

## DAN CRISAN

### Contact Details:

Department of Mathematics, Imperial College London  
180 Queen's Gate, London SW7 2AZ, UK  
Tel: 0207 594 8489, E-mail: d.crisan@imperial.ac.uk

### Employment:

Nov 2013-present	Director of the EPSRC Centre for Doctoral Training in the Mathematics of Planet Earth ( <a href="http://www.mpecdt.org">www.mpecdt.org</a> )
Aug 2011-present	Professor of Mathematics, Imperial College London
Oct 2007- July 2011	Associate Professor, Imperial College London
Sep 2000-Sep 2007	Lecturer/Senior Lecturer in Mathematics, Imperial College London
Oct 1998-Sep 2000	Assistant Lecturer, Statistical Laboratory, University of Cambridge, Fellow of Queens' College Cambridge
Oct1995-Sep 1998	Research Associate, Imperial College London

### Education:

Dec 1996	PhD in Mathematics, University of Edinburgh. Thesis title: The Problem of Nonlinear Filtering
Jun 1992	MSci (First Class) in Mathematics University of Bucharest

### Brief Biography

Dan Crisan is a Professor of Mathematics at Imperial College London. Crisan's research lies in Stochastic Analysis a topic at the interface between Mathematics Analysis and Probability Theory. He is particularly interested in studying macroscopic models such as solutions of partial differential equations through their microscopic and stochastic counterparts. Some of his key contributions relevant to the proposed research include: the theoretical justification for particle approximations for linear parabolic SPDEs; a sequential Monte Carlo method stable in the state space dimension; a refined analysis of the smoothness of solutions of semi-linear PDEs, a new McKean-Vlasov approximation for the Kushner-Stratonovich equation. His research is acknowledged by the scientific community at large, as illustrated by his many invitations at pure/applied mathematics, engineering and statistics conferences. He has pioneered the application of particle filters in data assimilation.

Crisan first came to Imperial in 1995 as a postdoctoral fellow. After a brief spell at the Statistical Laboratory in Cambridge, Crisan returned to Imperial in 2000, where he was awarded a Governors' Lectureship. Since then, he has assiduously promoted Stochastic Analysis in the Department of Mathematics, across the College and beyond. In December 2002, Crisan initiated the Stochastic Analysis (SA) group at Imperial College London. The SA group is now one of the largest and most successful research groups in the Department of Mathematics with 14 members of staff (7 full professors) and a large number of PhD students and postdocs.

In 2013, Crisan became the Director the newly founded Centre for Doctoral Training in the Mathematics of Planet Earth. The Centre has been a great success: it has received the highest ratings in the EPSRC Mid Term Review. For his work in establishing the Centre, Crisan was awarded the 2018 President's Award for Excellence in Research Supervision. Crisan has worked continuously not just to ensure the success of the Centre but also to promote the new

research area of Mathematics of Planet Earth. Crisan is one of the founding editors of the new series of Springer Briefs in Mathematics of Planet Earth. Weather, Climate, Oceans.<sup>1</sup> Crisan is the recipient of a 2018 Chair of Excellence to be held at Universidad Carlos III de Madrid.<sup>2</sup>

Dan Crisan was appointed Senior Coordinator at the International Mathematics Olympiad (IMO) 2019. In 2019, the UK hosted the 60<sup>th</sup> edition of the International Mathematics Olympiad (IMO) see <https://www.imo2019.uk>. The IMO is the largest and most prestigious of all of the international Olympiads. Initiated by Romania in 1959, the IMO has grown from the original seven countries to over a hundred to-date. The United Kingdom has participated since 1967 and has played host to the competition on two previous occasions (in 1979 and 2002). Dan Crisan was appointed Senior Coordinator also at IMO1999 and IMO2002.

In October 2019, Dan Crisan has been awarded a £10 mil ERC Synergy grant jointly with Chapron (Ifremer), Holm (Imperial) and Memin (Inria). This was the result of nearly two years' hard work for the four PI, passing through several selection stages.

### **PhD Students:**

Saadia Ghazali	The Global Error in Weak Approximations of Stochastic Differential Equations. Viva date: 26 March 2007
Konstantinos Manolarakis	On the Numerical Solution of Backward Stochastic Differential Equations. Viva date: 5 May 2008
Olasunkanmi Obanubi	Particle Filters with Random Resampling Times Viva date: 9 November 2010
Colm Nee	Sharp Gradient Bounds for Heat-Kernels and Applications, Viva date: 1 September 2011, now Head of Data Analytics, Enlighted Inc
Kai Li	Stochastic Filtering with Degenerate Noise Viva date: 14 November 2012
Sean Violante	Asymptotics of Wiener Functionals Viva date: 26 June 2012
Adam Persing	Some contributions to particle Markov chain Monte Carlo algorithms (jointly supervised with Leonardo Bottolo). Viva date: 12 December 2013
Wang Han	Stability of the Solution of the Continuous Time Filtering Problem. Viva date: 31 January 2014
Eamon McMurray	Regularity of McKean-Vlasov Stochastic Differential Equations and Applications: September 2015
Marcel Ogrodnik	Tail Estimates for Markovian Rough Paths (jointly supervised with Tom Cass): January 2017
Kollias-Liapis Spyridon	Stochastic Control for Partially Observed Processes. Viva Date: 30 September 2016
Andrea Granelli	Limit theorems for non-semimartingales (jointly supervised with Almut Veraart). Viva 25 November 2016
Francesc Pons Llopis	Particle filtering with Applications to Data Assimilation (jointly supervised with Nicolas Kantas and Helen Brindley). Viva 18 October 2019.
Oana Lang	Data Assimilation for SPDEs (jointly supervised with Peter Jan van

<sup>1</sup> <http://www.springer.com/series/15250>

<sup>2</sup> [https://www.uc3m.es/ss/Satellite/UC3MInstitucional/en/PortadaMiniSiteA/1371224077923/Chairs\\_of\\_Excellence](https://www.uc3m.es/ss/Satellite/UC3MInstitucional/en/PortadaMiniSiteA/1371224077923/Chairs_of_Excellence)



Hinesh Chotai	Leeuwen and Roland Potthast) Viva 17 July 2020 Forward-backward stochastic differential equations and applications to carbon emissions markets (jointly supervised with Jean-Francois Chassagneux and Mirabelle Muuls) Viva 3 June 2019
Oliver Street	SPDEs in fluid dynamics and their application to ocean debris (jointly supervised with Darryl Holm and Matthew Piggott).
Alexander Lobbe	Machine Learning for Nonlinear Filtering (jointly supervised with Salvador Ortiz Latorre)
Daniel Goodair	Nonlinear SPDEs

