

Teaching experience

01/2006 – 03/2006	Ergodic properties of Markov processes (4th year course)
10/2005 – 12/2005	Analysis I (1st year course)
01/2005 – 03/2005	Ergodic properties of Markov processes (4th year course)
10/2004 – 12/2004	Analysis I (1st year course)
10/2001 – 07/2002	Fourth year Stochastic Processes tutorial
01/2001 – 07/2001	First year Computational Techniques tutorial
10/2000 – 02/2001	Second year classical Mechanics tutorial
10/1999 – 07/2000	First year classical Mechanics tutorial
01/1999 – 07/1999	First year physics laboratory
09/1997 – 09/1999	Highschool physics laboratory

Past and current PhD students

C. Manson (PhD started November 2006).

P. Bubak (PhD started October 2004). Joint supervision with J. Robinson

A. Ohashi (PhD completed October 2006). Joint supervision with P. Ruffino

Organisation of workshops and seminars

May 2–3, 2003	<i>Workshop on fractional Brownian motion</i> , co-organiser
August 4–15, 2003	<i>Workshop on SPDEs and related topics</i> , co-organiser
July 9, 2004	<i>Third East Midlands Stochastic Analysis Seminar</i> , Warwick, co-organiser
2003 – 2007	<i>Organiser of the Stochastic Analysis Seminar of the University of Warwick</i>
July 9–13 2007	<i>SciCADE07</i> Co-organiser for two minisymposia
June 2008	<i>Easter Probability Meeting</i> , Warwick, co-organiser

Minicourses

March 1–2, 2007	Winter intensive course: <i>Hypoellipticity : Analysis & Stochastic Analysis</i> , Imperial College, London
July, 2007	Chinese Probability Summerschool, Wuhan, China
Autumn 2008	LMS Short Course Programme: <i>Stochastic Partial Differential Equations</i> , Imperial College, London

Administration duties

09/2004 – 09/2006	Postgraduate examination secretary
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Fellowships awarded

- 10/2006 5-year EPSRC Advanced Research Fellowship. (£413k)
- 10/2004 2-year Advanced research fellowship of the Swiss National Science Foundation (CHF 96k could not be taken up because it clashed with the position in Warwick).
- 10/2003 1-year Advanced research fellowship of the Swiss National Science Foundation. (CHF 48k)
- 10/2002 1-year Research fellowship of the Swiss National Science Foundation. (CHF 39k)

Grants awarded

- 10/2006 EPSRC Grant EP/E002269/1 (funding for a 3 year postoc position; joint with A. Stuart) (£267k)
- 10/2007 EPSRC Grant EP/F029950/1 (funding for a 1 week meeting; joint with W. Kendall (PI) and J. Warren) (£20k)

Publications and Preprints

Refereed articles

- [1] J.-P. Eckmann and M. Hairer, *Non-Equilibrium Statistical Mechanics of Strongly Anharmonic Chains of Oscillators*, Commun. Math. Phys. **212** (2000), no 1, pp. 105–164
- [2] J.-P. Eckmann and M. Hairer, *Invariant Measures for Stochastic PDE's in Unbounded Domains*, Nonlinearity **14** (2001), pp. 133–151
- [3] J.-P. Eckmann and M. Hairer, *Uniqueness of the Invariant Measure for a Stochastic PDE Driven by Degenerate Noise*, Commun. Math. Phys. **219** (2001), no 3, pp. 523–565
- [4] M. Hairer, *Exponential Mixing for a Stochastic PDE Driven by Degenerate Noise*, Nonlinearity **15** (2002), pp. 271–279
- [5] M. Hairer, *Exponential Mixing Properties of Stochastic PDEs Through Asymptotic Coupling*, Probab. Theory Relat. Fields **124** (2002), no 3, pp. 345–380
- [6] J.-P. Eckmann and M. Hairer, *Spectral Properties of Hypoelliptic Operators*, Commun. Math. Phys. **235** (2003), no 2, pp. 233–253
- [7] D. Blömker and M. Hairer, *Stationary Solutions for a Model of Amorphous Thin-Film Growth*, Stochastic Analysis and Applications **22** (2004), no 4, pp. 903–922
- [8] D. Blömker and M. Hairer, *Multiscale expansion of invariant measures for SPDEs*, Commun. Math. Phys. **251** (2004), pp. 515–555
- [9] M. Hairer and G. Pavliotis, *Periodic Homogenization for Hypoelliptic Diffusions*, J. Stat. Phys. **117** (2004), no. 1/2, pp. 261–279

