Konstantinos C. Zygalakis

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Education	

November 2008: Ph.D in Mathematics, University of Warwick.

September 2005: M.Sc. in Mathematics *with distinction*, University of Warwick.

July 2004: 5 year Diploma in Applied Mathematics and Physics, National Technical University of Athens, (N.T.U.A).

Professional Appointments

- **August 2019–present:** Reader in Mathematics of Data Science, School of Mathematics, University of Edinburgh, Edinburgh, UK.

- **January 2016–August 2019:** Lecturer in Mathematics of Data Science, School of Mathematics, University of Edinburgh, Edinburgh, UK.

- **February 2012–January 2016:** Lecturer in Applied Mathematics, Mathematical. Sciences, University of Southampton, Southampton, UK

- **February 2012–June 2012:** Postdoctoral Researcher, Chair of Comput. Math. & Num. Analysis (ANMC), Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland.

- **January 2009–January 2012:** Postdoctoral Research Assistant, Oxford Centre for Collaborative Applied Mathematics (OCCAM), University of Oxford, Oxford, UK.

- **September 2008–December 2008:** David Crighton Fellow, Department of Applied Mathematics and Theoretical Physics, University of Cambridge, Cambridge, UK.

Visiting Positions

- **September 2016– ,** Faculty Fellow, Alan Turing Institute.

- **January–June 2016,** Visiting Fellow, Newton Institute, University of Cambridge.

- **November/December 2010,** Visiting Professor, Department of Mathematics, EPFL, Switzerland (5 weeks).

Research Interests

Stochastic differential equations.
Theory: averaging/homogenization for SDEs.
Numerics: Numerical methods for multiscale SDEs, backward error analysis for SDEs.

Mathematical Biology.
Plant Modelling: Mathematical modelling of plants, especially of processes in the rhizosphere.
Stochastic Modelling and Applications: Stochastic simulation of chemical kinetics, stochastic simulation of reaction diffusion equations.

Computational Statistics.
Theory: Markov chain Monte Carlo algorithms for high dimensional problems, probabilistic solutions of ordinary differential equations.
Applications: Machine learning algorithms, data assimilation

Grants/Awards	• Simons Fellow, Newton Institute, University of Cambridge, January–June 2016.

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<tr><td>Grants/Awards</td><td>

- Simons Fellow, Newton Institute, University of Cambridge, January–June 2016.
- Co-organizer with R. Erban, D. Holcman, S. Isaacson of 6-month program on *Stochastic Dynamical Systems in Biology: Numerical Methods and Applications* at the Newton Institute, January-June 2016 (247,000£).
- Co-organizer with A. Beskos, D. Crisan, A. Doucet, Z. Ghahramani, S. Godsill , S. Singh, Y.W. Teh , S. Vollmer of Alan Turing Institute scoping workshop on *High dimensional statistical models and big data: Methods and Applications* (17,630£).
- Co-organizer with D. Firth, I. Kosmidis, A. Mazumder and R. Samworth of Alan Turing Institute scoping workshop on *Data Science for Data-Rich Sports* (14,500 £).
- International Travel Fund, University of Southampton (600 £).
- Leslie Fox Prize in Numerical Analysis (2nd prize).
- Celebrating New Appointments LMS grant (600 £)
- David Crighton Fellowship 2008 (to work as a visitor at University of Cambridge for 3 months with Prof. Haynes and Prof. Norris), (2500 £).
- LMS bursary to participate to BICS conference on Numerical Analysis, Multiscale Methods, Adaptivity and Complexity (100 £).
- SIAM travel award to participate to DS07 (500 $).
- Warwick Postgraduate Research Fellowship (WPRF) award 2006-2008.
- EPSRC Scholarship (fees only) 2005-2008.
- Funding from MASCI-net to participate at the 14th ECMI modelling week (Bristol August 2003).
- Erasmus Scholarship (Denmark,Copenhagen Fall 2002).
- Scholarship for entering 6th the Department of Applied Mathematics and Physics (N.T.U.A) 1999.

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<tr><td>Teaching Experience</td><td>