### **Research Associates (Postdocs)**

Alexander Lobbe	Nonlinear Filtering (ongoing)
Romeo Mensah	SPDEs (ongoing)
Oana Lang	Well Posedness for Stochastic Transport Equation (on-going)
Wei Pan	Data Assimilations for Stochastic Euler Equation (2016-2019)
Dr Igor Shevchenko	Variational principles in geophysical fluid dynamics (2016-2019)
Dr Eamon McMurray	Backward Stochastic Differential Equation 2015-2016 now at J.P. Morgan
Christian Litterer	Nonlinear Filtering 2014-2015 first at Ecole Polytechnique, now Lecturer at University of York
Konstantinos Manolarakis	High order methods for solving parabolic semilinear PDEs first at Goldman Sachs, then Stratagem Technologies

### **Grants:**

ERC Synergy Grant (PI) STUOD-856408	Stochastic Trasport in Upper Ocean Dynamics, €10Mil, Mar 20 – Feb 26 joint with Chapron, Holm and Memin
EPSRC: EP/L016613/1 (PI)	Centre for Doctoral Training in the Mathematics of Planet Earth at Imperial College London and the University of Reading £5.4Mil, Apr 14 - Sep 22
EPSRC: EP/H0005500/1 (PI)	Increasing the efficiency of numerical methods for estimating the state of a partially observed system. High order methods for solving parabolic PDEs, £314,973, Oct 09 - Mar 13
EPSRC: EP/N023781/1 (Co-I)	Variational principles for stochastic parameterisations in geophysical fluid dynamics, £773,844, Jun 16 – Aug 19
EPSRC: EP/E016596/1 (Co-I)	Workshop on sequential Monte Carlo methods: filtering and other applications, 3-5 July 2006 St Anne's College Oxford, Jul 06 - Oct 06, £6,523
EPSRC: MATH_P55224	Grant to fund postdoc Dr Eamon McMurray £46,747
Spanish Grant: BP-DGR 2009	Grant to fund visit of Salvator Ortiz-Latorre 63,544E.
BRITISH COUNCIL: Alliance Programme	Principal Investigator (2009, renewed in 2010) £15,000
IE110407, Royal Society International Exchanges	PROBABILISTIC METHODS FOR SEMILINEAR PDE'S WITH MEAN-FIELD INTERACTION (2011-2013, £12,000)
Singapore Ministry of Education (MOE)/tier 2 grant (Visiting Researcher)	Filtering High Dimensional Dynamical Systems

Duration: 01/11/16-31/10/18 Amount: approx  
\$415461 (Singapore dollars ~ 230k GBP)

Royal Society travel grants: 2002, 2004, 2006, 2008, LMS Conference Grants: 1999, 2006,  
LMS Visitor Grants: 2000, 2003, 2006, 2009, 2010, 2013, 2019.

## Examinations

### PhD Exams

Prior to 2016, I was external examiner at Oxford (4 students), Edinburgh (2 students), Warwick (1 student), Ecole Polytechnique (2 students), Nice (1 student) and internal at Imperial (6). Recent examinations:

- Andrew Allan 25 September 2019 Oxford
- Andris Gerasimovics 6 January 2020
- Tasmin Symonds 16 December 2019
- Nikolaos Kolliopoulos 18 December 2018 Oxford
- Lukas Gonon 31 January 2018 ETH
- Alexei Pak 13 March 2017 Warwick
- Achref Bachouch 15 September 2014 University Le Mans Habilitation exams
- Nadia Oudjane 30 July 2014 Ecole Polytechnique
- Noufel Frikha 22 November 2017 PhD thesis Rapporteur
- Long Li 08 January 2021

### ESRs-LSRs (Imperial)

- Rishabh Gvalani 24 January 2019

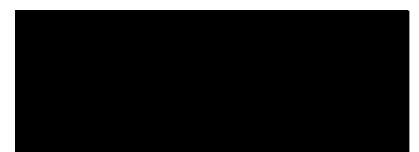
### Up to 2008 exams:

PhD transfer exams	<i>Pure Maths</i> : J. Inglis, J. Smith, G. D. Andrews, I. Papageorgiou, V. Kontis <i>Maths Finance</i> : E. Petrou, J. C. Esparragoza, J. Staples, I. Ward, R. Ward, Y. Cong, Y. Shen, D. Mobbs, <i>Statistics</i> : K. Platanioti,
Licentiate exams	K. Heine (Tampere University of Technology)
PhD exams:	N. R. Gomez (Imperial), M. Johansson (Imperial), L. G. Gyurko (Oxford), Litterer (Oxford), N. Wallner (Oxford), W. Yip (Imperial)

## Research Interests:

Keywords: Stochastic Analysis, Stochastic Partial Differential Equations, Fluid Dynamics, Nonlinear Filtering, Data Assimilation, Mathematical Finance, Particle Approximations, Malliavin Calculus, Machine Learning.

My research lies in the area of the theoretical analysis of stochastic dynamical systems and their numerical approximations and their inference partial observation. Key area of research include



- Stochastic partial differential equations, in particular the Nonlinear Fluid Dynamics Equations (Euler, Navier-Stokes, Camassa-Holm, rotating shallow water, quasi-geostrophic, primitive). Also the Zakai and the Kushner Stratonovitch equation which govern the evolution of the solution of the continuous time stochastic filtering problem.
- Data assimilation and Bayesian inference, inference for high dimensional systems.
- Partially observed Markov chains. These dynamical systems are related to the discrete time filtering problem. My results cover necessary and sufficient for the convergence of particle approximation to the solution of the filtering problem, optimal algorithms and, necessary conditions for the stability of the partially observed Markov chains
- Stochastic differential equations, equations perturbed by degenerate noise and their applications to option pricing and equations for processes with reflection/absorption at boundary.
- Forward-backward stochastic differential equations and their applications to *nonlinear* option pricing and energy markets



## Publications

Crisan has over 80 publications with over 5300 Google Scholar citations. His h-index is 34. Currently, 72 of Crisan's publications have appeared in Mathematical Reviews and 74 are indexed in the Zentralblatt MATH Database.

