

# BAILEY WHITBREAD

**Address:** School of Mathematics and Physics, The University of Queensland, St Lucia, Australia.

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## RESEARCH INTERESTS

I am interested in representation theory, geometry, combinatorics and machine learning. My current research is about character varieties, character stacks and their additive counterparts.

## EDUCATION

### Master of Philosophy

*The University of Queensland*

2022 - 2024

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

*The University of Queensland*

2017 - 2021

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.

### Certificate of Education

*Maroochydore State High School*

2012 - 2016

Maroochydore, Australia

**Result:** Australian Tertiary Admissions Rank 99.00+.

**Scholarships:** Smith Family Learning for Life program.

**Awards:** High Distinctions in the AMT Australian Mathematics Competition.

## INVITED TALKS

### Arithmetic geometry of representation spaces

*University of Glasgow Algebra and Number Theory Seminar*

Sep 2023

Glasgow, Scotland

## WORK AND SERVICE

### Co-organiser

*UQ Maths Graduate Student Seminar*

2023 - now

Brisbane, Australia

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

Funded by Cecilia Gonzalez Tokman and Ramiro Lafuente.

### Co-organiser

*Weil Conjectures Lecture Series*

2023

Online

Taught by Masoud Kamgarpour and Angus McAndrew.

### Competition marker

*Simon Marais Mathematics Competition*

2022

Online

International competition for undergraduates.

Coordinated by Sean Gardiner.

<b>Competition marker</b> <i>UQ/QAMT Problem Solving Competition</i> State competition for high school students. Coordinated by Michael Bulmer.	2022 Brisbane, Australia
<b>Question drafter</b> <i>UQ Maths Relay</i> Welcome event for undergraduates. Coordinated by Ramiro Lafuente, Ole Warnaar and Masoud Kamgarpour.	2021 - Now Brisbane, Australia
<b>Exam marker</b> <i>The University of Queensland</i> First and second year algebra and analysis final exams.	2021 - Now Brisbane, Australia
<b>Research assistant</b> <i>The University of Queensland</i> Working with students to improve clarity in writing. Funded by Masoud Kamgarpour.	2021 Brisbane, Australia
<b>Tutorial assistant</b> <i>The University of Queensland</i> I may have been your tutor for the following: <a href="#">MATH3303 Abstract Algebra &amp; Number theory</a> , <a href="#">MATH2401 Mathematical Analysis &amp; Advanced Topics</a> , <a href="#">MATH2400 Mathematical Analysis</a> , <a href="#">MATH2301 Linear &amp; Abstract Algebra &amp; Number Theory</a> , <a href="#">MATH2001 Calculus and Linear Algebra II</a> , <a href="#">MATH1071 Advanced Calculus &amp; Linear Algebra I</a> , <a href="#">MATH1061 Discrete Mathematics</a> , <a href="#">MATH1052 Multivariate Calculus &amp; Ordinary Differential Equations</a> , <a href="#">MATH1051 Calculus &amp; Linear Algebra I</a> , and <a href="#">First Year Learning Centre for Mathematics</a> .	2019 - Now Brisbane, Australia
<p>Some tutor evaluations written by students of MATH3303:</p> <ul style="list-style-type: none"> <li>• ‘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.’</li> <li>• ‘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!’</li> <li>• ‘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.’</li> <li>• ‘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.’</li> </ul>	
<b>Volunteer tutor</b> <i>UQ Queensland Mathematics Summer School</i> Summer school for senior high school students. Coordinated by Andrew Stephenson.	2019 Brisbane, Australia
<b>President and vice president</b> <i>UQ Mathematics Students Society</i> Undergraduate student society.	2017 - 2019 Brisbane, Australia

## TALKS

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

## CONFERENCES, SEMINARS, WORKSHOPS, ETC.

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