- **Applied Stochastic Differential Equations**. University of Edinburgh, (4th year course), 1st Semester 2017/18,2018/19, 2019/20 Lecturer.
- **Research Skills for Computational Applied Mathematics**. University of Edinburgh, (MSc course), 1st Semester 2017/18 Lecturer.
- **Several Variable Calculus and Differential Equations**. University of Edinburgh, (2nd year course), 1st Semester 2016/17 Lecturer.
- **Mathematical Methods for Scientists**. University of Southampton, (1st year course), 1st Semester 2015/16 Lecturer.
- **Simulation and Modelling**. University of Southampton, (PhD course), 1st Semester 2014/15, 2015/16 Lecturer.
- **Partial Differential Equations**. University of Southampton, (2nd year course), 2nd Semester 2014/15 Lecturer.
- **Structure and Dynamics of Networks**. University of Southampton, (4th year course), 1st Semester 2013/14, 2014/15, 2015/16 Lecturer.
- **Applications of Differential Equations**. University of Southampton, (3rd year course), 2nd Semester 2012/13, 2013/14 Lecturer.
- **Advance Differential Equations**. University of Southampton, (4th year course), 1st Semester 2012/13, 2013/14 Lecturer.
- **Nonlinear Systems**. University of Oxford, (3rd year course), Hilary Term, 2009/10, 2010/11, Teaching Assistant.
- **Techniques of Applied Mathematics**. University of Oxford, (3rd year course), Michaelmas Term, 2009/10, Teaching Assistant.
- **Homogenization Theory for PDE**. University of Warwick, (4th year course) 1st term, 2006/07, Teaching Assistant and Lecturer (4 lectures on Homogenization for Elliptic PDEs).
- **Mathematics by Computer**. University of Warwick, (1st year course) 2nd term, 2005/06, 2006/07, Teaching Assistant.
- **Analysis III**. University of Warwick,(2nd year course) 1st term 2005/06, Teaching Assistant.
- **Introductory tools for Financial Maths**. University of Warwick, MSc in Financial Mathematics, September 2005,2006, Lecturer (1 week intensive course on ODEs, PDEs and Linear Algebra).

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Miscellaneous	• Lecturer, Data Assimilation short course, KAUST, 17-20 February 2014. • Stipendiary Lecturer in Applied Mathematics, Christ Church College, University of Oxford, Trinity Term 2011. • Mathematics Tutor, 4 groups (15, 1st year students), University of Warwick, 1st 2nd 3rd term 2005/06. • Mathematics Tutor, 1 group (4, 2nd year students), University of Warwick, 1st 2nd term 2006/07. • Mathematics Tutor, 3 tutorials on Itô's integral and homogenization for the summer School: Modelling Across the Scales, University of Bath, 26-30 June 2006. • Teaching Assistant for the LMS-EPSRC Short Course, An Introduction to Multiscale Methods, University of Warwick, (5 tutorials). • Lecturer, 2 lectures on Itô's integral and homogenization for BMS summer school-Mathematics of Multiscale Phenomena, Free University of Berlin 1-12 September 2008.
Student Supervision	• J. Lipkova, summer intern, 06/09-09/09, OCCAM, (co-supervised with R. Erban). • T. Szekely, Ph.D student, 09/09-05/14, University of Oxford (co-supervised with K. Burrage, R. Erban). • S. Ridden, Ph.D student, 08/12-06/16, University of Southampton (co-supervised with B. Mac Arthur). • J. Heppel, Ph.D student, 08/12-12/14, University of Southampton (co-supervised with T. Roose and J. Fliege). • S. Kontogeorgaki, MPhil student, 10/13-09/16, University of Southampton (co-supervised with B. Mac Arthur and R. Ewing). • T. Horne, MMath student, 10/13-06/14, University of Southampton. • P. Goggin, Ph.D student, 10/14-06/16, University of Southampton (co-supervised with R. Oreffo and P. Schneider). • M. Wildgoose, project student, 09/16-04/17, University of Edinburgh. • J. Hall, L. Howell, S. Pethick, K. Petropoulou, group project students, 09/17-04/18, University of Edinburgh. • R. Gao, C. Kee, T. Murphy, M. Murrison, group project students, 09/17-04/18, University of Edinburgh. • A. Jordana, summer intern, 04/18-07/18, University of Edinburgh. • L. Vargas, MSc student, 05/18-08/18, University of Edinburgh, (co-supervised with M. Pereyera). • H. Xue, MSc student, 05/19-08/19, University of Edinburgh. • K. Alexiou, MSc student, 05/19-08/19, University of Edinburgh. • K. Rusch, MSc student, 05/19-08/19, University of Edinburgh, (co-supervised with J. Pearson). • L. Vargas, PhD student, 09/18-today, University of Edinburgh, (co-supervised with M. Pereyera). • M. Holden, PhD student, 09/18-today, University of Edinburgh, (co-supervised with M. Pereyera). • A. Morisson, undergraduate project student, 09/18-05/10, University of Edinburgh. • M. Macmillan, undergraduate dissertation student, 09/18-05/19, University of Edinburgh. • W. Luming, O. Mati, J. Spence, group project students, 09/18-05/19, University of Edinburgh.

