

# BAILEY WHITBREAD

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

**Office:** Building 69, Room 714.

**Website:** [www.baileywhitbread.com](http://www.baileywhitbread.com).

## 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 - Now  
Brisbane, Australia

**Advisors:** [Masoud Kamgarpour](#), [Ole Warnaar](#).

**Topic:** Arithmetic geometry of representation spaces.

**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.

<p><b>Competition marker</b>  <i>UQ/QAMT Problem Solving Competition</i>          State competition for high school students.          Coordinated by Michael Bulmer.</p>	<p>2022          Brisbane, Australia</p>
<p><b>Question drafter</b>  <i>UQ Maths Relay</i>          Welcome event for undergraduates.          Coordinated by Ramiro Lafuente, Ole Warnaar and Masoud Kamgarpour.</p>	<p>2021 - Now          Brisbane, Australia</p>
<p><b>Exam marker</b>  <i>The University of Queensland</i>          First and second year algebra and analysis final exams.</p>	<p>2021 - Now          Brisbane, Australia</p>
<p><b>Research assistant</b>  <i>The University of Queensland</i>          Working with students to improve clarity in writing.          Funded by Masoud Kamgarpour.</p>	<p>2021          Brisbane, Australia</p>
<p><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          First Year Learning Centre for Mathematics.</p>	<p>2019 - Now          Brisbane, Australia</p>
<p>Some tutor evaluations written by students of MATH3303:</p> <ul style="list-style-type: none"> <li>• <i>'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.'</i></li> <li>• <i>'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!'</i></li> <li>• <i>'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.'</i></li> <li>• <i>'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.'</i></li> </ul>	
<p><b>Volunteer tutor</b>  <i>UQ Queensland Mathematics Summer School</i>          Summer school for senior high school students.          Coordinated by Andrew Stephenson.</p>	<p>2019          Brisbane, Australia</p>
<p><b>President and vice president</b>  <i>UQ Mathematics Students Society</i>          Undergraduate student society.</p>	<p>2017 - 2019          Brisbane, Australia</p>

## TALKS

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

## CONFERENCES, SEMINARS, WORKSHOPS, ETC.

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