Saifuddin (Saif) Syed

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Date of Birth	July 28, 1992
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February 22, 2026

University of British Columbia
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Affiliations and Education

2025 – **Assisstant Professor**.
University of British Columbia, Department of Statistics.
– Associate Member Department of Computer Science
– Founding member of the AI Methods for Scientific Impact (AIM-SI) cluster
– Member of Centre for Artificial Intelligence Decision-making and Action (CAIDA) – Next-Generation Event Horizon Telescope, Algorithms and Inference Working Group

2023 – 2025 **Florence Nightingale Bicentennial Fellow and Tutor**.
University of Oxford, Department of Statistics.
– Computational statistics and machine learning (OxCSML).

2022 – 2023 **Postdoctoral Researcher**.
University of Oxford, Department of Statistics.
Supervised by Arnaud Doucet.
– CoSInES Postdoctoral Fellow.

2017 – 2022 **PhD in Statistics**.
University of British Columbia, Department of Statistics.
Supervised by Alexandre Bouchard-Côté.
Thesis: "Non-reversible parallel tempering on optimized paths".
Dissertation Awards:
– Marshall Prize
– SSC Pierre Robillard Award
– CAIMS Cecil Graham Dissertation Award
– ISBA Savage Award: Theory and Methods (Honourable Mention).

2014 – 2016 **MSc in Mathematics.**
University of British Columbia, Department of Mathematics.
Supervised by Ed Perkins.
Thesis: "Spatial diffusions with singular drifts: The construction of super Brownian motion with immigration at unoccupied sites".

2010 – 2014 **BMath in Mathematics.**
University of Waterloo, Faculty of Mathematics.
– Double major in pure mathematics and applied mathematics.
– Graduated with distinction on the Dean's honours list.

Preprints

[1] Leo Zhang, **Saifuddin Syed**. "The Cosine Schedule is Fisher-Rao-Optimal for Masked Discrete Diffusion Models." Available at arXiv:2508.04884.

[2] **Saifuddin Syed**, Alexandre Bouchard-Côté, Kevin Chern, Arnaud Doucet. "Optimised annealed sequential Monte Carlo samplers ." Available at arXiv:2408.12057.

[3] Nikola Surjanovic, **Saifuddin Syed**, Alexandre Bouchard-Côté, Trevor Campbell. "Uniform ergodicity of parallel tempering with efficient local exploration." Available at arXiv:2405.11384.

* *denotes equal author contribution.* † *denotes joint last author.*

Peer Reviewed Publications

[1] Jiajun He, Paul Jeha*, Peter Potaptchik*, Leo Zhang*, José Miguel Hernández-Lobato, Yuanqi Du, **Saifuddin Syed***†, Francisco Vargas*†. "CREPE: Controlling Diffusion with Replica Exchange." To appear in Advances in the International Conference on Learning Representations, 2026. Available at arXiv:2509.23265.

[2] Leo Zhang*, Peter Potaptchik*, Jiajun He*, Yuanqi Du, Arnaud Doucet, Francisco Vargas, Hai-Dang Dau, **Saifuddin Syed**. "Accelerated Parallel Tempering via Neural Transports."To appear in Advances in the International Conference on Learning Representations, 2026. Available at arXiv:2502.10328.

[3] Charlie B. Tan*, Majdi Hassan*, Leon Klein, **Saifuddin Syed**, Dominique Beaini, Michael M. Bronstein, Alexander Tong, Kirill Neklyudov. "Amortized Sampling with Transferable Normalizing Flows." To appear in Advances in Neural Information Processing Systems, 2025. Available at arXiv:2508.18175.

[4] Nikola Surjanovic, Miguel Biron-Lattes, Paul Tiede, **Saifuddin Syed**, Trevor Campbell, Alexandre Bouchard-Côté. "Pigeons.jl: Distributed sampling from intractable distributions." The Proceedings of the JuliaCon Conference 7:1–13, 2025. Available at arXiv:2308.09769.

