavin.

29. Hurst Index Estimation for Self-similar processes with Long-Memory. *Recent Advances in Stochastic Dynamics and Stochastic Analysis*, J. Duan, S. Luo and C. Wang, editors, World Scientific, 2009; 85-112. With A. Chronopoulou.

30. Mutual fund performance: false discoveries, bias, and power. *Annals of Finance*, **7** no. 2 (2011), 137-169. With N. Tuzov.

31. Application of Malliavin calculus to long-memory parameter estimation for non-Gaussian processes. *Comptes Rendus - Mathématique*, **347**, no. 11-12 (2009), 663-666. With A. Chronopoulou and C. Tudor.

32. Variations and Hurst index estimation for a Rosenblatt process using longer filters. *Electronic Journal of Statistics*, **3** (2009), 1393-1435. With A. Chronopoulou and C. Tudor.

33. Variations and estimators for selfsimilarity parameters through Malliavin calculus. *Annals of Probability*, **37**, no. 6 (2009), 2093-2134. With C. Tudor.

34. Density estimates and concentration inequalities with Malliavin calculus. *Electronic Journal of Probability* **14** (2009), 2287-2309. With I. Nourdin.

35. Stein's lemma, Malliavin calculus, and tail bounds, with application to polymer fluctuation exponent. *Stoch. Processes Appl.* **119** (2009), 3671-3698.

36. Estimators for the long-memory parameter in LARCH models, and fractional Brownian. *Statistical Inference for Stochastic Processes*, **12** no. 3 (2009) 221-250. With M. Levine and S. Torres.

37. The fractional stochastic heat equation on the circle: Time regularity and potential theory. *Stochastic Processes and Applications*, **119** (2009), 1505-1540. With E. Nualart.

38. Variations of the fractional Brownian motion via Malliavin calculus. 2008, 13 pages. To appear in *Australian Journal of Mathematical Analysis*. With C. Tudor.

39. Sharp Estimation of the Almost Sure Asymptotic Behavior for a Brownian Polymer in a Fractional Brownian Environment. *Journal of Functional Analysis*, 2**55** no. 10 (2008), 2810-2860. With T. Zhang.

40. Lyapunov exponents for stochastic Anderson models with non-Gaussian noise. *Stochastics and Dynamics*, **8** no. 3 (2008) 451-473. With H.-Y. Kim and A. Vizcarra.

41. Sharp asymptotics for the partition function of some continuous-time directed polymers. *Potential Analysis*, **29** no. 2 (2008) 129-166. With A. Cadel, S. Tindel.

42. Stochastic volatility: option pricing using a multinomial recombining tree. *Applied Mathematical Finance*, **15** no. 2 (2008) 151-181. With I. Florescu.

43. Superdiffusivity for a Brownian polymer in a continuous Gaussian environment. *Annals of Probability*, **36** no. 5 (2008) 1642-1675. With S. Bézerra, S. Tindel.

44. Some applications of the Malliavin calculus to sub-Gaussian and non-sub-Gaussian random fields. *Seminar on Stochastic Analysis, Random Fields and Applications*, Progress in Probability **59**, 363-396, Birkhäuser, 2008. With A.B. Vizcarra.

45. Supremum Concentration Inequality and Modulus of Continuity for Sub-nth Chaos Processes. *Journal of Functional Analysis* **248** (2007) 1-26. With A.B. Vizcarra.

46. Portfolio optimization with consumption in a fractional Black-Scholes market. *Communications on Stochastic Analysis*, **1** no. 3 (2007) 357-379. With Y. Sarol, T. Zhang.

47. Space regularity of stochastic heat equations driven by irregular Gaussian processes. *Communications on Stochastic Analysis* **1** no. 2 (2007) 209-229. With O. Mocioalca.

48. Statistical aspects of the fractional stochastic calculus. *Annals of Statistics,* Vol. **35** no. 3 (2007), 1183–1212. With C.A. Tudor.

49. Ito formula for the two-parameter fractional Brownian motion using the extended divergence operator. *Stochastics, An International Journal of Probability & Stochastic Processes.* **78** (6) (2006), 443-462. With C.A. Tudor.

50. Selection of an Optimal Portfolio with Stochastic Volatility and Discrete Observations. *Transactions of the Wessex Institute on Modelling and Simulation*, **43** (2006), 371-380. With N. Batalova, V. Maroussov.

51. Sharp estimation for the almost-sure Lyapunov exponent of the Anderson model in continuous space. *Probab. Theory and Related Fields*, **135** no. 4 (2006), 603-644. With I. Florescu.

52. Time regularity of the evolution solution to the fractional stochastic heat equation. *Discrete and Continuous Dynamical Systems B*, **6** (2006) no. 4, 895-910. With Y. Sarol.

53. A Binomial Tree Approach to Stochastic Volatility Driven Model of the Stock Price. *Annals of the University of Craiova, Mathematics and Computer Science Series*, **32** (2005), 126-142. With I. Florescu.

54. Relating the almost-sure Lyapunov exponent of a parabolic SPDE and its coefficients' spatial regularity. *Potential Analysis*, **22** (2005) no. 2, 101-125. With S. Tindel.

55. Skorohod integration and stochastic calculus beyond the fractional Brownian scale (2004). *Journal of Functional Analysis,* **222** (2004) no. 2, 385-434. With O. Mocioalca.

56. Sharp Gaussian regularity on the circle, and applications to the fractional stochastic heat equation. *J. Funct. Analysis*, **217** (2004) no. 2, 280-313. With S. Tindel and C.A Tudor.

57. Convergence of a branching particle system to the solution of a parabolic Stochastic PDE. *Rand. Operators Stoch. Eqs.* **12** (2004), no. 2, 129–144. With S. Tindel.

58. Itō formula and the local time for the fractional Brownian sheet. *Electronic Journal of Probability,* **8** (2003) no. 14, 1-31. With C.A. Tudor.

59. A Monte-Carlo method for portfolio optimization under partially observed stochastic volatility. *IEEE International Conference on Computational Intelligence for Financial Engineering, 2003. Proceedings* (2003), 257 - 263. With R. Desai and T. Lele.

60. Stochastic Evolution Equations with Fractional Brownian Motion. *Probability Theory and Related Fields* **127** (2003), no. 2, 186–204. With S. Tindel., C.A. Tudor.

61. Portfolio optimization under partially observed stochastic volatility. *COMCON 8. The 8th International Conference on Advances in Communication and Control. W. Wells, Ed.* 1-12. Optim. Soft., Inc, Pub. Div., 2002.

62. Almost sure exponential behavior for a parabolic SPDE on a manifold. *Stochastic Processes and Applications* **100** (2002), no. 1-2, 53-74. With S. Tindel.

63. Regularity conditions for the stochastic heat equation on some Lie groups. *Seminar on Stochastic Analysis, Random Fields and Applications III, Centro Stefano Franscini, Ascona, September 1999.* Progress in Probability, **52** Birkhäuser (2002), 275-297. With S. Tindel.

