

## Simon L. Cotter

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CONTACT INFORMATION School of Mathematics  
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### ACADEMIC POSITIONS

*Senior Lecturer in Applied Mathematics, University of Manchester, August 2016-present*

*Visiting Fellowship of the Isaac Newton Institute for Mathematical Sciences, March-May 2016*

*Lecturer in Numerical Analysis, University of Manchester, November 2012-July 2016*

*Junior Research Fellowship, St. Cross College Oxford, October 2011-September 2013*

*Postdoctoral Research Assistant, OCCAM, Mathematical Institute, University of Oxford, April 2010-September 2013*

### EDUCATION

*PhD, Mathematics, University of Warwick, 2010*

- Thesis Title: Applications of MCMC Methods on Function Spaces

*MMath, University of Warwick*

- 1st Class Hons, June 2006.

### PUBLICATIONS

- [1] D. F. Anderson and S. L. Cotter, *Product-form stationary distributions for deficiency zero networks with non-mass action kinetics*, submitted to the Bulletin of Mathematical Biology.
- [2] S. J. Calvert, M. S. Longtine, S. L. Cotter, C. J. P. Jones, C. P. Sibley, J. D. Aplin, D. M. Nelson, and A. E. P. Heazell, *Studies of the dynamics of nuclear clustering in human syncytiotrophoblast*, to appear in *Reproduction* 2016.
- [3] C. J. Cotter, S. L. Cotter and P. Russell, *Parallel Adaptive Importance Sampling*, submitted to *SIAM Journal for Uncertainty Quantification* 2016.
- [4] S. L. Cotter, *Constrained Approximation of Effective Generators for Multiscale Stochastic Reaction Networks and Application to Conditioned Path Sampling*, submitted to the *Journal of Computational Physics* 2015.
- [5] S. L. Cotter and R. Erban, *Error Analysis of Diffusion Approximation Methods for Multiscale Systems in Reaction Kinetics*, accepted to appear in the *SIAM Journal for Scientific Computing* (2016).
- [6] S. L. Cotter, Václav Klika, L. S. Kimpton, S. L. Collins and A. E. P. Heazell, *A Stochastic Model for Early Placental Development*, *Journal of The Royal Society Interface* {3.917} 11, no. 97 (2014): 20140149.<4>

- [7] S. L. Cotter, G. O. Roberts, A. M. Stuart, and D. White, *MCMC Methods for Functions: Modifying Old Algorithms to Make Them Faster*, Statistical Science Volume 28, Number 3 (2013), 424-446.
- [8] C. J. Cotter, S. L. Cotter and F.-X. Vialard, *Bayesian Data Assimilation in Shape Registration*, Inverse Problems 29.4 (2013): 045011.
- [9] S. L. Cotter, T. Vejchodský and R. Erban, *Adaptive Finite Element Method Assisted by Stochastic Simulation of Chemical Systems*, SIAM Journal on Scientific Computing 35.1 (2013): B107-B131.
- [10] S. L. Cotter, M. Dashti, and A. M. Stuart, *Variational Data Assimilation Using Targetted Random Walks*, International Journal for Numerical Methods in Fluids 68(4), 403–421, (2012) (Published online 2011)
- [11] S. L. Cotter, K. C. Zygalakis, I. G. Kevrekidis, and R. Erban, *A Constrained Approach to Multiscale Stochastic Simulation of Chemically Reacting Systems*, Journal of Chemical Physics 135, 094102 (2011)
- [12] S. L. Cotter, M. Dashti, and A. M. Stuart, *Approximation of Bayesian Inverse Problems for PDEs*, SIAM Journal of Numerical Analysis 48, 322-345 (2010)
- [13] S. L. Cotter, M. Dashti, J. C. Robinson and A. M. Stuart, *Bayesian Inverse Problems for Functions and Applications to Fluid Mechanics*, Inverse Problems 25 115008 (2009)
- [14] L. Humphrey, A. Wallace and S. L. Cotter, *Performance of Various ADSL CPE in Presence of 100 Hz Repetitive Impulse Noise* ITU-T SG15/Q4 LC-031, Lake Tahoe August 2004.

RESEARCH  
GRANT  
AWARDS

- CASE award from the Smith Institute, sponsored by the National Physical Laboratory (NPL) Sept 2015 - Apr 2018, (£107,670), joint PI.
- Faculty of Life Sciences Quantitative Biology Pump-Priming Sept 2014 - Aug 2015 (£37,957), co-PI.
- EPSRC First Grant Sept 2014 - Aug 2016 (£117,564), sole PI.

