Grigorios A. Pavliotis

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Personal Data

Date of birth: February 28, 1976
Place of birth: Thessaloniki, Greece
Citizenship: Greek

Education

May 2002: PhD in Mathematics, Rensselaer Polytechnic Institute.
May 2000: MSc. in Applied Mathematics, Rensselaer Polytechnic Institute.
September 1997: BSc in Physics, Aristotle University of Thessaloniki.
March 2008: Certificate of Advanced Study in Learning and Teaching, Imperial College London.

Professional Appointments

- **August 2014 – present** Professor of Applied Mathematics, Department of Mathematics, Imperial College London, UK.
- **October 2011 – July 2014** Reader in Applied Mathematics, Department of Mathematics, Imperial College London, UK.
- **March 2012 – September 2012** Invited Professor, Biocomputing Group, Department of Mathematics, Freie Universitat, Berlin, Germany. http://www.biocomputing-berlin.de/biocomputing/en/
- **September 2011 – February 2012** Invited Professor, CERMICS - Ecole des Ponts ParisTech, Paris, France. http://www-roc.inria.fr/micmac/spip.php?rubrique184
- **October 2008 – September 2011** Senior Lecturer in Applied Mathematics, Department of Mathematics, Imperial College London, UK.
- **October 2005 – September 2008** Lecturer in Applied Mathematics, Department of Mathematics, Imperial College London, UK.
- **October 2004 – September 2005** Chapman Fellow, Department of Mathematics, Imperial College London, UK.
- **October 2003 – September 2004** Temporary Lecturer, Mathematics Institute, University of Warwick, UK.
- **June 2002 – September 2003** Postdoctoral Fellow, Mathematics Institute, University of Warwick, UK.

Visiting Positions

- **May 2016**, Institute for Analysis und Scientific Computing, TU Wien, Austria (1 week).
- **June 2015**, Bernoulli Center (CIB), EPFL, Switzerland (1 week).
- **April 2010**, Institute for Mathematics and its Applications (IMA), Minneapolis, MI, USA (2 weeks).
- **February 2010**, Statistical and Applied Mathematical Sciences Institute (SAMSI), NC, USA (2 weeks)
- **August/September 2009**, Department of Mathematics, EPFL, Switzerland (1 week)
- **May 2009**, Department of Applied Mathematics, University of Crete, Greece (1 week)
- **April 2009**, Department of Mathematics, EPFL, Switzerland (2 weeks)
- **May 2008**, CWI, Amsterdam, the Netherlands (2 weeks)
- **July 2007**, Department of Mathematics, University of Bielefeld, Germany (1 week)
- **April 2007**, Mathematical Sciences Research Institute (MSRI), Berkeley, CA, USA (1 month)

Visiting Positions (Continued)

- **June 2006** Department of Applied Mathematics, Ecole Polytechnique, Paris, France (1 week)
- **June 2006** Max–Planck Institute for Mathematics in the Sciences, Leipzig, Germany (1 week)
- **March 2003** Visiting Research Fellow, IAS, School of Mathematics, Princeton, NJ, USA (1 month)
- **July-August 2002** Visiting Research Fellow, SCCM, Stanford University, CA, USA (2 months)
- **1997, March – July, 1998 February - May** Research Assistant, Solvay Institute for Physics and Chemistry, Free University of Brussels, Belgium.
- **1996, July - August** Research Assistant, Department of Theoretical Physics, University of Jena, Germany.

Major Grants

- EPSRC funding profile: http://gow.epsrc.ac.uk/NGBOViewPerson.aspx?PersonId=-188882.
- EP/L025159/1 Statistical mechanics of soft matter: Derivation, analysis and implementation of dynamic density functional theories (co-I; PI: Professor S. Kalliadasis). £379,072. http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/L025159/1
- EP/L024926/1 Mathematical fundamentals of Metamaterials for multiscale Physics and Mechanics (co-I; PI: Professor R.V. Craster) £2,551,402. http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/L024926/1.
- EP/L020564/1 Multiscale Analysis of Complex Interfacial Phenomena (MACIPh): Coarse graining, Molecular modelling, stochasticity, and experimentation £1,616,110 (co-I; PI: Professor S. Kalliadasis). http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/L020564/1
- EP/J009636/1. *Creating macroscale effective interfaces encapsulating microstructural physics.*. 10/12-04/16. Funds two postdocs travel, computer.PI. Co-Is: R.V. Craster and A.O. Parry (IC). £550,000. http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/J009636/1
- (Previous Grant) EP/H034587/1. *Active-dissipative nonlinear spatially extended media: Complexity, coarse-graining, multiscale analysis and numerical methods.*. 10/10-31/03/14. Funded one post-doc, one PhD student, travel, computer. PI S. Kalliadasis (IC). £390,155. http://gow.epsrc.ac.uk/ViewGrant.aspx?GrantRef=EP/H034587/1

Other Grants/Awards

- Grant from the ICMS (via the EPSRC and the LMS), £20,000 for workshop organization: *Computational methods for statistical mechanics*, ICMS,Edinburgh, 26 June 2014
- Grant from the (EPSRC funded) Platform Grant, Department of Mathematics, Imperial College London, London Mathematical Society and the Grantham Institute for Climate Change for the organization of workshop *Critical Transitions in Complex Systems.* £12,000. co-PIs: J. Lamb, M. Rasmussen.
- Grant from Netherlands Organisation for Scientific Research (through the Lorentz Center) for the organization of Workshop on Coherent Structures in Evolutionary Equations, 12-16 July 2010, Lorentz Center, The Netherlands. 12,000 Euros.
- Grant from EPSRC/LMS for organizing a short course on Multiscale Methods (Warwick University, April 2007), £ 15,000.
- The Rensselaer Department of Mathematical Sciences Joacquin B. Diaz Prize for the Best Thesis in 2002, May 2002.
- Erasmus Fellowship, Spring 1997.
- A.I.E.S.E.C. Fellowship, Summer 1996.
- Award from the Greek National Fellowships Foundation (I.K.Y.), 1997, 1998.

