Chris J. Oates

Researcher in statistics, computation, machine learning, and probabilistic AI.

Location: School of Mathematics, Statistics & Physics, Herschel Building, Newcastle University, NE1 7RU, UK.
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Background

2026	Visiting Researcher, Business School, University of Sydney, Australia.
2024 – 2026	Affiliate Professor of Statistics, Department of Mathematics, King's College London, UK.
2018 – present	Professor of Statistics, School of Mathematics and Statistics, Newcastle University, UK.
2018 – 2026	Turing Fellow, The Alan Turing Institute, UK.
2017 – 2023	Group Leader, Program on Data-Centric Engineering, The Alan Turing Institute, UK.
2017 – 2018	Senior Lecturer, School of Mathematics and Statistics, Newcastle University, UK.
2015 – 2017	Research Fellow, ARC Centre of Excellence for Mathematical & Statistical Frontiers (ACEMS), University of Technology Sydney, Australia.
2013 – 2015	Research Fellow, Centre for Research in Statistical Methodology (CRiSM), University of Warwick, UK.
2011 – 2012	PhD (visiting), Mukherjee Lab, Dept. Biochemistry, Nederlands Kanker Instituut, Amsterdam, NL.
2010 – 2013	PhD, Centre for Complexity Science, University of Warwick, UK.
2009 – 2010	MSc, Complexity Science, University of Warwick, UK. [Distinction]
2006 – 2009	BA, Mathematics, University of Cambridge, UK. [Robinson College; Class I]

Achievements

2024	ISBA Savage Award for Theory and Methods (supervised - Takuo Matsubara). Web
2024	Royal Statistical Society Guy Medal in Bronze. Article
2024	Fellowship of the Higher Education Academy, Level D2.
2023	Leverhulme Prize (for Mathematics and Statistics). Article Web
2022	Best Student Paper (supervised - Takuo Matsubara), ASA Section on Bayesian Statistical Science, JSM 2022. Web
2021	Best Student/Postdoc Contributed Paper Award (supervised - Takuo Matsubara) at ISBA 2021.
2020	Most Highly Cited Paper in SIAM Review (Top 3; 2018-2020). Article
2018	Best Student Paper (supervised - Jon Cockayne), ASA Section on Bayesian Statistical Science, JSM 2018. JSM Photo
2017	Outstanding Reviewer Award, NIPS 2017. Web
2017	Biennial Research Prize of the Royal Statistical Society. RSS ACEMS Video
2016	Best Student Paper (supervised - François-Xavier Briol), ASA Section on Bayesian Statistical Science, JSM 2016. JSM
2014	Best Paper, European Conference on Computational Biology (ECCB) 2014. ECCB
2012	Best Presentation, Amsterdam Oncology Graduate School Annual Retreat. (250 EU)
2009	Fröhlich Prize for Mathematics, Robinson College Cambridge.

Research Funding

2025 – 2026	Co-investigator on UKRI HPC for "Diffusion Modelling Under the Lens of Markov Diffusion Processes" (15,000 GPUh on Bede; APP80558). (Led by Marina Riabiz @ KCL.)
2024 – 2026	Turing Fellowship, the Alan Turing Institute, UK.
2024 – 2027	Leverhulme Prize (Mathematics and Statistics, 2023; 100,000 GBP). The Leverhulme Trust.
2024	Principal Investigator on "Mathematical Foundations for the Next Generation of Extrapolation Methods" (4,950 GBP). Heilbronn Institute Small Grant.
2023	Co-Investigator on Probabilistic Numerics Network Grant (20,000 GBP). Isaac Newton Institute. (Led by Jon Cockayne @ Southampton.)
2022 – 2028	Co-Investigator on "NUData", an STFC Centre for Doctoral Training in Data Intensive Science (1,086,584 GBP). STFC (ST/W006790/1). (Led by James McLaughlin @ Northumbria and Tamara Rogers @ NU.)
2022 – 2026	Principal Investigator on "Harnessing the Power of Stein Discrepancies in Bayesian Computation" (704,773 GBP). EPSRC (EP/W019590/1).
2021 – 2024	Co-Investigator on "Measuring and Modelling Atrial Mechanics in Health and Heart Failure" (315,477 GBP). British Heart Foundation (PG/21/10534). (Led by Steven Niederer @ Imperial).
2020	Principal Investigator on "Probabilistic Approaches to Numerical Computation" (6,300 GBP). Heilbronn Institute Focused Research Grant. Web
2020	Co-Investigator on "Modelling the Heart's Chemical Signals" (27,000 USD). Alan Turing Institute Azure Funding. (Led by Steven Niederer @ KCL).
2020 – 2025	Co-Investigator on "Selecting Rhythm or Rate Control in Patients with both Atrial Fibrillation and Heart Failure" (691,686 GBP). British Heart Foundation Programme Grant (RG/20/4/34803). (Led by Steven Niederer @ KCL).
2020 – 2022	Co-Investigator on "Advances in Sequential Monte Carlo Methods for Complex Bayesian Models" (390,000 AUD). Australian Research Council Discovery Project (DP200102101). (Led by Chris Drovandi @ QUT.)
2020 – 2023	Turing Fellowship, the Alan Turing Institute, UK.
2019 – 2021	Fellowship in Data-Centric Engineering (470,000 GBP), supported by the Lloyd's Register Foundation and Newcastle University.
2018 – 2020	Co-Investigator on "Auto Generation of Optimal Deep Learning Networks" (114,393 GBP) from the Alan Turing Institute, UK. (Led by Steven McGough @ NU.)
2018 – 2019	Turing Fellowship (20% Salary), the Alan Turing Institute, UK.
2018 – 2022	Co-Investigator on "Approximate Bayesian computation with application to 3D printing" (191,700 EUR). SFI-EPSRC Lead Agency Agreement, University College Dublin, IE, and the Alan Turing Institute, UK. (Led by Nial Friel at UCD.)
2018	Principal Investigator on "Overcoming Uncertainty in Legacy Engineering Resilience Modelling for Flood Hazards" (22,380 GBP), Models 2 Decisions Feasibility Fund.
2018 – 2020	Co-Investigator on "Quantifying Functional Co-Variation in Calcium Handling Proteins in Cardiac Myocytes" (196,538 GBP), BHF-Turing Cardiovascular Data-Science Award, British Heart Foundation and the Alan Turing Institute, UK. (Led by Steven Niederer @ KCL).
2018	Cambridge Philosophical Society Bursary to spend time at the Isaac Newton Institute, Cambridge, UK. (500 GBP)
2017 – 2020	Secondment to the Lloyd's Register Foundation programme on data-centric engineering at the Alan Turing Institute, UK. (105,000 GBP)
2015	VicBiostat Visiting Fellowship. (2,000 AUD)

Publications

Work in Progress

Shen Z, Duran-Martin G, Oates CJ. Predictively-Oriented Kalman Filtering. arXiv

Oates CJ, Howey R, Karvonen T. Sparse Probabilistic Richardson Extrapolation. arXiv

Liu Q, Fisher MA, Shen Z, Zhao X, Tant K, Curtis A, Oates CJ. Detecting Model Misspecification in Bayesian Inverse Problems via Variational Gradient Descent. arXiv

Chazal C, Kanagawa H, Shen Z, Korba A, Oates CJ. A Computable Measure of Suboptimality for Entropy-Regularised Variational Objectives. arXiv

Xi M, Shen Z, Riabiz M, Chopin N, Oates CJ. Extrapolation of Tempered Posteriors. arXiv

Shen Z, Wang H, Riabiz M, Oates CJ. Operator-Informed Score Matching for Markov Diffusion Models. arXiv

2026

Fast Approximate Solutions of Stein Equations for Post-Processing of MCMC — Liu Q, Kanagawa H, Fisher MA, Briol F-X, Oates CJ. (2026) In: Lemieux C, Feng B (eds.). **Monte Carlo and Quasi-Monte Carlo Methods 2024**. Springer Verlag. Book arXiv

Integrating imaging and invasive pressure data into a multi-scale whole-heart model — Strocchi M, Augustin CM, Gsell MA, Rinaldi CA, Vigmond EJ, Plank G, Oates CJ, Wilkinson RD, Niederer SA. (2026) **Journal of Biomechanical Engineering**, 148(5): 051001. Journal

Harnessing the Power of Reinforcement Learning for Adaptive MCMC — Wang C, Fisher MA, Kanagawa H, Chen W, Oates CJ. **AISTATS 2026**. arXiv

Stationary MMD Points for Cubature — Chen Z, Karvonen T, Kanagawa H, Briol FX, Oates CJ. **ICML 2026**. arXiv

Thinned Mean Field Langevin Dynamics — Chen Z, Kanagawa H, Briol F-X, Oates CJ, Mackey L. **ICML 2026**. arXiv

Calibrating Black-Box Probabilistic Numerical Methods — Chen J, Rau M, Oates CJ. **Proceedings of the Second International Conference on Probabilistic Numerics**, 2026.