SELECTED  
RECENT  
INVITED TALKS

- October 2016, Applied and Computational Mathematics seminar, University of Edinburgh
- July 2016, Stochastic numerical algorithms, multiscale modeling and high-dimensional data analytics, ICERM, Brown University
- April 2016, Stochastic numerics in biology workshop, Newton Institute, Cambridge University
- April 2016, Society for Industrial and Applied Mathematics conference on Uncertainty Quantification, EPFL, Lausanne.
- June 2015, Numerical Analysis Conference, Strathclyde.

- March 2015, Applied Maths Seminar, University of Southampton
- January 2015, London Mathematical Society inverse problems workshop, UCL
- May 2014, International Centre for Mathematical Sciences workshop, University of Bath
- April 2014, International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing, University of Leuven.
- October 2013, Applied Mathematics and Mathematical Physics seminar, Imperial College
- July 2013, Oxford Conference on Challenges in Applied Mathematics, Oxford
- June 2013, Numerical Analysis Conference, Strathclyde.
- September 2012, Numerical Solution of Differential and Differential-Algebraic Equations, Halle.
- August 2012, Society for Industrial and Applied Mathematics conference on the Life Sciences, San Diego.
- February 2012, Program in Applied and Computational Mathematics visitor seminar, Princeton
- January 2012, Applied maths seminar, Czech Academy of Sciences, Prague

SESSIONS  
CHAired AND  
ORGANISED

- *Opening Workshop: Stochastic Dynamical Systems in Biology: Numerical Methods and Applications*, Newton Institute Cambridge, first two days of five chaired, January 2016.
- *The Role of Inverse Problems and Optimisation in Uncertainty Quantification*, Turing Gateway workshop, session chaired, June 2015.
- *Numerical Methods in Stochastic Problems in Biology*, Biennial Numerical Analysis Conference, Strathclyde University, June 2015.
- *Stochastic modelling of gene expression*, Society for Industrial and Applied Mathematics Life Sciences '12, San Diego, August 2012.
- *Multiscale modelling of reaction kinetics in biology*, European Conference on Mathematical and Theoretical Biology '11, Krakow, June 2011.

RESEARCH  
VISITS

- Cambridge, 1 March - 31 May 2016 (fully funded by the Newton Institute).
- Princeton, 5-18 July 2015 (\$2000 given by Princeton to support visit).
- Princeton, 13-17 February 2012 (partially supported by Princeton).
- Czech Academy of Sciences, 16-20 January 2012.
- Czech Academy of Sciences, 19-23 July 2010.

WORKSHOPS  
ORGANISED

- *Computational Challenges in Biochemical Networks: Multiscale Modelling and Inverse Problems*, University of Manchester, August 2016.
- *Opening Workshop: Stochastic Dynamical Systems in Biology: Numerical Methods and Applications*, Newton Institute Cambridge, January 2016.
- *Mathematics-in-Medicine Study Group '10 follow up meeting: Placental Growth Modelling*, Oxford, May 2011.

TEACHING  
EXPERIENCE  
(AT UoM)

*Lecturer*

- 2013-present, PDEs and Vector Calculus (MATH20401, 2nd year mathematics)
- 2013-2015, Transferrable skills, Applied MSc (MATH65740, problem-based learning)
- 2012-2014, Mathematics for 2nd year civil engineers (MATH29662, Fourier series and vector calculus)

*Class Tutor*

- 2012-present, PDEs and Vector Calculus.
- 2012-present, feedback supervisions in calculus.
- 2012-present, various service course tutorials.

POSTGRADUATE  
SUPERVISION

*PhD Supervisor, University of Manchester*

- Paul Russell September 2013-Present, main supervisor (100%)
- James Rynn September 2015-Present, co-supervisor (50%)
- Filippo Pagani September 2016-Present, co-supervisor (50%)

*MSc Supervisor, University of Manchester*

- 2 students.

ADMINISTRATION  
AND SERVICE

*Athena Swan Committee Member*

- 2015-present.

*Undergraduate Admissions Tutor*

- 2015-present.

*Numerical Analysis Undergraduate Event Organiser*

- Organised event in 2014 and 2015.

INDUSTRIAL  
ENGAGEMENT

*Unilever/UoM workshop on digital manufacturing*, represented the numerical analysis group as part of the wider “Big Data” team at a residential event at Port Sunlight.

*CASE studentship sponsored by NPL*, supervision and collaboration on a research project with the National Physical Laboratories.

*VYPR Intelligence Engine*, ongoing potential collaboration with Manchester-based market research start-up. Recent grant application to an Innovate UK call was unfortunately unsuccessful.

PASTORAL  
CARE

*Academic Advisor, University of Manchester*

- 2013-present.