Publications (Books)

[1] K.J. H. Law, A. M. Stuart and K. C. Zygalakis, *Data Assimilation: A mathematical introduction.* Springer (2015), vol 62 in the series *Texts in Applied Mathematics.*

Publications (Papers submitted to refereed journals)

[1] K. Rusch, J. W. Pearson, K C. Zygalakis, *Constructing Gradient Controllable Recurrent Neural Networks Using Hamiltonian Dynamics.* (Submitted to Mathematical and Scientific Machine Learning Conference Proceedings)

[2] J.M. Sanz Serna, K.C. Zygalakis, *Contractivity of Runge-Kutta methods for convex gradient systems.* (Submitted to SIAM Journal of Numerical Analysis).

[3] A. Eftekhari, B. Vandereycken, G. Vilmart, K C. Zygalakis, *Explicit Stabilised Gradient Descent for Faster Strongly Convex Optimisation.* (Submitted BIT Numerical Mathematics).

[4] A. Duncan, G. A. Pavliotis, K. C. Zygalakis, *Nonreversible Langevin Samplers: Splitting Schemes, Analysis and Implementation.* (Submitted to SIAM/ASA UQ).

[5] C. A. Yates, A. B. Duncan, A. Jordana C. Smith, A. George, K. C. Zygalakis, *A hybrid framework for the simulation of stochastic reaction-diffusion processes.* (Submitted to Journal of the Royal Society Interface).

[6] L. Vargas, M. Pereyra, K.C. Zygalakis ,*Accelerating proximal Markov Chain Monte Carlo by using explicit stabilised methods.* (Submitted to SIAM Journal on Imaging Science).

[7] O. M. Crook, T. Hurst, C-B Schonlieb, M. Thorpe, K. C. Zygalakis, *Differential Equation Numerical Schemes for Semi-Supervised Learning on Point Clouds.* (Submitted to SIAM Data Science).

Publications (Papers published in refereed journals)

[1] L. Szpruch, S. Vollmer, K. C. Zygalakis, M. B. Giles, *Multi Level Monte Carlo methods for a class of ergodic stochastic differential equations.* Stat. Comput., *to appear*, (2019).

[2] A. L. Bertozzi, X. Luo, A. M. Stuart, and K. C. Zygalakis, *Uncertainty Quantification in the Classification of High Dimensional Data.* SIAM UQ, 6(2):2568-595, (2018).

[3] T. Plesa, K. C. Zygalakis, D. F. Anderson, R. Erban, *Noise control for molecular computing* J. R. Soc., 15 (144), 20180199 (2018) .

[4] S.D. Keyes, K.C. Zygalakis and T. Roose, *An explicit structural model of micro-scale root-hair and rhizosphere interactions parameterized by synchrotron X-ray computed tomography.* Bull Math. Biol., 79: 2785-2813 (2017).

[5] S. Kontogeorgaki, R.J. Sanchez-Garcia, R. M. Ewing, K. C. Zygalakis, B. D. MacArthur, *Noise-processing by signalling networks.* Sci. Rep., 532, (2017).

[6] A. Durmus, G. O. Roberts, G. Vilmart, K. C. Zygalakis, *Fast Langevin based algorithm for MCMC in high dimensions* Ann. App. Prob., 27(4), 2195-2237, (2017).

[7] A. Duncan, R. Erban, K.C. Zygalakis, *Hybrid framework for the simulation of stochastic chemical kinetics,* J. Comp. Phys., 326, 398-419, (2016).

[8] O. Teymour, K. C. Zygalakis, B. Carlderhead, Probabilistic Linear Multistep Methods. Advances in Neural Information Processing Systems 29, 4321-4328 , (2016).

[9] J. Heppell, S. Payvandi, P.Talboys, K. C. Zygalakis, D. Langton, R.Sylvester-Bradley, R.Walker, D.L.Jones and T. Roose, *Use of a coupled soil-root-leaf model to optimise phosphate fertiliser use efficiency in barley.* Plant Soil 406, (1–2), 341–357, (2016).

[10] P. R. Conrad, M. Girolami, S. Sarkka, A. M. Stuart, K. C. Zygalakis, *Statistical analysis of differential equations: introducing probability measures on numerical solutions.* Stat. Comput. 1-18, (2016).

[11] P.M. Goggin, K. C. Zygalakis, R. O. C. Oreffo, P. Schneider, *High-resolution 3D imaging of osteocytes and computational modelling in mechanobiology: Insights on bone development, ageing, health and disease.* eCM, 31:264-295, (2016).

[12] S. J. Vollmer, K.C. Zygalakis and Y. W. Teh, *Exploration of the (Non-)asymptotic Bias and Variance of Stochastic Gradient Langevin Dynamics.* J. Mach. Learn. Res., 17(159): 1-48, (2016).

[13] J. Heppell, S. Payvandi, P.Talboys, K.C. Zygalakis, J. Fliege, D. Langton, R.Sylvester-Bradley, R.Walker, D.L.Jones and T. Roose, *Modelling the optimal phosphate fertiliser and soil management strategy for crops.* Plant Soil, 401(1):135-149, (2016).