Extrapolating from Regularised Solutions for Solving Ill-Conditioned Linear Systems in Machine Learning — Hegde D, Cockayne J, Oates CJ. (2026) **TMLR**. Journal arXiv

2025

GaussED: A Python Package for Sequential Experimental Design — Fisher MA, Teymur O, Oates CJ. **Proceedings of the First International Conference on Probabilistic Numerics**, 2025. arXiv

Online Semiparametric Regression via Sequential Monte Carlo — Menictas M, Oates CJ, Wand MP. **Australian & New Zealand Journal of Statistics**, 67(2):224-249. Journal arXiv

Probabilistic Richardson Extrapolation — Oates CJ, Karvonen T, Teckentrup AL, Strocchi M, Niederer SA. **Journal of the Royal Statistical Society, Series B**, 87(2):457-479. Journal arXiv

Prediction-Centric Uncertainty Quantification via MMD — Shen Z, Knoblauch J, Power S, Oates CJ. **Artificial Intelligence and Statistics (AISTATS 2025)**. video arXiv

Reinforcement Learning for Adaptive MCMC — Wang C, Chen W, Kanagawa H, Oates CJ. **Artificial Intelligence and Statistics (AISTATS 2025)**. arXiv

2024

Minimum Kernel Discrepancy Estimators — Oates CJ. In: Hinrichs A, Kritzer P, Pillichshammer F (eds.). **Monte Carlo and Quasi-Monte Carlo Methods 2022**. Springer Verlag. Book arXiv

The Matérn Model: A Journey through Statistics, Numerical Analysis and Machine Learning — Porcu E, Bevilacqua M, Schaback R, Oates CJ. **Statistical Science**, 39(3):469-492. Journal arXiv

Grand Challenges in Bayesian Computation — Bhattacharya A, Linero A, Oates CJ (2024) **ISBA Bulletin** 31(3). arXiv

2023

Gradient-Free Kernel Stein Discrepancy — Fisher M, Oates CJ. **Advances in Neural Information Processing Systems (NeurIPS 2023)**. arXiv

Stein Π-Importance Sampling — Wang C, Chen WY, Kanagawa H, Oates CJ. **Advances in Neural Information Processing Systems (NeurIPS 2023)**. Selected for spotlight presentation. arXiv

Stein's Method Meets Statistics: A Review of Some Recent Developments — Anastasiou A, Barp A, Briol F-X, Ebner B, Gaunt RE, Ghaderinezhad F, Gorham J, Gretton A, Ley C, Liu Q, Mackey L, Oates CJ, Reinert G, Swan Y. **Statistical Science**, 38(1): 120-139. Journal arXiv

Regularised Zero-Variance Control Variates for High-Dimensional Variance Reduction — South LF, Oates CJ, Mira M, Drovandi C. **Bayesian Analysis**, 18(3): 865-888. Journal arXiv

Maximum Likelihood Estimation in Gaussian Process Regression is Ill-Posed — Karvonen T, Oates CJ (2023) **Journal of Machine Learning Research**, 24(120):1-47. Journal arXiv

Sobolev Spaces, Kernels and Discrepancies over Hyperspheres — Hubbert S, Porcu E, Oates CJ, Girolami M (2023) **Transactions on Machine Learning Research**. OpenReview arXiv

Meta-learning Control Variates: Variance Reduction with Limited Data — Sun Z, Oates CJ, Briol FX. **Conference on Uncertainty in Artificial Intelligence (UAI 2023)**. Selected for oral presentation. arXiv

Cell to Whole Organ Global Sensitivity Analysis on a Four-chamber Electromechanics Model Using Gaussian Processes Emulators — Strocchi M, Longobardi S, Augustin CM, Gsell MAF, Petras A, Rinaldi CA, Vigmond EJ, Plank G, Oates CJ, Wilkinson RD, Niederer SA. **PLoS Computational Biology**, 19(6): e1011257. Journal

Generalised Bayesian Inference for Discrete Intractable Likelihood — Matsubara T, Knoblauch J, Briol FX, Oates CJ. (2023) **Journal of the American Statistical Society**, 119(547), 2345-2355. Journal arXiv

Statistical Properties of the Probabilistic Numeric Linear Solver BayesCG — Reid TW, Ipsen ICF, Cockayne J, Oates CJ. **Numerische Mathematik, 155, 239-288**. Journal arXiv

Review of "Probabilistic Numerics" by Hennig, Osborne and Kersting — Oates CJ. **SIAM Review**, 65(3):905-915. Journal

2022

Robust Generalised Bayesian Inference for Intractable Likelihoods — Matsubara T, Knoblauch J, Briol FX, Oates CJ. **Journal of the Royal Statistical Society (Series B)**, 84(3):997-1022. Journal arXiv Video

Optimal Thinning of MCMC Output — Riabiz M, Chen WY, Cockayne J, Swietach P, Niederer SA, Mackey L, Oates CJ. **Journal of the Royal Statistical Society (Series B)**, 84(4):1059-1081. Journal arXiv Software

Semi-Exact Control Functionals From Sard's Method — South LF, Karvonen T, Nemeth C, Girolami M, Oates CJ. **Biometrika**, 109(2):351-367. arXiv Software

Scalable Control Variates for Monte Carlo Methods via Stochastic Optimization — Si S, Oates CJ, Duncan AB, Carin L, Briol F-X. **Proceedings of the 14th International Conference in Monte Carlo & Quasi-Monte Carlo Methods in Scientific Computing, Springer 2022**. Book arXiv

Post-Processing of MCMC — South LF, Riabiz M, Teymur O, Oates CJ. **Annual Reviews of Statistics and its Application, 9:529-555**. Journal arXiv

A Statistical Approach to Surface Metrology for 3D-Printed Stainless Steel — Oates CJ, Kendall WS, Fleming L. **Technometrics**, 64(3):370-383. Journal arXiv

A Riemann-Stein Kernel Method — Barp A, Oates CJ, Porcu E, Girolami M. **Bernoulli**, 28(4): 2181-2208. Journal arXiv

Testing Whether a Learning Procedure is Calibrated — Cockayne J, Graham MM, Oates CJ, Sullivan TJ. (2022) **Journal of Machine Learning Research**, 23(203):1-36. Journal arXiv

Parameter Space Reduction for Four-chamber Electromechanics Simulations Using Gaussian Processes Emulators — Strocchi M, Longobardi S, Augustin CM, Gsell MAF, Vigmond EJ, Plank G, Oates CJ, Wilkinson RD, Niederer SA. **Proceedings of the 10th Vienna International Conference on Mathematical Modelling**, 2022.