64. Towards pathwise stochastic fast dynamo in magneto-hydrodynamics. *Fields Institute Communications* **34** (2002), 75-89. With S.B. Hazra.

65. Stochastic heat equation with white noise drift. *Annales de l'Institut Henri Poincaré Probab. Statist.* **36** (2000), no. 2, 181–218. With E. Alòs, D. Nualart.

66. Evolution equation of a stochastic semigroup with white-noise drift. *Ann. Probab.* **28** (2000), no. 1, 36–73. With D. Nualart.

67. On space-time regularity for the stochastic heat equations on Lie groups. *J. Funct. Analysis* **169** (1999), no. 2, 559–603. With S. Tindel.

68. Robustness of Zakai's equation via Feynman-Kac representations. *Stochastic analysis, control, optimization and applications,* 339–352, Systems Control Found. Appl., Birkhäuser Boston, Boston, MA, 1999. With R. Atar, O. Zeitouni.

69. Almost-sure exponential behavior of a stochastic Anderson model with continuous space parameter. *Stochastics & Stochastics Reports.* **64** (1998) 251-273. With R. Carmona.

70. Sharp upper bound on exponential behavior of a stochastic partial differential equation. *Random Operators and Stochastic Equations*, **4** no. 1 (1996) 43-49. With R. Carmona, S. Molchanov.

Preprints and submitted papers

71. Bayesian approach to model-based extrapolation of nuclear observables. *Preprint, submitted*, 18 pages, 2018. With L Neufcourt, Y Cao, W Nazarewicz. `https://arxiv.org/abs/1806.00552`

71. Optimal rates for parameter estimation of stationary Gaussian processes. Preprint, revision submitted to *Stochastic Processes and their Applications*, 49 pages, 2018. With Khalifa Es-Sebaiy. `https://arxiv.org/abs/1603.04542`

72. A Martingale Approach for Fractional Brownian Motions and Related Path Dependent PDEs. *Preprint, submitted*, 43 pages, 2017. With Jianfeng Zhang. `https://arxiv.org/abs/1712.03637` .

73. Berry-Esséen bounds for parameter estimation of general Gaussian processes. *Preprint, submitted*, 35 pages, 2017. With Soukaina Douissi, Khalifa Es-Sebaiy. `https://arxiv.org/abs/1706.02420`

74. Donsker-type theorem for fractional Poisson process, and application to ARCH models. *Preprint, submitted*, 30 pages, 2018. With Héctor Araya, Natalia Bahamonde, Soledad Torres.

75. Risk, Agricultural Production, and Weather Index Insurance in Village South Asia. *Preprint, submitted*, 34 pages, 2017. With Jeffrey D. Michler and Gerald Shively.

76. Hitting probabilities for general Gaussian processes, *Preprint*, 2014, 34 pages. With E. Nualart. `http://arxiv.org/pdf/1305.1758`

77. A localized version of the Sherrington-Kirkpatrick model with external field. *Preprint*, 2004. With S. Tindel.

78. Precise propagation of chaos estimates for Feynman-Kac and genealogical particle models. *Preprint*, 2003. With P. del Moral and L. Miclo.

Books, edited research volumes, and special issues

1. **Editor** for *Handbook of High-Frequency Trading and Modeling in Finance*, with I. Florescu, M.C. Mariani, H.E. Stanley. Book contains 12 refereed research articles, 435 pages, Wiley, 2016.

2. **Author** for *Mathématiques pour les sciences de la vie*. Textbook aimed at first-year college science students. With Claire David, Sami Mustafa, Nathalie Capron. 525 pages, Dunod, Paris, Aug 2014.

3. **Editor** for *Malliavin Calculus and Stochastic Analysis: a Festschrift in Honor of David Nualart*, with J. Feng, E. Nualart, Y. Hu. Book contains 25 refereed research articles, 600 pages, published by Springer V., N.Y., Feb 2013.

4. **Guest Editor** for "Modeling High-frequency data" with E.H. Stanley, M.C. Mariani, I. Florescu, a special issue published in *Quantitative Finance*, 2012. Contains 12 refereed research articles, 250 pp.

5. **Guest Editor** for "Stochastic Volatility", a special issue published in *Annals of Finance*, Vol. 8, no. 2-3, May 2012. Contains 11 refereed research articles, 275 pages.

6. **Editor** for *Handbook of Modeling High-frequency Data in Finance*, with I. Florescu and M.C. Mariani. Book contains 15 refereed research articles, 450 pages, Wiley, Dec 2011.

7. **Editor** for "A Special Issue on Gaussian Processes: Analysis and Inference", with F. Baudoin, C. Lacaux, I. Nourdin, published in *Communications on Stochastic Analysis*, Vol. 5, no. 1, March 2011. Contains 12 refereed research articles, 245 pages.

Invited professional visits

1. Universidad de Valparaíso, Chile, Centro CIMFAV, 2 months in summer 2014. *Research.*
2. University of Paris VI, France, Laboratoire de Probabilités et Modèles aléatoires. July-Dec 2013. *Research, lecturing.*
3. Universitat Pompeu Fabra, Barcelona Business School, Spain, June 20-22 and Nov 14-16, 2013.
4. Universidad de Valparaíso, Chile, Centro CIMFAV, 2 months in summer 2013. *Research*
5. Wroclaw University of Technology, Wroclaw, Poland, June 28 - July 2, 2012. *Research, outreach.*
6. Centre interfacultaire Bernoulli, EPFL, Switzerland, May 22-26, 2012. *Research.*
7. Faculté des Sciences Université Cadi Ayyad - Marrakech, Morocco, July 4, 2011. *Research, outreach.*
8. Universidad de Valparaíso, Chile, October 2010. *Research, consulting for the development of a Ph.D. program.*
9. University of Paris I Panthéon-Sorbonne, Laboratoire de Statistique Appliquée et Modélisation Stochastique. June 2009. *Research.*
10. University of Paris VI, France, Laboratoire de Probabilités, February-July 2008. *Research.*
11. University of Paris XIII, Lab. d'Analyse, Géométrie, et Applications. May 2007. *Research.*
12. University of Paris I Panthéon-Sorbonne, Laboratoire de Statistique Appliquée et Modélisation Stochastique. June 2007. *Research.*
13. University of Valparaíso, Chile, Department of Statistics and centro CIMFAV, 4 months, May-August 2006. *Research and lecturing.*
14. University of Utah, Department of Mathematics, 1 week, April 2006. *Research.*
15. University of Paris XIII, France, Lab. d'Analyse, Géométrie, et Applications, 1 month, June-July 2005. *Research.*
16. University of Paris VI, France, Laboratoire de Probabilités, 1 month, May-June 2005. *Research.*
17. University of Paris XIII, France, Lab. d'Analyse, Géométrie, et Applications, 5 months, March-July 2004. *Research and lecturing.*
18. University of Valparaíso, Chile, Department of Statistics, 3 weeks, March 2003. *Research.*
19. University of Paris VI, France, Laboratoire de Probabilités, 1 month every summer from 2000 to 2004. *Research, unpaid (office space and computing privileges).*
20. University of Paris VI, France, Laboratoire de Probabilités, 12 months, 1998-99. *Research (NSF-NATO postdoc).*
21. University of Edinburgh, Scotland, Department of Mathematics, 3 weeks, April 1997. *Spring School on SPDEs.*
22. The Technion, Haifa, Israel, Department of Electrical Engineering, 4 weeks, March 1997. *Research.*
23. University of Barcelona, Spain, Department of Statistics, 12 months, 1996-97. *Research (NSF postdoc).*