Teaching Experience

- **Computational Stochastic Processes**, winter terms 2013/14, 2014/15. Department of Mathematics, Imperial College London, course offered to MSc and to MRes students.
- **Topics in Non-Equilibrium Statistical Mechanics**, summer term 2011/12. 20 lectures, Berlin Mathematical School, Berlin, Germany.
- **Stochastic processes**, autumn terms 2008/09, 2009/10, 2010/11, 2012/13, 2015/16, 2016/17. 30 lectures, course offered to fourth year and MSc students.
- **Applied stochastic processes** autumn terms 2007/08, 2008/09, 2009/10, 2010/2011. 20 lectures, course offered to PhD students, part of the EPSRC taught course centre in pure and applied mathematics.
- **Dynamics**, winter terms 2007/08, 2008/09, 2009/10, 2010/11. 18 lectures, second year course, second part of the course *Fluids and Dynamics*.
- **Mathematics for electrical engineers**, winter/summer terms 2006/07, 2007/08. (30 lectures, first year course).
- **Homogenization theory for partial differential Equations**. Winter term 2003/04 (at Warwick University), autumn terms 2004/05,2005/06, 2006/07. 30 lectures, course offered to fourth year and MSc students.
- **3D Geometry and motion**. Autumn term 2003/04, Warwick University. 30 lectures, first year course.

Postdoctoral Mentoring

- H. Hutridurga, since 09/2016.
- S. Gomes, since 06/2016.
- A. Duncan, 06/2014-08/2016. Currently a lecturer at Sussex University.
- R. Joubaud, 10/2012-03/2014. Currently in Industry, France.
- M. Schmuck, 04/2011-09/2013, co-mentored with Professor S. Kalliadasis. Currently a lecturer at Heriot-Watt University.
- B. Goddard, 09/2012-09/2014 co-mentored with Professor S. Kalliadasis. Currently a lecturer at the University of Edinburgh.
- M. Pradas, 10/2012-09/2014, co-mentored with Professor S. Kalliadasis. Currently a lecturer at the Open University.

Graduate Student Supervision: PhD Students

- R. Gvalani, PhD student, since 09/2016.
- K. Timperi, PhD student, since 01/2016.
- R. Tomlin, PhD student, since 10/2015, co-supervised with Professor D.T. Papageorgiou.
- N. Nüsken, PhD student, since 10/2014.
- U. Vaes, MRes/PhD student, since 10/2013.
- S. Gomes, PhD Student, 10/2012-06/2016, co-supervised with Professor D.T. Papageorgiou. Currently a Postdoc at Imperial College London.
- S. Krumscheid, PhD student, 10/2010-09/2014. Currently a postdoc at EPFL.
- M. Ottobre, PhD student, since 10/2008-01/2012. Now a lecturer at Heriot-Watt University.
- K. Zygalakis, Ph.D Student University of Warwick 09/04–11/08 (Co–supervised with A.M. Stuart). Currently a lecturer at the University of Edinburgh.

Graduate Student Supervision: MSc and Diploma Students

- R. Passeggeri, MSc student, 12/2014-09/2015. F. He, MSci student, 10/2014-06/2015. M. Majorel, MSc student, 12/2013-09/2014. F. Pons Llopis, MSc student, 12/2013-09/2014. A. Farid, MSc student, 12/2013-09/2014. V. Belz, MSc student, 01/2011–09/2011. A. Neidle, MSci student, 10/2010-06/2011. J. Strbac, MSc student, 01-09/2010. M. Dubois, MSc student, 01-09/2010. Z. Fan, MSc student, 01-09/2010. A. Othman, MSc student (co-supervised with C.J. Cotter) 05/09-09/09 L. Costard, MSc student, 06/09-09/09. E. Espic, MSc student, 06/09-09/09. H S Wun, MSc student, 10/08-09/09. A. Johann, MSc student, 05/08–09/08 (Co–supervised with J.C. Vassilicos). A. Vogiannou, Erasmus student (diploma thesis), 09/07-12/07. P. Chirawatthanaporn, MSc. student, 05/07–09/07 (Co–supervised with J.C. Vassilicos). A. Sykulski, MSc. student, Imperial College London 10/06–09/07 (Co–supervised with S. Olhede). O. Hamid, MSc. student, Imperial College London 10/04–9/05. S. Morrelet, MSc. student, Imperial College London 10/04–9/05. C. Cuthbertson, MSc. student, University of Warwick 10/03–04/04 (Co-supervised with P. Wiberg). L. Band, MSc. student, University of Warwick 10/02–04/03 (Co-supervised with A.M. Stuart).

Course Development

Homogenization theory for Partial Differential Equations. Course for fourth year and MSc students. Basic introduction to the mathematical theory of homogenization for PDEs and applications to homogenization for SDEs. Taught 4 times (2004-2007).