BayesCG As An Uncertainty Aware Version of CG — Reid TW, Ipsen ICF, Cockayne J, Oates CJ. **Technical Report**, 2022. arXiv

2021

A Data-Centric Approach to Generative Modelling for 3D-Printed Steel — Dodwell TJ, Fleming LR, Buchanan C, Kyvelou P, Detommaso G, Gosling PD, Scheichl R, Kendall WS, Gardner L, Girolami MA, Oates CJ. **Proceedings of the Royal Society A**, 477(2255). Journal

Probabilistic Iterative Methods for Linear Systems — Cockayne J, Ipsen ICF, Oates CJ, Reid TW. **Journal of Machine Learning Research**, 22(232):1-34. Journal arXiv

Bayesian Numerical Methods for Nonlinear Partial Differential Equations — Wang J, Cockayne J, Chkrebtii O, Sullivan TJ, Oates CJ. **Statistics and Computing**, 31(55). Journal arXiv

The Ridgelet Prior: A Covariance Function Approach to Prior Specification for Bayesian Neural Networks — Matsubara T, Oates CJ, Briol F-X. **Journal of Machine Learning Research**, 22(157):1-57. Journal arXiv

Integration in Reproducing Kernel Hilbert Spaces of Gaussian Kernels — Karvonen T, Oates CJ, Girolami M. **Mathematics of Computation**, 90(331):2209-2233. Journal arXiv

Optimal Quantisation of Probability Measures Using Maximum Mean Discrepancy — Teymur O, Gorham J, Riabiz M, Oates CJ. **International Conference on Artificial Intelligence and Statistics (AISTATS 2021)**. Journal arXiv

Causal Graphical Models for Systems-Level Engineering Assessment — Stephenson V, Oates CJ, Finlayson A, Thomas C, Wilson K. **ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering**, 7(2):04021011. Journal

Improved Calibration of Numerical Integration Error in Sigma-Point Filters — Prüher J, Karvonen T, Oates CJ, Straka O, Särkkä S. **IEEE Transactions on Automatic Control**, 66(3):1286-1292. Journal arXiv

Measure Transport with Kernel Stein Discrepancy — Fisher MA, Nolan T, Graham MM, Prangle D, Oates CJ. **AISTATS 2021**. Selected for oral presentation (top 3%). Journal arXiv Software

Black Box Probabilistic Numerics — Teymur O, Foley CN, Breen PG, Karvonen T, Oates CJ. **Advances in Neural Information Processing Systems (NeurIPS 2021)**. Journal arXiv

2020

Maximum Likelihood Estimation and Uncertainty Quantification for Gaussian Process Approximation of Deterministic Functions — Karvonen T, Wynne G, Tronarp F, Oates CJ, Särkkä S. **SIAM Journal of Uncertainty Quantification**, 8(3):926-958. Journal arXiv

A Locally Adaptive Bayesian Cubature Method — Fisher MA, Oates CJ, Powell C, Teckentrup A. **AISTATS 2020**. Journal arXiv

Discussion of "Unbiased Markov Chain Monte Carlo with Couplings" — South LF, Nemeth C, Oates CJ. **Journal of the Royal Statistical Society (Series B)**, 82(3):590-592. Journal arXiv

Optimality Criteria for Probabilistic Numerical Methods — Oates CJ, Cockayne J, Prangle D, Sullivan TJ, Girolami M. **In Multivariate Algorithms and Information-Based Complexity, De Gruyter**. arXiv

A Role for Symmetry in the Bayesian Solution of Differential Equations — Wang J, Cockayne J, Oates CJ. **Bayesian Analysis**, 15(4):1057-1085. Journal arXiv

2019

Editorial: Special Edition on Probabilistic Numerics — Girolami M, Ipsen I, Oates CJ, Owen A, Sullivan T. **Statistics and Computing**, 29(6):1181-1183. Journal

Causal Learning via Manifold Regularization — Hill SM, Oates CJ, Blythe D, Mukherjee S. **Journal of Machine Learning Research, 20:1-32**. Journal arXiv

Stein Point Markov Chain Monte Carlo — Chen WY, Barp A, Briol FX, Gorham J, Girolami M, Mackey L, Oates CJ. **ICML 2019**. Journal arXiv Software

A Modern Retrospective on Probabilistic Numerics — Oates CJ, Sullivan TJ. **Statistics and Computing**, 29(6):1335-1351. Journal arXiv

Bayesian Probabilistic Numerical Methods — Cockayne J, Oates CJ, Sullivan T, Girolami M. **SIAM Review**, 61(4):756-789. Journal arXiv

Symmetry Exploits for Bayesian Cubature Methods — Karvonen T, Särkkä S, Oates CJ. **Statistics and Computing, 29:1231-1248**. Journal arXiv Software

A Bayesian Conjugate Gradient Method — Cockayne J, Oates CJ, Ipsen I, Girolami M. **(with discussion and rejoinder) Bayesian Analysis**, 14(3):937-1012. Journal arXiv Software

Bayesian Probabilistic Numerical Methods in Time-Dependent State Estimation for Industrial Hydrocyclone Equipment — Oates CJ, Cockayne J, Aykroyd RG, Girolami M. **Journal of the American Statistical Association**, 114(528):1518-1531. Journal arXiv

Optimal Monte Carlo Integration on Closed Manifolds — Ehler M, Gräf M, Oates CJ. **Statistics and Computing**, 29(6):1203-1214. Journal arXiv

Convergence Rates for a Class of Estimators Based on Stein's Method — Oates CJ, Cockayne J, Briol F-X, Girolami M. (2019) **Bernoulli**, 25(2):1141-1159. Journal arXiv

Probabilistic Integration: A Role in Statistical Computation? (with discussion and rejoinder) — Briol F-X, Oates CJ, Girolami M, Osborne MA, Sejdinovic D. **Statistical Science**, 34(1):1-22. Journal arXiv

Graphical Models in Molecular Systems Biology — Mukherjee S, Oates CJ. **In Handbook of Graphical Models, CRC Press**. Preprint

2018

A Bayes-Sard Cubature Method — Karvonen T, Oates CJ, Särkkä S. **NeurIPS 2018**. Journal arXiv

Stein Points — Chen WY, Mackey L, Gorham J, Briol FX, Oates CJ. **ICML 2018, PMLR 80:844-853**. Journal arXiv

2017

Probabilistic Models for Integration Error in Assessment of Functional Cardiac Models — Oates CJ, Niederer S, Lee A, Briol F-X, Girolami M. **NIPS 2017**. Journal arXiv

On the Sampling Problem for Kernel Quadrature — Briol FX, Oates CJ, Cockayne J, Chen WY, Girolami M. (2017) **ICML 2017, PMLR 70:586-595**. Journal arXiv

Discussion of "A Bayesian information criterion for singular models" — Friel N, McKeone JP, Oates CJ, Pettitt AN. (2017) **Journal of the Royal Statistical Society (Series B)**, 79(2):323-380. Journal arXiv

Repair of Partly Misspecified Causal Diagrams — Oates CJ, Kasza J, Simpson JA, Forbes AB. (2017) **Epidemiology**, 28(4):548-552. Journal PubMed

Control Functionals for Monte Carlo Integration — Oates CJ, Girolami M, Chopin N. (2017) **Journal of the Royal Statistical Society, Series B**, 79(3):695-718. Journal arXiv

Investigation of the Widely Applicable Bayesian Information Criteria — Friel N, McKeone JP, Oates CJ, Pettitt AN. (2017) **Statistics and Computing**, 27(3):833-844. Journal arXiv

2016

Probabilistic Numerical Methods for PDE-constrained Bayesian Inverse Problems — Cockayne J, Oates CJ, Sullivan T, Girolami M (2016) **AIP Conference Proceedings**, 1853:060001. Journal arXiv

Discussion of "Causal inference using invariant prediction: identification and confidence intervals" — Oates CJ, Kasza J, Mukherjee S (2016) **Journal of the Royal Statistical Society (Series B)**, 78(5):947-1012. Journal arXiv

