

**Grant Lythe** Department of Applied Mathematics, University of Leeds LS29JT, U.K.

Reader in Applied Mathematics

**email:** grant@maths.leeds.ac.uk<http://www1.maths.leeds.ac.uk/~grant>**Areas of research:** Stochastic dynamics, numerical methods, Immunology.**Research students:** Emily Stirk, James Currie, Mark Day, Joseph Reynolds.**Academic editor:** PLoS ONE.**Teaching areas:** Mathematical biology and medicine, Financial mathematics, Differential equations, LaTeX.

Current and recent research funding
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|---|----------|
| • <i>Stochastic modelling of T cell responses: chemical skin sensitisation</i><br>Unilever, CH-2011-0828.   | £404k    |
| • <i>International Network in Theoretical Immunology</i><br>FP7 Marie Curie Actions (People) PIRSES-GA-2008-230665<br><a href="http://www1.maths.leeds.ac.uk/applied/INTI">http://www1.maths.leeds.ac.uk/applied/INTI</a> | 230,000€ |
| • Co-investigator. <i>White Rose Studentship – White Rose Immune Modelling Network</i>  | £145k    |
| • <i>Immunology Imaging and Modelling Network – I<sup>2</sup>M</i><br>BBSRC BB/F003811/1<br><a href="http://www1.maths.leeds.ac.uk/applied/I2M">http://www1.maths.leeds.ac.uk/applied/I2M</a>                             | £99,914  |

Selected Recent Publications
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- *Mathematical modelling and immune cell biology*  
Grant Lythe and Carmen Molina-París (Editors)  
Springer 2011
- *Stochastic competitive exclusion in the maintenance of the naive T cell repertoire*  
Emily R. Stirk, Grant Lythe, Hugo A. van den Berg and Carmen Molina-París  
Journal of Theoretical Biology **265** 396-410 (2010)
- *The limiting conditional distribution in a stochastic model of T cell repertoire maintenance*  
Emily R. Stirk, Grant Lythe, Hugo A. van den Berg, Gareth A. D. Hurst and Carmen Molina-París  
Mathematical Biosciences **224** 74-86 (2010)
- *Accurate stationary densities with partitioned numerical methods for stochastic differential equations*  
Kevin Burrage and Grant Lythe  
SIAM Journal on Numerical Analysis **47** 1601-1618 (2009)
- *Numerical experiments on noisy chains: from collective transitions to nucleation-diffusion*  
Mario Castro and Grant Lythe  
SIAM Journal on Applied Dynamical Systems (2008)

Recent conference talks
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- *Brownian motion and the adaptive immune system*  
*Theoretical and Experimental Immunology*  
Indian Institute of Science, Bangalore. 16 August 2011
- *Stochastic dynamics and the immune system*  
*International Congress on Industrial and Applied Mathematics*  
Vancouver, 18-22 July 2011.
- *Diffusive lymphocyte movement and interactions, in silico and in vivo*  
*Imaging, Interpretation and Modeling in Modern Immunology*  
BIRS, Banff, Canada, 14 April 2011
- *Timescales of the immune response*  
*Physics of Immunity: Complexity Approach*  
Max Planck Institute, Dresden, Germany, 7 April 2011
- *Kinks and nucleation in a stochastic PDE*  
Random Dynamical Systems Bielefeld, Germany, 5 Nov 2010
- *Kink stochastics*

*Stochastic Partial Differential Equations: Approximation, Asymptotics and Computation*

Isaac Newton Institute for Mathematical Sciences, Cambridge. 1 Jul 2010

- *Kink stochastic*  
*Coherent structures in evolutionary equations*  
Lorentz Centre, Leiden. 16 Jul 2010
- *Stochastic dynamics and T cells*  
*SIAM DSPDEs 2010*  
Barcelona, Spain. 2 Jun 2010
- *Timescales of lymphocyte motion and collisions in a lymph node*  
*British Society for Immunology Congress 2008*. Glasgow. 24 Nov 2008.

## Recent external seminars

- *Stochastic dynamics and T cells*  
Department of Mathematics, University of Leicester. 17 March 2011.
- *Stochastic dynamics and T cells*  
Department of Mathematics, University of Auckland. 4 March 2010.
- *Kink stochastic*  
Applied Mathematics and Mathematical Physics, Imperial College London, 3 Nov 2009

## Recent Graduate courses

- *Stochastic Processes* (MAGIC065). Four lectures, 2010.
- *Discrete and continuous stochastic modelling* Leeds Summer School, 4 Sep 2009
- *Numerical methods for stochastic dynamics*. Opening tutorial, SAMSI programme, USA. 30 Aug 2009.
- *Stochastic Modelling in Biology* (MAGIC047). Six lectures, 2008 and 2009.
- *Markov chains and stochastic processes*. Intensive two-day course, part of the European Phd Programme in Computational Biology, given at the Gulbenkian Institute, Lisbon, Portugal. 24-24 November 2008

## Recent Conference organisation

**16 May 2011** Theoretical immunology**18 March 2011** Experimental and theoretical immunology in the real world**10 January 2011** Workshop on Experimental and Theoretical Immunology**13-17 September 2010** Summer school on theoretical and experimental immunology.**1-3 September 2008** ESF exploratory workshop *Challenges for Theoretical and Experimental Immunology*

## Recent minisymposium organisation

- *Stochastic Dynamics: Equilibrium and Non-equilibrium*  
*International Congress on Industrial and Applied Mathematics*. Vancouver, 18-22 July 2011.
- *Stochastic Waves and Coherent Structures*  
*SIAM nonlinear waves and coherent structures*. Rome, Italy. 21 Jul 2008.
- *Mathematical Immunology*  
*Royal Society Frontiers of Science*. Hyderabad, India. March 2008.

## Previous employment and education

- 2000 Fellowship, Spanish Ministry of Education and Culture. Held at the Universidad Carlos III de Madrid, Spain
- 1997-9 Director's Postdoc, Los Alamos National Laboratory, USA
- 1995-6 Postdoc, Optique nonlinéaire théorique, Université Libre de Bruxelles, Belgium.
- 1994 Completed Ph.D Thesis *Stochastic slow-fast dynamics*,  
Department of Applied Mathematics and Theoretical Physics,  
University of Cambridge, U.K. (Trinity College)
- 1990 Master of Science (Physics, 1st Class Hons), University of Auckland, New Zealand.

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