Applied Stochastic Processes. Course for MSc and PhD students in applied mathematics and mathematical physics. Introduction to the theory of continuous time stochastic processes. Markov processes, forward (Fokker-Planck) and backward Kolmogorov equations, stochastic differential equations (SDEs). Methods of solution for the Fokker-Planck equation, Asymptotic problems for Markov processes. Reaction rate theory, Brownian motion in periodic potentials, numerical methods for SDEs. Introduction to non-equilibrium statistical mechanics. Taught 8 times (2007-2011, 2013, 2015-2016).

Topics in Non-Equilibrium Statistical Mechanics Course for MSc students. Classical open systems. Derivation of stochastic differential equations from first principles. Linear response theory. Taught one time (FU Berlin, Summer Term 2012).

Computational Stochastic Processes Course offered to MSc students. Simulation of stochastic processes, numerical solution of stochastic differential equations, Markov Chain Monte Carlo, importance sampling, bias reduction techniques. Part of the MSc programme in Applied Mathematics and to MRes students. Taught 2 times, 2013-14. 2014-15.

Research Interests

Analysis, statistical inference and numerical methods for multiscale stochastic dynamical systems. Molecular dynamics and computational statistical mechanics

- **Numerical Analysis and Statistical Inference:** Parameter estimation for multiscale diffusions, numerical methods for multiscale stochastic PDEs. Filtering and control for multiscale stochastic systems.
- **Markov Chain Monte Carlo.** Development and analysis of accelerated sampling techniques. MCMC for multiscale probability measures. Computational statistical mechanics.
- **Theory:** spectral theory for hypoelliptic operators, asymptotic problems for non-Markovian processes, amplitude equations for stochastic PDEs, averaging/homogenization for SDEs.

Stochastic Modelling and Applications: Brownian motors, surface diffusion, inertial particles, atmosphere/ocean science, noise-induced transitions. interface hydrodynamics, physics of complex systems.

Statistical Mechanics: density functional theory, mean field limits for interacting diffusions, nonequilibrium statistical mechanics, kinetic theory and transport processes.

Homogenization theory for partial differential equations: Homogenization theory for diffusion processes, phase field models in heterogeneous domains, diffusion on fluctuating surfaces.

Editorial

- Associate editor for SIAM J. MMS. `http://www.siam.org/journals/mms/board.php`
- Associate Editor for SIAM Review. `http://www.siam.org/journals/sirev/board.php`
- Associate Editor for Communications in Mathematical Sciences. `http://intlpress.com/site/pub/pages/journals/items/cms/_home/editorial/index.html`

Publications

All of my publications are available from `http://www2.imperial.ac.uk/~pavl/publ_prepr.htm`.

Books

[1]. *Stochastic Processes and Applications.* Springer (2014), vol. 60 in the series *Texts in Applied Mathematics.*

[2]. *Multiscale Methods: Averaging and Homogenization.* (with A.M. Stuart), Springer (2008), vol. 53 in the series *Texts in Applied Mathematics.*

Submitted

[3]. *Three-dimensional wave evolution on electrified falling films* (with R. J. Tomlin, D. T. Papageorgiou). Submitted to J. Fluid Mech. November (2016).

[4]. *Spectral methods for multiscale stochastic differential equations* (with A. Abdulle and U. Vaes). Submitted to SIAM J. UQ, September 2016.

[5]. *Controlling roughening processes in the stochastic Kuramoto-Sivashinsky equation* (with S. Gomes, S. Kalliadasis, D.T. Papageorgiou and M. Pradas). Submitted to Physica D, April 2016.

[6]. *Brownian motion in an N-scale periodic potential* (with A.B. Duncan). Submitted to SIAM J. MMS, May 2016.

Papers published in refereed journals

[7]. *Noise-induced transitions in rugged energy landscapes* (with A.B. Duncan, S. Kalliadasis, M. Pradas). Phys. Rev. E, 94, 032107 (2016).

[8]. *Variance Reduction using Nonreversible Langevin Samplers* (with A. Duncan and T. Lelievre). J. Stat. Phys. 163(3) pp 457-491, (2016).

[9]. *Stabilising falling liquid film flows using feedback control* (with A. B. Thompson, S. N. Gomes, D. T. Papageorgiou). Phys. Fluids 28, 012107 (2016).

[10]. *Stabilizing nontrivial solutions of the generalized Kuramoto-Sivashinsky equation using feedback and optimal control* (with S.N. Gomes and D.T. Papageorgiou). IMA J. Appl. Math. (2016).

[11]. *Efficient numerical calculation of drift and diffusion coefficients in the diffusion approximation of kinetic equations* (with V. Bonnaillie-Noel, J.A. Carrillo and T. Goudon). IMA J. Num. Analysis **36**(4) pp. 1536–1569 (2016).

[12]. *Controlling Spatiotemporal Chaos in Active Dissipative-Dispersive Nonlinear Systems.* (with S. Gomes, S. Kalliadasis, D.T. Papageorgiou and M. Pradas). Phys Rev E 92, 022912 (2015).

[13]. *Data-driven coarse graining in action: Modelling and prediction of complex systems* (with S. Kalliadasis, S. Krumscheid and M. Pradas Gene). Phys. Rev. E 92, 042139 (2015).

[14]. *A new framework for extracting coarse-grained models from time series with multiscale structure* (with S. Kalliadasis and S. Krumscheid). J. Comp. Phys. 296, pp. 314-328 (2015).

[15]. *Some remarks on degenerate hypoelliptic Ornstein-Uhlenbeck operators* (with M. Ottobre and K. Pravda-Starov). J. Math. Analysis Appl. 429(2), pp. 676-712 (2015)

[16]. *A multiscale analysis of diffusions on rapidly varying surfaces* (with A.B. Duncan, C.M. Elliott, A.M. Stuart). J. Nonlinear Science, 25(2), pp. 389-449 (2015).