[14] S. Ridden, K.C. Zygalakis and B. D. MacArthur, *Bet-hedging and collective decision-making by mammalian progenitor cells.* Phys. Rev. Lett., 115, 208103, (2015).

[15] A. Abdulle, G. Vilmart, and K.C. Zygalakis, *Long time accuracy of Lie-Trotter splitting methods for Langevin dynamics .* SIAM J. Numer. Anal., 53(1):1-16, (2015).

[16] J. Heppell, P. Talboys, S. Payvandi, K. C. Zygalakis, J. Fliege, P. Withers, D.L. Jones, and T. Roose, *How changing root system architecture can help tackle a reduction in soil phosphate (P) levels for better plant P acquisition.* Plant Cell Envir. 38: 118-128, (2015).

[17] S. Payvandi, K.R. Daly, K.C. Zygalakis and T. Roose, *Modelling the effects of diffusion on phloem flow.* Bull Math. Biol., 76:2834-2865, (2014).

[18] T. Székely, K. Burrage, K. C. Zygalakis, and M. Barrio, *Efficient simulation of stochastic chemical kinetics with the stochastic Bulirsch-Stöer method.* BMC Syst. Biol., 8(1):71, (2014).

[19] A. Abdulle, G. Vilmart, and K.C. Zygalakis, *High order numerical approximation of the invariant measure of ergodic SDEs.* SIAM J. Numer. Anal., 52(4):1600-1622, (2014).

[20] J. Heppell, S. Payvandi, K. C. Zygalakis, J. Smethurst, J. Fliege and T. Roose ,*Validation of a spatial-temporal soil water movement and plant water uptake model.* Géotechnique. 64:526-539(13), (2014).

[21] S. Payvandi, K.R. Daly, D.L. Jones, P. Talboys, K.C. Zygalakis, and T. Roose, *A mathematical model of water and nutrient transport in xylem vessels of a wheat plant.* Bull Math. Biol., 76, 566–596, (2014).

[22] A. Abdulle, G. Vilmart, and K.C. Zygalakis, *Second weak order explicit stabilized methods for stiff stochastic differential equations.* SIAM J. Sci. Comput. 35(4):A1792-A1814, (2013)

[23] D. Blömker, K. Law, A.M. Stuart, and K.C. Zygalakis, *Accuracy and stability of the continuous-time 3DVAR filter for the Navier-Stokes equation.* Nonlinearity 26: 2193-2219, (2013), (Featured Article)

[24] A. Abdulle, G. Vilmart, and K.C. Zygalakis, *Mean-square A-stable diagonally drift-implicit integrators of weak second order for stiff Itô stochastic differential equations.* BIT Numer. Math. 1-14, (2013).

[25] G. Iyer, and K.C. Zygalakis, *Numerical studies of homogenization under a fast cellular flow.* Multiscale Model. Simul., 10(3):1046-1058, (2012).

[26] T. Székely, K. Burrage, R. Erban, and K.C. Zygalakis, *Higher-order numerical methods for stochastic simulation of chemical reaction systems.* BMC Systems Biology, 6:85 (2012).

[27] A. Abdulle, D. Cohen, G. Vilmart and K.C. Zygalakis, *High order weak methods for stochastic differential equations based on modified equations.* SIAM J. Sci. Comput. 34(3):A1800-A1823, (2012).

[28] K.C. Zygalakis and T. Roose, *A mathematical model for investigating the effect of cluster roots on plant nutrient uptake.* Eur. Phys. J. Special Topics, 204, (1), 103-118, (2012).

[29] S.L. Cotter, K.C. Zygalakis, I. Kevrekidis and R. Erban, *A Constrained Approach to Multiscale Stochastic Simulation of Chemically Reacting Systems.* J. Chem. Phys. 135, 094102, (2011), (selected for the September 2011 issue of JCP : BioChemical Physics).

[30] K.C. Zygalakis, G.D.J. Kirk, D.L. Jones, M. Wissuwa and T. Roose, *A dual porosity model of nutrient uptake by root hairs.* New Phytol., 192 (3) : 676-688, (2011).

[31] E. Oburger, D. Leitner, D.L. Jones, K.C. Zygalakis, A. Schnepf and T. Roose, *Fate of organic acid anions in soil: sorption dynamics of citric acid.* Eur. J. Soil Sci., 62 (5) : 733-742, (2011).

[32] J. Lipkova, K.C. Zygalakis, S.J. Chapman, and R. Erban, *Analysis of Brownian Dynamics Simulations of Reversible Bimolecular Reactions.* SIAM J. Appl. Math. 71, 714-730, (2011).

[33] K.C. Zygalakis, *On the Existence and Applications of Modified Equations for Stochastic Differential Equations.* SIAM J. Sci. Comput. 33(1), 102-130, (2011).