### Submitted

1. D Crisan, DD Holm, JM Leahy, T Nilssen, Variational principles for fluid dynamics on rough paths, arXiv preprint arXiv:2004.07829, 2020
2. D Crisan, O Lang, Local well-posedness for the great lake equation with transport noise, arXiv preprint arXiv:2003.03357, 2020
3. OD Street, D Crisan, Semi-martingale driven variational principles, arXiv preprint arXiv:2001.101051, 2020
4. C Cotter, D Crisan, DD Holm, W Pan, I Shevchenko, A Particle Filter for Stochastic Advection by Lie Transport (SALT): A case study for the damped and forced incompressible 2D Euler equation, arXiv preprint arXiv:1907.11884, 6, 2019
5. D Crisan, O Lang, Well-posedness for a stochastic 2D Euler equation with transport noise, arXiv preprint arXiv:1907.00451, 3, 2019
6. D Crisan, P Dobson, M Ottobre, Uniform in time estimates for the weak error of the Euler method for SDEs and a Pathwise Approach to Derivative Estimates for Diffusion Semigroups, arXiv preprint arXiv:1905.03524, 2, 2019
7. ÖD Akyildiz, D Crisan, J Míguez, Parallel sequential Monte Carlo for stochastic gradient-free nonconvex optimization, arXiv preprint arXiv:1811.09469, 2018
8. T Cass, D Crisan, P Dobson, M Ottobre, Long-time behaviour of degenerate diffusions: UFG-type SDEs and time-inhomogeneous hypoelliptic processes, arXiv preprint arXiv:1805.01350, 3, 2018
9. C Cotter, D Crisan, DD Holm, W Pan, I Shevchenko, Modelling uncertainty using circulation-preserving stochastic transport noise in a 2-layer quasi-geostrophic model, arXiv preprint arXiv:1802.05711, 21, 2018
10. D Paulin, A Jasra, A Beskos, D Crisan, A 4D-Var method with flow-dependent background covariances for the shallow-water equations, arXiv preprint arXiv:1710.11529, 1, 2017.

### Published

1. C Cotter, D Crisan, D Holm, W Pan, I Shevchenko, Data assimilation for a quasi-geostrophic model with circulation-preserving stochastic transport noise, Journal of Statistical Physics, 1-36, 2020
2. D Crisan, A López-Yela, J Míguez, Stable approximation schemes for optimal filters, SIAM/ASA Journal on Uncertainty Quantification 8 (1), 483-509, 2020
3. D Crisan, S Ortiz-Latorre, A high order time discretization of the solution of the non-linear filtering problem, Stochastics and Partial Differential Equations: Analysis and Computations, 1-68 2, 2019
4. D Crisan, F Flandoli, DD Holm, Solution properties of a 3D stochastic Euler fluid equation, Journal of Nonlinear Science 29 (3), 813-870 60 2019 (**fast citation rate 77 citations**)

5. D Paulin, A Jasra, D Crisan, A Beskos, Optimization based methods for partially observed chaotic systems, *Foundations of Computational Mathematics* 19 (3), 485-559, 3, 2019
6. C Cotter, D Crisan, DD Holm, W Pan, I Shevchenko, Numerically modeling stochastic Lie transport in fluid dynamics, *Multiscale Modeling & Simulation* 17 (1), 192-232 27, 2019
7. J Barré, D Crisan, T Goudon, Two-dimensional pseudo-gravity model: Particles motion in a non-potential singular force field, *Transactions of the American Mathematical Society* 371 (4), 2923-2962 1 2019
8. D Crisan, E McMurray, Cubature on Wiener space for McKean–Vlasov SDEs with smooth scalar interaction, *The Annals of Applied Probability* 29 (1), 130-177, 3, 2019
9. JF Chassagneux, D Crisan, F Delarue, Numerical method for FBSDEs of McKean–Vlasov type, *The Annals of Applied Probability* 29 (3), 1640-1684 17, 2019
10. D Crisan, PD Moral, J Houssineau, A Jasra, Unbiased multi-index Monte Carlo, *Stochastic Analysis and Applications* 36 (2), 257-273, 2018.
11. D Crisan, DD Holm, Wave breaking for the Stochastic Camassa–Holm equation, *Physica D: Nonlinear Phenomena* 376, 138-143, 2018.
12. D Crisan, E McMurray, Smoothing properties of McKean–Vlasov SDEs, *Probability Theory and Related Fields* 171 (1-2), 97-148, 2018.
13. D Crisan, J Míguez, G Ríos-Muñoz, On the performance of parallelisation schemes for particle filtering, *EURASIP Journal on Advances in Signal Processing* 2018 (1), 31, 2018.
14. D Crisan, J Miguez, Nested particle filters for online parameter estimation in discrete-time state-space Markov models, *Bernoulli* 24 (4A), 3039-3086, 2018. (fast citation rate 35).
15. D Crisan, C Janjigian, TG Kurtz, Particle representations for stochastic partial differential equations with boundary conditions *Electronic Journal of Probability* 23, 2018.
16. D Paulin, A Jasra, D Crisan, A Beskos, On concentration properties of partially observed chaotic systems, *Advances in Applied Probability* 50 (2), 440-479, 2018
17. D Paulin, A Jasra, D Crisan, A Beskos, Optimization Based Methods for Partially Observed Chaotic Systems, *Foundations of Computational Mathematics*, 1-75, 2017
18. D Crisan, J Miguez, Uniform convergence over time of a nested particle filtering scheme for recursive parameter estimation in state--space Markov models, *arXiv preprint arXiv:1603.09005*, *Adv. Appl. Prob.* 49, 1170–1200 2017.
19. D Crisan, E McMurray, Smoothing properties of McKean–Vlasov SDEs, *Probability Theory and Related Fields*, 1-52, 2017.
20. Beskos, Alexandros; Crisan, Dan; Jasra, Ajay; Kamatani, Kengo; Zhou, Yan; A stable particle filter for a class of high-dimensional state-space models. *Adv. in Appl. Probab.* 49 (2017), no. 1, 24–48.
21. D Crisan, M Ottobre, Pointwise gradient bounds for degenerate semigroups (of UFG type) *Proc. R. Soc. A* 472, 2016.
22. Crisan, Dan; Litterer, Christian; Lyons, Terry Kusuoka-Stroock gradient bounds for the solution of the filtering equation. *J. Funct. Anal.* 268 (2015), no. 7, 1928–1971.
23. Crisan, Dan; Otobe, Yoshiki; Peszat, Szymon Inverse problems for stochastic transport equations. *Inverse Problems* 31 (2015), no. 1, 015005, 20 pp.
24. D. Crisan, The stochastic filtering problem: a brief historical account, Volume 51, Issue A (Celebrating 50 Years of The Applied Probability Trust), December 2014 , pp. 13-22.
25. Cass, Thomas; Clark, Martin; Crisan, Dan The filtering equations revisited. *Stochastic analysis and applications* 2014, 129–162, *Springer Proc. Math. Stat.*, 100, Springer, Cham, 2014.
26. Crisan, Dan; Míguez, Joaquín Particle-kernel estimation of the filter density in state-space models. *Bernoulli* 20 (2014), no. 4, 1879–1929.