[17]. *Langevin dynamics with space-time periodic nonequilibrium forcing* (with R. Joubaud and G. Stoltz). J. Stat. Phys., 158(1) pp 1-36 (2015).

[18]. *A New Mode Reduction Strategy for the Generalized Kuramoto-Sivashinsky Equation* (with M. Schmuck, M. Pradas Gene, S. Kalliadasis). IMA J. Appl. Math., 80(2), pp. 273-301 (2015).

[19]. *Optimal control of multiscale systems using reduced-order models* (with W. Zhang, J.C. Latorre and C. Hartmann). J. Comp. Dyn. 1(2), pp 279-308, (2014).

[20]. *Mapping multiplicative to additive noise* (with K.J. Rubin and G. Pruessner). J. Physics A, **47** (2014) 195001.

[21]. *Rate of Convergence of Phase Field Equations in Strongly Heterogeneous Media towards their Homogenized Limit.* (with M. Schmuck and S. Kalliadasis). Applied Math. Lett., **35** (2014) pp 12-17.

[22]. Numerical Methods for Computing Effective Transport Properties of Flashing Brownian Motors (with J.C. Latorre and P.R. Kramer). J. Comp. Phys., 257, Part A, pp. 57–82 (2014).

[23]. *Derivation of effective macroscopic Stokes-Cahn-Hilliard equations for periodic immiscible flows in porous media.* (with M. Schmuck, M. Pradas and S. Kalliadasis). Nonlinearity, **26**(12), pp. 3259–3277, (2013).

[24]. *Optimal nonreversible linear drift for the convergence to equilibrium of a diffusion.* (with T. Lelievre and F. Nier). J. Stat. Phys. **152**(2) 237-274 (2013).

[25]. *Semi-Parametric Drift and Diffusion Estimation for Multiscale Diffusions* (with S. Krumcheid, S. Kalliadasis). SIAM J. MMS **11**(2), 442473 (2013).

[26]. *Nonlinear interfacial dynamics in stratified multilayer channel flows.* (with E.S. Papaeuthymiou and, D.T. Papageorgiou). J. Fluid Mech. 734, pp 114-143 (2013).

[27]. *A new stochastic mode reduction strategy for dissipative systems* (with M. Schmuck, M. Pradas Gene, S. Kalliadasis). Phys. Rev. Lett. 110, 244101, (2013).

[28]. *Corrections to Einstein's relation for Brownian motion in a tilted periodic potential* (with J.C. Latorre and P.R. Kramer). Journal of Statistical Physics, **150**(4), 776-803 (2013).

[29]. *Generalized Dynamical Density Functional Theory for Classical Fluids* (with B. Goddard, A. Nold, N. Savva, S. Kalliadasis). Phys. Rev. Let. **109**, 120603, (2012).

[30]. *Upscaled phase field models for interfacial dynamics in strongly heterogeneous/perforated domains* (with M. Schmuck, M. Pradas, S. Kalliadasis). Proc. Roy. Soc. London A, **468**, 3705-3724 (2012).

[31]. *The Overdamped Limit of dynamic Density Functional Theory: Rigorous Results.* (with B. Goddard and S. Kalliadasis). SIAM J. MMS, 10-2, pp. 633-663 (2012).

[32]. *Additive Noise Effects in Active Nonlinear Spatially Extended Systems* (with M. Pradas Gene, D. Tseluiko, S. Kalliadasis, D.T. Papageorgiou). Eur. J. Appl. Math., **23**(5) 563-591 (2012).

[33]. *Exponential Return to Equilibrium for Hypoelliptic Quadratic Systems* (with M. Ottobre and K. Pravda-Starov). J. Func. Analysis 262(9) pp. 4000-4039 (2012).

[34]. *Numerical methods for stochastic partial differential equations with multiple scales.* (with A. Abdulle) J. Comp. Phys, 231(6) pp. 24822497 (2012).

[35]. *Noise induced state transitions, intermittency and universality in the noisy Kuramoto-Sivashinksy equation.* (With M. Pradas Gene, D. Tseluiko, S. Kalliadasis, D.T. Papageorgiou.) Phys. Rev. Lett. Phys. Rev. Lett. 106, 060602 (2011).

[36]. *Asymptotic Analysis for the Generalized Langevin Equation.* (with M. Ottobre). Nonlinearity, **24** 1629-1653 (2011).

[37]. *Contact lines over random topographical substrates. Part II. Dynamics.* (with N. Savva and S. Kalliadasis). J. Fluid Mechanics, **672** pp. 384-410 (2011).

[38]. *Contact lines over random topographical substrates. Part I. Statics.* (with N. Savva and S. Kalliadasis). J. Fluid Mechanics, **672** pp. 358-383 (2011).

[39]. *Asymptotic Analysis for Foreign Exchange Derivatives with Stochastic Volatility.* (With C. Cuthbertson, A. Rafailidis and P. Wiberg). Int. J. Theor. and Appl. Finance, **13**(7) 1131–1147 (2010).

[40]. *Asymptotic Analysis of the Green-Kubo Formula.* IMA J. Appl. Math. **75**(6) 951-967, 2010.

[41]. *Two-dimensional droplet spreading over random topographical substrates.* (with N. Savva and S. Kalliadasis). Phys. Rev. Lett. 104, 084501 (2010).

[42]. *Estimating eddy diffusivities from Lagrangian observations* (with C.J. Cotter), Comm. Math. Sci. **7**(4), 805-838 (2009).