Lectures

Invited conference lectures

1. American Mathematical Society Central Sectional Meeting, Ann Arbor, MI, Oct 20-21, 2018.
2. Stochastic Analysis Workshop (Banff Int'l Rsch Station), Oaxaca, Mexico, tentative, Sep 9-14, 2018.
3. Cropping systems conference "Corn in Context", Ames, IA, July 24-25, 2018.
4. Symposium on Optimal Stopping, Rice University, Houston, TX, June 25-29, 2018.
5. Southern Regional Council on Statistics, Research Conference, Virginia Beach, VA, June 4-5, 2018.
6. 8th Int'l Workshop on High-Dimensional Data Analysis, Marrakech, Morocco, April 9-13, 2018.
7. Information and Statistics in Nuclear Experiment and Theory 5th ed., York, UK, Nov 6-9, 2017.
8. Mathematical Congress of the Americas, Session on Probability, Montreal, Canada, July 24-27, 2017.
9. Conference on Probability, Partial Differential Equations, and Financial Mathematics: plenary talk. Rutgers University, New Brunswick, NJ, May 17-19, 2017.
10. SIAM conference on Financial Mathematics and Engineering, Invited session on Algorithmic and High-Frequency Trading, Austin, TX, November 17-19, 2016.
11. Workshop on Modeling Food Systems, Oxford University, UK, July 18-21, 2016.
12. Special session on high-frequency data, Annual Meeting of the Statistical Society of Canada: Brock University in St Catherines, ON, May 29-June 1, 2016,
13. Marrakech International Conference on Probability and Statistics: plenary presentation, Université Cadi Ayyad, Marrakech, Morocco, April 25-28, 2016.
14. European Meeting of Statistics, Session on "Integration by parts formulas and convergence in total variation distance", Amsterdam, July 6-10, 2015.
15. Workshop on New Directions in Stein's Method, Institute of Mathematical Science, National University of Singapore, Singapore, May 18-29, 2015.
16. Workshop on Multiscale modeling of the food system, The American Institute of Mathematics, San José, CA, April 27-30, 2015.
17. 23rd Congress of Mathematics "Capricornio COMCA", Copiapó, Chile, Aug 6 - 9, 2014.
18. Stochastic Processes and Applications (Special session on New developments in Malliavin calculus). Universidad de Buenos Aires, Argentina, July 28 - Aug 1, 2014.
19. Workshop on Financial Engineering and Risk Management – Computational Finance: invited lecture, Sun Yat-sen University, Guangzhou, China, July 24 - 28, 2014.
20. Workshop on Financial Engineering and Risk Management – Computational Finance: 3 hour invited minicourse, Sun Yat-sen University, Guangzhou, China, July 24 - 28, 2014.
21. Barcelona Graduate School of Economics Summer Forum, Session on "Statistics, jump processes and Malliavin calculus: recent applications", U. Pompeu Fabra, Barcelona, Spain, June 25-27, 2014.
22. NSF/CBMS Conference on Stochastic PDEs, Michigan State U., Aug 19-23, 2013.
23. 6th CI2MA Focus Seminar on "Stochastic Modeling and Numerical Analysis", Universidad de Concepción, Chile, Aug 8, 2013.
24. 22nd Congress of Mathematics "Capricornio COMCA", La Serena, Chile, Jul 31 - Aug 2, 2013.

25. Conference on "High-frequency data and high-frequency trading", U. of Chicago, May 16-18, 2013.
26. CIMPA school on Statistical methods and applications in finance and insurance, Principal lecturer, College of Science and Technology, Univ. Cadi Ayyad, Marrakech, Morocco, April 8-20, 2013.
27. Seminar on Stochastic Processes, Plenary speaker, Duke U., Durham, NC, March 14-16, 2013.
28. 6th European Congress of Mathematics, Minisymposium on "Stochastic Models in Biosciences and Climatology", Krakow, Poland, July 2-7, 2012.
29. Conference on "Stochastic Analysis and Stochastic Partial Differential Equations", Banff International Research Station, Banff, Canada, April 1-6, 2012.
30. 12th Latin American Congress of Probability and Mathematical Statistics (XII CLAPEM), Plenary address, Viña del Mar, Chile, March 26-30, 2012.
31. 5th CSDA International Conference on Computational and Financial Econometrics, Session on "Volatility estimation and forecasting", University of London, UK, Dec 17-19, 2011.
32. Premières Journées de Probabilités et Statistique, Ecole Nationale des Sciences Appliquées, Plenary address, Marrakech, Morocco, December 15-17, 2011.
33. 3rd Africa Carbon Forum, Workshop on "Prioritizing mitigation actions through low carbon development planning", Marrakech, Morocco, July 4-6, 2011.
34. 7th Seminar on Stochastic Analysis, Random Fields, and Applications, Ascona, Switzerland, May 23-27, 2011.
35. AMS Western Section Meeting, Special Session on Recent Developments in Stochastic Partial Differential Equations, Las Vegas, NV, April 30 – May 1, 2011.
36. Diversity in Mathematics Conference, African Institute of Mathematical Sciences (AIMS), Cape Town, South Africa, July 14-17, 2010.
37. Journée Calcul de Malliavin. Université de Paris 6. June 15, 2010.
38. AMS Western Section Meeting, Special Session on Financial Mathematics, Principal Speaker, Albuquerque NM, April 17-18, 2010.
39. Workshop on Stochastic PDEs. Isaac Newton Institute, Cambridge University, Jan 4-8, 2010.
40. Conference on modeling high-frequency data in finance. Stevens Institute of Technology, Hoboken NJ, July 9-11, 2009.
41. Second Winter School on Applied Mathematics. City University of Hong Kong. December 9-20, 2008. Principal Lecturer, series of 10 lectures: "Elements of Stochastic and Malliavin Calculus, and Applications".
42. AMS Southern Section Meeting in Huntsville, AL (Gaussian Analysis and Stochastic Partial Differential Equations). October 25-26, 2008.
43. Workshop on Differential equations driven by fractional Brownian motion as random dynamical systems, Banff International Research Station, Canada, Sep 28 - Oct 5, 2008.
44. Malliavin Calculus and Applications. Kent State University, OH. July 7-12, 2008. Talk on July 11.
45. Malliavin Calculus and Applications. Kent State University, OH. July 7-12, 2008. Talk on July 10.
46. International Conference on Stochastic Analysis: from Mathematical Physics to Mathematical Finance. Princeton, NJ. June 13-15, 2008.
47. Conference "Journées Fractionnaires Parisiennes". University of Paris 6. June 9-10, 2008.

