

Department of Data Science and Operations, University of Southern California
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Academic Positions

Postdoctoral Scholar - Research Assistant Sept 2025 - Present
With Prof. Jacob Bien
Department of Data Science and Operations, University of Southern California

Postdoctoral Research Assistant Oct 2024 - July 2025
With Prof. Sir John A. D. Aston
Statistical Laboratory, University of Cambridge

Education

PhD in the Mathematics of Information Oct 2020 - Oct 2024
St Catharine's College, University of Cambridge
Thesis: *Symmetry and Other Structures: Topics in Nonparametric Regression*
Supervisor: Prof. Sir John A. D. Aston

Master of Advanced Study in Mathematical Statistics Oct 2019 - Jul 2020
Trinity College, University of Cambridge
Ungraded due to Covid-19
Dissertation: *The Statistics of Manifold Valued Data*
Supervisor: Prof. Sir John A. D. Aston

Bachelor of Science and Bachelor of Arts (First Class Honours) Mar 2014 - Nov 2018
University of Auckland
Majors: Mathematics, Statistics, Economics, and Physics
Dissertation: *An Analytic Proof of the Morse Inequalities*
Supervisor: Dr. Pedram Hekmati

Publications and Pre-Prints

- [1] Louis Goldwater Christie and John AD Aston. (2025). Symmetry: A general structure in nonparametric regression. *The Annals of Statistics*, 53(5):2040–2076.
- [2] Louis G Christie and John AD Aston. (2025). Estimating maximal symmetries of regression functions via subgroup lattices. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, 87(5):1576–1618.
- [3] Louis G Christie and John AD Aston. (2022). Testing for geometric invariance and equivariance. *arXiv preprint arXiv:2205.15280*.

- [4] Dodge Cahan, Hongjia H Chen, Louis Christie, and Arkadii Slinko. (2021). Spatial competition on 2-dimensional markets and networks when consumers don't always go to the closest firm. *International Journal of Game Theory*, 50(4):945–970.
- [5] Louis Christie, Kenneth J Dykema, and Igor Klep. (2020). Classifying minimal vanishing sums of roots of unity. *arXiv preprint arXiv:2008.11268*.

Conferences, Workshops, and Seminars

Invited Seminars

<i>Scaling Laws and Symmetries</i>	Massachusetts Institute of Technology	Jun 2026
<i>Utilising Symmetry for Dimension Reduction</i>	University of Konstanz	Jun 2025
<i>Learning Symmetries of Regression Functions</i>	University of Auckland	Feb 2022

Conference Presentations

<i>Modelling individual-cell time dynamics without repeated observation</i> , at CBIOMES	Simons Foundation, New York	Jun 2026
<i>Symmetries in Regression</i> , at the Joint Statistical Meetings	American Statistical Association	Aug 2024
<i>Inference for Symmetries</i> , at the First Symposium of Geometry and Statistics	Beijing Institute of Mathematical Sciences and Applications	Jul 2023

Workshops

<i>High Dimensional Statistics and Distribution Shift</i>	ETH Zurich	Jun 2025
<i>Object Oriented Data Analysis in Health Sciences</i>	Institute for Mathematical and Statistical Innovation, Chicago	Jul 2023
<i>NZMRI Summer Workshop: Number Theory and Applications</i>	New Zealand Mathematics Research Institute	Feb 2022

Supervised Students

Undergraduate Projects

Som Bagchi	<i>Algebraic Manifold Learning</i>	University of Cambridge	Summer 2023
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Teaching

Lecturer

<i>Statistical Modelling</i> (Part II)	University of Cambridge	2024
<i>Statistics Preparatory Workshops</i> (Part III)	University of Cambridge	2022 - 2023

Teaching Assistant

<i>Statistical Modelling</i> (Part II)	University of Cambridge	2022
<i>Statistics</i> (Part IB)	University of Cambridge	2021
<i>Statistical Modelling</i> (Part II)	University of Cambridge	2021
<i>Stochastic Methods in Finance</i> (Part II)	University of Cambridge	2021
<i>General Mathematics 1</i> (Maths 108)	University of Auckland	2018
<i>Advancing Mathematics 1</i> (Maths 150)	University of Auckland	2018
<i>Discrete Structures</i> (CompSci 225)	University of Auckland	2017
<i>Tuākana Programme</i>	University of Auckland	2016
<i>General Mathematics 2</i> (Maths 208)	University of Auckland	2016
<i>Accelerated Mathematics</i> (Maths 153)	University of Auckland	2016
<i>Accelerated Mathematics</i> (Maths 153)	University of Auckland	2015

Part IB courses are for second year undergraduates, Part II courses are for third year undergraduates, and Part III courses are for Masters Students.

Awards and Achievements

Smith-Knight Prize in Mathematics	2023
Harding Distinguished Postgraduate Scholarship (£160,000)	2020
Trinity College Overseas Bursary (NZ\$50,000)	2019
First in Course Awards in Maths 250, 255, 714, and 730 and Stats 210 and 723	2014 - 2018
University of Auckland (UoA) Postgraduate Honours Scholarship (NZ\$20,000)	2018
CAPE South East Asia Study Tour Scholarship	2017
Ministry of Primary Industries Scholarship in Quantitative Marine Biology (NZ\$5000)	2017
UoA Representative for Business Management Case Competitions in: Australia, Canada, Japan, and Thailand	2015 - 2018
National Winner of the NZ Undergraduate Programming Competition	2015
UoA Summer Research Scholarships in Mathematics (NZ\$5000 $\times$ 2)	2014, 2016
UoA Ivan Reilly Prize for Stage 2 Mathematics	2014
NZQA Outstanding Scholar Award (NZ\$15000)	2013
Saint Kentigern College Dux Medalist	2013
AMP “Do Your Thing” Scholarship (NZ\$1000)	2013

Other Employment

McGrathNicol Advisory	Data Analyst, Sydney	Jan 2019 - Sep 2019
Deloitte	Technology Consulting Intern, Auckland	Nov 2016 - Feb 2017
Mozilla	Software Engineering Intern, Auckland	Nov 2015 - Feb 2016

Professional Activities

Reviewed for:

Journal of the Royal Statistical Society, Series B	2023
AI Stats Conference Proceedings	2022

Volunteer Positions:

<i>Consultant</i>	StatsLab Clinic, University of Cambridge	2021 - 2023
<i>Social Director</i>	Philippa Fawcett Internship programme	Summer 2022
<i>Social Secretary</i>	St. Catharine's College MCR	2021 - 2022
<i>Social Director</i>	Harding Scholars Society	2020 - 2022
<i>First Year Representative</i>	Trinity College BA Society	2019 - 2020
<i>Alpine Instruction Officer</i>	Auckland University Rock and Alpine Club	2018
<i>Vice President</i>	Auckland University Tramping Club	2017
<i>Secretary</i>	Auckland University Tramping Club	2016
<i>Tech Competition Director</i>	Management Consulting Club (UoA)	2016
<i>Administrative Director</i>	Champions Trophy Case Competition (UoA)	2016
<i>Publications Officer</i>	Auckland University Tramping Club Committee	2015
<i>Competition Director</i>	Champions Trophy Case Competition (UoA)	2015