27. Crisan, Dan; Kurtz, Thomas G.; Lee, Yoonjung Conditional distributions, exchangeable particle systems, and stochastic partial differential equations. *Ann. Inst. Henri Poincaré Probab. Stat.* 50 (2014), no. 3, 946–974.
28. Crisan, Dan; Xiong, Jie Numerical solution for a class of SPDEs over bounded domains. *Stochastics* 86 (2014), no. 3, 450–472.
29. Beskos, Alexandros; Crisan, Dan; Jasra, Ajay On the stability of sequential Monte Carlo methods in high dimensions. *Ann. Appl. Probab.* 24 (2014), no. 4, 1396–1445.
30. Beskos, Alexandros; Crisan, Dan O.; Jasra, Ajay; Whiteley, Nick Error bounds and normalising constants for sequential Monte Carlo samplers in high dimensions. *Adv. in Appl. Probab.* 46 (2014), no. 1, 279–306.
31. Chassagneux, Jean-François; Crisan, Dan Runge-Kutta schemes for backward stochastic differential equations. *Ann. Appl. Probab.* 24 (2014), no. 2, 679–720.
32. Crisan, Dan; Manolarakis, Konstantinos Second order discretization of backward SDEs and simulation with the cubature method. *Ann. Appl. Probab.* 24 (2014), no. 2, 652–678.
33. Crisan, D.; Diehl, J.; Friz, P. K.; Oberhauser, H. Robust filtering: correlated noise and multidimensional observation. *Ann. Appl. Probab.* 23 (2013), no. 5, 2139–2160.
34. Crisan, Dan; Ortiz-Latorre, Salvador A Kusuoka-Lyons-Victoir particle filter. *Proc. R. Soc. Lond. Ser. A Math. Phys. Eng. Sci.* 469 (2013), no. 2156, 20130076, 19 pp.
35. Míguez, Joaquín; Crisan, Dan; Djurić, Petar M. On the convergence of two sequential Monte Carlo methods for maximum a posteriori sequence estimation and stochastic global optimization. *Stat. Comput.* 23 (2013), no. 1, 91–107.
36. Crisan, Dan; Delarue, François Sharp derivative bounds for solutions of degenerate semi-linear partial differential equations. *J. Funct. Anal.* 263 (2012), no. 10, 3024–3101.
37. Crisan, D.; Manolarakis, K. Solving backward stochastic differential equations using the cubature method: application to nonlinear pricing. *SIAM J. Financial Math.* 3 (2012), no. 1, 534–571.
38. Crisan, D.; Obanubi, O. Particle filters with random resampling times. *Stochastic Process. Appl.* 122 (2012), no. 4, 1332–1368.
39. Crisan, D., Manolarakis, K., Probabilistic methods for semilinear partial differential equations. *Applications to finance, ESAIM: Mathematical Modelling and Numerical Analysis*, Vol. 44, No. 5 pp 1107–1133, 2010.
40. Crisan, D., Manolarakis, K., Touzi, N., On the Monte Carlo simulation of BSDEs: an improvement on the Malliavin weights. *Stochastic Processes Appl.* 120, no. 7, 1133–1158, 2010.
41. Crisan, D., Xiong, J., *Approximate McKean-Vlasov representations for a class of SPDEs*, *Stochastics* 82, no. 1-3, 53–68, 2010.
42. Crisan, D., Kouritzin, M. A., Xiong, J., Nonlinear filtering with signal dependent observation noise, *Electronic Journal of Probability* pp 1863-1883, 2009.
43. Crisan, D., Heine, K., Uniform Monte Carlo Approximation of Discrete Time Filter, *Advances in Applied Probability*, no 4 pp 979-1001, 2008 .
44. Crisan, D., Heine, K., "Stability of the discrete time filter in terms of the tails of noise distributions", *Journal of the London Mathematical Society*, Vol. 78, No 2, pp 441-458, 2008.
45. Crisan, D., Xiong J., "A central limit type theorem for a class of particle filters", *Communications on Stochastic Analysis*, No 1, pp 103-104, 2007.
46. Crisan, D., "Particle approximations for a class of stochastic partial differential equations", *Applied Mathematics and Optimization Journal*, Vol 54, No 3, pp 293-317, 2006.
47. J.M.C. Clark, Crisan D., "On a robust version of the integral representation formula of nonlinear filtering", *Probability Theory and Related Fields*, Vol 133, No 1 pp 43-56, 2005.



48. Crisan, D., "Superprocesses in random environments", Proceedings of The Royal Society of London. Series A. Mathematical, Physical and Engineering Sciences, 460 no. 2041, pp 243–270, 2004.
49. Crisan, D., "Exact Rates of Convergence for a Branching Particle Approximation to the Solution of the Zakai Equation", Annals of Probability, Vol. 31, No. 2, pp 693–718, 2003.
50. Crisan, D., Lyons. T., "Minimal Entropy Approximations and Optimal Algorithms for the Filtering Problem", Monte Carlo Method and Applications, Vol 8, No 4, pp 343-357, 2002
51. Crisan, D., Doucet, A., "Convergence Results on Particle Filtering Methods for Practitioners", IEEE Transactions on Signal Processing, Vol 50, No 3, pp 736-747, 2002.
52. Crisan, D., Del Moral, P., Lyons. T., "Interacting Particle Systems Approximations of the Kushner Stratonovitch Equation", Advances in Applied Probability, vol.31, no. 3, pp 819-838, 1999.
53. Crisan, D., Del Moral, P., Lyons. T., "Discrete Filtering Using Branching and Interacting Particle Systems", Markov Processes and Related Fields, Vol. 5, No. 3, 293-319, 1999.
54. Crisan, D., Lyons. T., "A Particle Approximation to the Solution of the Kushner-Stratonovitch Equation", Probability Theory and Related Fields, Vol 115 no 4, 549-578, 1999.
55. Crisan, D., Gaines, J., Lyons. T., "Convergence of a Branching Particle Method to the Solution of the Zakai Equation", SIAM Journal of Applied Probability, Vol 58 No. 5, 1568-1598, 1998.
56. Crisan, D., Lyons. T., "Non-Linear Filtering and Measure-Valued Processes", Probability Theory and Related Fields, 109, 217-244, 1997.
57. Crisan, D., "Direct Computation of the Benes Filter Conditional Density", Stochastics and Stochastic Reports, Vol 55, 47-54, 1995.
58. Crisan, D., "Curvature Properties of a Special Class of Curves", Bull. Math. de la Soc. Sci. Math. de Roumanie, Tome 34 (82), no. 3, 219-222, 1990.

#### Contributions to Books (refereed)

59. Crisan, D.; Manolarakis, K.; Nee, C. Cubature methods and applications. Paris-Princeton Lectures on Mathematical Finance 2013, 203–316, Lecture Notes in Math., 2081, Springer, Cham, 2013.
60. Crisan, D. Discretizing the continuous-time filtering problem: order of convergence. The Oxford handbook of nonlinear filtering, 572–597, Oxford Univ. Press, Oxford, 2011.
61. Crisan D., Ghazali S., "On the convergence rates of a general class of weak approximations", Stochastic Differential Equations – Theory and Applications, Eds. P. Baxendale, S. Lototsky, World Scientific, 2007.
62. Crisan, D., "Particle Filters. A Theoretical Perspective", Chapter 2 in "Sequential Monte Carlo Methods in Practice", Eds. A. Doucet, J. F. G. de Freitas, N. J. Gordon, pp 17-43, Springer Verlag, 2001.