RNA editing generates sequence diversity within cell populations — Harjanto D, Papamarkou T, Oates CJ, Rayon Estrada V, Papavasiliou FN, Papavasiliou A. (2016) **Nature Communications, 7:12145**. Journal

Control Functionals for Quasi-Monte Carlo Integration — Oates CJ, Girolami M. (2016) **AISTATS, JMLR W&CP, 51:56-65**. Selected for Oral Presentation (top 6.5% of submissions). Journal arXiv

Estimation of Causal Structure Using Conditional DAG Models — Oates CJ, Smith JQ, Mukherjee S. (2016) **Journal of Machine Learning Research**, 17(54):1-23. Journal arXiv

The Controlled Thermodynamic Integral for Bayesian Model Evidence Evaluation — Oates CJ, Papamarkou T, Girolami M (2016) **Journal of the American Statistical Association**, 111(514):634-645. Journal arXiv

Exploiting Multi-Core Architectures for Reduced-Variance Estimation with Intractable Likelihoods — Friel N, Mira A, Oates CJ (2015) **Bayesian Analysis**, 11(1):215-245. Journal arXiv

Exact Estimation of Multiple Directed Acyclic Graphs — Oates CJ, Smith JQ, Mukherjee S, Cussens J (2016) **Statistics and Computing**, 26(4):797-811. Journal arXiv

2015

Frank-Wolfe Bayesian Quadrature: Probabilistic Integration with Theoretical Guarantees — Briol F-X, Oates CJ, Girolami M, Osborne MA. (2015) **NIPS 2015**. Selected for Spotlight Presentation. Journal arXiv

Decoupling of the PI3K pathway via mutation necessitates combinatorial treatment in HER2+ breast cancer — Korkola JE, Collisson EA, Heiser L, Oates CJ, et al. (2015) **PLoS One**, 10(7):e0133219. Journal

Accelerated Nonparametrics for Cascades of Poisson Processes — Oates CJ. (2015) **Stat**, 4(1):183-195. Journal arXiv

Discussion of "Sequential Quasi-Monte Carlo" by Gerber and Chopin — Oates CJ, Simpson D, Girolami M (2015) **Journal of the Royal Statistical Society (Series B)**, 77(3):555-556. Journal arXiv

Towards a Multi-Subject Analysis of Neural Connectivity — Oates CJ, Costa L, Nichols T (2015) **Neural Computation**, 27:151-170. Journal arXiv

2014

Quantifying the Multi-Scale Performance of Network Inference Algorithms — Oates CJ, Amos R, Spencer SEF (2014) **Statistical Applications in Genetics and Molecular Biology** 13(5):611-631. Journal arXiv

Joint Estimation of Multiple Related Biological Networks — Oates CJ, Korkola J, Gray JW, Mukherjee S (2014) **The Annals of Applied Statistics** 8(3):1892-1919. Journal arXiv

Causal network inference using biochemical kinetics — Oates CJ, Dondelinger F, Bayani N, Korkola J, Gray JW, Mukherjee S (2014) Bioinformatics 30(17):i468-i474. **Best Paper at the European Conference on Computational Biology 2014**. Journal arXiv

Joint Structure Learning of Multiple Non-Exchangeable Networks — Oates CJ, Mukherjee S (2014) **AISTATS, JMLR W&CP** 33:687-695. Journal arXiv

Single-Cell States in the Estrogen Response of Breast Cancer Cell Lines — Casale FP, et al. (2014) **PLoS One** 9(2):e88485. Journal

A stochastic model dissects cellular states and heterogeneity in transition processes — Armond J, Saha K, Rana AA, Oates CJ, Jaenisch R, Nicodemi M, Mukherjee S (2014) **Nature Scientific Reports** 4:3692. Journal

2013

Bayesian Inference for Protein Signalling Networks — Oates CJ (2013) **PhD Thesis**. pdf

Self Organisation and Emergence — Chau Y-X, Oates CJ, Rana AA, Robinson L, Nicodemi M. (2013) **In: Complexity Science: The Warwick Master's Course, Cambridge University Press**.

2012

Network Inference and Biological Dynamics — Oates CJ, Mukherjee S (2012) **The Annals of Applied Statistics** 6(3):1209-1235. Journal arXiv

Network Inference Using Steady State Data and Goldbeter-Koshland Kinetics — Oates CJ, Hennessy BT, Lu Y, Mills GB, Mukherjee S (2012) **Bioinformatics** 28(18):2342-2348. Journal arXiv

Supervision — Current Group Members

Wafa M Alahmari (2025-2029) PhD candidate in the School of Mathematics, Statistics and Physics, Newcastle University, supported by Saudi Arabia. (Co-supervised by Dr. Matthew Fisher.)

Yinghan Li (2025-2028) PhD candidate in the School of Mathematics, Statistics and Physics, Newcastle University. (Co-supervised by Dr. Matthew Fisher.)

Juntao Chen (2026-2029) PhD candidate in the School of Mathematics, Statistics and Physics, Newcastle University, supported by the China Scholarship Council. (2025-2026) MPhil candidate in the School of Mathematics, Statistics and Physics, Newcastle University. (Co-supervised by Dr. Markus Rau.)

Quinne Lin (2025-2030) PhD candidate in the School of Computing, Newcastle University. (Co-supervised by Dr. Jichun Li and Dr. Stephen McGough.)

Qingyang Liu (2024-2027) PhD candidate in the School of Mathematics, Statistics and Physics, Newcastle University, supported by the China Scholarship Council. (Co-supervised by Dr. Matthew Fisher.)

Huihui Wang (2024-2028) PhD candidate in the Department of Mathematics, King's College London, UK. (Co-supervised by Dr. Marina Riabiz.)

Mengxin Xi (2023-2027) PhD candidate in the Department of Mathematics, King's College London, UK. (Co-supervised by Dr. Marina Riabiz.)

Carrow Morris-Wiltshire (2022-2026) PhD candidate in the Geospatial Systems CDT, Newcastle University, supported by EPSRC. (Co-supervised by Prof. Stuart Barr.)

Supervision — Former Group Members

Zheyang Shen (2023-2026) Postdoctoral researcher in the School of Mathematics, Statistics and Physics, Newcastle University, supported by EPSRC.

Congye Wang (2022-2026) PhD candidate in the School of Mathematics, Statistics and Physics, Newcastle University, supported by the China Scholarship Council. (Co-supervised by Dr. Matthew Fisher.) (Joined Lancaster University as a Senior Research Associate in 2026.)

Aidan Mullins (2022-2026) PhD candidate in the School of Mathematics, Statistics and Physics, Newcastle University. (Co-supervised by Dr. Markus Rau.)

Heishiro Kanagawa (2022-2025) Postdoctoral researcher in the School of Mathematics, Statistics and Physics, Newcastle University, supported by EPSRC. (Joined Fujitsu as a Research Scientist in 2025.)

Marina Strocchi (2021-2025) Postdoctoral researcher on a BHF Programme Grant, joint with Imperial College London, UK. (Co-supervised by Prof. Steven Niederer and Prof. Richard Wilkinson.) (Joined Medtronic as a Senior Computational Modelling Engineer in 2025.)

Takuo Matsubara (2019-2023) PhD candidate in the School of Mathematics, Statistics and Physics, Newcastle University, joint with the Alan Turing Institute, London, UK. (Joined the University of Edinburgh on a William Gordon Seggie Brown Research Fellowship in 2023.)

Matthew Fisher (2021-2022) UKRI Mathematical Sciences Fellow in the School of Mathematics, Statistics and Physics, Newcastle University, UK. (Joined Newcastle University as a Lecturer in Statistics in 2022.)