48. AMS Western sectional meeting in Albuquerque, New Mexico (Special Session on Financial Mathematics: The Mathematics of Financial Markets and Structures, Principal Speaker). Oct 13-14, 2007.

49. Stochastic Processes and Applications (Special Session on Stochastic Equations). University of Illinois, Aug 6-10, 2007.

50. Stochastic Processes and Applications (Special session on Stochastic Partial Differential Equations and Gaussian Analysis). University of Illinois, Aug 6-10, 2007.

51. Stochastic Processes and Applications (Special Session on Random Media). University of Illinois, Aug 6-10, 2007.

52. Conférence Dynamique Stochastique. University of Paris Panthéon-Sorbonne, June 11-12, 2007.

53. AMS Central sectional meeting in Cincinnati, Ohio (Special Session on Financial and Actuarial Mathematics), Oct 21-22, 2006.

54. AMS Western sectional meeting in Salt Lake City, Utah (Special Session on Interface of Stochastic PDEs and Gaussian Analysis), Oct 7-8, 2006.

55. Invited Mini-course on Malliavin Calculus (Principal Speaker) at the Winter School on Stochastic Analysis and Applications of the Universidad de Valparaíso, Chile, July 3-7, 2006.

56. Fifth Seminar on Stochastic Analysis, Random Fields and Applications, Principal Speaker, Ascona, Switzerland. May 30-June 3, 2005.

57. Conference on Particle and Monte Carlo Methods. University of Barcelona, July 24-25, 2004.

58. Journée "Analyse stochastique des phénomènes irréguliers". Universite de Paris 13, March 10th 2004.

59. Fourth International Symposium on Probability and its Applications, Banff, Alberta, Canada. July 31 - Aug 2, 2002. Session on Computational Methods in Finance.

60. Filtering Theory and Applications 2002, Edmonton and Jasper, Alberta, Canada. July 25-29, 2002.

61. Annual AMS meeting, San Diego, CA, Jan 6-9, 2002. Special session on partial Differential Equations and Applications.

62. Southern California Probability Symposium, Irvine, CA Nov 10-11, 2001. Theme: Stochastic Analysis and Mathematical Finance.

63. Eigth International Conference on Communications and Control, Rithymna, Crete, Grece, June 25-30, 2001. Special Session on Financial Mathematics.

64. Annual AMS meeting, New Orleans, LA, Jan 10-13 2001. Special session on Stochastic Analysis and Applications.

65. Western Regional AMS conference, San Francisco, CA, Oct 22, 2000. Special session on Probability with emphasis on Markov Chains and Random Matrices.

66. Workshop on stochastic Navier-Stokes equations, Universitat de Barcelona, Spain, July 3-7, 2000.

67. Stochastic Analysis, Random Fields and Applications, Ascona, Switzerland, Sept 20-24, 1999.

68. Workshop on Numerics and Stochastic, Fields Institute, Toronto, ON, Apr 20-24, 1999.

Contributed conference talks

1. 5th Congress of the Bernoulli Society, Guanajuato, Mexico, May 15-20, 2000.
2. Annual AMS Meeting, Jan 14-17, San Antonio, TX, 1999.
3. Stochastic Analysis and its Applications, May 25-30, IHP Paris, 1998.
4. Annual AMS Meeting, Jan 6-10, Baltimore, MD, 1998.
5. Infinite Dimensional Workshop, Nov 3-7, 1997, MSRI, Berkeley, CA.
6. Ecole d'Eté de Probabilités de Saint-Flour, France, July 7-23, 1997
7. Stochastic Analysis and its Applications, June 30-July 4, Univ. Barcelona, Spain, 1997.
8. Lyapunov exponents, U. Bremen, Germany. April 21-25, 1997. (Poster).
9. Stochastic PDEs and Applications - IV, CIRM, Trento, Italy. Jan 6-11, 1997. (Poster).
10. Workshop on Stochastic PDEs and Applications, Jan 3-7, 1996. USC, Los Angeles, CA
11. Ecole d'Eté de Probabilités de Saint-Flour, France, July 10-26, 1995.

Invited seminar lectures

1. University of Michigan, Statistics Colloquium, Ann Arbor, MI, Nov 30, 2018.
2. University of Southern California, Probability Seminar, Los Angeles, CA, Nov 27, 2017.
3. Rice University, Statistics Colloquium, Houston, TX, Oct 1, 2017.
4. University of Washington, Probability Seminar, Seattle, WA, April 24, 2017.
5. Andrews University, Pi Mu Epsilon Lecture, Mathematics dept, Berrien Springs, MI, Feb 24, 2017.
6. Michigan State University, Facility for Rare Isotope Beams, East Lansing, MI, Feb 22, 2017.
7. University of Windsor, Statistics Colloquium, Windsor, ON, Canada, Oct 27, 2016.
8. University of Southern California, Probability Seminar, Los Angeles, CA, Sep 18, 2015.
9. U.S. Department of Agriculture, Economic Research Seervice, Washington, DC, May 28, 2015.
10. University of Southern California, Mathematical Finance Colloquium, Los Angeles, CA, May 4, 2015.
11. Columbia University, Mathematical Finance Seminar, Dept. Statistics, New York, NY, Apr 16, 2015.
12. Univ. Michigan, Financial Mathematics Seminar, Dept. Mathematics, Ann Arbor, MI, Mar 25, 2015.
13. Carnegie Mellon University, Center for Probability and Computational Finance Seminar, Pittsburgh, PA, Feb 16, 2015.
14. U. Illinois at Urbana-Champaign, Department of Statistics Colloquium, Urbana, IL, October 2, 2014.
15. Universidad Católica de Valparaíso, Departamento de Estadística, graduate lecture on statistics and climate change, Valparaíso, Chile, Aug 19, 2014.
16. Sun Yat-sen University, Colloquium, School of Mathematics and Computational Science, Guangzhou, China, July 25, 2014
17. Sun Yat-sen Business School, Financial Engineering Seminar, Guangzhou, China, July 21, 2014.
18. University of Southern California, Mathematical Finance Colloquium, Los Angeles, CA, May 5, 2014.