[34] B. Mélykúti, K. Burrage, and K.C. Zygalakis, *Faster Stochastic Simulation of Biochemical Reaction Systems by Alternative Formulations of the Chemical Langevin Equation.* J. Chem. Phys. 132, 164109, (2010), (selected for the May 1, 2010 issue of Virtual Journal of Biological Physics Research).

[35] G.A. Pavliotis, A.M. Stuart, and K. C Zygalakis, *Calculating effective diffusiveness in the limit of vanishing molecular diffusion.* J. Comp. Phys. 228(4) 1030-1055, (2009).

[36] G.A. Pavliotis, A.M. Stuart, and K.C. Zygalakis, *Homogenization for inertial particles in a random flow.* Comm. Math. Sci., 5, (3), 507-531, (2007).

Publications (Book Chapters, Conference Proceedings)

[1] D. Blömker, K. Law, A.M. Stuart, and K.C. Zygalakis, *The 3DVAR filter for the Navier-Stokes equation: Accuracy and stability in the limit of high-frequency observations.* AIP Conf. Proc. 1479, 916, (2012)

[2] T. Székely, K.C. Zygalakis, K. Burrage, and R. Erban . *Higher order numerical simulation of stochastic chemical reaction systems.* 8th EBSA European Biophysics Congress, Budapest, Hungary. Eur. Biophys. J. , 40(1):118, (2011).

[3] D. Leitner, E. Oburger, D.L. Jones, K.C. Zygalakis, T. Roose and A. Schnepf *A Kinetic Sorption Model for Citrate in Soil* Czech Technical University Publishing Company, Book of Abstract, (2010).

[4] P.H. Haynes, V.H. Hoang, J.R. Norris, and K.C. Zygalakis, *Homogenization for advection-diffusion in a perforated domain.* Probability and Mathematical Genetics: Papers in Honour of Sir John Kingman, LMS Lecture Notes Series 397, (2010).

[5] K.C. Zygalakis and T. Roose, *A mathematical model for the uptake of nutrients by roots hairs.* Proceedings of the 42nd Agricultural Research Modellers Group, (2010)

[6] C.G. Bell, A.B. Bonfiglio, C.B. Breward, I.V. Chenchiah, Z. Jones, J. Meskauskas, S. Naire, D. O'Hare, S. Payvandi, D.L. Tseng, R.J. Whittaker and K.C Zygalakis, *Measuring vesicular release from neurons.* 2009 Mathematics in Medicine study group proceedings, (2009).

Publications (Theses)

[1]. **Ph.D Thesis:** *Effective Diffusive Behaviour for Passive Tracers and Inertial Particles: Homogenization and Numerical Algorithms.*
Thesis Advisor: A.M. Stuart, University of Warwick, UK, November 2008.

[2]. **MSc Thesis:** *Homogenization for Inertial Particles.*
Thesis Advisor: A.M. Stuart, University of Warwick, UK, October 2005.

[3]. **Diploma Thesis:** *Study of Chaos in Electrical Circuits.*
Thesis Advisor: T. Alexopoulos, National Technical University of Athens, Greece, July 2004.

Main Presentations

- **Bayesian inverse problems, prior modelling and algorithms for posterior sampling.** Centre for Mathematics and Algorithms for Data, University of Bath, November 2019.

- **Explicit stabilised methods and their application to Bayesian inverse problems.** Workshop on the future of structure-preserving algorithms ICMS, Edinburgh, October 2019.

- **Hybrid modelling for the stochastic simulation of multi-scale chemical kinetics.** Workshop on fast-slow systems, ICMS, Edinburgh, July 2019.

- **Explicit stabilised methods and their application to Bayesian inverse problems.** Equadiff 2019, University of Leiden, July 2019.

- **Explicit stabilised methods and their application to Bayesian inverse problems.** Statistics Seminar, University of Cambridge, March 2019.

- **Bayesian Inference and mathematical imaging: Where Stochastic Analysis meets Optimization.** UDRC Themed Meeting: Scalable Signal Processing with Bayesian Graphical Models, University of Edinburgh, February 2019.

- **Explicit stabilised methods and their application to Bayesian inverse problems.** Applied Mathematics Seminar, University of Warwick, February 2019.

- **Explicit stabilised methods and their application to Bayesian inverse problems.** 23rd SIAM UKIE Annual Meeting, University of Oxford, January 2019.

- **Ergodic Stochastic Differential Equations and Sampling: A numerical analysis perspective.** Statistics & Actuarial Mathematics Seminar, Heriot-Watt University, October 2018.

- **Explicit stabilised Runge-Kutta methods for optimization** Gradient flows: challenges and new directions, ICMS Edinburgh, September 2018.