[5] Christopher Williams, Andrew Campbell, Arnaud Doucet, **Saifuddin Syed**. "Score-Optimal Diffusion Schedules." Advances in Neural Information Processing Systems, 2024, **(25.8% acceptance)**. Available at arXiv:2412.07877.

[6] Nikola Surjanovic*, Miguel Biron-Lattes*, **Saifuddin Syed**, Trevor Campbell, Alexandre Bouchard-Côté. "autoMALA: Locally adaptive Metropolis-adjusted Langevin algorithm." The International Conference on Artificial Intelligence and Statistics, 2024, **(27% acceptance)**. Available at arXiv:2310.16782.

[7] Fabian Falck*, Christopher Williams*, George Deligiannidis, Chris Holmes, Arnaud Doucet, and **Saifuddin Syed**. "A Unified Framework for U-Net Design and Analysis." Advances in Neural Information Processing Systems, 2023, **(26.1% acceptance)**. Available at arXiv:2305.19638.

[8] Trevor Campbell, **Saifuddin Syed**, Chiao-Yu Yang, Michael I. Jordan, and Tamara Broderick. "Local exchangeability." Bernoulli 29(3), 2084–2100, 2023. Available at arXiv:1906.09507.

[9] Nikola Surjanovic, **Saifuddin Syed**, Trevor Campbell, and Alexandre Bouchard-Côté. "Parallel tempering with a variational reference." Advances in Neural Information Processing Systems, 2022 **(25.6% acceptance)**. Available at arXiv:2206.00080.

[10] **Saifuddin Syed**, Alexandre Bouchard-Côté, George Deligiannidis, and Arnaud Doucet. "Non-reversible parallel tempering: a scalable highly parallel MCMC scheme." Journal of the Royal Statistical Society (Series B) 84(2), 321–350, 2022. Available at arXiv:1905.02939.

[11] **Saifuddin Syed***, Vittorio Romaniello*, Trevor Campbell, and Alexandre Bouchard-Côté. "Parallel tempering on optimized paths." International Conference on Machine Learning, 2021 **(21.5% acceptance)**. Available at arXiv:2102.07720.

* *denotes equal author contribution.*

Workshop Papers

[1] Nikola Surjanovic, Miguel Biron-Lattes, Paul Tiede, **Saifuddin Syed**, Trevor Campbell, Alexandre Bouchard-Côté. "Reproducible sampling from intractable distributions with Pigeons.jl" Championing Open-source DEvelopment in ML Workshop at the International Conference on Machine Learning, 2025. Available at Open Review.

[2] Leo Zhang, Peter Potaptchik, Arnaud Doucet, Hai-Dang Dau, **Saifuddin Syed**. "Generalised Parallel Tempering: Flexible Replica Exchange via Flows and Diffusions" Frontiers in Probabilistic Inference: learning meets Sampling at the International Conference on Learning Representations Workshop, 2025. Available at arXiv:2412.07877.

Prizes, Scholarships and other Honours

2023 – 2026 Florence Nightingale Bicentennial Fellowship.
Award by the University of Oxford's Department of Statistics.

2023 – 2025 NSERC Postdoctoral Fellowship.
Awarded by the Natural Sciences and Engineering Research Council of Canada.

2023 ISBA Savage Award: Theory and Methods (Honourable Mention).
Doctoral thesis award from the International Society for Bayesian Analysis.

2023 CAIMS Cecil Graham Dissertation Award.
Doctoral thesis award from the Canadian Applied and Industrial Mathematics Society.

2023 SSC Pierre Robillard Award.
Doctoral thesis award from the Statistical Society of Canada.

2021 Marshall Prize.
Research award issued by UBC Department of Statistics.

2017 – 2021 UBC Four Year Fellowship.

2020 NeurIPS Top Reviewer (Top 10%).

2017 – 2020 NSERC Canada Graduate Scholarship Doctorate Award (CGS-D).