Onur Teymur (2020-2021) Postdoctoral researcher in the School of Mathematics, Statistics and Physics, Newcastle University, joint with the Alan Turing Institute, London, UK. (Joined the University of Kent as a Lecturer in Statistics in 2021.)

Toni Karvonen (2020-2021) Postdoctoral researcher at the Alan Turing Institute, London, UK. (Joined the University of Helsinki on an Academy of Finland Postdoctoral Fellowship in 2021.)

Matt Graham (2020-2021) Postdoctoral researcher in the School of Mathematics, Statistics and Physics, Newcastle University, joint with the Alan Turing Institute, London, UK. (Joined University College London in 2021.)

Liam Fleming (2019-2022) PhD candidate in the School of Mathematics, Statistics and Physics, Newcastle University, joint with the Alan Turing Institute, London, UK. (Joined Johnson Matthey in 2022.)

Marina Riabiz (2018-2021) Postdoctoral researcher on a BHF-Turing Cardiovascular Data Science Award, joint with King's College London and the Alan Turing Institute, London UK. (Joined the Statistics group at King's College London as a Lecturer in 2021.)

Junyang Wang (2017-2021) PhD candidate in the EPSRC Cloud Computing CDT. (Joined Imperial College London as a postdoc in 2021.)

PhD Theses Examined / PhD Defence Committee Member

2026	Dominic Broadbent, University of Bristol, UK.
2025	Tadashi Matsumoto, University of Warwick, UK.
2024	Xing Liu, Imperial College London, UK.
2024	Matthew Hutchings, Cardiff University, UK.
2024	Viet Wild, University of Oxford, UK.
2023	Satoshi Hayakawa, University of Oxford, UK.
2023	Ba-Hien Tran, Sorbonne Université, France.
2023	Jack Kennedy, Newcastle University, UK.
2022	Zheyang Shen, Aalto University, Finland.
2022	Lorenzo Pacchiardi, University of Oxford, UK.
2022	Alex Lewis, University of Nottingham, UK.
2022	Tim Reid, North Carolina State University, US.
2021	Michael Dunne-Willows, Newcastle University, UK.
2021	Henry Chai, Washington University in St Louis, US.
2021	Antonia Kontaratou, Newcastle University, UK.
2021	Wenkai Xu, University College London, UK.
2020	Ayoub Belhadji, École Centrale de Lille, France.
2020	Xi Chen, Newcastle University, UK.
2019	Christian Davey, Monash University, Australia.
2018	Onur Teymur, Imperial College London, UK.
2017	Nathan Owen, University of Exeter, UK.

Editorial

2025 – 2027 Associate Editor for the SIAM/ASA Journal of Uncertainty Quantification.

2022 – present Action Editor for the Journal of Machine Learning Research.

2022 – 2027 Associate Editor for Bernoulli (Bernoulli Society for Mathematical Statistics and Probability)

2022 – 2023 Associate Editor for a Journal of the Royal Statistical Society, Series B, discussion paper call.

2021 – 2024 Area Chair for NeurIPS.

2020 – 2024 Area Chair for AISTATS.

2016 – 2022 Associate Editor for Statistics and Computing (Springer).

2018 – 2019 Editor for a Special Issue of Statistics and Computing on Probabilistic Numerics.

Committees and Working Groups

2026 – 2027 Member of the Honours Search Committee, Royal Statistical Society.

2025 – 2029 REF Unit of Assessment Lead (Mathematics) for Newcastle University.

2025 – 2028 Member of the Programme Committee for the International Centre for Mathematical Sciences.

2024 – 2025 Chair of the Computation Section of the International Society for Bayesian Analysis. Web

2022 – present Vice Chair of the Computational Statistics and Machine Learning Section of the Royal Statistical Society.

2022 – 2023 Chair Elect of the Computation Section of the International Society for Bayesian Analysis. Web

2021 Member of the Scientific Committee for the Australian Mathematical Sciences Institute Winter School, 2021.

2021 Member of the Scientific Committee for Monte Carlo Methods (MCM), August 2021 @ Universität Mannheim, Germany.

2020 – 2024 Member of the Advisory Board for CHIMERA: Collaborative Healthcare Innovation through Mathematics, EngineeRing and AI. Web Web2

2020 – 2022 Member of the Statistical Computing Section Committee of the Royal Statistical Society.

2020 Participant in the Physics-Informed Machine Learning Theory and Challenge Fortnight at the Alan Turing Institute. Web

2017 – 2018 Group Leader for the SAMSI working group on Probabilistic Numerics (co-led with Tim Sullivan)

External Assessor / Interview Panel

2026 Lecturer / Senior Lecturer / Reader / Professor in Data Science, Newcastle University, UK.

2026 Assistant / Associate / Professor in AI, Lappeenranta-Lahti University of Technology LUT, Finland.

2025 Lecturer / Senior Lecturer / Reader / Professor in Data Science, Newcastle University, UK.

2025 Assistant / Associate / Professor in AI, Lappeenranta-Lahti University of Technology LUT, Finland.

2024 Lecturer / Senior Lecturer in Statistics, Newcastle University, UK.

2023 Reader / Professor in Statistics, Newcastle University, UK.

2022 Associate Professor, Government College University, Faisalabad, Pakistan.

2022 Reader / Professor in Statistics, Newcastle University, UK.

2021 Lecturer / Senior Lecturer in Statistics, Newcastle University, UK.

2019 Lecturer in Statistics, University College Dublin, IE.

Reviewing Service

AISTATS; Anal. Appl.; Ann. Stat.; Bayesian Anal.; Bioinformatics; Biometrika; BMC Syst. Biol.; Can. J. Stat.; Commun. Comput. Phys.; Electron. J. Stat.; IEEE T. Inform. Theory; IEEE T. Pattern Anal.; IJCAI; Int. J. Intell. Syst.; J. Am. Stat. Assoc.; J. Appl. Probab.; J. Approx. Theory; J. Comput. Graph. Stat.; J. Comput. Neurosci.; J. Comput. Phys.; J. Mach. Learn. Res.; J. R. Soc. Interface; J. R. Statist. Soc. B; J. R. Statist. Soc. C; Mach. Learn.; Math. Biosci.; MCQMC; Methodol. Comput. Appl.; NeurIPS; Prob Num; SIAM J. Matrix Anal. A.; SIAM J. Opt.; SIAM J. Sci. Comput.; SIAM J. Uncertainty Quantification; Stat. Appl. Genet. Mo. B.; Stat. Comput.; Stat. Method App.

Grant Reviewing Service

EPSRC Standard Grants, UK

ERC Consolidator Grants, EU

Horizon 2020, EU

Isaac Newton Institute Programme Grants, UK

KU Leuven Internal Funding

Marsden Fund, Royal Society of New Zealand, NZ

National Science Centre, Poland

NERC Landscape Decisions, UK

Research Grants Council of Hong Kong, HK

Teaching

2026

MAS3919: Foundations of Machine Learning, Newcastle University. Course Website

MAS8607: Foundations of Machine Learning with Advanced Topics, Newcastle University. Course Website

2024

MAS8956: Advanced Topics in Statistics A, Newcastle University.