- **Ergodic Stochastic Differential Equations and Sampling: A numerical analysis perspective.** Numerical Analysis Seminar, 12th International Vilnius conference in probability and mathematical statistics, July 2018.

- **Bayesian Uncertainty Quantification in the Classification of High Dimensional Data.** Workshop on microlocal analysis, Alan Turing Institute, June 2018.

- **Explicit stabilised Runge-Kutta methods for convex optimization.** Workshop on new directions in applied linear algebra, numerical methods for PDEs, and applications, ICMS Edinburgh, April 2018.

- **Ergodic Stochastic Differential Equations and Sampling: A numerical analysis perspective.** Mathematics Seminar, University of Dundee, January 2018.

- **Ergodic Stochastic Differential Equations and Sampling: A numerical analysis perspective.** Numerical Analysis Seminar, University of Geneva, December 2017.

- **Bayesian Uncertainty Quantification in the Classification of High Dimensional Data.** GAMES Seminar, University of Edinburgh, November 2017.

- **Ergodic Stochastic Differential Equations and Sampling: A numerical analysis perspective.** Workshop on Monte Carlo and Hybrid Methods, University of Sussex, June 2017.

- **Bayesian Uncertainty Quantification in the Classification of High Dimensional Data.** 5th PDE Scottish Colloquium , University of St Andrews, June 2017.

- **Hybrid Modelling of Stochastic Chemical kinetics.** Workshop on Piecewise Deterministic Markov Process, Seillac, May 2017.

- **Bayesian Uncertainty Quantification in the Classification of High Dimensional Data.** Partial Differential Equations for Large Data workshop, University of Warwick, May 2017.

- **Hybrid Modelling of Stochastic Chemical kinetics.** Workshop on developing efficient methodologies for modelling stochastic dynamical systems in biology, University of Bath, April 2017.

- **Bayesian Uncertainty Quantification in the Classification of High Dimensional Data.** Numerical Analysis and Scientific Computing Seminar, University of Strathclyde, March 2017.

- **On long time approximation of ergodic stochastic differential equations: Examples from homogenization and molecular dynamics.** Applied Mathematics Seminar, University of Birmingham, February 2017.

- **Ergodic Stochastic Differential Equations and Sampling: A numerical analysis perspective.** Workshop on Multiscale methods for stochastic dynamics, University of Geneva, January 2017

- **On long time approximation of ergodic stochastic differential equations: Examples from homogenization and molecular dynamics.** Dynamical Systems and PDE seminar, University of Surrey, November 2016.

- **Ergodic Stochastic Differential Equations and Sampling: A numerical analysis perspective.** Adaptive and Neural Computation Seminar, University of Edinburgh, November 2016.

- **Probabilistic Numerical Methods for Deterministic Differential Equations.** MIGSAA Industrial Sandpit, ICMS, October 2016.

- **Hybrid Modelling of Stochastic Chemical kinetics.** Mathematical Biology Seminar, University of Edinburgh, October 2016.

- **Hybrid Modelling of Stochastic Chemical kinetics.** Computational Challenges in Biochemical Networks: Multiscale Modelling and Inverse Problems, University of Manchester, August 2016.

- **Ergodic Stochastic Differential Equations and Sampling: A numerical analysis prespective.** Stochastic numerical algorithms, multiscale modeling and high-dimensional data analytics, ICERM, July 2016.

- **Long Time Approximation of Ergodic SDEs and Multi-Level Monte Carlo.** Numerical Schemes for SDEs and SPDEs, University Lille, June 2016.

- **Qualitative Behaviour of Numerical Methods for SDEs and applications to homogenization, molecular dynamics and machine learning.** Division of Mathematics Seminar, National Technical University of Athens, May 2016.

- **Hybrid Modelling of Stochastic Chemical kinetics.** Multiscale Methods for Stochastic Dynamical Systems, BAMC, University of Oxford, April 2016.

- **Hybrid Modelling of Stochastic Chemical kinetics.** Multiscale Methods for Stochastic Dynamical Systems, ICMS Edinburgh, March 2016.

- **Ergodic Stochastic Differential Equations and Big Data.** Never Mind the Big Data here's the Big Models, University of Warwick, December 2015.

- **Hybrid Modelling of Stochastic Chemical kinetics.** Mathematical Biology and Ecology Seminar, University of Oxford, October 2015.

- **Probabilistic Numerical Methods for Deterministic Differential Equations.** SciCADE 2015, University of Potsdam, September 2015.

- **On long time approximation of ergodic stochastic differential equations: Applications in molecular dynamics and big data.** Workshop in Stochastic Dynamics, Academy of Mathematics and Systems Science of the Chinese Academy of Sciences, Beijing, August 2015.

- **Hybrid Modelling of Stochastic Chemical kinetics.** 26th Biennial Numerical Analysis Conference, University of Strathclyde, June 2015.