2017 – 2020 UBC Faculty of Science Graduate Award.

2017 Anona Thorne and Takao Tanabe Graduate Entrance Scholarship.

2015 – 2016 NSERC Alexander Graham Bell Canada Graduate Scholarship (CGS-M).

2010 – 2014 Queen Elizabeth II Aiming for the Top Scholarship.

2010 – 2014 University of Waterloo Math Faculty Dean's Honours List.

2013 NSERC Undergraduate Student Research Award (USRA).

2011 University of Waterloo Research Award.

2011 University of Waterloo President's Scholarship.

Supervision

2024 – **Peter Potaptchik**, *DPhil Statistics 2nd year, University of Oxford.*
Topic: Statistical theory of diffusion models and generative modelling.

2023 – **Leo Zhang**, *DPhil Statistics 2nd year, University of Oxford.*
Co-supervised with Yee Whye Teh.
Topic: Geometric analysis of generative modelling and sampling algorithms.

2023 – **Chris Williams**, *DPhil Statistics 3nd year, University of Oxford.*
Co-supervised with Arnaud Doucet and George Deligiannidis.
Topic: Pre-conditioning for algorithms in sampling and generative modelling.

2023 – **Amitis Shidani**, *DPhil Statistics 4nd year, University of Oxford.*
Co-supervised with Arnaud Doucet and George Deligiannidis.
Topic: Representation learning through the lens of mutual information and distribution matching.

Teaching Experience

2024 – 2025 **Lecturer**. *University of Oxford, Department of Statistics.*
Advanced Simulation Methods, Oxford Statistics MSc and Part C.
HT 2023: 8 hours of lectures and 6 hours of tutorials with 80 enrolled students.
HT 2024: 16 hours of lectures and 12 hours of tutorials with 121 enrolled students.

Duties: Lecturing, managing 5 TAs, office hours, writing and grading exams.

2022 **Teaching Assistant**. *University of Oxford, Sommerville College.*
M3 Probability, Prelim probability for a general audience.

2018 – 2021 **Teaching Assistant**. *University of British Columbia, Department of Statistics.*
STAT 547C, Topics in probability for statistics.
Duties: Office hours, grading, and guest lectures.

2015 – 2016 **Recitation Instructor**. *University of British Columbia, Department of Mathematics.*
MATH 100V/101V, Differential/Integral Calculus (Vantage College).
Approximately 25 students, 24 hours of instruction per term for 2 terms.
Duties: lecturing, managing office hours, and managing four teaching assistants.

2015 **Instructor**. *University of British Columbia, Department of Mathematics.*
MATH 105, Integral calculus for commerce and social sciences.
Approximately 80 students, 36 hours of instruction.
Duties: lecturing, creating assignments, office hours, and managing teaching assistants.

2015 **Workshop Instructor**. *Beat Your Course Inc.*
Led exam review workshops in differential equations and multivariate calculus.

2014 – 2015 **Instructor**. *BrainBoost Education.*
Taught Grade 5-12 students with learning disabilities (e.g. autism, dyslexia, etc).

2014 **Teaching Assistant**. *University of British Columbia, Department of Mathematics.*
MATH 220, Mathematical proof.
Math learning centre tutor.

Service and Relevant Experience

2025 **Reviewer**. *Biometrika.*

2025 **Reviewer**. *Annales de l'Institut Henri Poincaré (B) Probabilités et Statistiques.*

2025 **Reviewer**. *Conference on Neural Information Processing Systems (NeurIPS).*

2024 – **Departmental Committees**. *Department of Statistics, University of Oxford.*
Research Strategy Committee
MSc Admission Committee.

2023 – 2024 **Seminar Organizer**. *OxCSML seminar, Univeristy of Oxford.*
Weekly seminar series for computational statistics and machine learning group.

2023 **Reviewer**. *Artificial Intelligence and Statistics Conference (AISTATS).*

2023 **Workshop Organizer**. *CoSInES + Bayes4Health, University of Warick.*
"Interface between computational physics and computational statistics."

