Bailey Whitbread

Address: School of Mathematics and Physics, The University of Queensland, St Lucia, Australia.
Office: Building 69, Room 714.
Website: www.baileywhitbread.com.

Research interests

I am interested in representation theory, geometry and machine learning.

Education

Master of Philosophy 2022 - 2024
The University of Queensland Brisbane, Australia
Advisors: Masoud Kamgarpour, Ole Warnaar.
Topic: Arithmetic geometry of character varieties.
Scholarships: UQ Research Training Program scholarship ($142,500).

Bachelor of Mathematics, First Class Honours 2017 - 2021
The University of Queensland Brisbane, Australia
Advisors: Masoud Kamgarpour, Anna Puskás.
Thesis: Hecke algebras and Gelfand pairs in representation theory.
Scholarships: UQ Academic Merit, UQ Link, and Smith Family Tertiary scholarships ($25,000).
Awards: UQ Dean's Commendations for Academic Excellence.

Work

Counting points on character varieties 2024
Masoud Kamgarpour, GyeongHyeon Nam, Bailey Whitbread, Stefano Giannini Submitted
arXiv:2409.04735

CharacterVarieties.jl 2024
A package for computing E-polynomials of character varieties Julia
github.com/baileywhitbread/CharacterVarieties.jl

Service

Co-organiser 2023 - 2024
UQ Maths Graduate Student Seminar Brisbane, Australia
Co-organised with Madeline Nurcombe, Alistair Falconer, and Alexander Lim.
Funded by Cecilia Gonzalez Tokman and Ramiro Lafuente.

Co-organiser 2023
Weil Conjectures Lecture Series Online
Taught by Masoud Kamgarpour and Angus McAndrew.

Competition marker 2022
Simon Marais Mathematics Competition Online
International competition for undergraduates.
Coordinated by Sean Gardiner.

Competition marker   2022
UQ/QAMT Problem Solving Competition   Brisbane, Australia
State competition for high school students.
Coordinated by Michael Bulmer.

Question drafter   2021 - 2023
UQ Maths Relay   Brisbane, Australia
Welcome event for undergraduates.
Coordinated by Ramiro Lafuente, Ole Warnaar and Masoud Kamgarpour.

Exam marker   2021 - 2024
The University of Queensland   Brisbane, Australia
First and second year algebra and analysis final exams.

Research assistant   2021
The University of Queensland   Brisbane, Australia
Working with students to improve clarity in writing.
Funded by Masoud Kamgarpour.

Tutorial assistant   2019 - 2024
The University of Queensland   Brisbane, Australia
I may have been your tutor for the following:

MATH3303 Abstract Algebra & Number theory   MATH2001 Calculus and Linear Algebra II
MATH2401 Mathematical Analysis &   MATH1071 Advanced Calculus & Linear Algebra I
Advanced Topics   MATH1061 Discrete Mathematics
MATH2400 Mathematical Analysis   MATH1052 Multivariate Calculus & ODEs
MATH2301 Linear & Abstract Algebra &   MATH1051 Calculus & Linear Algebra I
Number Theory   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   2019
UQ Queensland Mathematics Summer School   Brisbane, Australia
Summer school for senior high school students.
Coordinated by Andrew Stephenson.

President and vice president   2017 - 2019
UQ Mathematics Students Society   Brisbane, Australia
Undergraduate student society.

Invited Talks

Arithmetic geometry of representation spaces   Sep 2023
University of Glasgow Algebra and Number Theory Seminar   Glasgow, Scotland

Talks

???   Jan 2025
AMSI Summer School   Sydney, Australia
???   Dec 2024
68th Annual Meeting of the Australian Mathematical Society   Auckland, New Zealand
Character varieties   Aug 2024
Australian Postgraduate Algebra Colloquium   Online
Counting points on character varieties   Aug 2024
University of Queensland Maths Graduate Student Seminar   Brisbane, Australia
Polynomials in the variable p   Jan 2024
AMSI Summer School   Canberra, Australia
Character varieties in arbitrary type   Dec 2023
67th Annual Meeting of the Australian Mathematical Society   Brisbane, Australia
Shadows of groups   August 2023
University of Queensland Mathematics Students Society   Brisbane, Australia
Arithmetic, geometry & polynomials in the variable q   July 2023
University of Queensland Maths Graduate Student Seminar   Brisbane, Australia
Counting points on representation varieties   Dec 2022
66th Annual Meeting of the Australian Mathematical Society   Sydney, Australia
The representation variety and its E-polynomial   July 2022
AMSI Winter School 2022   Brisbane, Australia
Hecke algebras and Gelfand pairs in representation theory   May 2021
Honours final talk   Brisbane, Australia
Kinky sets   Mar 2021
University of Queensland Mathematics Students Society   Brisbane, Australia
The twin prime and Elliot–Halberstam conjectures   Oct 2020
Undergraduate coursework   Brisbane, Australia

Conferences, Seminars, Workshops, etc.

AMSI Summer School   Jan 2025
Course   Canberra, Australia
68th Annual Meeting of the Australian Mathematical Society   Dec 2024
Conference   Auckland, New Zealand
Australian AI Safety Forum 2024   Nov 2024
Forum   Sydney, Australia
Geometry Day @ UQ   Aug 2024
Conference   Brisbane, Australia
AMSI Summer School   Jan 2024
Course   Canberra, Australia
67th Annual Meeting of the Australian Mathematical Society   Dec 2023
Conference   Brisbane, Australia
UQ School of Mathematics and Physics Poster Day   Oct 2023
Poster day   Brisbane, Australia
Categorified Enumerative Geometry and Representation Theory   Sep 2023
Workshop   Lausanne, Switzerland

UQ Flag Varieties Seminar Jun - Aug 2023

Seminar Brisbane, Australia

Differential Geometry Days @ UQ Feb 2023

Conference Brisbane, Australia

66th Annual Meeting of the Australian Mathematical Society Dec 2022

Conference Sydney, Australia

Number Theory Down Under 10 Sep 2022

Conference Brisbane, Australia

AMSI Winter School: New Directions in Representation Theory Jun 2022

Course Brisbane, Australia

Character Varieties, E-Polynomials and Representation Zeta Functions Feb 2022

Workshop Online

Stradbroke Island Workshop on Character Varieties Dec 2021

Workshop Brisbane, Australia

Heron Island Workshop on Geometry and Representation Theory Jun 2021

Workshop Gladstone, Australia

Stradbroke Island Workshop on Representation Theory Feb 2021

Workshop Brisbane, Australia

UQ 'What is. . . ?' (Wise) Seminar 2021 - 2022

Seminar Online

AMSI Summer School on Stochastic Modelling Jan 2021

Course Online