- **On long time approximation of ergodic stochastic differential equations: Applications to Big Data.** Workshop on Mathematical Methods for Massive Data Sets, University of Edinburgh, May 2015.

- **On long time approximation of ergodic stochastic differential equations: Applications to Big Data (and molecular dynamics).** Algorithms & Computationally Intensive Inference seminar, University of Warwick, May 2015.

- **On the long time approximation of ergodic stochastic differential equations.** CMS Seminar, University of Plymouth, February 2015.

- **On the long time approximation of ergodic stochastic differential equations.** Workshop on Stochastic and Multiscale Problems, University of Oxford, September 2014.

- **Numerical methods for ergodic SDEs.** Numerical Analysis and Scientific Computing Seminar, University of Manchester, January 2014.

- **Numerical methods for ergodic SDEs.** LMS Workshop on Interfaces between Numerical Analysis and Computational Statistics, University of Southampton, January 2014.

- **Numerical studies of homogenization under a fast cellular flow.** SciCADE 2013, University of Valladolid, September 2013.

- **Numerical studies of homogenization under a fast cellular flow.** Oxford Conference on Challenges in Applied Mathematics, University of Oxford, July 2013

- **Numerical studies of homogenization under a fast cellular flow.** CNM Seminar, University of Bath, October 2012.

- **Numerical studies of homogenization under a fast cellular flow.** ALGORITMY 2012, Podbanske, September 2012.

- **High order weak methods for SDEs based on modified equations.** Swiss Numerical Colloquium, University of Bern, April 2012.

- **Qualitative behaviour of numerical methods for SDEs and applications.** NIAS and Applied & Computational Mathematics Seminar, University of Edinburgh, March 2012.

- **Qualitative behaviour of numerical methods for SDEs and application to homogenization.** Applied Mathematics & Mathematical Physics seminar, Imperial College, January 2012.

- **Mathematical modelling of the Rhizosphere.s** Oxford/Princeton Collaborative workshop, Oxford, January 2012.

- **Qualitative behaviour of numerical methods for SDEs and application to homogenization.** Probability, Stochastic modelling and Financial mathematics seminar, University of Leeds, December 2011.

- **Qualitative behaviour of numerical methods for SDEs and application to homogenization.** CNA Seminar, Carnegie Mellon University, October 2011.

- **A dual porosity model for the nutrient uptake by root hairs.** ECTMB 2011, Krakow, June 2011.

- **Alternative Formulations of the Chemical Langevin Equation.** ECTMB 2011, Krakow, June 2011.

- **Modified equations, backward error analysis and numerical methods for stochastic differential equations.** 15th Leslie Fox prize in numerical analysis meeting, University of Manchester, June 2011.

- **Modified equations, backward error analysis and numerical methods for stiff stochastic differential equations.** Stochastic Analysis seminar, University of Oxford, June 2011.

- **A dual porosity model for the nutrient uptake by root hairs.** Rhizosphere processes on multiple scales, BOKU Vienna, March 2011.

- **Modified equations and backward error analysis for stochastic differential equations.** Numerical Analysis Seminar, EPFL, November 2010.

- **Modified equations and backward error analysis for stochastic differential equations.** Numerical Analysis and Scientific Computing Seminar, University of Manchester, October 2010.

- **Mathematical models for nutrient uptake.** X-ray CT scanning and plant modelling workshop, University of Oxford, September 2010.

- **On the existence and the applications of modified equations for SDEs.** Applied and Numerical Analysis Seminar, University of Crete, June 2010.

- **A dual porosity model for the uptake of nutrients by root hairs.** Fluids and Material Seminar, University of Bristol, March 2010.

- **On the existence and the applications of modified equations for SDEs.** Computational and Applied Mathematics Seminar, University of Oxford, January 2010.

- **Some problems in modelling the Rhizosphere.** Modelling Plant Nutrient Uptake Workshop, University of Oxford, August 2009.

- **On the existence and the applications of modified equations for SDEs.** Capstone conference, Mini-symposium on Numerical Methods for Multiscale Stochastic Systems, University of Warwick, July 2009.

- **Mathematical modelling of the Rhizosphere.** OCCAM Launch Event, University of Oxford, June 2009.

- **Applications of Modified Equations for SDEs.** Fourteenth Cambridge/Oxford Applied Mathematics Meeting, University of Cambridge, June 2009.

- **Modified Equations for Stochastic Differential Equations.** ICMS Edinburgh, Adaptivity, robustness and complexity of multiscale algorithms, March 2009.

- **Effective Diffusive Behaviour for Passive Tracers and Inertial Particles: Homogenization and Numerical Algorithms.** Mathematical Physics Seminar, University of Helsinki, December 2008.

- **Modified Equations for Stochastic Differential Equations.** Applied Mathematics/Statistics Interface Seminar, University of Warwick, November 2008.