2024 **Reviewer**. *Computers and Operations Research.*

2024 **Reviewer**. *Bioinformatics.*

2023 **Workshop Organizer**. *CoSInES + Bayes4Health, University of Warick.*
"Optimal transport masterclass."

2022 – 2023 **Seminar Organizer**. *CoSInES seminar.*
Bi-weekly seminar series to showcase international computational statistics research.

2023 **Reviewer**. *International Conference on Artificial Intelligence and Statistics.*

2020, 2022 **Reviewer**. *Statistics and Computing.*

2022 **Interviewer**. *University of Oxford, Sommerville College.*
Interviewing prospective undergraduate students for admission to Somerville College.

2020 **Reviewer**. *Biometrika.*

2020 **Reviewer**. *Conference on Neural Information Processing Systems (NeurIPS).*

2018 **Reviewer**. *Association for Uncertainty in Artificial Intelligence (UAI).*

2012 – 2014 **General Manager & Co-editor-in-chief**. *Waterloo Math Review (WMR).*
The WMR was a Canada-wide journal to showcase undergraduate math research.
Duties: Manage submissions, reviewers, design journal, and distribute across Canada.

2013 **Research Assistant**. *University of Waterloo, Department of Pure Mathematics.*
Supervised by Spiro Karigiannis.

2012 **Actuarial Analyst Intern**. *Desjardins General Insurance Group.*
Completed P/1 and FM/2 exams from the Society of Actuaries.

2011 **Research Assistant**. *University of Waterloo, Department of Pure Mathematics.*
Supervised by Kevin Hare.

Talks/Seminars

2025 **University of Calgary**. *Calgary, Canada.*
(Invited Conference) "Accelerating parallel tempering via neural transports"

UBC Applied Mathematics Meeting. *Vancouver, Canada.*
(Plenary Keynote) "An introduction to annealing algorithms"

Fast and Curious II: MCMC in action. *Toronto, Canada.*
(Invited Conference) "Why do we anneal?"

International Seminar on Monte Carlo Methods. *Online.*
(Invited Seminar) Optimised annealed sequential Monte Carlo samplers.

2024 **Cambridge University**. *Cambridge, UK.*
(Invited Seminar) Scalable inference with annealing algorithms.

University of Warwick. *Conventry, UK.*
(Invited Seminar) Scalable inference with annealing algorithms.

University of South Hampton. *Southampton, UK.*
(Invited Seminar) Scalable inference with annealing algorithms.

Université Paris-Dauphine. *Paris, France.*
(Invited Seminar) Scalable inference with annealing algorithms.

Inria Center of University Grenoble Alpes. *Grenoble, France.*
(Invited Seminar) Scalable inference with annealing algorithms.

University of Lancaster. *Lancaster, UK.*
(Invited Seminar) Scalable inference with annealing algorithms.

University of Leeds. *Leeds, UK.*
(Invited Seminar) Scalable inference with annealing algorithms.

Amazon Research StatML CDT Workshop. *Berlin, Germany.*
(Invited Conference) Scalable inference with parallel tempering.

ProbAI Hub Launch Event. *London, UK.*
(Invited Conference) Scalable inference with parallel tempering.

University of College London Department of Statistics. *London, UK.*
(Invited Seminar) "Scalable inference with annealing algorithms."

University of British Columbia Department of Statistics. *Vancouver, Canada.*
(Invited Seminar) "The design and analysis of annealing algorithms."

2023 **King's College London Department of Statistics**. *London, UK.*
(Invited Seminar) "Annealing algorithms for scalable Bayesian inference."

Imperial College London Department of Statistics. *London, UK.*
(Invited Seminar) "Annealing algorithms for scalable Bayesian inference."

Imperial College London School of Public Health. *London, UK.*

(Invited Seminar) "Scalable Bayesian inference with non-reversible parallel tempering."

European Young Statisticians Meeting 2023. *Ljubljana, Slovenia.*
(Invited Conference) Representative from the UK.