19. U. Paris Est, Marne-la-Vallée, Groupe de travail modélisation stochastique et finance, Dec 13, 2013.
20. University of Paris 6, Probability Seminar, Dec 3, 2013.
21. Bloomberg LLP, Quantitative Finance Research Group, Oct 23, 2014.
22. University of Nancy, France, Probability Seminar, June 27, 2013.
23. Université de Paris 6, Séminaire de Maths Financières, June 6, 2013.
24. Princeton University, Center for Applied and Computational Mathematics, and Department of Operations Research and Financial Engineering, Joint Colloquium, Apr 1, 2013.
25. Johns Hopkins University, Dept. Applied Math. and Stat., Colloquium, Baltimore, MD, Feb 12, 2013.
26. Georgia Institute of Technology, Seminar on Financial Mathematics, Atlanta, GA, Sep 19, 2012.
27. Wroclaw University of Technology, Wroclaw, Poland, Mathematics colloquium (3 lectures), June 28, 29, and July 2, 2012.
28. U. de Barcelona & U. Autònoma de Barcelona, Spain, Probability seminar, May 30, 2012.
29. Université de Paris 6, Séminaire de Probabilités, May 15, 2012.
30. Columbia University, New York, NY, Risk Seminar, Dec 7, 2011.
31. City University of New York, Graduate Center, Probability Seminar, Dec 6, 2011.
32. Worcester Polytechnic Institute, Worcester, MA, Mathematics Departmental Colloquium, Nov 3, 2011.
33. Rutgers University, Mathematical Finance and Probability Seminar, Oct 11, 2011.
34. University of Luxembourg, Luxemburg, Probability Seminar, June 9, 2011.
35. University of Nancy, France, Probability Seminar, June 7, 2011.
36. Pennsylvania State University, Probability Seminar, April 15, 2011
37. University of Delaware, Probability Seminar, March 11, 2011.
38. University of Maryland at College Park, Probability Seminar, December 1, 2010.
39. Midlands State University, Gweru, Zimbabwe, University Public Lecture, August 20, 2010.
40. University of Namibia, Windhoek, Namibia, Mathematics department colloquium, July 21, 2010.
41. University of Texas at El Paso, Mathematics Department Colloquium, April 16, 2010.
42. University of Maryland at College Park, Probability Seminar, June 23, 2009.
43. Université Paris Panthéon-Sorbonne, Séminaire de probabilités, June 12, 2009.
44. Michigan State University, Statistics and Probability Colloquium, April 10, 2009.
45. Université de Rennes, Séminaire de Probabilités, June 2, 2008.
46. Université de Paris 6, Séminaire de Probabilités, March 11, 2008.
47. Université de Paris 13, Séminaire de Probabilités, March 5, 2008.
48. Université Paris Panthéon-Sorbonne, Séminaire de Probabilités, June 15, 2007.
49. Université de Paris 13, Séminaire de Probabilités. June 6, 2007.
50. Université de Paris 6, Groupe de travail Aspects Fractals, May 23, 2007.

51. Universidad Católica de Chile, Santiago. June 20, 2006. Seminario de Análisis Estocástico y Fisica Matemática.
52. U. Valparaíso, Chile, Centro de Investigaciones y Modelamiento Fenómenos Aleatorio. May 30, 2006.
53. University of Utah, Salt Lake City, Probability Seminar, April 7, 2006.
54. Kent State University, Mathematical Sciences Colloquium, March 24, 2006.
55. University of Wisconsin, Madison, Mathematics Colloquium, Feb 10, 2006.
56. University of Wisconsin, Madison, Probability Seminar, Feb 9, 2006.
57. University of Texas, Austin, Seminar in Financial Mathematics, Oct 28, 2005.
58. Indiana University, Probability and Statistics Seminar, Oct 21, 2005.
59. Institut Elie Cartan, Univ. Nancy I, France. Séminaire de Probabilités, June 27, 2005.
60. Université de Paris 13, Séminaire de Probabilités, June 29, 2005.
61. Université Paris Panthéon-Sorbonne, Matinée de Calcul Stochastique, June 17, 2005.
62. University of Utah, Salt Lake City, Probability Seminar, March 4, 2005.
63. Institut Elie Cartan, University de Nancy 1, Groupe de travail Brownien fractionnaire, April 30, 2004.
64. Laboratoire de Statistique et Probabilites, U. Toulouse, Séminaire de probas/stats. May 29, 2004.
65. Université de Paris 13, Séminaire de Probabilités, June 5, 2002.
66. Université de Bretagne Occidentale, Séminaire de Mathématiques, June 4, 2002
67. Université de Paris 6, Séminaire de Probabilités, May 28, 2002.
68. University of Illinois, Urbana-Champaign, Probability Seminar, Sep 11, 2001.
69. Texas A & M University, College Station, Undergraduate Seminar, Oct 4, 2000.
70. North Carolina State University, Probability seminar, Sep 11, 2000.
71. Texas A & M University, Commerce, Probability seminar, Nov 10, 1999.
72. Université de Paris VI, "Milieux Aléatoires", June 15, 1999.
73. University of California, Irvine, Probability seminar, Apr 26, 1999.
74. Ecole Polytechnique, Paris, Probability seminar, May 19, 1998.
75. Université de Paris VI, "Modélisation Stochastique", Mar 31, 1998.
76. Université de Paris VI, "Etude fine du Mouvement Brownien", Mar 20, 1998.
77. Ecole Nationale Supérieure des Télécommunications, Paris, Mar 10, 1998.
78. Université de Paris XIII, Probability seminar, Feb 24, 1998
79. Universite de Paris X, Probability seminar, Feb 7, 1998.
80. Technion, Haifa, Israel, Probability seminar, Mar 15, 1997.
81. Université de Marseille, France, Probability seminar, Feb 1, 1997.

Outreach and Engagement

- Introductory lecture on Bayesian uncertainty quantification in climatology, agricultural economics, and astrostatistics; Andrews University, Berrien Springs, MI, Feb 24, 2017.
- Presentation to early-career researchers on strategies for publishing high-impact papers, Wiley Author Workshop, Joint Mathematics Meetings, Atlanta, GA, Jan 20, 2017.
- Non-technical lecture at Colegio Saint-Dominic, Viña del Mar, on professional opportunities in probability and statistics for high-school juniors and seniors, Valparaíso province, Chile, Aug 18, 2014.
- Two non-technical lectures in the conference series "Horizon Sciences" at the University of Paris 6, France, for first-year college students in Math, CS, Physics, and Engineering: Oct 15, 2013.
  - Les statistiques Bayesiennes et le changement climatique;
  - L'analyse stochastique et les marchés financiers mondiaux.
- Invitation by City of Wroclaw, Poland, to speak in "Visiting Professors" series on two outreach topics:
  - address a group of high-school and undergraduate students on professional opportunities in mathematics and statistics. Wroclaw University of Technology, Poland, June 29, 2012.
  - public lecture on newly developed economies' foreign assistance strategies for the developing world, Wroclaw University of Technology, Poland, July 2, 2012.
- Pan-African Center for Mathematics, nomination to its Advisory Board on March 29, 2012. This center opened its doors in Dar-es-Salaam, Tanzania, in 2013, to graduate students in Mathematics (MS and Ph.D.) from across the African continent.
- Mentor for undergraduate and graduate students ("Scholars") in the National Mathematics Alliance, starting in Fall 2011.
- Collaboration on uncertainty quantification in renewable energy projects in the Kingdom of Morocco, with a focus on Concentrated Solar Power (CSP), wind mapping, and electricity storage. Interacting with the Université Cadi Ayyad, Morocco's Royal Academy of Science and Technology, and the World Bank. Started in July 2011, ongoing project.
- Mathematics tutor for a high-school senior, Pacers Academy (for teens in challenging social situations), Indianapolis, IN, Fall 2011 (25 hours).
- Science Adviser (Franklin Fellow), Department of State, Bureau of African Affairs, Office of Economic Policy (Washington, DC), working on climate change, energy, and environmental diplomacy, 2010-2011 (one year).
- Meeting with University Administrators and Science and Agriculture faculty on development strategy, Midlands State University, Gweru, Zimbabwe, August 20, 2010.
- Meeting with Science faculty on development strategy, University of Namibia, Windhoek, Namibia, July 20, 2010.
- Participation in the Discussion Panel "Statistics in a variety of forms", at the Diversity in Mathematics conference in Cape Town, South Africa, July 17, 2010.
- High-School Science Fair judge: annual International School of Indiana Science Fair, Feb 23, 2009: judged 6th, 7th, and 8th graders science projects; spoke with students in English, Spanish, and French.
- High-School Science Fair judge: annual International School of Indiana Science Fair, Feb 17, 2007: judged 6th, 7th, and 8th graders science projects; spoke with students in English, Spanish, and French.
- Service to community / medical research: free consulting for G. O'Keefe, Dept. Surgery, U. Texas Southwestern Medical Center: Designing a more efficient critical care respirator. 1998-99.