#### Published Conference Proceedings (refereed)

63. J Míguez, D Crisan, IP Marino, Particle filtering for Bayesian parameter estimation in a high dimensional state space model, Signal Processing Conference (EUSIPCO), 2015 23rd European, 1241-1245.
64. Crisan D, Li K, 2011, GENERALISED PARTICLE FILTERS WITH GAUSSIAN MEASURES, 19TH EUROPEAN SIGNAL PROCESSING CONFERENCE (EUSIPCO-2011), Pages: 659-663, ISSN: 2076-1465.

65. Crisan, D.; Manolarakis, K. Solving backward stochastic differential equations using the cubature method. Application to nonlinear pricing. Progress in analysis and its applications, 389–397, World Sci. Publ., Hackensack, NJ, 2010.
66. Crisan, D. Xiong, J., “An approximate McKean-Vlasov model for the stochastic filtering problem” Conference Oxford sur les méthodes de Monte Carlo séquentielles, ESAIM Proc., 19, EDP Sci., Les Ulis, pp 18-21, 2007.
67. Crisan, D. Xiong, J., “Numerical solutions for a class of SPDEs over bounded domains” Conference Oxford sur les méthodes de Monte Carlo séquentielles, ESAIM Proc., 19, EDP Sci., Les Ulis, pp 121-125, 2007.
68. Crisan, D., “Particle Filters in a Continuous Time Framework”, Proceedings of the Nonlinear Statistical Signal Processing Workshop 13-15 September 2006 IEEE, pp 73-78, 2006.
69. Crisan, D., “Numerical Methods for Solving the Stochastic Filtering Problem”, Numerical methods and stochastics (Toronto, ON, 1999), pp 1-20, Fields Inst. Commun., Vol. 34, Amer. Math. Soc., Providence, RI, 2002.
70. Crisan, D., Lyons. T., “Optimal Filtering on Discrete Sets”, in “Numerical methods and stochastics”, Numerical methods and stochastics (Toronto, ON, 1999), pp 21-27, Fields Inst. Commun., Vol. 34, Amer. Math. Soc., Providence, RI, 2002.

#### Other papers

71. Dan Crisan and Kai Li, A central limit type theorem for Gaussian mixture approximations to the nonlinear filtering problem, Preprint.
72. Crisan, D., Doucet, A., “Convergence of Sequential Monte Carlo Methods” Technical Report Cambridge University, CUED/FINFENG /TR381, 2000.
73. Crisan, D., Grunwald, M., “Comparison of Branching Algorithms versus Resampling Algorithms”, Statistical Laboratory Research Report 1999-9, 1999.

#### Book

74. Bain, A., Crisan D., “Fundamentals of Stochastic Filtering”, Series: Stochastic Modelling and Applied Probability, Vol. 60, Springer Verlag, 2009.

#### Edited Books and Proceedings

1. D. Crisan, “Mathematics of Planet Earth. A Primer”, World Scientific, 2017.
2. D. Crisan, B. Hambly, T. Zariwopoulou, “Stochastic Analysis and Applications 2014”, Springer Verlag 2014
3. Crisan D., Rozovsky B. “The Oxford Handbook of Non-Linear Filtering”, Oxford University Press, 2011.
4. Crisan, D. “Stochastic Analysis 2010”, Springer Verlag 2010.
5. Andrieu C., Crisan, D., Conference Oxford sur les méthodes de Monte Carlo séquentielles, ESAIM Proc., 19, EDP Sci., Les Ulis, pp 121-125, 2007.

#### Editorial work:

- a. Editor-in-Chief Springer Briefs series in Mathematics of Planet Earth. Weather, Climate, Oceans (from 2016)
- b. Associate Editor AAP (from 2018).
- c. Member of the Editorial board of the LMS Journal (from 2018)



- d. Member of the Editorial board of the Journal of SPDEs, Springer (from 2012)
- e. Member of the Editorial board of the Journal of Mathematics of Computation (2010-2016)
- f. Member of the Editorial board of the Revue Roumaine de Mathematiques Pures et Appliquees and of the Mathematics Reports published by the Romanian Academy.
- g. Editor of the Oxford Handbook of Nonlinear Filtering, Oxford University Press (2011)
- h. Editor of Springer's special volumes Stochastic Analysis 2010 and 2014 Springer Verlag
- i. Editor of the Proceedings of the Workshop on Sequential Monte Carlo Methods, July, 2006 European Series in Applied and Industrial Mathematics (ESAIM).

#### **Recent sessions and meetings organized:**

December 2020	New Directions in Rough Path Theory, Oberwolfach Workshop ID 2012b, December 6-12 2020.
September 2019	Member of the Scientific Committee for the Workshop on Big data, data assimilation, and uncertainty quantification, 12 November 2019 - 15 November 2019, IHP, Paris
April 2019	EGU2019 - Convener Assignment
March 2019	Member of the Scientific Committee for the Workshop on New Directions in Stochastic Analysis: Rough Paths, SPDEs and Related Topics, On the occasion of Terry Lyons' 65th Birthday, March 18-22, 2019, Zuse Institute Berlin.
April 2018	EGU2018 - Convener Assignment
July 2017	International Workshop on BSDEs, SPDEs and their Applications, Edinburgh 3-7 July 2017. The symposium continues a tradition which has its origin in 1996 in France and was organized in the UK for the first time. The symposium was held three times in Le Mans, France (1996, 1999 and 2008). Shandong University and Fudan University, China, were the hosts in 2002, 2014(Weihai) and 2005 (Shanghai). The 6th symposium was held in Los Angeles in 2011. This was a major conference with over 200 participants <a href="http://www.ed.ac.uk/maths/bsde-spde-2017">http://www.ed.ac.uk/maths/bsde-spde-2017</a>
July 2017	LMS-EPSRC Durham Symposium on Stochastic Analysis, 10-20 July 2017 ( <i>over 90 participants</i> ). The meeting brought together over 90 participants working in the area (further details at <a href="http://www.maths.dur.ac.uk/lms/106/index.html">http://www.maths.dur.ac.uk/lms/106/index.html</a> ) The LMS-EPSRC Durham Research Symposia began in 1974, and form an established series of international research meetings, with over 100 symposia to date. They provide an excellent opportunity to explore an area of research in depth, to learn of new developments, and to instigate links between different branches.
April-May 2014	Programme on <i>Advanced Monte Carlo Methods for Complex Inference Problems</i> , Isaac Newton Institute
January 2014	Rough Paths: Theory and Applications, IPAM, USA
September 2013	Stochastic Analysis and Applications, Oxford.
September 2012	Advanced Monte Carlo Methods for Complex Inference Problems, Isaac Newton Institute
August 2012	Data Assimilation. The third workshop on numerical methods for solving the filtering problem. Oxford-Man Institute of Quantitative Finance
July 2012	Workshop on Rough Paths and PDEs, Oberwolfach
Sept 2010/2011	Mini-symposium of Probabilistic Methods for PDEs- The 6th European Congress of Mathematics