JSM 2023. *Toronto, Canada.*
(Invited Conference) "ISBA Savage Award Finalist: Theory and Methods."

SMC Down Under Workshop. *Brisbane, Australia.*
(Plenary Keynote) "Annealed sequential Monte Carlo samplers."

CAIMS 2023 Annual Meeting. *Fredericton, Canada.*
(Plenary Keynote) "Cecil Graham Doctoral Dissertation Award lecture."

SSC Annual Meeeting 2023. *Ottawa, Canada.*
(Plenary Keynote) "Pierre Robillard Award lecture."

Heilbronn Cybersecurity Workshop. *Bristol, UK.*
(Invited Conference) "Parallel tempering with a variational reference."

University of College London Statistics Seminar. *London, UK.*
(Invited Seminar) "Parallel tempering with a variational reference."

Bayes4Health & CoSInES Workshop. *Oxford, UK.*
(Invited Conference) "Annealing algorithms."

BayesComp 2023. *Levi, Finland.*
(Invited Conference) "Parallel tempering on optimized paths."

Johns Hopkins Biostats Seminar. *Remote.*
(Invited Seminar) "Non-reversible parallel tempering."

2022 **CMStatistics 2022**. *London, UK.*
(Invited Conference) "Parallel tempering with a variational reference."

NeurIPS 2022. *New Orleans, USA.*
(Invited Poster) "Parallel tempering with a variational reference."

Harvard University Black Hole Initiative. *Cambridge, United States.*
(Invited Seminar) "Non-reversible parallel tempering and the EHT."

ISBA 2022 World Meeting. *Montreal, Canada.*
(Invited Conference) "Non-reversible parallel tempering."

University of Montreal Department of Statistics. *Montreal, Canada.*
(Invited Seminar) "Non-reversible parallel tempering on optimized paths."

University of Oxford OxCSML Seminar. *Oxford, UK.*
(Invited Seminar) "Non-reversible parallel tempering on optimized paths."

CoSInES Seminar. *Remote.*
(Invited Seminar) "Non-reversible parallel tempering."

Queensland University of Technology. *Remote.*
(Invited Seminar) "Non-reversible parallel tempering on optimized paths."

UBC Department of Statistics. *Remote.*
(Invited Seminar) "Non-reversible parallel tempering on optimized paths."

Simon Fraser University Department of Statistics. *Burnaby, Canada.*
(Invited Seminar) "Non-reversible parallel tempering on optimized paths."

2021 **MCM 2021**. *Remote.*
(Contributed Conference) "Parallel tempering on optimized paths."

ICML 2021. *Remote.*
(Invited Poster) "Parallel tempering on optimized paths."

ISBA 2021 World Meeting. *Remote.*
(Contributed Conference) "Parallel tempering on optimized paths."

Riskfuel Analytics Inc. *Remote.*
(Invited Seminar) "Parallel tempering on optimized paths."

2020 **CAIDA: BC's AI Showcase**. *Remote.*
(Contributed Poster) "Non-reversible parallel tempering."

MURI Seminar. *Remote.*
(Invited Seminar) "Non-reversible parallel tempering."

2019 **University of Bristol Department of Mathematics**. *Bristol, UK.*
(Invited Seminar) "Non-reversible parallel tempering: scaling and optimality."

CMStatistics 2019. *London, UK.*
(Invited Conference) "Non-reversible parallel tempering."

University of Oxford OxCSML Seminar. *Oxford, UK.*
(Invited Seminar) "Non-reversible parallel tempering."

MCM 2019. *Sydney, Australia.*
(Invited Conference) "Non-reversible parallel tempering: scaling and optimality."

1QBit Information Technologies Inc. *Vancouver, Canada.*
(Invited Seminar) "Non-reversible parallel tempering: scaling and optimality."

Microsoft Research. *Redmond, USA.*
(Invited Seminar) "Optimal scaling of parallel tempering."