Internal seminar talks

Internal seminar talks include one or more talks in each of the following:

- Universitat de Barcelona, Seminari de Probabilitats
- University of North Texas
  - Mathematics Colloquium, Stochastic Lunch Seminar, Graduate Student Seminar
- Purdue University
  - Mathematics Advisory Board Council, Statistics Advisory Board Council, Statistics Colloquium, Probability Seminar, VIGRE-GAAN Seminar, Computational Finance Seminar, Science Freshman Honors Seminar, Mathematics Bridge to Research seminar, College of Science Great Issues course, Department of Agricultural Economics Colloquium.
- Michigan State University
  - Statistics and Probability Colloquium, FRIB Theory Group seminar, Probability Seminar, Quantum Information Science Forum.

Other Professional Activity

1. Founding Editor and Editor-in-Chief for *High Frequency*, 2016-present
2. Associate Editor for:
   - *The Annals of Finance*, 2005-present
   - *Communications on Stochastic Analysis*, 2007-present
   - *Stochastics and Dynamics*, 2010-present
   - *The Annals of Probability*, 2011-2018.
   - *ALEA (Latin-American Journal of Probability and Mathematical Statistics)*, 2012-present
   - *Stochastics*, 2015-present
   - *Bernoulli*, 2016-present
   - *Electronic Journal of Statistics*, 2016-present
3. Series Editor for:
   - *Frontiers in Probability and the Statistical Sciences*, Springer V. series
4. Reviewer of manuscripts for the following professional journals:
   - Journals on probability and stochastic processes, including:
     Stochastic Processes and Applications, Annals of Probability, Annals of Applied Probability, Electronic Journal of Probability, European Series in Applied and Industrial Mathematics: Probability and Statistics, Communication on Stochastic Analysis, Journal of Theoretical Probability, Stochastics, Stochastics and Dynamics, Journal of Stochastic Analysis and Applications, Probability Theory and Related Fields
   - Journals on statistics, including:
     Annals of Statistics, Statistics and Probability Letters, Statistics, ESAIM Probability and Statistics
   - Journals on quantitative and mathematical finance, and econometrics
     Annals of Finance, Econometric Theory, Economic Theory, Quantitative Finance, International Journal of Theoretical and Applied Finance

- Journals on other branches of the mathematical sciences, including
  Journal of Functional Analysis, Advances in Applied Mathematics, Potential Analysis, Electronic Journal of Differential Equations, Applied Mathematics and Optimization, Journal of Mathematical Analysis and Applications, Discrete and Continuous Dynamics Systems
- Journals of wide scope in the mathematical sciences, including:
  Canadian Journal of Mathematics, Rocky Mountain Journal of Mathematics, Journal of the American Mathematical Society, Revista Matematica Iberoamericana
- Journals on physics and engineering
  Journal of Physics A (mathematical and general), International Journal of Control, Automation, and Systems, Signal Processing
- Journals on earth sciences
  Nature Communications, Geophysical Research Letters

5. Reviewer of book manuscripts for
   - Brooks Cole
   - Houghton Mifflin
   - Springer V.
6. National Science Foundation, Panel Review member
   - Graduate Research Fellowship Program in Mathematcs, 2011-2012
   - Stochastic Systems panel, 2010-11
   - Probability panel, 2007-08, 2009-10, 2013-2014.
7. National Science and Engineering Research Council (NSERC, Canada),
   - Chair, Pure Math Section, Grant Selection Committee member for Mathematics and Statistics, 2011-2012
   - Grant Selection Committee member for Mathematics and Statistics, 2009-2011.
   - Grant Selection Committee member for Mathematics, 2008-2009.
8. U.S. Civilian Research & Development Foundation, Grant Selection Committee for Mathematics, 2010.
9. National Defense Science and Engineering Graduate Fellowship program, Panel Review member, 2011, 2012.
10. Reviewer of grant proposals for:
    - *National Science Foundation*
    - *National Security Agency*
    - *National Science and Engineering Research Council (NSERC, Canada)*
    - *Mathematics of Information Technology and Complex Systems (MITACS, Canada)*
    - *U.S. Civilian Research & Development Foundation*
    - *Simons Foundation Collaboration Grants for Mathematicians*
    - *National Fund for Scientific and Technological Development (FONDECYT, Chile)*
    - *American Society for Engineering Education*
11. Reviewer for
    - *Mathematical Reviews*

12. Book review for

    - *Mathematical Reviews*, Feynman-Kac Formulae: Genealogical and Interacting Particle Systems with Applications, Pierre del Moral. 2004.
    - *J. Amer. Stat. Assoc.*, **97**, no. 460: Stochastic Processes from Physics to Finance, W. Paul and J. Baschnagel. Springer V. 1999.