September 2010	Workshop on numerical methods for solving the filtering problems and high order methods for solving nonlinear PDEs 34 <sup>th</sup> Conference on Stochastic Processes and Applications, Session on Probabilistic Numerical Methods, Osaka.
July 2008	LMS-EPSRC Short Course, Stochastic Partial Differential Equations Imperial College London

#### International lectures series/mini-courses:

October 2019	<i>An introduction to Backward Stochastic Differential Equations</i> , Ritsumeikan University, Kyoto.
November 2019	<i>Particle Filters for Data Assimilation</i> , The Mathematics of Climate and the Environment, IHP, Paris, Sep 9 - Dec 21 2019.
April 2019	Minicourse on <i>Stochastic Transport in Geophysical Fluid Dynamics</i> , EGU2019, Vienna (joint with D. Holm and E. Memin).
June 2018	<i>Particle Filters in High Dimensions</i> , The Henri Lebesgue Center for Mathematics, Rennes
July 2017	<i>Data assimilation using Particle Filters</i> , Kick-Off Workshop, SFB 1294 Data Assimilation, Potsdam <i>Cubature Methods and Applications</i> , CEMRACS 2017 Numerical methods for stochastic models: control, uncertainty quantification, mean-field, Marseille.
September 2016	<i>Particle filters in the continuous time framework. Applications of cubature methods</i> , Edinburgh.
January 2014	Convergence of particle filters and relation to data
April 2012	assimilation, Bangalore. <i>Stochastic Filtering</i> , Second school of CREMMA, Tunis <i>Cubature methods and applications</i> , Institut Henri Poincare, Paris
February-April 2010	
June 2009	<i>Stochastic filtering: theory and algorithms</i> , Chemnitz
June 2008	<i>Stochastic filtering: theory and algorithms</i> , Berlin
April 2008	<i>Particle filters - a theoretical perspective</i> , Madrid

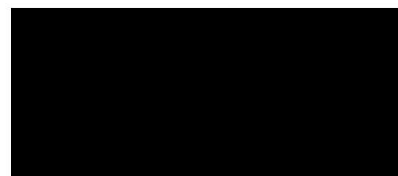
#### Invited talks (recent):

1. *Well-posedness for stochastic transport partial differential equations*, Workshop Cooperation TUM – ICL, 9-10 January 2020, TUM Munchen.
2. *Data assimilation using particle filters for class of partially observed stochastic geophysical fluid dynamics models*. Big Data, Data Assimilation and Uncertainty Quantification, Institut Henri Poincare, Paris, France, 12-15 November 2019.
3. *Well-posedness for a class of fluid dynamics equations with stochastic transport noise*, 11 October, 2019, Waseda University.
4. *Uncertainty quantification and data assimilation for Stochastic Euler Equation*, Workshop on Statistical Inference for Stochastic PDEs, September 18-20, 2019, Humboldt-Universitat, Berlin.





5. *Well-posedness for a class of fluid dynamics equation with stochastic transport noise*, Conference on Stochastic Analysis and Applications, 26-30 August 2019, Risør, Norway
6. *Particle Filters: A Theoretical Perspective Tutorial*, Imperial College London, 3rd July 2019.
7. *Modelling multi-period carbon markets using singular forward backward SDEs*, Paris Bachelier Seminar, Institut Henri Poincaré, 21 June 2019.
8. *Long Time Asymptotics for Diffusion Semigroups Gradient Bounds*, Analyse stochastique et themes connexes 6-9 mai 2019, Conference dédiée à la mémoire de Nicu Boboc, Bucuresti, Romania.
9. *Long-Time Behaviour of Degenerate Diffusions*, THE 22nd CONFERENCE of the ROMANIAN SOCIETY of PROBABILITY and STATISTICS, BUCHAREST, MAI 10-11, 2019, Simion Stoilow Institute of Mathematics of the Romanian Academy.
10. *Well-posedness properties of the Euler equation with Lie-transport noise*, New Directions in Stochastic Analysis: Rough Paths, SPDEs and Related Topics On the occasion of Terry Lyons' 65th Birthday, March 18-22, 2019, Zuse Institute Berlin.
11. *Well-posedness of a 3D stochastic Euler equations*, Seminar on Stochastic Processes, March 13-16, 2019, The University of Utah, Salt Lake City, Utah.
12. *Predicting the Unpredictable. Particle approximations to fluid dynamics models*, Universidad Carlos III de Madrid, 13 February 2019.
13. *Particle Filters in High Dimensions*, Department of Signal Theory and Communications Universidad Carlos III de Madrid. 29 January 2019.
14. *Solution Properties of a 3D Stochastic Euler Fluid Equation*, Probability and Statistics Seminar School of Mathematics University of Manchester 26 September 2018.
15. *Integration: Past, Present and Future*, Imperial College London, 15 September 2018
16. *Smoothing properties of McKean-Vlasov SDEs*, Workshop on BSDEs, Information and McKean-Vlasov equations 10-12 September Leeds.
17. *Particle Filters in High Dimensions*, Bayesian Computation for High-Dimensional Statistical Models Opening Workshop 27-31 August 2018.
18. *Long-Time Behaviour of Degenerate Diffusions*, Workshop on Stochastic Dynamical Systems and Ergodicity Loughborough University 23-27 July 2018
19. *Solution Properties of a 3D Stochastic Euler Fluid Equation*, The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, July 5 - July 9, 2018 Taipei, Taiwan Special Session 81 Stochastic Systems, SDEs/SPDEs and Games with Numerics and Application.
20. *Time discretizations of the solution of the non-linear filtering problem*, The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, July 5 - July 9, 2018 Taipei, Taiwan Special Session 61 Stochastic filtering, Optimal Control and their applications.
21. *Well-posedness properties of SPDEs with transport noise*, Scuola Normale Superiore of Pisa, 27 June 2018.
22. *High order discretizations for the solution of the nonlinear filtering problem*, 40th Conference on Stochastic Processes and Their Applications 11-15 June 2018, Chalmers Conference Center Gothenburg, Sweden.
23. *High order discretizations for the solution of the nonlinear filtering problem*, Simons Semester "PDEs/SPDEs and Functional Inequalities 1 April - 30 June 30 2018, Stefan Banach International Mathematical Center Warsaw, Poland.
24. *3D Stochastic Euler Fluid Equation*, Workshop on PDEs/SPDEs and Functional Inequalities" Bedlewo, 22-28 April 2018.
25. *Solution Properties of a 3D Stochastic Euler Fluid Equation*, A 21-a CONFERINTA A SOCIETATII DE PROBABILITATI SI STATISTICA DIN ROMANIA Academia de Studii Economice din Bucuresti, Centrul de Cercetari Matematice Fundamentale si Aplicative 13-14 aprilie 2018.