- **Calculating Effective Diffusivities in the Limit of Vanishing Molecular Diffusion.** Applied and Computation Mathematics Graduate Seminar, University of Cambridge, October 2008.

- **Effective Diffusive Behaviour for Passive Tracers and Inertial Particles: Homogenization and Numerical Algorithms.** CNM Seminar, University of Bath, June 2008.

- **Effective Diffusive Behaviour for Passive tracers and Inertial Particles.** SIAM DS 07, May 2008.

- **Calculating Effective Diffusivities in Vanishing Viscosity.** British Applied Mathematics Colloquium 2008, University of Manchester, April 2008.

- **Calculating Effective Diffusivities in Vanishing Viscosity.** Statistics for stochastic differential equations models, La Manga, Spain, May 2007.

- **Homogenization for Inertial Particles Moving in a Random Velocity Field.** British Applied Mathematics Colloquium 2006, University of Keele, April 2006.

Major Conferences and Summer Schools Attended

- **Capstone Conference**, University of Warwick, 31 June -3 July, 2009.

- **Adaptivity, robustness and complexity of multiscale algorithms**, ICMS Edinburgh, 30 March-3 April, 2009.

- **Biomechanics of Growth in Plant Biology**, University of Bristol, 23-27 March, 2009.

- **BMS summer school-Mathematics of Multiscale Phenomena**, Free University Berlin, 1-12 September, 2008.

- **SIAM Conference on Applications of Dynamical Systems (DS07)**, Utah, 28 May-1 June, 2007.

- **Mathematical Issues in Stochastic Approaches for Multiscale Modeling**, MSRI Berkeley, 21-25 May, 2007.

- **Statistics for Stochastic Differential Equations Models (SEMSTAT 07)**, La Manga, 6-12 May, 2007.

- **LMS-EPSRC Short Course, An Introduction to Multiscale Methods**, University of Warwick, 15-20 April, 2007.

- **Multiscale Analysis and Computations in Stochastic Differential Equation Modelling 2007 (macsdiem07)**, University of Sussex, 22-24 February 2007.

- 5th **Prague Summer School in Mathematical Statistical Mechanics**, Prague, 11-22 September, 2006.

- **Modelling Across the Scales**, University of Bath, 26-30 June, 2006.

Other Activities

- Graduate Students of University of Warwick SSLC, (Student Staff Liaison Committee), representative 2006-2007.

- Organizer of the post graduate seminar, 2006-2007, (University of Warwick).

- Co-organizer, with T. Roose of OCCAM x-ray CT scanning and plant modelling workshop, Mathematical Institute, University of Oxford, 21-22 September 2010.

- Co-organizer, with G. Pavliotis of homogenisation mini-symposium, Equadiff 2011, University of Loughborough, 1-5 August 2011.

- Co-organizer, with G. Gyurko and L. Szpruch of the 1st Joint OCCAM-OMI workshop on stochastic differential equations: numerical algorithms and applications. 8-10 August 2011.

- Co-organizer, with P. C. Bressloff, S.J. Chapman, R. Erban and P.K. Maini of LMS short instructional course: Stochastic modelling in biological systems. 18-23 March 2012.

- Co-organizer, with A. Abdulle of Multiscale modelling: numerical methods and applications, mini-symposium, SciCADE 2013, University of Valladolid, 16-20 September 2013.

- Organizer, Interfaces between numerical analysis and computational statistics workshop, University of Southampton, 15 January 2014.

- Co-organizer with S. Cotter of Numerical Methods in Stochastic Problems in Biology, mini-symposisum, 16th Biennial Numerical Analysis Conference, University of Strathclyde 23-26 July 2015.

- Referee for:
    - Journal of Chemical Physics
    - PLoS Computational Biology
    - Bulletin of Mathematical Biology
    - IMA Journal of Applied Mathematics
    - Journal of Applied Probability
    - IMA Journal of Numerical Analysis
    - Multiscale Modelling and Simulation
    - SIAM Journal of Applied Mathematics
    - SIAM Journal of Scientific Computing
    - Journal of Computational and Applied Mathematics
    - Journal of Theoretical Biology
    - Applied Numerical Mathematics
    - Journal of Computational Physics
    - BIT Numerical Mathematics
    - SIAM Journal of Numerical Analysis
    - Foundations of Computational Mathematics
    - Numerische Mathematik
    - Philosophical Transaction of Royal Society A
    - SIAM Journal on Applied Dynamical Systems
    - Chemical Engineering Science
    - Information and Inference: A journal of the IMA

Skills

- Languages: Greek (native), English (Fluent) (Proficiency from University of Michigan, TOEFL 284/300), Spanish (elementary)

- Computer Skills: C Unix, Linux, LaTeX, Matlab, Mathematica, Maple.

December 6, 2019