[43]. *Multiscale Inference for high frequency data* (with S. Olhede and A. Sykulski), SIAM J. MMS **8**(2), 393-427 (2009).

[44]. *Calculating Effective Diffusivities in the Limit of Vanishing Molecular Diffusion* (with A.M. Stuart and K.C. Zygalakis) J. Comp. Phys. 228(4) 1030-1055 (2009).

[45]. *Maximum Likelihood Drift Estimation for Multiscale Diffusions* (with A. Papavasiliou and A.M. Stuart), Stoch. Proc. Appl. **119**(10), 3173-3210 (2009) .

[46]. *Diffusive Transport in Periodic Potentials: Underdamped Dynamics* (with A. Vogiannou), Fluct. Noise Lett. **8**(2) L155-173 (2008).

[47]. *From Ballistic to Diffusive Behavior in Periodic Potentials.* (with M. Hairer), J. Stat. Phys. **131**(1) 175-202 (2008).

[48]. *Optimizing the Source Distribution in Fluid Mixing.* (with J-L. Thiffeault), Physica D, **237**(7), 918-929 (2008).

[49]. *Homogenization for Inertial Particles in a Random Flow.* (With A.M. Stuart and K.C. Zygalakis), Comm. Math. Sci., **5**(3) 507-531 (2007).

[50]. *Multiscale Analysis for Stochastic PDEs with Quadratic Nonlinearities.* (With D. Blömker and M. Hairer), Nonlinearity, 20 1721-1744 (2007).

[51]. *Estimates for the Two-Dimensional Navier-Stokes Equations in Terms of the Reynolds Number.* (With J.D. Gibbon), J. Math. Phys., 48, 065202 (2007).

[52]. *Parameter Estimation for Multiscale Diffusions.* (With A.M. Stuart), J. Stat. Phys., **127**(4) 741-781, (2007).

[53]. *A Multiscale Approach to Brownian Motors* Phys. Lett. A, 344 (2005) 331–345.

[54]. *Periodic Homogenization for Inertial Particles.* (with A.M. Stuart), *Physica D*, 204 161–187, (2005).

[55]. *Analysis of White Noise Limits for Stochastic Systems with two Fast Relaxation Times.* (with A.M. Stuart), *SIAM J. MMS* **4**(1) 1–35, (2005).

[56]. *Modulation Equations: Stochastic Bifurcation in Large Domains.* (with D. Blömker and M. Hairer), *Comm. Math. Phys.* **258**(2) 479–512, (2005).

[57]. *Itô versus Stratonovich White Noise Limits for Systems with Inertia and Colored Multiplicative Noise.* (with R. Kupferman and A.M. Stuart), Phys. Rev. E, 70 036120 (2004).

[58]. *Periodic Homogenization for Hypoelliptic Diffusions.* (with M. Hairer), J. Stat. Phys. 117 no. 1/2 (2004), 261-279.

[59]. *White Noise Limits for Inertial Particles in a Random Field.* (with A.M. Stuart), *SIAM J. MMS*, **1**(4) (2003) 527–553.

[60]. *A Perturbation Based Numerical Method for Solving a Three Dimensional Axisymmetric Indentation Problem.* (with M.H. Holmes), *J. Engineering Mathematics*, **43**(1) 2002 1-17.

[61]. Riemannian curvature and stability of monoparametric families of trajectories. (with G. Bozis) *Inverse Problems*, 15 (1999) 141-153.

Peer Reviewed Book Chapters and Conference Proceedings

[62]. *Parameter Estimation for Multiscale Diffusions: an Overview.* (with Y. Pokern and A.M. Stuart) in *Statistical Methods for Stochastic Differential Equations* edited by M. Kessler, A. Lindner, M. Sorensen, 2012.

[63]. *Multiscale modeling and inverse problems.* (with J. Nolen and A.M. Stuart) in *N*umerical analysis of multiscale problems, 134, Lect. Notes Comput. Sci. Eng., 83, Springer, Heidelberg, 2012

[64]. *Some Remarks on Stabilization by Additive Noise.* with D. Blömker and M. Hairer in *S*tochastic Partial Differential Equations and Applications, Edited by G. Da Prato and L. Tubaro, *Quaderni di Matematica*, vol 25,pp. 37–50, 2011.

[65]. *Stochastic Swift–Hohenberg Equation Near a Change of Stability.* (With D. Blömker and M. Hairer), Proceedings of Equadiff-11, pp. 25–37. 2005.

[66]. *Monte Carlo Studies of Effective Diffusivities for Inertial Particles.* (with A.M. Stuart and L. Band), Monte Carlo and quasi-Monte Carlo methods 2004, 431–441, Springer, Berlin, 2006.

Theses

[67]. PhD Thesis: *Homogenization Theory for Advection–Diffusion Equations with Mean Flow.* Thesis Advisor: P.R. Kramer, RPI, USA, May 2002.

[68]. Diploma Thesis: *Chaos and Integrability in a Simple Geodesic Flow.* Thesis Advisor: I. Antoniou, Free University of Brussels, Belgium, July 1997.