26. *Asset pricing through competing traders valuations*, CeQuFin Seminar Series, LT3, Grimond Building, University of Kent, 9 March 2018.
27. *Two-dimensional pseudo-gravity model: particles motion in a non-potential singular force field*, 9 November 2017, Mathematical Institute, University of Oxford.
28. *Principled Data Assimilation - A Dream or Reality*, Deutscher Wetterdienst Offenbach, 3 November 2017.
29. *Data Assimilation using Ensemble Based Methods*, IMA Conference on Inverse Problems, 19 - 21 September 2017 CMS, University of Cambridge (*Keynote lecture*).
30. *Stochastic Modelling of Transport Noise*, SIAM Conference on Mathematical and Computational Issues in the Geosciences, Erlangen, September 11-14, 2017.
31. *Large time asymptotics for diffusion semigroups gradient bounds*, Workshop on Asymptotics for Stochastic Dynamical Systems, Swansea, 29-31 August 2017.
32. *Cubature Methods for McKean-Vlasov SDEs with Smooth Scalar Interaction*, International Workshop on BSDEs and SPDEs, Edinburgh, 3-7 July 2017.
33. *Data Assimilation for Stochastic Transport Models*, 12TH INTERNATIONAL ENKF WORKSHOP, Bergen, 12-14 June, 2017.
34. *Integration: Past, Present and Future*, Essex - Greenwich – London, Applied \& Numerical Mathematics Workshop, Greenwich, 9 June 2107.
35. *Solution Properties of a 3D Stochastic Euler Fluid Equation*, Nonlinear PDEs, Stochastic Control and Filtering, Conference in honour of the 75th birthday of NICOLAI KRYLOV, ICMS, Edinburgh, 29 May - 2 June 2017.
36. *Two-dimensional pseudo-gravity model: particles motion in a non-potential singular force field*, PDE & Probability Methods for Interactions, Inria (Sophia Antipolis), 30-31 March 2017.
37. *Smoothing properties of McKean-Vlasov SDEs*, Paris Bachelier Seminar, Institut Henri Poincare, 17 February 2017.
38. *Particle representations for SPDEs with boundary conditions*, 1 February 2017, BERLINER KOLLOQUIUM, WAHRSCHEINLICHKEITSTHEORIE, Berlin, 1 February 2017.
39. *Principled Data Assimilation: A Dream or Reality*, MPE Wednesday, Reading, 18 January 2017.
40. *Particle representations for SPDEs with boundary conditions*, Numerics for SPDE and their Applications, Special Semester on Computational Methods in Science and Engineering, The Johann Radon Institute for Computational and Applied Mathematics, Linz, December 12-16, 2016.
41. *Exponential Decay of Gradient Bounds for Diffusion Semigroups*, School of Stochastic Dynamical Systems and Ergodicity, Loughborough, 5-9 December 2016. *Towards a stable Particle Filter in High-Dimension. Take Two*, Mathematical and Algorithmic Aspects of Data, Assimilation in the Geosciences, 1640 Oberwolfach Workshop, 2-8 October 2016.
42. *High order discretizations for the solution of the nonlinear filtering problem*, Imperial ETH Workshop on Mathematical Finance, Zurich, 26-28 September 2016.
43. *Integration: Past, Present and Future*, MIGSAA 2nd Annual Colloquium , Edinburgh, 23 September 2016.
44. *Variational principles for stochastic parameterisations in geophysical fluid dynamics*, Nonlinearity in Climate and the Geosciences, A Special Session Honouring Peter Lax, The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando 1 - 5 July 2016.



45. *Particle representations for SPDEs with boundary conditions*, SPDEs/SDEs and Stochastic Systems with Control/Optimization and Applications, The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando 1 - 5 July 2016.
46. *Particle filters in High Dimension*, Data assimilation and nonlinear filtering, The 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando 1 - 5 July 2016.
47. *Nested particle filters for online parameter estimation*, ATI Workshop "MCMC and Diffusion Techniques", London, 9-10 June 2016.
48. *Particle filters in High Dimension*, Analysis, Geometry and Stochastics for Planet Earth, University of Bath, 26 February 2016.
49. *Particle representations for SPDEs with boundary conditions*, Stochastic Analysis, Rough Paths, Geometry, London, 7-9 January 2016.
50. *Integration: Past, Present and Future*, LMS Graduate Student Meeting BMA House, Tavistock Square, WC1H 9JP, 13 November 2015.
51. *Gradient bounds for the solution of the filtering equation*, Stochastic calculus, Monte-Carlo methods and Mathematical Finance CONFERENCE IN HONOR OF PROFESSOR VLAD BALLY Le Mans, Institut du Risque et de l'Assurance 6 - 9 October 2015.
52. *Towards a stable Particle Filter in High-Dimension*, Minisymposium on Nonlinear Dynamical Aspect Data Assimilation XXXV Dynamics Days Europe 2015, Exeter, 6-10 September 2015.
53. *Nested particle filters for online parameter estimation*, SMC2015: Sequential Monte Carlo workshop ENSAE, Paris, 26-28 August 2015.
54. *Particle filters in High Dimension*, 38th Conference on Stochastic Processes and their Applications University of Oxford 13th - 17th July 2015.
55. *Inverse problems for stochastic transport equations*, Equadiff 2015 Universite Claude Bernard Lyon, 7 July 2015.
56. *Sharp gradient bounds for the solutions of a class of linear SPDEs*, Numerical probabilistic methods for non-linear PDEs. Imperial College London, 30 June 2015.
57. *Particle filters in High Dimension*, Reading-Warwick Data Assimilation meeting, Data Assimilation Research Centre, 22 June 2015.
58. *Particle approximations for partially observed 2D Navier-Stokes equations*, Workshop Classic and Stochastic Geometric Mechanics Lausanne, CIB-EPFL, 8-11 June 2015.
59. *Robust Filtering*, 45th Annual John H. Barrett Memorial Lectures Stochastic Filtering, Computations and Their Applications University of Tennessee, Knoxville May 13-16, 2015 (plenary talk).
60. *Limit Theorems in Stochastic Filtering*, Probability Seminar Queen Mary University of London, 22 April 2015.
61. *Limit Theorems in Stochastic Filtering*, Limit Theorems in Probability A conference in honour of Nick Bingham's 70th birthday, Imperial Probability Centre, 23 - 26 March 2015.
62. *A second order time discretization of the solution of the non-linear filtering problem*, North British Probability Seminar, Edinburgh, 13 February 2015.
63. *Kusuoka-Stroock bounds for the solution of the filtering problem*, Mathematical Finance and Stochastic Analysis Seminar York University, 10 February 2015.