MAS8405: Bayesian Data Analysis, Newcastle University. Course Website

2023

MAS8954: Advanced Topics in Statistics A, Newcastle University. Course Website

MAS8405: Bayesian Data Analysis, Newcastle University. Course Website

2022

MAS8952: Research Topics in Statistics, Newcastle University. Course Website

MAS8405: Bayesian Data Analysis, Newcastle University. Course Website

2021

ETICS (École Thématique sur les Incertitudes en Calcul Scientifique) Summer School on Uncertainty in Scientific Computing (6 hours of lectures on "Minimum Discrepancy Methods in Uncertainty Quantification"). Course Website Slides

2017

Dobbiaco Summer School on Probabilistic Numerics (6 hours of lectures). Course Website Slides

2014

ST911: Fundamentals of Modern Statistical Inference, University of Warwick. Course Website

Organised Conferences & Workshops

2026 Post-Bayesian Statistics, August 2026, University of Sydney, Australia.

2026 Markov Chain and Quasi Monte Carlo Methods, June 2026, University of Edinburgh, UK. Web

2026 Uncertainty Quantification in the North East, February 2026, Newcastle University, UK. Web

2025 Kernels, Flows and Sampling, October 2025, Newcastle University, UK. Web

2024 Next-Generational Extrapolation Methods, November 2024, Newcastle University, UK. Web

2024 Prob Num 2024. July 2024 @ St Pancras Meeting Rooms, UK. Web

2024 Probabilistic Numerics Spring School, April 2024, University of Southampton, UK. Web

2023 Next Generational Kernel Methods, October 2023, Newcastle University, UK. Web

2023 Making Better use of MCMC Samples, September 2023, RSS Annual Conference @ Harrogate, UK. Web

2023 Modelling, Analysis and Inference for Digital Twins, March 2023 @ Alan Turing Institute, UK. Web

2023 Stein Discrepancies, March 2023 @ Bayes Comp, Levi, Finland. Web

2022 Prob Num 2022. March 2022 @ St Pancras Meeting Rooms, UK. Web

2021 Stein's Method in Computational Statistics, December 2021, Royal Statistical Society, UK. Web

2021 European Young Statistician's Meeting: Online (EYSM), September 2021. (International organising committee)

2021 Stein's Method: Post-processing of Monte Carlo. Monte Carlo Methods (MCM), August 2021 @ Universität Mannheim, Germany. Web

2020 Bayesian Young Statisticians Meeting: Online (BAYSM:O), November 2020. (Senior discussant) Web

2020 Cosines & Bayes4Health Data Study Group, September 2020, University of Warwick, UK.

2020 Quantifying Uncertainty due to Discretisation Error in Numerical Computation, September 2020, RSS Annual Conference @ Bournemouth, UK. Web

2020 Probabilistic Numerical Methods for Cubature, March 2020 @ SIAM UQ, Garching, Germany. Web

2019 Prob Num 2019. October 2019 @ Alan Turing Institute, UK.

2019 Stein's Method for Machine Learning and Statistics, June 2019 @ ICML, California, USA. Web Videos

2018 Evolution of Data-Centric Engineering, September 2018, RSS Annual Conference @ Cardiff, UK. Web

2018 Max Ent, July 2018 @ Alan Turing Institute, UK. Web

2018 Minisymposium on Probabilistic Numerical Methods for Quantification of Discretisation Error. April 2018 @ SIAM UQ, Orange County, CA, USA. Web

2018 Meeting of the SAMSI Probabilistic Numerics Working Group. April 2018 @ Alan Turing Institute, UK. Web

2018 Data Sciences for Climate and Environment, March 2018 @ Alan Turing Institute, UK. Web

2017 Grand Challenges in Data-Centric Engineering. September 2017, RSS Annual Conference @ University of Strathclyde, UK. Web

2016 Probabilistic Numerics. August 2016, MCQMC @ Stanford, California, USA. Web

2016 Algorithms for Intractable Problems. January 2016, MCMSki @ Lenzerheide, Switzerland. Web

2016 Probabilistic Integration: Integrating Inference With Integration. January 2016, MCMSki @ Lenzerheide, Switzerland. Web

2015 Julia for Statisticians. November 2015 @ University of Technology Sydney. Web

2015 Probabilistic Numerics for Differential Equations. April 2015 @ University of Warwick, UK. Web

2014 Statistical Systems Biology. December 2014 @ University of Warwick, UK. Web

2012 Inference and Control for Complex Dynamical Systems. November 2012 @ University of Warwick, UK. Web

Invited Presentations

2026

TBA. **Stein's Method and its Statistical Applications**, December 2026, ESSEC Business School, Paris, France. Web

TBA. **Rethinking the Role of Bayesianism in the Age of Modern AI**, University of Edinburgh, UK. Web

Overcoming Model Misspecification in Bayesian Inference of Molecular Signalling Networks. **Data-driven Modeling, Simulation and Inference for Neurobiological Problems**, National Institute for Theory and Mathematics in Biology, Chicago, IL, USA. Web

Post-Bayesian Statistics. **One-Day Workshop**, August 2026, Queensland University of Technology, Australia.

Overcoming Model Misspecification in Bayesian Inference of Molecular Signalling Networks. **Statistics Seminar Series**, August 2026, University of New South Wales, Australia.

Post-Bayesian Statistics. **One-Day Workshop**, August 2026, University of Sydney, Australia.

A Computable Measure of Suboptimality for Entropy-Regularised Variational Objectives. **MCQMC**, June 2026, University of Edinburgh, UK. Web

Optimisation and Post-Bayesian Inference in Machine Learning. **Panel Discussion**, May 2026, AISTATS, Tangiers, Morocco. Web

Detecting Model Misspecification in Bayesian Inverse Problems via Variational Gradient Descent. **Optimisation and Post-Bayesian Inference in Machine Learning**, May 2026, AISTATS, Tangiers, Morocco. Web

An Introduction to Predictively-Oriented Posteriors. **Statistics Seminar**, January 2026, Newcastle University, UK.

Mathematical models for real world systems should (often) not be given the Bayesian treatment. **Mathematics of Real World Systems CDT Seminar**, January 2026, University of Warwick, UK. Web

2025

Problems with Digital Twins. **Meeting of the RSS North East**, December 2025, Durham University, UK.

Optimisation on Probability Distributions - Are We There Yet? **Computational Mathematics and Applications Seminar**, November 2025, University of Oxford, UK. Web

Stationary MMD Points for Cubature. **Numerical Linear Algebra Group**, November 2025, University of Oxford, UK.

Stein Discrepancy is a Variational Gradient. **Linking Geometry and Statistics: Beyond a Mere Coincidence?**, September 2025, The Alan Turing Institute, UK. Web

De-randomising the (Mean Field) Langevin Dynamics. **Non-Reversible Sampling: Robustness, Methodology, Applications**, September 2025, Newcastle University, UK. Web

Automatic Balancing of Numerical Errors in Complex Simulators via Gaussian Process Surrogate Models. **RSS Conference**, September 2025, Edinburgh, UK. Web

Prediction-Centric Uncertainty Quantification via MMD. **Uncertainty Quantification for Dynamical Modelling**, July 2025, University of Edinburgh, UK. Web

Probabilistic Richardson Extrapolation. **Bayes Comp**, June 2025, National University of Singapore. Web

Prediction-Centric Uncertainty Quantification via MMD. **Bayesian Computation and Inference with Misspecified Models**, June 2025, National University of Singapore. Web

Probabilistic Richardson Extrapolation. **CRiSM ReLaunch Workshop**, May 2025, University of Warwick, UK. Web

Problems with Digital Twins. **Mathematics Department Colloquium**, May 2025, University of Manchester, UK.

Problems with Digital Twins. **Machine Learning Group Meeting**, April 2025, University College London, UK.

Beyond Generalised Bayes: Prediction-Centric Alternatives. **Post-Bayesian Seminar Series**, March 2025, Virtual. Video

Prediction-Centric Uncertainty Quantification via MMD. **Statistics Seminar**, March 2025, King's College London, UK.

Prediction-Centric Uncertainty Quantification via MMD. **STOR-i Seminar**, February 2025, Lancaster University, UK.

Prediction-Centric Uncertainty Quantification via MMD. **Statistics Seminar**, January 2025, Newcastle University, UK.

Reinforcement Learning for Adaptive MCMC. **UQSay Seminar**, January 2025, Université Paris Saclay, FR. Web

2024

Prediction-Centric Uncertainty Quantification via MMD. **Applied Probability Seminar**, December 2024, Newcastle University, UK.

