

Matt Dunlop | Curriculum Vitae

Annenberg Center 337, California Institute of Technology
1200 E California Blvd, Pasadena, California 91125

☎ (626) 531 0099 • ✉ mdunlop@caltech.edu • 🌐 mdunlop.org

Education

- 2013–2016 **PhD Mathematics and Statistics**, *University of Warwick*, UK.
Title: Analysis and Computation for Bayesian Inverse Problems.
Supervisors: Prof. Andrew Stuart and Dr. Marco Iglesias.
- 2012–2013 **MSc Mathematics and Statistics**, *University of Warwick*, UK.
Dissertation title: On the support of diffusion processes with irregular drift coefficients.
Supervisor: Prof. Xue-Mei Li.
Grade: Distinction.
- 2008–2012 **MMath Mathematics**, *University of Warwick*, UK.
Dissertation title: Malliavin calculus and applications.
Supervisor: Prof. Xue-Mei Li.
Grade: First class honours.

Professional Experience

- 2016– **Postdoctoral Scholar**, *California Institute of Technology*, Pasadena, USA.
Department of Computational and Mathematical Sciences.
Supervisor: Prof. Andrew Stuart.

Research Papers

Published & Submitted

- [5] D. Calvetti, M. M. Dunlop, E. Somersalo and A. M. Stuart. “Iterative updating of model error for Bayesian inversion.” *Submitted* (2017).
- [4] M. M. Dunlop, C. M. Elliott, V. Ha Hoang, A. M. Stuart. “Bayesian formulations of multidimensional barcode inversion.” *Submitted* (2017).
- [3] M. M. Dunlop, M. A. Iglesias, A. M. Stuart. “Hierarchical Bayesian level set inversion.” *Statistics and Computing* **27** 6 (2017) 1555 - 1584.
- [2] M. M. Dunlop, A. M. Stuart. “The Bayesian formulation of EIT: analysis and algorithms.” *Inverse Problems and Imaging* **4** 4 (2016) 1007 - 1036.
- [1] M. M. Dunlop, A. M. Stuart. “MAP estimators for piecewise continuous inversion.” *Inverse Problems* **32** 10 (2016) 105003.

In Preparation

- M. M. Dunlop, M. Girolami, A. M. Stuart, A. L. Teckentrup. “How deep is a deep Gaussian process?”
- M. M. Dunlop, D. Slepčev, A. M. Stuart, M. Thorpe. “Large data and zero noise limits of graph-based semi-supervised learning algorithms.”
- V. Chen, M. M. Dunlop, O. Papaspiliopoulos, A. M. Stuart. “Robust MCMC sampling with non-Gaussian and hierarchical priors in high dimensions.”

Supervision and Organization

- 2017 **Co-supervisor** (with Andrew Stuart) of Victor Chen, undergraduate research student, California Institute of Technology.
- 2016 **Co-organizer** (with Marco Iglesias, Claudia Schillings and Aretha Teckentrup) of the minisymposium "Large-Scale PDE constrained Bayesian Inverse Problems" at SIAM UQ 2016, Lausanne, Switzerland.
- 2015 **President of Warwick SIAM student chapter.**
Duties included sourcing speakers for a seminar series, and co-organization of two small conferences.

Teaching Experience

- 2016– **Teaching Assistant**, *California Institute of Technology*, Pasadena, USA.
Graduate course: Introduction to Linear Analysis with Applications.
- 2011–2016 **Undergraduate Supervisor**, *University of Warwick*, UK.
- 2014–2015 **Teaching Assistant**, *University of Warwick*, UK.
Third year course: Matrix Analysis and Algorithms.
Second year course: Analysis III.
First year course: Probability A & B.

Selected Presentations

- Sept 2017 **Erlangen, Germany**, *SIAM GS 2017*.
Minisymposium: Dynamics and data in stochastic systems, far from equilibrium.
- Aug 2017 **Lorentz Center, Netherlands**, *Bayesian and Nonlinear Inverse Problems*.
- May 2017 **Hangzhou, China**, *AIP 2017*.
Minisymposium 1: Bayesian inverse problems with non-Gaussian priors.
Minisymposium 2: Structure exploiting methods in large-scale Bayesian computation.
- Feb 2017 **Atlanta, Georgia**, *SIAM CSE 2017*.
Minisymposium: Efficient Algorithms for Bayesian Inverse Problems Governed by PDE Forward Problems.
- Aug 2016 **University of Helsinki, Finland**, *Inverse Problems Seminar*.
- July 2016 **Orlando, Florida**, *11th AIMS Conference on Dynamical Systems*.
Minisymposium 1: Uncertainty Quantification in Dynamical Systems.
Minisymposium 2: Uncertainty Quantification.
- June 2016 **Santiago de Compostela, Spain**, *ECMI 2016*.
Minisymposium: Stochastic Inverse Problems.
- April 2016 **Lausanne, Switzerland**, *SIAM UQ 2016*.
Minisymposium 1: Large-Scale PDE-constrained Bayesian Inverse Problems.
Minisymposium 2: Advances in Sampling Methods for Bayesian Inverse Problems.
- Nov 2015 **Stony Brook University, New York**, *Sensitivity, Error and UQ for Atomic, Plasma, and Material Data*.
- May 2015 **University of Reading, UK**, *SIAM National Student Chapter Conference 2015*.
- April 2015 **University of Cambridge, UK**, *4th CCA-MASDOC Student Conference*.
- Nov 2014 **University of Warwick, UK**, *Applied PDEs Seminar*.
- May 2014 **University of Warwick, UK**, *Reading-Warwick Data Assimilation Meeting*.

Computer skills

Coding MATLAB, Mathematica, C++, PHP, HTML, CSS, SQL, \LaTeX .
Software Microsoft Office, Adobe Photoshop.

References

Andrew Stuart

Computing & Mathematical Sciences
California Institute of Technology
Pasadena, CA 91125
✉ astuart@caltech.edu
☎ +1 (626) 395-4076

Carola-Bibiane Schönlieb

Department of Applied Mathematics
and Theoretical Physics
University of Cambridge
Cambridge, CB3 0WA, UK
✉ cbs31@cam.ac.uk
☎ +44 1223 764251

Erkki Somersalo

Department of Mathematics
Case Western Reserve
Cleveland, OH 44106-7058
✉ erkki.somersalo@case.edu
☎ +1 (216) 368-5190