64. *Asset pricing through competing traders valuations*, 12nd CFM-Imperial Workshop on Quantitative Finance, London 20 October 2014.
65. *High order discretizations for the filtering problem*, Workshop on "Partial Information and Filtering" Thematic Semester on "Information in Finance and Insurance" Institut Henri Poincare, Paris, 6 October 2014.
66. *Asset pricing through competing traders valuations*, NUS-U of Tokyo Workshop on Quantitative Finance Tokyo 25-26 September 2014.
67. *Kusuoka-Stroock bounds for the solution of the filtering problem*, UK-Japan Stochastic Analysis School JSPS Core-to-Core programme Warwick, 1-5 September 2014.
68. *High order approximations for the filtering problem*, The 10th AIMS Conference on Dynamical Systems Differential Equations and Applications Madrid, Spain 7-11 July 2014.
69. *Runge-Kutta schemes for backward stochastic differential equations*, Stochastic Numerics and Random Dynamical systems Festschrift in honour of Peter Kloeden's 65th Birthday Mannheim 25-27 June 2014.
70. *Runge-Kutta schemes for backward stochastic differential equations*, The 7th International Symposium on Backward SDEs Shandong University 22-27 June 2014.
71. *Stochastic filtering - a brief historical account*, Advanced Monte Carlo Methods for Complex Inference Problems Isaac Newton Institute for Mathematical Sciences 22 Apr-16 May 2014.
72. *Classical and modern results in the theory and applications of stochastic filtering*, 50th anniversary of the Journal of Applied Probability, Sheffield, 9 April 2014.
73. *Kusuoka-Stroock bounds for the solution of the stochastic filtering problem with applications to particle filters*, From Spectral Gaps to Particle Filters, Reading, 17-18 September 2013.
74. *Data Assimilation and Stochastic Filtering*, Reading, 11 September 2013.
75. *A brief introduction to stochastic filtering*, Thalesian Society Dockmaster's House Canary Wharf, London, 4 September 2013
76. *Kusuoka-Stroock gradient bounds for solutions of a class of stochastic PDEs*, Anniversary Conference, Faculty of Science 150 years, Bucharest, August 29 - September 1, 2013.
77. *Generalized Particle Filters*, Data Assimilation Research Centre, Reading, 5 June 2013.
78. *Conditional distributions, exchangeable particle systems and stochastic partial differential equation*, 14th Linnaeus University Workshop in Stochastic Analysis and Applications, 22-24 May 2013.
79. *BSDEs and smoothness of solutions for degenerate semilinear PDEs*, Imperial-ETH Workshop on Mathematical Finance Imperial College London 6-7 March 2013
80. *Generalized Particle Filters*, Probability and Statistics seminar Department of Mathematics University of Bristol, 22 February 2013.
81. *A mathematician's view on Asimov's psychohistory*, Imperial College London, 23 January 2013 (inaugural talk).
82. *Particle versus Gaussian Approximations: What is the difference?*, Workshop on Mathematical and Algorithmic Aspects of Atmosphere-Ocean Data Assimilation Oberwolfach 2-8 December, 2012.
83. *Cubature Filters*, Workshop Sequential Monte Carlo Methods and Efficient Simulation in Finance Ecole Polytechnique & INRIA Bordeaux Paris, 10-12 October 2012.



84. *Solving semilinear partial differential equations using the cubature method*, Beijing-London Workshop on Stochastic Analysis King's College London 5 October 2012.
85. *Solving semilinear partial differential equations using the cubature method*, The 8th World Congress in Probability and Statistics Istanbul 9-14 July, 2012
86. *Gradient bounds for solutions of Semi-Linear Partial Differential Equations*, Probabilistic Methods for Partial Differential Equations 6th European Congress of Mathematics Krakow, July 2-7, 2012.
87. *Particle Approximations for the Solution of The Filtering Problem*, International Conference on Controlled Deterministic and Stochastic Systems Iasi, 2-7 July 2012

### **Membership to Professional Bodies:**

- a. London Mathematical Society
- b. European Mathematical Society
- c. Royal Meteorological Club

### **Current Teaching Duties:**

Lecture courses                      An Introduction to Stochastic Calculus with Application to Nonlinear Filtering (Fourth year course/MSc course).

### **Past Teaching Duties:**

Lecture courses                      Dynamical Systems II (graduate course)  
    Analysis I (First year undergraduate course)  
    Analysis II (Second year undergraduate course)  
    Stochastic Filtering (Fourth year course/MSc course)  
    Calculus I (First year undergraduate course for Engineers)  
    Numerical Stochastics (MSc course).

Problem classes                      Analysis I, Calculus I, Analysis II, Stochastic Filtering

Others                                      Project supervision (all 4 years+ MSc), Personal Tutor (~30 students)

### **Other Current Local Administrative Duties:**

- a. Co-organizer of the Stochastic Analysis Seminar
- b. Co-organizer of the Stochastic Analysis Reading Group
- c. Co-organizer of the Math Plus! meetings
- d. Co-organizer of the London Analysis and Probability Seminar

### **Other Activities (past)**

- a. Chair of the Search Committee for Imperial College IX lectureships in Mathematics, December 2021.
- b. Senior Coordinator at the 60<sup>th</sup> International Mathematics Olympiad, Bath, UK, July 2020.
- c. Panel Committee Memberships: Mathematics of Planet Earth NWOL (2014).
- d. Member of the European Mathematical Society Meetings Committee (2013-2017)
- e. Session on *Functional Equations*, IMO training Camp, Tonbridge, May 2015.
- f. Chair at the International Congress of Mathematicians 2006
- g. Session on *Inequalities*, Trinity College, March 2015.



- h. Senior Coordinator at the European Girls' Mathematical Olympiad, Cambridge, 2012
- i. Senior Coordinator at the 43<sup>rd</sup> International Mathematics Olympiad, Glasgow, UK, July 2002.
- j. Problem Selection Committee member, 43<sup>rd</sup> International Mathematics Olympiad, Glasgow, UK, July 2002.
- k. Instructor at the National Mathematics Summer School (part of the British Mathematical Olympiad programme), Queen's College, Birmingham, July 2000.
- l. Coordinator at the 40<sup>th</sup> International Mathematics Olympiad, 10-22 July 1999.
- m. Member of the Departmental Research Committee, Undergraduate Teaching Committee, Member of the Departmental Computing Committee, Member of the College Entrance Qualifications Sub-Committee

### **Refereeing:**

Research Councils	ERC, EPSRC (UK), NSF (USA), Technology Foundation STW (Holland), Ministry of Education (Greece)
Publishers	Springer Verlag, Cambridge University Press, Oxford University Press
Journals	Annals of Probability, Annals of Applied Probability, IEEE Transaction of Signal Processing, Journal of Applied Probability, London Mathematical Society, Stochastics and Stochastic Reports, Probability Theory and Related Fields, Electronic Journal of Probability, Mathematics Reviews, etc.