Short Courses/Summer Schools

- **Introduction to Stochastic Differential Equations**. CRITICS SUMMER SCHOOL, KULHUSE, DENMARK. August 2016.
- **Nonreversible Langevin Samplers**. Alan Turing Institute, June 2016.
- **Homogenization methods.** 4 one-hour lectures. **From the Grain to the Continuum: Two Phase Dynamics of a Partially Molten, Polycrystalline Aggregate.** INI, Cambridge, UK, 12-13 April 2016.
- **Stochastic processes and nonequilibrium statistical mechanics** 10 2-hour lectures, Peking University Summer School in mathematics, Beijing, China, July 2014.
- **Coarse-graining techniques for deterministic and stochastic systems** Four 2-hour lectures, part of the summer school **Emergent dynamics of discrete and stochastic multiscale systems.** ICMS Advanced Study Center, Eindhoven University of Technology, 17-21 June 2013.
- **Multiscale methods for SDEs and PDEs.** Three (90 min) lectures, part of the summer course **Applied and Numerical Analysis of PDEs and SDEs** Mathematics Institute, Warwick University, 02-04 July 2012.
- **Markovian Approximation and Linear Response Theory for Classical Open Systems.** Two lectures (four hours), CERMICS - Ecole des Ponts ParisTech 09,28/11/2011.
- **An Introduction to Random Perturbations in Continuous Time.** Four lectures, part of the short course **Stochastic and Random Dynamics** Department of Mathematics, Imperial College London, 19–23 November 2007.
- **Multiscale Methods for Partial Differential Equations.** One of the two main lecturers of the short course on **Multiscale Methods**, Department of Mathematics, Warwick University, 15–20 April 2007.
- **Multiscale Methods for Partial Differential Equations.** One of the two main lecturers of the short course on **Multiscale Methods**, MSRI, Berkeley, CA, USA, 2–5 April 2007.

Main Presentations (Since 2008)

- **Optimal Langevin samplers**. MCMC AND PARTICLE METHODS, ICMS, Edinburgh, UK, 05/09/2016.

- **Data-driven coarse-graining and applications**. CRITICS SUMMER SCHOOL, KULHUSE, DENMARK. 31/08/2016.
- **Data-driven coarse-graining and applications**. Mathematics of Dispersion in the Environment. U. Birmingham 04/04/2016.
- **Optimal Langevin Samplers**. University of Glasgow 30/10/2015.
- **Optimal Langevin Samplers**. Workshop on nonreversible MCMC, University of Warwick, 21/09/2015.
- **Efficient numerical calculation of drift and diffusion coefficients in the diffusion approximation of kinetic equations.** Oberwolfach Workshop *Interplay of Analysis and Probability in Applied Mathematics*, 26/07-01/08 2015.
- **Analysis of stochastic multiscale systems: derivation of coarse-grained models, calculation of effective coefficients and data driven approaches** Postgraduate ASI in Mathematical and Physical Sciences: Modelling, Numerical Analysis and Applications. Newton Institute, Cambridge 20/07/2015.
- **Linear Response Theory, The Green-Kubo formula and Langevin Dynamics**, 7th International Workshop and Summer School on Nonequilibrium Thermodynamics. Hilvarenbeek, The Netherlands, 07/07/2015.
- **Accelerating convergence and reducing variance for Langevin samplers,** University of Lille, France, 30/06/2015.
- **Accelerating convergence and reducing variance for Langevin samplers**, EPFL, Lausanne, Switzerland, 17/06/2015.
- **Accelerating convergence and reducing variance for Langevin samplers,** University of Nottingham, 26/05/2015.
- **Accelerating convergence and reducing variance for Langevin samplers,** University of Bath, 26/03/2015.
- **Accelerating convergence and reducing variance for Langevin samplers,** Workshop: *Analytic approaches to scaling limits for random systems*, Hausdorff Center, Bonn, Germany, 28/01/2015.
- **Accelerating convergence and reducing variance for Langevin samplers,** University of Edinburgh, 27/11/2014.
- **Inference and Inverse Problems for Multiscale Diffusions**. Workshop *Stochastic and Multiscale Inverse Problems*, Paris 03/10/2014.
- **Accelerating Convergence to Equilibrium for Nonreversible Diffusions**. Stochastic and Multiscale Problems Workshop. University of Oxford, 31/08/2014.
- **Noise Induced State Transitions, Intermittency and Universality in the Noisy Kuramoto-Sivashinsky Equation**. SIAM Conference on Nonlinear Waves 11/08/2014.
- **Accelerating Convergence to Equilibrium for Diffusion Processes**. University of Beijing, China, 31/07/2014.
- **Accelerating Convergence to Equilibrium for Diffusion Processes**. University of Warwick, 18/06/2014.
- **Accelerating Convergence to Equilibrium for Diffusion Processes**. University of Southampton 13/05/2014.