- [10] M. Hairer and J. Mattingly, *Ergodicity of the 2D Navier-Stokes Equations with Degenerate Stochastic Forcing*, Accepted for publication in *The Annals of Maths* (2005).
- [11] D. Blömker, M. Hairer, and G. Pavliotis, *Modulation Equations: Stochastic Bifurcation in Large Domains*, *Commun. Math. Phys.* (258) (2005), no 2, pp. 479–512
- [12] M. Hairer, J. Mattingly, and E. Pardoux, *Malliavin calculus for highly degenerate 2D stochastic Navier-Stokes equations*, *C. R. Acad. Sci. Paris, Ser. I* **339** (2004), no. 11, pp. 793–796
- [13] M. Hairer and J. Mattingly, *Ergodic properties of highly degenerate 2D stochastic Navier-Stokes equations*, *C. R. Acad. Sci. Paris, Ser. I* **339** (2004), no. 12, pp. 879–882
- [14] M. Hairer, *Ergodicity of stochastic differential equations driven by fractional Brownian motion*, *The Annals of Probability* **33** (2005), no 3, pp. 703–758
- [15] M. Hairer, A. M. Stuart, J. Voß, and P. Wiberg, *Analysis of SPDEs Arising in Path Sampling Part I: The Gaussian Case*, *Comm. Math. Sci.* **3** (2005), no 4, pp. 587–603
- [16] M. Hairer, A. M. Stuart, and J. Voß, *A Bayesian approach to data assimilation*, to appear in *Physica D* (2007)
- [17] M. Hairer and A. Ohashi, *Ergodic theory for SDEs with extrinsic memory*, to appear in *The Annals of Probability* (2007)
- [18] F. Baudoin and M. Hairer, *Hörmander’s theorem for fractional Brownian motion*, to appear in *Probab. Theory Relat. Fields* (2007)
- [19] D. Blömker, M. Hairer, and G. Pavliotis, *Multiscale Analysis for SPDEs with Quadratic Nonlinearities*, To appear in *Nonlinearity* (2007)
- [20] M. Hairer, A. M. Stuart, and J. Voß, *Analysis of SPDEs Arising in Path Sampling Part II: The Nonlinear Case*, To appear in the *Annals of Applied Probability* (2007)

Proceedings articles

- [1] E. Hairer and M. Hairer, *GniCodes - Matlab programs for geometric numerical integration*. *Frontiers in Numerical Analysis (Durham 2002)*, Springer, Berlin, 2003.
- [2] M. Hairer, *Coupling stochastic PDEs*, Proceedings of the ICMP, 2003
- [3] D. Blömker and M. Hairer, *Amplitude Equations for SPDEs: Approximate Centre Manifolds and Invariant Measures*, Proceedings of the IMA (2003)

Submitted articles

- [1] F. Flandoli, M. Gubinelli, M. Hairer, and M. Romito, *Remarks on the K41 scaling law in turbulent fluids*, Preprint, (2005).
- [2] M. Hairer and J. Mattingly, *Spectral gaps in Wasserstein distances and the 2D stochastic Navier-Stokes equations*, Preprint (2006)
- [3] M. Hairer and E. Pardoux *Homogenization of periodic linear degenerate PDEs*, Preprint (2007)
- [4] M. Hairer *Ergodic properties of a class of non-Markovian processes*, Preprint (2007)

Unpublished notes

- [1] M. Hairer, *A probabilistic argument for the controllability of conservative systems*, Unpublished note (2007).
- [2] M. Hairer, *Ergodic properties of Markov processes*, Unpublished lecture notes (2005).

Theses

- [1] M. Hairer, *Systèmes Mécaniques Couplés à des Bains Thermiques de Températures Différentes*, Diploma Thesis, University of Geneva, 1998
- [2] M. Hairer, *Comportement Asymptotique d'Équations à Dérivées Partielles Stochastiques*, PhD Thesis, University of Geneva, 2001

Invited talks at conferences and seminars (from 2004)