13. Conference and Seminar Organizer and co-organizer:

    - Michigan State Symposium on Mathematical Statistics and Applications: From Time Series and Stochastics, to Semi- and Non-Parametrics, and to High-Dimensional Models, *Michigan State University*, Sep 14-16, 2018.
    - 8th International Workshop on High-Dimensional Data Analysis, Marrakech, Morocco, April 9-13, 2018
    - Long-term Scientific Committee Moderator of the *Seminar on Stochastic Processes*, since 2017.
    - 7th Conference on High Frequency Finance and Data Analytics: Nov 2-4, 2016, *Stevens Institute of Technology*, Hoboken NJ.
    - Seminar on Stochastic Processes, March 16-19, 2016 *University of Maryland,* College Park, MD.
    - Special session on Stochastic Processes and Stochastic PDEs, *American Mathematical Society Eastern Sectional Meeting*, Georgetown University, Washington, DC, March 7-8, 2016.
    - 6th Conference on High Frequency Finance and Data Analytics: Oct 29-31, 2015, *Stevens Institute of Technology*, Hoboken NJ.
    - *Seminar on Stochastic Processes*, Scientific Committee permanent member since 2013.
    - 5th Conference on Modeling High-Frequency Data in Finance, *Stevens Institute of Technology*, Hoboken, NJ, October 2013.
    - 4th Conference on Modeling High-Frequency Data in Finance, *Stevens Institute of Technology*, Hoboken, NJ, August 2012.
    - 8th International Purdue Symposium on Statistics, "Diversity in the Statistical Sciences for the 21st Century", Scientific committee member and co-organizer, *Purdue University*, June 20 - 24, 2012.
    - Premières Journées de Probabilités et Statistique, *Ecole Nationale des Sciences Appliquées,* Scientific committee member, Marrakech, Morocco, December 15-17, 2011.
    - International conference on Malliavin calculus and stochastic analysis, *University of Kansas*, March 19-21, 2011.
    - Second Conference on Modeling High-Frequency Data in Finance, *Stevens Institute of Technology*, Hoboken, NJ, June 24-26, 2010.
    - Stochastic Analysis Workshop, *Purdue University*, Sep 29 - Oct 1, 2009.
    - *Purdue Probability Seminar*, Fall 2009.
    - *Purdue Computational Finance Seminar*, Spring 2009
    - Workshop on Differential equations driven by fractional Brownian motion as random dynamical systems. *Banff International Research Station*, Banff, Canada, Sep 28 - Oct 5, 2008.
    - Malliavin Calculus and Applications, *Kent State University*, August 7-12, 2008, Kent, OH.
    - International conference on stochastic analysis: from mathematical physics to mathematical finance, *Princeton University*, June 13-15, 2008.
    - *Purdue Probability Seminar*, Fall 2007.
    - Special Session on Financial Mathematics, *Stochastic Processes and Applications conference, University of Illinois*, Aug 6-10, 2007.

- Kent-Purdue Minisymposium on Financial Mathematics, *Kent State University*, April 27-28, 2007, Kent, OH.
- Second Purdue Minisymposium on Financial Mathematics, *Purdue University*, April 15-16, 2005, West Lafayette, IN.
- Scientific program committee Chair, *26th Midwest Probability Colloquium*, Evantston, IL, Oct 15-17, 2004.
- *Purdue Probability Seminar*, Fall 2004 - Spring 2006.
- First Purdue Minisymposium on Financial Mathematics, *Purdue University*, April 3, 2003, West Lafayette, IN.
- Special session on Stochastic Analysis with Applications, *American Mathematical Society Sectional Meeting,* April 4-6, 2003, Bloomington, IN.
- *Purdue Computational Finance Seminar*, 2000-2003.
- Special session on Probability, *4th Joint Meeting of the American Mathematical Society and the Sociedad Matemática Mexicana*, May 19-24, 1999, Denton, TX.

Postdoctoral mentees

Name	*Subject / location*	*Dates*	*Mentor*	*Current Affiliation*
Ciprian Tudor	Probability / Purdue	Jan-May 2002	Viens	U Lille & U. Paris Sorbonne (Prof. w/ tenure)
Oana Mocioalca	Probability / Purdue	2002-2004.	Viens	Kent State University (Assoc Prof. w/ tenure)
Léo Neufcourt	Statistics, Nuclear Physics, Family Medicine / MSU	August 2016 - August 2018	Viens	MSU Statistics and Probability MSU Facility for Rare Isotope Beams

Other visitors mentored

Name	*Fellowship Program*	*Dates*	*Mentor*	*Home Affiliation*
Bo Yi, Ph.D. student	China Scholar. Council	8/2012-12/2013	Viens	Sun Yat-Sen U. Guangzhou, China
Jicheng Liu, Assoc Pr.	China Scholar. Council	11/2012-8/2013	Viens	Huazong UST, Wubei, China.
K. Essebaiy, Assoc Pr.	Fulbright Research Schol.	Jan-May, 2014	Viens	University of Kuwait
Léo Neufcourt, MS st.	Stage Polytechnique	May-July 2013	Viens	Columbia U. & E. Polytechnique, France
Xiaohui Wang, Ph.D. st.	China Scholar. Council	10/2013-4/2015	Viens	South China University of Technology
Héctor Araya, Ph.D. st.	Conicyt Graduate Fellow	1/2015-3/2015	Viens	Universidad de Valparaíso, Chile
Ashraf Noumir, Ph.D. st.	Joint Supervis. Schol.	12/2014-12/2015	Viens	American University in Cairo, Egypt
Ailing Gu, Assoc. Pr.	China Scholar. Council	8/2015-2/2017	Viens	University of Guangzhou, China
Olivier Coudray, MS st.	Stage Polytechnique	April-Aug 2018	Viens	Ecole Polytechnique, France
Julien Chhor, MS st.	Stage Polytechnique	April-Aug 2018	Viens	Ecole Polytechnique, France
Clément Mantoux, MS st.	Stage Polytechnique	April-Aug 2018	Viens	Ecole Polytechnique, France
Ruihua Ruan, MS St.	Stage Polytechnique	April-Aug 2018	Viens	Ecole Polytechnique, France
Luyi SHEN, MS St.	Stage Polytechnique	April-Aug 2018	Viens	Ecole Polytechnique, France
Dennis Ikpe, Ph.D.	Teaching Devel. Grant	May-July 2018	Viens	U. of South Africa, U. of Pretoria
Kamran Kalbasi, Ph.D.	Independent visit	May-July 2018	Viens	Ecole Polytech. Fed. Lausanne, Switz.

Ph.D. major advisor

Name	*Subject*	*Ph.D. date*	*Advisor*	*Current Affiliation*
Ionut Florescu	Stat	Dec 2004	Viens	Stevens Inst. of Tech. (research associate professor)
Yalcin Sarol	Math	Aug 2005	Viens	U. Southern Indiana (associate professor, tenured)
Tao Zhang	Math	Dec 2006	Viens	Bank of America, NYC (investment banker)
A. Vizcarra	Math	May 2008	Viens	D5 Advisors, CT (hedge fund manager)
A. Chronopoulou	Stat	Dec 2009	Viens	University of Illinois (assistant prof. tenure track)
Nikita Tuzov	Stat	May 2009	Viens	AEGON Risk Group, Baltimore (financial engineer)
Ha-Young Kim	Math	May 2010	Viens	Samsung Research and Development (mathematician)
Joseph Zadeh	Math	May 2012	Viens	Greenplum Analytics (massive data scientist)
Richard Eden	Math	Aug 2012	Viens	Ateneo de Manila University (tenure track)
Luis Barboza	Stat	Dec 2012	Bo Li / Viens	Universidad de Costa Rica (tenure track)
Jishnu Jaganathan	Math	May 2014	Viens	Unknown
Rolando Navarro	Stat	Dec 2015	Viens	Options Clearing Corp., Chicago (quant researcher)
Yankeng Luo	Math	May 2015	Figueroa / Viens	Virginia Commonwealth University (instructor)
Baron Law	Stat	May 2015	Viens	Deloitte, NY (quantitative modeler)
Xin Zhang	Math	Aug 2016	Viens	Unknown
Fatimah Alshahrani	Stat	TBD	Viens	Michigan State University
Han Wang	Stat	TBD	Viens	Michigan State University
Vojtech Kejzlar	Stat	TBD	Maiti / Viens	Michigan State University

MS major advisor

From Fall 2000 to Spring 2015, Viens has ***graduated over100 MS students*** at Purdue, in Computational Finance.