- **Accelerating Convergence to Equilibrium for Diffusion Processes**. Workshop on Multiscale Methods and High Performance Computing, ICMS, Edinburgh 08/05/2014
- **Data driven approaches to the modeling of multiscale systems**. Workshop "Stochastic Modeling of Multiscale Systems", Eindhoven Multiscale Institute, December 2-6 2013.
- **Speeding up convergence to equilibrium for diffusion processes** University of Essex, 21 October 2013.
- **Speeding up convergence to equilibrium for diffusion processes** University of Reading, 15 October 2013.
- **Statistical inference and sampling in molecular dynamics simulations**. Royal Society Meeting, Kavli Seminar: Multiscale systems: linking quantum chemistry, molecular dynamics, and microfluidic hydrodynamics, 22-23 July 2013.
- **Speeding up convergence to equilibrium for diffusion processes** Multiscale Inverse Problems, Warwick University 17-19 June 2013.
- **General dynamical density functional theory for classical fluids** U. Bristol 01/05/2013.
- **Optimal nonreversible linear drift for the convergence to equilibrium of a diffusion process and applications** Department of Mathematics, University of Chicago 24/04/2013.
- **Optimal nonreversible linear drift for the convergence to equilibrium of a diffusion process and applications** Workshop on Randomness and PDEs, Nantes, France, 15-17/04/2013.
- **Statistical inference for multiscale diffusions**. AHOI Workshop on Ambit Stochastics and Applications at Imperial College London, 25-27 March 2013.
- **Convergence to equilibrium for nonreversible diffusions** Queen Mary UL 22/01/2013.
- **Optimal nonreversible linear drift for the convergence to equilibrium of a diffusion process and applications** Imperial College London 18/01/2013.
- **Convergence to equilibrium for nonreversible diffusions.** U Cardiff 03/12/2012.
- **General dynamical density functional theory for classical fluids** Imperial College London 14/10/2012.
- **General dynamical density functional theory for classical fluids**, *Modelling the Dynamics of Complex Molecular Systems* Lorentz Center, Leiden, The Netherlands. 17/08/2012.
- **Analysis and Numerics for SPDEs with Multiple Scales.** FU Berlin 25/06/2012.
- **Analysis and Numerics for SPDEs with Multiple Scales.** RWTH Aachen 19/06/2012.
- **Analysis and Numerics for SPDEs with Multiple Scales.** K.U. Leuven 15/02/2012.
- **Long Time Asymptotics for Open Classical Systems** U. Lille 07/02/2012.
- **Markovian Approximation of Open Classical Systems** Workshop on Interplay of Analysis and Probability in Physics, Oberwolfach, Germany, 22-28/01/2012.
- **Long Time Asymptotics for Open Classical Systems** Cergy-Pontoise 18/01/2012.
- **Long Time Asymptotics for Open Classical Systems** TU Dresden 10/11/2011.
- **Long Time Asymptotics for Open Classical Systems** CRM, Barcelona 18/10/2011.
- **Diffusive Limits for Non-Markovian Langevin Equations.** Equadiff 2011, Loughborough 04/08/2011.

- **Long Time Asymptotics for Non-Markovian Langevin Equations.** Coarse-graining of many-body systems: analysis, computations and applications, University of Crete, 08/06/2011
- **Long Time Asympotics for Open Classical Systems.** Workshop on Evolution Partial Differential Equations and Applications, University of Cyprus, 08/06/2011
- **Analysis and Numerics for SPDEs with Multiple Scales** SIAM Conference on Applications of Dynamical Systems, Snowbird, UT 22/05/2011
- **Long Time Asympotics for Open Classical Systems.** Annual London Dynamical Systems Group meeting, 06/05/2011.
- **Asymptotic Analysis for the Generalized Langevin Equation.** Oxford Centre for Nonlinear PDEs, University of Oxford UK, 07/02/2011.
- **Asymptotic Analysis for the Generalized Langevin Equation.** CERMICS, Paris, France 13/01/2011.
- **Amplitude Equations for Stochastic PDEs.** Department of Mathematics, Imperial College London, UK, 14/12/2010.
- **Asymptotic Analysis for the Generalized Langevin Equation.** Department of Mathematics, University of Augsburg, Germany, 23/11/2010.
- **Asymptotic Problems for the Generalized Langevin Equation.** Workshop on Simulation of hybrid dynamical systems and applications to molecular dynamics, Institute Henri Poincare, Paris, 27-30 September 2010.
- **Asymptotic Problems for the Generalized Langevin Equation.** Workshop on Stochastic PDEs, University of York, 31 May - 4 June 2010 (part of Semester on Stochastic PDEs, Isaac Newton Institute, Cambridge).
- **Asymptotic Analysis for the Generalized Langevin Equation** Theory and Qualitative Behavior of Stochastic Dynamics - February 8-10, 2010, SAMSI, NC, USA.
- **Asymptotic Problems for the Generalized Langevin Equation.** Annual SIAM UKIE Meeting, Edinburgh 08/01/2010.
- **Asymptotic Problems for the Generalized Langevin Equation.** Department of Mathematics University of Surrey 13/11/2009.
- **Asymptotic Problems for the Generalized Langevin Equation.** Workshop on SPDEs, TU Darmstadt, 24-28 August 2009.
- **Long Time Asymptotics for Randomly Perturbed Hamiltonian Systems.** Workshop on Random Dynamical Systems and Applications, Department of Mathematics, Imperial College London, 12 June 2009.
- **Calculating and Estimating Eddy Diffusivities.** Atmosphere/Ocean Sciences Seminar, Imperial College London, 05 June 2009.
- **Long time/weak friction asymptotics for the Langevin equation.** Stochastic Analysis Seminar, University of Oxford, 25 May 2009.
- **Amplitude equations for stochastic partial differential equations.** Navier-Stokes: analysis, experiments and computations. In honour of Prof John D Gibbon on the occasion of his 60th birthday, 11-13 May 2009 IMS, Imperial College London
- **Long time/weak friction asymptotics for the Langevin equation.** Department of Applied Mathematics, University of Crete, 07 May 2009.