Richardson Extrapolation meets Multi-Fidelity Modelling. **MCQMC**, August 2024, University of Waterloo, CA. [Plenary Talk] Web

Richardson Extrapolation meets Multi-Fidelity Modelling. **ISBA World Meeting**, July 2024, Ca' Foscari University, Venice, IT. Web

Richardson Extrapolation meets Multi-Fidelity Modelling. **SAMPSCI**, June 2024. Web

Black Box Probabilistic Numerics. **Probabilistic Numerics Spring School**, April 2024, University of Southampton, UK. Web

Richardson Extrapolation meets Multi-Fidelity Modelling. **Statistics Seminar Series**, March 2024, University of Edinburgh, UK.

Monte Carlo Methods for Text-to-3D. **Statistics Seminar Series**, March 2024, Newcastle University, UK.

2023

Discussant at the **Young Bayesian's' Meeting**, November 2023, virtual. Web

Probabilistic Richardson Extrapolation. **Next-Generational Kernel Methods**, October 2023, Newcastle University, UK. Web

Sampling with Stein Discrepancies. **Potsdam Data Assimilation Days**, September 2023, University of Potsdam, Berlin, DE. Web

Probabilistic Numerical Methods. **International Congress on Industrial and Applied Mathematics**, August 2023, Waseda University, Tokyo. Web

Sampling with Stein Discrepancies. **Probability for Machine Learning Seminar**, May 2023, University of Oxford, UK.

Sampling with Stein Discrepancies. **Mathematics of Information and Data Science Seminar**, March 2023, Heriot-Watt University, UK.

Gradient-Free Kernel Stein Discrepancy. **Bayes Comp**, March 2023, Levi, Finland. Web

Sampling with Stein Discrepancies. **Mathematical Finance and Stochastic Analysis Seminar**, January 2023, University of York, UK.

2022

Robust Generalised Bayesian Inference for Intractable Likelihoods. **CMStatistics**, December 2022, London.

Black Box Probabilistic Numerics. **Gaussian Process Summer School**, September 2022, University of Sheffield. Web

Sampling with Stein Discrepancies. **MCQMC**, July 2022, RICAM, Linz, AU. Web

Sampling and Stein's Method. **Advances in Stein's method and its applications in Machine Learning and Optimization**, April 2022, Banff, CA. Web

Optimal Thinning of MCMC Output. **Adaptivity, High Dimensionality and Randomness**, April 2022, Erwin Schrödinger International Institute, Vienna, AU. Web

Robust Generalised Bayesian Inference for Intractable Likelihoods. **Turing and FCAI Meetup**, February 2022, Finnish Centre for AI, FI. Web

Optimal Thinning of MCMC Output. **DataSig Seminar Series**, February 2022, University of Oxford, UK.

Robust Generalised Bayesian Inference for Intractable Likelihoods. **Lifting Inference with Kernel Embeddings**, January 2022, University of Bern, Switzerland. Web Video

2021

Black Box Probabilistic Numerics. **Probabilistic Numerical Methods - From Theory to Implementation**, October 2021, Schloss Dagstuhl, Germany. Web

Robust Generalised Bayesian Inference for Intractable Likelihoods. **Statistics Seminar Series**, October 2021, University College London, UK.

Optimal Thinning of MCMC Output. **Accelerated Statistical Inference for the Sciences**, September 2021, University of Bern, Switzerland. Web

Optimal Thinning of MCMC Output. **UQSay Seminar Series**, April 2021, Paris Saclay, France. Web

A Statistical Perspective on Solving Linear Systems of Equations. **Probability, Statistics, Operations Research and Machine Learning Seminar**, February 2021, Cardiff University, UK. Video

2020

Statistical Techniques for Engineering with Advanced Materials. **Statistics Seminar Series**, November 2020, Newcastle University, UK.

Recasting Sampling as Optimisation via Stein's Method. **Statistics Seminar Series**, November 2020, Athens University of Economics and Business, Greece.

Statistical Techniques for Engineering with Advanced Materials. **AI, Data & Analytics Seminar Series**, Stanley Black & Decker, November 2020.

A Covariance Function Approach to Prior Specification for Bayesian Neural Networks. **Laplace's Demon Seminar Series**, October 2020, Criteo, France.

Recasting Sampling as Optimisation via Stein's Method. **MCQMC**, August 2020, University of Oxford, UK. Video

Optimal Thinning of MCMC Output. **AI Seminar Series**, August 2020, University College London, UK. Video

Stein's Method in Computational Statistics. **Probability and Statistics Seminar Series**, April 2020, University of Bristol, UK.

Computational Methods for Bayesian Inference of Cardiac Models. **Statistics Seminar Series**, April 2020, Lancaster University, UK.

Fast Bayesian Inference for Differential Equations Using Probabilistic Numerical Methods. **SIAM UQ**, March 2020, Garching, Germany.

Gaussian Process Approximation of Deterministic Functions. **Workshop on Emerging Themes in Computational Statistics**, February 2020, Institute of Statistical Mathematics, Tokyo, Japan.

Computational Methods for Bayesian Inference of Cardiac Models. **Statistics & Probability Seminar Series**, February 2020, University of Nottingham, UK.

Computational Methods for Bayesian Inference of Cardiac Models. **Applied Mathematics Seminar Series**, February 2020, Liverpool John Moores University, UK.

Gaussian Process Approximation of Deterministic Functions. **Statistics Seminar Series**, January 2020, Imperial College London, UK.

2019

Stein Point Markov Chain Monte Carlo. **Statistics Seminar Series**, November 2019, Newcastle University, UK.

Stein's Method in Computational Statistics. **Royal Statistical Society of Belgium**, October 2019, St Truiden, Belgium. [Keynote Talk]

Stein Point Markov Chain Monte Carlo. **Recent Advances in Kernel Methods**, September 2019, University College London, UK.

Stein Point Markov Chain Monte Carlo. **French-German-Swiss Conference on Optimization**, September 2019, Nice, France.

Recent Advances in Uncertainty Quantification. **The Fickle Heart**, May 2019, Isaac Newton Institute, Cambridge, UK.

Stein's Method in Computational Statistics. **Van Dantzig Seminar**, April 2019, VU Amsterdam, NL.

Probabilistic Numerics. **Accenture-Turing Workshop**, April 2019, The Dock, Dublin, Ireland.

Panel: Exploring novel opportunities for data science in cardiovascular research. **BHF-Turing Workshop**, February 2019, Alan Turing Institute, UK.

2018

Stein's Method in Computational Statistics. **RICAM Workshop on Frontier Technologies for High-Dimensional Problems and Uncertainty Quantification**, December 2018, Linz, Austria.

What is an Optimal Bayesian Method? **RICAM Workshop on Multivariate Algorithms and Information-Based Complexity**, November 2018, Linz, Austria. [Plenary Talk]

Computational Methods in Data Centric Engineering. **CoSInES Opening Workshop**, November 2018, University of Warwick, UK.

Stein Points. **Statistics Seminar Series**, October 2018, Newcastle University, UK.

Bayesian Probabilistic Numerical Methods. **Statistics Seminar Series**, October 2018, University of Southampton, UK.

Bayesian Probabilistic Numerical Methods. **Gatsby Computational Neuroscience Unit Seminar Series**, September 2018, University College London, UK.

A Bayes-Sard Cubature Method. **Robotics Institute Seminar Series**, July 2018, University of Oxford, UK.

Bayesian Probabilistic Numerical Methods. **Statistics Seminar Series**, July 2018, University of Edinburgh, UK.

Bayesian Probabilistic Numerical Methods. **MaxEnt 2018**, July 2018, Alan Turing Institute, London, UK.

Stein's Method and Intractable Likelihood. **i-like Workshop**, June 2018, Newcastle University, UK.

Posterior Integration and Stein's Method. **SPA2018**, June 2018, Gothenburg, Sweden.

