

BAILEY WHITBREAD

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EDUCATION

Doctor of Philosophy

The University of Sydney

Advisors: [Geordie Williamson](#).

2025 -
Sydney, Australia

Master of Philosophy

The University of Queensland

Advisors: Masoud Kamgarpour, Ole Warnaar.

Thesis: Arithmetic geometry of character varieties.

Awards: Bernhard H. Neumann prize, hon. men.

Scholarship: UQ Research Training Program scholarship.

2022 - 2024
Brisbane, Australia

Bachelor of Mathematics

The University of Queensland

Advisors: Masoud Kamgarpour, Anna Puskás.

Thesis: Hecke algebras and Gelfand pairs in representation theory.

Awards: UQ Dean's Commendations for Academic Excellence.

Scholarships: UQ Academic Merit, UQ Link, and Smith Family Tertiary scholarships.

2017 - 2021
Brisbane, Australia

WORK

Counting points on character varieties

Masoud Kamgarpour, GyeongHyeon Nam, Bailey Whitbread, Stefano Giannini
[arXiv:2409.04735](#)

2024
Submitted

CharacterVarieties.jl

A package for computing E -polynomials of character varieties
github.com/baileywhitbread/CharacterVarieties.jl

2024
Julia

TALKS

Counting points on character varieties

Representation theory down under

What is the Jones polynomial?

Informal Thursday Seminar

Counting points on character varieties

Joint Meeting of the NZMS, AustMS and AMS

Character varieties

Australian Postgraduate Algebra Colloquium

Counting points on character varieties

University of Queensland Maths Graduate Student Seminar

Polynomials in the variable p

AMSI Summer School

Character varieties in arbitrary type

67th Annual Meeting of the Australian Mathematical Society

Arithmetic geometry of representation spaces

University of Glasgow Algebra and Number Theory Seminar

Counting points on representation varieties

66th Annual Meeting of the Australian Mathematical Society

The representation variety and its E -polynomial

AMSI Winter School 2022

Hecke algebras and Gelfand pairs in representation theory

Honours final talk

Kinky sets

University of Queensland Mathematics Students Society

The twin prime and Elliot–Halberstam conjectures

Undergraduate coursework

June 2025
Sydney, Australia
May 2025
Brisbane, Australia
Dec 2024
Auckland, New Zealand
Aug 2024
Online
Aug 2024
Brisbane, Australia
Jan 2024
Canberra, Australia
Dec 2023
Brisbane, Australia
Sep 2023
Glasgow, Scotland
Dec 2022
Sydney, Australia
July 2022
Brisbane, Australia
May 2021
Brisbane, Australia
Mar 2021
Brisbane, Australia
Oct 2020
Brisbane, Australia

SERVICE

Co-organiser

UQ Maths Graduate Student Seminar

Co-organised with Madeline Nurcombe, Alistair Falconer, and Alexander Lim.

Funded by Cecilia Gonzalez Tokman and Ramiro Lafuente.

2023 - 2024

Brisbane, Australia

Co-organiser

Weil Conjectures Lecture Series

Taught by Masoud Kamgarpour and Angus McAndrew.

2023

Online

Competition marker

Simon Marais Mathematics Competition

International competition for undergraduates.

Coordinated by Sean Gardiner.

2022

Online

Competition marker

UQ/QAMT Problem Solving Competition

State competition for high school students.

Coordinated by Michael Bulmer.

2022

Brisbane, Australia

Question drafter

UQ Maths Relay

Welcome event for undergraduates.

Coordinated by Ramiro Lafuente, Ole Warnaar and Masoud Kamgarpour.

2021 - 2023, 2025

Brisbane, Australia

Exam marker

The University of Queensland

First and second year algebra and analysis final exams.

2021 - 2025

Brisbane, Australia

Research assistant

The University of Queensland

Working with students to improve clarity in writing and presenting.

Funded by Masoud Kamgarpour.

2024 - 2025

Brisbane, Australia

Tutorial assistant

The University of Queensland

2019 - 2025

Brisbane, Australia

MATH3303 Abstract Algebra & Number theory

MATH2401 Advanced Real Analysis

MATH2400 Real Analysis

MATH2301 Linear & Abstract Algebra & Number Theory

MATH2001 Calculus and Linear Algebra II

MATH1071 Advanced Calculus & Linear Algebra I

MATH1061 Discrete Mathematics

First Year Learning Centre for Mathematics

Some tutor evaluations written by students of MATH3303:

'Bailey was extremely knowledgeable in the subject, easily approachable, and is among one of the best tutors I've ever had during my time at UQ. From him, I have learnt not only course content, but how to be an effective educator.'

'Bailey has been hands-down the best maths tutor I have had. He was extremely approachable, and always encouraged questions. He would explain the theory very clearly and always made sure you had a good understanding of the concepts. This course would have been a lot harder without him as a tutor!'

'Bailey was very helpful and professional in the tutorials. He offered excellent help to all students and explained the challenging assignment questions with great clarity and insight.'

'Bailey is really good at putting different ideas into a wider context in algebra which can help guide intuition and also helps students gain a wider appreciation of what we are studying.'

Volunteer tutor

UQ Queensland Mathematics Summer School

Summer school for senior high school students.

Coordinated by Andrew Stephenson.

2019

Brisbane, Australia

President and vice president

UQ Mathematics Students Society

Undergraduate student society.

2017 - 2019

Brisbane, Australia

CONFERENCES, SEMINARS, WORKSHOPS, ETC.

AMSI Summer School	Jan 2025
<i>School</i>	Canberra, Australia
68th Annual Meeting of the Australian Mathematical Society	Dec 2024
<i>Conference</i>	Auckland, New Zealand
Australian AI Safety Forum 2024	Nov 2024
<i>Forum</i>	Sydney, Australia
Geometry Day @ UQ	Aug 2024
<i>Conference</i>	Brisbane, Australia
AMSI Summer School	Jan 2024
<i>School</i>	Canberra, Australia
67th Annual Meeting of the Australian Mathematical Society	Dec 2023
<i>Conference</i>	Brisbane, Australia
UQ School of Mathematics and Physics Poster Day	Oct 2023
<i>Poster day</i>	Brisbane, Australia
Categorified Enumerative Geometry and Representation Theory	Sep 2023
<i>Workshop</i>	Lausanne, Switzerland
UQ Flag Varieties Seminar	Jun - Aug 2023
<i>Seminar</i>	Brisbane, Australia
Differential Geometry Days @ UQ	Feb 2023
<i>Conference</i>	Brisbane, Australia
66th Annual Meeting of the Australian Mathematical Society	Dec 2022
<i>Conference</i>	Sydney, Australia
Number Theory Down Under 10	Sep 2022
<i>Conference</i>	Brisbane, Australia
AMSI Winter School: New Directions in Representation Theory	Jun 2022
<i>School</i>	Brisbane, Australia
Character Varieties, E-Polynomials and Representation Zeta Functions	Feb 2022
<i>Workshop</i>	Online
Stradbroke Island Workshop on Character Varieties	Dec 2021
<i>Workshop</i>	Brisbane, Australia
Heron Island Workshop on Geometry and Representation Theory	Jun 2021
<i>Workshop</i>	Gladstone, Australia
Stradbroke Island Workshop on Representation Theory	Feb 2021
<i>Workshop</i>	Brisbane, Australia
UQ 'What is...?' (Wise) Seminar	2021 - 2022
<i>Seminar</i>	Online
AMSI Summer School on Stochastic Modelling	Jan 2021
<i>School</i>	Online