Graduate committee member for local Ph.D. students

Name	*Subject*	*Degree*	*Advisor*
Bryan Scott	Civil Engr	Ph.D. 2002	R. Salgado
Adam Maung	AgEcon	Ph.D. 2001	K. Foster
Xiaodong Sun	Math	Ph.D. 2001	J. Ma
Jianfeng Zhang	Math	Ph.D. 2001	J. Ma
Xiang Long	Math	Ph.D. 2001	Ph. Protter
Kiseop Lee	Stat	Ph.D. 2002	Ph. Protter
Olga Korosteleva	Stat	Ph.D. 2002	T. Sellke
M, Niederhausen	Math	Ph.D. 2005	J. Ma
Yuping Liu	Math	Ph.D. 2005	J. Ma
F. Piera Ugarte	ECE	Ph.D. 2005	R. Mazumdar
Yuhua Yu	Math	Ph.D. 2006	J. Ma
Yujuan Jien	Math	Ph.D. 2008	J. Ma
Xinyi Tu	Soil Sci.	Ph.D. TBD	S. Snapp
Jinguang (Tony) Li	Stat	Ph.D. 2008	M. Levine
Song Yao	Math	Ph.D. 2008	J. Ma
Yusun Wang	Math	Ph.D. 2009	J. Ma
Jongyin Daye	Stat	Ph.D. 2009	M. Zhu
Shan Yang	Math	Ph.D. 2009	J. Ma
Juan Jose Viquez	Math	Ph.D. 2012	F. Baudoin
Junha Woo	ECE	Ph.D. 2006	I. Pollack
J. Chavez-Casillas	Math	Ph.D. 2014	J.E. Figueroa
Shuai Chen	Stat	Ph.D. 2012	M. Levine
Jeff Gaither	Math	Ph.D. 2014	M. Ward
Jeff Nisen	Stat	Ph.D. 2013	J.E. Figueroa
Sveinn Olafsson	Stat	Ph.D. 2014	J.E. Figueroa
M. Gopaladesikan	Stat	Ph.D. 2014	M. Ward
Jinwoo Hwang	Math	Ph.D.	F. Baudoin

Graduate committee member for Ph.D. students at other universities

Name	*Subject*	*Degree*	*Advisor*	*University*
Solesne Bourgain	Mathematics	Ph.D. 2011	C.A. Tudor	U. Paris Sorbonne
Peng Hu	Mathematics	Ph.D. 2012	P. Del Moral	U. Toulouse, France
Jorge Clarke	Math. Engineering	Ph.D. 2013	Torres, Tudor, Rodriguez	U. Valparaíso, Chile
Benjamin Arras	Math, Engineering	Ph.D. 2014	Jacques Lévy-Véhel	INRIA / E. Centrale Paris, France
Ashraf Noumir	Finance	Ph.D. 2015	Saad Motawea	American University Cairo, Egypt
Soukaina Douissi	Mathematics	Ph.D. TBD	Khalifa es-Sebaiy	Fulbright Scholar, MSU and Cadi Ayyad U., Marrakech, Morocco
Salwa Bajja	Mathematics	Ph.D. 2018	I. Ouassou	Cadi Ayyad U., Marrakech, Morocco

External funding

Sponsor	Title	Start and Duration	Amount	Role and Location
NSF Research Grant, Statistics Program	Exact & Asymptotic Distribution Thry for General Gaussian Processes	Aug 2018 3 years	**250,000**	**Role: co-PI** (50%) Rice Univ.; MSU
NSF conference grant	MSU Symposium on Mathematical Statistics	May 2018 1 year	**25,000**	**Role: PI** MSU
ONR Research grant funding recommended	Statistical inference for stochastic processes with correlations	May 2018 3 years	**311,000**	**Role: co-PI** (33%) Rice Univ.; MSU
NSF Research Grant, Probability Program	Topics in stochastic analysis and Malliavin calculus	July 2014 5 years	**150,000**	**Role: PI** MSU
NSF conference grant	5th Conference on Modeling High Frequency Data in Finance	Oct 24-6 2013	**40,000**	**Role: co-PI** Stevens Inst.
NSF conference grant	4th Conference on Modeling High Frequency Data in Finance	Aug 16-19 2012	**44,410**	**Role: co-PI** Stevens Inst.
Purdue U, Engagement Leave travel grant	Franklin Fellow / Science Adviser U.S. Department of State	Sep 2010 9 months	**30,000**	**Role: Fellow** U.S. Dept. State
NSF conference grant	Int'l conference on Stochastic Analysis and Malliavin Calculus	Mar 19-21 2011	**27,260**	**Role: PI** U Kansas
NSF conference grant	Second Conference on Modeling High-Frequency Data in Finance	June 24-26 2010	**25,000**	**Role: co-PI** Stevens Inst.
NSF Research Grant, Probability Program	Density and tail estimates via Malliavin calculus and applications	July 2009 4 years	**232,000**	**Role: PI** Purdue
NSF Research Grant, Probability Program	Stochastic analysis and random medium in continuous space and time	July 2006 4 years	**375,000**	**Role: PI** Purdue Univ.
NSF conference grant	International conference on stochastic analysis	June 13-15 2008	**14,000**	**Role: PI** Princeton
NSF conference grant	Kent-Purdue Minisymposium on Financial Mathematics	Apr 27-28 2007	**8,500**	**Role: co-PI** Kent State
NSF conference grant	2nd Purdue Minisymposium on Financial Mathematics	Apr 15-16 2005	**7,500**	**Role: PI** Purdue Univ.
NSF Stand Rsch Grant, Probability program	Stochastic PDEs: interrelation of local and long-term behavior, and representation	Sep 2002 4 years	**122,000**	**Role: PI** Purdue Univ.
Fulbright U.S. Scholar Lecturing/Research	Stochastic PDEs: interrelation of local and long-term behavior	Feb 2004 4 months	$\cong$ **12,000**	**Role: PI** Univ. Paris 13
NSF-NATO Postdoc. Fellowship	Lyapunov exponents for linear systems of stochastic PDEs	Jan 1998 12 months	**42,749**	**Role: PI** Univ. Paris 6
NSF Int'l Opport. Postdoc. Fellow	Behavior of systems of stochastic PDEs	Sep 1996 12 months	**44,500**	**Role: PI** Univ. Barcelona
Hon. Fellow, Internship Program in Probability		Jun 1996 2 months	**6,000**	**Role: PI** Univ. Wisconsin

Internal funding

Sponsor	Title	Period	Amount	Role and Location
Purdue faculty fellowship for study in a second discipline	climate change and uncertainty quantification in agricultural economics	2014-2013	**22,500**	**Role: PI** Purdue Univ.
Purdue internal grants for research and travel	over 10 proposals funded since 2001	2001 to the present	$>$ **80,000**	**Role: PI** Purdue Univ.
UNT Junior Faculty and Research Initiation grants	5 proposals funded in 3 years for summer salary	1998-2000 10 months	**20,300**	**Role: PI** Univ. N. Texas