- 05/01/2004 *Stochastic Partial Differential Equations and Applications VII*, Trento, Italy, Title of talk: 'Stochastic amplitude equations'
- 19/02/2004 Mathematics Seminar, University of Wales, Swansea
- 18/03/2004 Stochastic Analysis Seminar, University of Hull
- 07/06/2004 Mathematical Physics Seminar, University of Geneva
- 22/10/2004 Probability seminar, Toulouse
- 27/10/2004 Stochastic Analysis seminar, The University of Warwick
- 10/12/2004 Stochastic Analysis seminar, Loughborough University
- 16/12/2004 PDE seminar, ENS Lyon
- 04/03/2005 East Midlands Stochastic Analysis seminar, University of Hull
- 21/03/2005 Institute colloquium, Chinese Academy of Science, Beijing, China
- 24/03/2005 Applied Mathematics seminar, Chinese Academy of Science, Beijing
- 31/03/2005 Miniworkshop on the stochastic Navier-Stokes equations and related topics, Wuhan, China
- 20/04/2005 *Dynamics and Fluctuations in Extended Systems*, IHP Paris. Title of talk: 'Ergodic properties of the 2D Navier-Stokes equations'
- 08/05/2005 Swiss Probability Seminar, Bern
- 25/05/2005 *SIAM Conference on Applications of Dynamical Systems*, Snowbird, USA, Title of talk: 'Ergodicity and Stochastic PDEs'
- 06/08/2005 *New Directions In Probability Theory*, Minneapolis, USA, Title of talk: 'Stochastic modulation equations'
- 22/11/2005 Probability seminar, Cambridge
- 08/12/2005 Probability seminar, Toulouse, France
- 22/12/2005 Colloquium, Institute of Statistics, Bangalore, India
- 13/01/2006 Bonn Stochastic Days 2006, Bonn
- 25/01/2006 Probability seminar, ETH Zurich
- 03/03/2006 Probability seminar, Bath
- 04/04/2006 *Stochastic Partial Differential Equations*, Scuola Normale, Pisa, Italy, Title of talk: 'A spectral gap for the stochastic Navier–Stokes equations'
- 24/04/2006 Stochastic Analysis seminar, Oxford
- 26/04/2006 East Midlands Stochastic Analysis seminar, York
- 18/05/2006 Stochastic Analysis seminar, Imperial College London
- 13/06/2006 Probability Seminar, Toulouse, France
- 17/07/2006 *Stochastic Processes and Applications*, Paris V
- 26/07/2006 *Stochastic Fluid Mechanics and SPDEs*, Scuola Normale, Pisa
- 19/09/2006 *Computational Aspects of SPDEs*, Salzburg
- 31/10/2006 SFB-Seminar, Bonn
- 15/12/2006 Numerical analysis seminar, Berlin

- 24/01/2007 *Dynamics and statistics of non-equilibrium phenomena*, IHP Paris
 15/02/2007 Stochastic analysis seminar, Loughborough
 24/02/2007 *Multiscale Analysis and Computations in Stochastic Differential Equation Modelling*, Sussex
 26/03/2007 *Stochastic Dynamical Systems and Control*, MSRI Berkeley
 21/04/2007 *Stochastic Analysis, Stochastic Differential Geometry and Applications*, Swansea
 22/05/2007 *Partial differential equations and fluid mechanics*, Warwick
 06/06/2007 *Functional inequalities: Probabilities and PDEs*, Paris
 20/06/2007 *Stochastic Analysis and Related Fields*, Toulouse
 22/06/2007 *Séminaire Hypatie*, Marseille
 03/07/2007 *Recent Developments in Random Walks*, Durham
 11/08/2007 *EquaDiff*, Vienna (**Plenary Talk**)
 11/09/2007 *Stochastic Partial Differential Equations*, Mittag-Leffler institute
 20/09/2007 Seminar, Mittag-Leffler institute
 22/10/2007 Stochastic Analysis seminar, Oxford
 24/10/2007 Applied mathematics seminar, ETH Zurich
 26/10/2007 Theoretical Physics seminar, Geneva

Awards and achievements outside of academia

- 1989 Distinction “Very Good” for the work “REDO: Résolution d’Équations Différentielles Ordinaires” at the Swiss national contest for young scientists.
- 1990 Distinction “Excellent” for the work “ElectroSim: Simulation de circuits électriques sur Macintosh” at the Swiss national contest for young scientists. This work was selected to represent Switzerland at the European Community Contest for Young Scientistst.
- 1991 The program “ElectroSim” is distinguished with the “COMETT Award” at the third European Community Contest for Young Scientistst in Zürich.
- 1994 Distinction “Excellent” for the work “Amadeus: traitement et analyse de sons sur Macintosh” at the Swiss national contest for young scientists.
- 1997–2007 Development of the Macintosh sharewares “Amadeus II” and “Amadeus Pro”. These popular sound editors are used by more than 30’000 private and professional registered users worldwide, including many schools and universities.
- 2000 Development of a \LaTeX to $\mathcal{A}\mathcal{M}\mathcal{S}$ - \TeX converter for the journal “L’Enseignement Mathématique”.
- 2001 Development of the \LaTeX document class file `ensmath.cls` that is used by the journal “L’Enseignement Mathématique”.