- **On the Derivation of Stochastic Differential Equations from Deterministic Dynamics.** Department of Applied Mathematics, University of Crete, 05 May 2009.
- **Amplitude Equations for Stochastic PDEs.** Department of Mathematics, EPFL, Switzerland, 15 April 2009.
- **Parameter Estimation for Multiscale Diffusions.** Adaptivity, robustness and complexity of multiscale algorithms March 30, 2009 - April 3, 2009, ICMS, Edinburgh.
- **Parameter Estimation for Multiscale Diffusions.** Department of Mathematics, Imperial College London, 27 January 2009.
- **Parameter Estimation for Multiscale Diffusions.** Department of Mathematics, University of Bath, 26 January 2009.
- **Parameter Estimation for Multiscale Diffusions.** Department of Mathematics, University of Edinburgh, 16 January 2009.
- **Weak friction asymptotics for the Langevin equation.** Molecular Dynamics, Thermostats and Convergence to Equilibrium Nov 12, 2008 - Nov 14, 2008, ICMS, Edinburgh.
- **Multiscale Analysis for Stochastic Partial Differential Equations.** Department of Mathematics, University of Bristol, 1 December 2008.
- **Parameter Estimation for Multiscale Diffusions.** Workshop on Mathematical Challenges of Molecular Dynamics, Mathematics Institute, Warwick University, UK, 16 July 2008.
- **From ballistic to diffusive behaviour in periodic potentials.** Workshop on Gradient Models and Elasticity, Mathematics Institute, Warwick University, UK, 11 June 2008.
- **Amplitude Equations for SPDEs.** CWI, Amsterdam, the Netherlands, 27 May 2008.
- **Amplitude Equations for SPDEs.** Department of Mathematics, University of Augsburg, Germany, 17 April 2008.
- **From ballistic to periodic motion in periodic potentials.** Physics Institute, Humboldt University, Berlin, Germany, 14 April 2008.
- **From ballistic to periodic motion in periodic potentials.** Numerical methods in molecular simulation, Hausdorff Institute, Bonn, Germany, 11 April 2008.
- **Multiscale analysis for the stochastic Burgers equation.** Geometric and stochastic methods in geophysical fluid dynamics, Bremen, Germany, 09/01/2008.

Other Activities

- Course Director of MSc program in Applied Mathematics. Department of Mathematics, Imperial College London. From 10/2009-09/2015.
- Co-organizer (with G. Stoltz and C. Hartmann) of ICMS workshop on *Computational methods for statistical mechanics*, 2 6 June 2014, ICMS, Edinburgh
- Co-organizer (with J. Lamb and M. Rasmussen) of Workshop on Critical Transitions in Complex Systems , 19-23 March 2012, Imperial College London, UK.
- Co-organizer (with M. Hairer and A.M. Stuart) of Workshop on Multiscale Systems: Theory and Applications , 12-16 December 2011, Warwick University, UK.
- Co-organizer (with K.C. Zygalakis) of Minisymposium on Homogenization at Equadiff 2011, Loughborough University 01-05 August 2011.

- Co-organizer (with S. Kalliadasis and B. Goddard) of MD-Net Annual Meeting (workshop funded by the EPSRC). March 07-09 2011, Department of Mathematics, Imperial College London.
- Co-organizer (with J. Rademacher, CWI, Amsterdam, The Netherlands) of Workshop on Coherent Structures in Evolutionary Equations, 12-16 July 2010, Lorentz Center, The Netherlands.
- Organizer of the Applied Mathematics and Mathematical Physics (AMMP) Colloquium, Department of Mathematics, Imperial College London, from January 2007 to June 2011.
- Co-organizer (with J. Lamb), of LMS funded workshop on *Random Dynamical Systems and Applications*. Department of Mathematics, Imperial College London, UK, June 12, 2009.
- Co-organizer and main lecturer, with A.M. Stuart, of LMS/EPSRC funded short course on *Multiscale Methods*. Department of Mathematics, University of Warwick, UK, April 15–20, 2007.
- Co-organizer and main lecturer, with A.M. Stuart, of short course on *Multiscale Methods*. MSRI, Berkeley, CA, USA, April 02–05, 2007.
- Co-organizer, with O. Lakkis and P. Plechac of workshop *Multiscale Analysis and Numerics for Stochastic Differential Equations*. University of Sussex, Brighton, UK, February 22–24, 2007.
- Co-organizer, with Dr. D. Blömker, of workshop on *Multiscale Analysis for Stochastic Dynamics*. Mathematics Institute, University of Warwick, UK, October 20 2003.
- Co-organizer, with Professor A.M. Stuart, of the Computational and Applied Mathematics Seminar, Fall term, 2002, Mathematics Institute, University of Warwick.
- External examiner of 9 PhD theses (U. Warwick, Ecole des Ponts, University of Bath, Queen Mary University London, University of Grenoble, Lille University, FU Berlin.) Internal examiner of 8 PhD theses.
- Reviewer for the EPSRC, German Science Foundation, Israel Science Foundation, Netherlands Organisation for Scientific Research, ERC, French National Research Agency (ANR), ICMS, Franco-British research partnerships programme, Greek Science Foundation, Swiss Science Foundation, Canadian Science Foundation, Qatar National Research Fund, Hong Kong Research Grants Council.
- Referee for SIAM J. MMS, SIAM J. Appl. Math., IMA J. Numerical Analysis, SIAM J. Sci. Comp., Comm. Math. Sci., Numerische Mathematik, LMS Journal on Comp. Math., IMA J. Applied Mathematics, J. Stat. Phys., SIAM J. Math. Analysis, M2AN, J. Computational Math., Nonlinearity, Proceedings of the Royal Society of London, European Journal of Applied Mathematics, J. Fluid Mehcanics Phys. Let. A, Physica D., J. Diff. Eqns., J. Physics A, J. Physics D, New J. Physics, Annals of Probability, Applied Mathematics and Computation, Stochastic Processes and Applications, European Journal of Applied Mathematics, Springer, Oxford University Press.
- Reviewer for MathSciNet and Zentralblatt.

Professional Societies

- American Mathematical Society.
- Society for Industrial and Applied Mathematics.
- London Mathematical Society.