Outputs of the Probabilistic Numerics Working Group. **QMC Transition Workshop**, May 2018, SAMSI, North Carolina, USA.

Stein's Method in Computational Statistics. **Statistics Seminar Series**, April 2018, University of Leeds, UK.

Probabilistic Meshless Methods for PDEs and Bayesian Inverse Problems. **SIAM UQ**, April 2018, Orange County, California, USA.

Stein Points. **SIAM UQ**, April 2018, Orange County, California, USA.

A Bayesian Conjugate Gradient Method. **Bayes Comp**, March 2018, Barcelona, Spain.

A Bayesian Conjugate Gradient Method. **Statistics Seminar Series**, March 2018, Imperial College London, UK.

Sampling to Optimisation. **Special Interest Group on Sampling Methods**, February 2018, Alan Turing Institute, London, UK.

Bayesian Probabilistic Numerical Methods. **Isaac Newton Institute Workshop on Key UQ Methodologies and Motivating Applications**, January 2018, Cambridge, UK.

2017

Bayesian Probabilistic Numerical Methods. **Cantab Capital Institute for the Mathematics of Information**, November 2017, Cambridge, UK.

Exact Methods for Learning DAGs - A Tutorial. **Statistics Seminar Series**, November 2017, Newcastle University, UK.

An Introduction to Probabilistic Numerical Methods. **Turing Data Science Classes**, September 2017, Alan Turing Institute, London, UK. Slides

Bayesian Probabilistic Numerical Methods. **SAMSI Programme on Quasi Monte Carlo**, August 2017, Duke University, North Carolina, USA.

Bayesian Probabilistic Numerical Methods. **ICERM Workshop on Probabilistic Scientific Computing**, June 2017, Brown University, Rhode Island, USA.

An Introduction to Probabilistic Numerical Methods. **Cloud Computing for Big Data CDT Seminar**, May 2017, Newcastle University, UK.

Bayesian Probabilistic Numerical Computation. **Statistics and Probability Seminar Series**, March 2017, University of New South Wales, Sydney, Australia.

Bayesian Probabilistic Numerical Computation. **HDA2017**, February 2017, University of New South Wales, Sydney, Australia.

2016

It Works, It Actually Works! **Australian Statistical Conference**, December 2016, Canberra, Australia.

Probabilistic Integration for Intractable Distributions. **MCQMC**, August 2016, Stanford, California, USA.

Probabilistic Meshless Methods. **School of Mathematical Sciences Colloquium**, August 2016, University of Adelaide, Australia.

Probabilistic Meshless Methods. **Statistics and Probability Seminar Series**, July 2016, University of New South Wales, Australia.

Stein Operators on Hilbert Spaces. **Business School Seminar Series**, May 2016, University of Sydney, Australia.

Stein Operators on Hilbert Spaces. **CSML Seminar Series**, April 2016, University College London, UK.

Probabilistic Meshless Methods for Bayesian Inverse Problems. **SIAM Conference on Uncertainty Quantification**, April 2016, Lausanne, Switzerland.

The Role of the Statistician in Numerical Analysis. **Mathematics Seminar Series**, February 2016, University of New South Wales, Australia.

Variance Reduction for Doubly Intractable Likelihood Problems. **MCMSki V (IMS-ISBA Joint Meeting)**, January 2016, Lenzerheide, Switzerland.

2015

An Overview of Probabilistic Numerical Methods. **ACEMS Annual Retreat**, November 2015, Adelaide, Australia.

Causal Inference and High-Throughput Proteomics. **Work in Progress Sessions**, October 2015, VicBiostat, Australia.

Probabilistic Integration. **Mathematics and Statistics Seminar Series**, August 2015, University of Technology Sydney, Australia.

Probabilistic Integration. **Statistics Seminar Series**, August 2015, University of Sydney, Australia.

Probabilistic Integration. **Mathematics Seminar Series**, July 2015, Queensland University of Technology, Australia.

A Formal Generalisation of Bayesian Quadrature. **DALI 2015: Probabilistic Numerics**, April 2015, La Palma (Canaries), Spain.

Conditional DAG Models for Proteomic Data Analysis. **DALI 2015: Networks – Processes and Causality**, April 2015, La Palma (Canaries), Spain.

Searching for Evidence of Causal Relationships in Real-World Systems. **Oxford and Warwick Statistics Programme**, March 2015, University of Oxford, UK.

Control Functionals for Monte Carlo Integration. **Statistics Seminar Series**, February 2015, Newcastle University, UK.

Averaging, Revisited. **CSML Seminar Series**, February 2015, University College London, UK.

Control Functionals. **Algorithms and Computationally Intensive Inference**, January 2015, University of Warwick, UK.

2014

Joint Estimation of Multiple Related Biological Networks. **Workshop on Statistical Systems Biology**, December 2014, University of Warwick, UK.

Discussion of "Sequential Quasi-Monte Carlo" by Gerber and Chopin. **Meeting of the Royal Statistical Society**, December 2014, Royal Statistical Society, London, UK.

Control Functionals: A Surprising Link Between Inverse Problems and Asymptotically Efficient Monte Carlo and Quasi Monte Carlo Integration. **Oxford and Warwick Statistics Programme**, November 2014, University of Oxford, UK.

Exact Estimation of Multiple Directed Acyclic Graphs via Integer Linear Programming. **AIGM14**, September 2014, AgroParisTech, Paris, France.

Causal Network Inference Using Biochemical Kinetics. **ECCB 2014**, September 2014, Strasbourg, France. [Best Paper Prize]

Joint Estimation of Multiple Graphical Models: An Integer Linear Programming Approach. **UK-CIM**, April 2014, University of Cambridge, UK.

Joint Structure Learning of Multiple Non-Exchangeable Networks. **AISTATS**, April 2014, Reykjavik, Iceland.

An Integer Linear Programming Approach to Causal Inference in Protein Signalling Networks. **MASAMB**, April 2014, University of Sheffield, UK.

2013

Bayesian Estimation of Multiple Graphical Models. **ERCIM WG on Computational and Methodological Statistics**, December 2013, University of London, UK.

Network Inference and Dynamical Prediction Using Biochemical Kinetics. **Dynamics of Biological Networks**, June 2013, University of Edinburgh, UK.

Statistical Analysis of Complex Systems in Molecular Biology. **Warwick-Monash Alliance Workshop**, March 2013, Monash University, Melbourne, Australia.

2012

"What My Cells Say About Yours": Joint Modelling of Network Heterogeneity Across a Panel of Breast Cancer Cell Lines. **Annual Staff Evening of the Netherlands Cancer Institute**, November 2012, Amsterdam, The Netherlands.

Network Inference Using Steady State Data and Goldbeter-Koshland Kinetics. **MLSB'12**, September 2012, Basel, Switzerland.

Causal Variable Selection Using Equilibrium Relations from Nonlinear Dynamics. **Workshop on Causal Structure Learning, UAI'12**. August 2012, Santa Catalina, CA, USA.

Network Inference Using Chemical Kinetics. **Netherlands Bioinformatics Conference (NBIC)**. April 2012, Lunteren, The Netherlands.

2011

Responsible Interpretation of Large Datasets. **Oncology Graduate School Amsterdam, Annual Retreat**. October 2011, Texel, The Netherlands. [Best Presentation Prize]

Media and Engagement

2025 Recorded an interview for the Numberphile podcast. Youtube

2025 Created a video on Stein's Paradox for the Numberphile channel. YouTube

2025 Interview for Research Professional News. Web

2025 Guy Medal in Bronze of the Royal Statistical Society. Web

2023 Leverhulme Prize for Mathematics and Statistics. Web

2017 Programme on Data-Centric Engineering at the Alan Turing Institute. Web

2017 Biennial Research Prize of the Royal Statistical Society. RSS ACEMS

2017 Gave evidence to the NSW State Parliament on housing regulation. More frivolously, featured in a lobbying advert. Video