

Dr. Yeeka Yau

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Nationality: Australian

[Personal webpage](#)

School of Mathematics and Statistics

The University of Sydney, Australia

Employment History

Lecturer (Education Focused) <i>School of Mathematics and Statistics, The University of Sydney, Australia</i>	2025 -
Learning Success Advisor (Mathematics) <i>Learning Hub Mathematics, The University of Sydney, Australia</i>	2024
Assistant Professor (Tenure-track) <i>University of North Carolina Asheville, Asheville, North Carolina, USA</i>	July 2023 - Dec 2023
Visiting Assistant Professor <i>Furman University, Greenville, South Carolina, USA</i>	2022 - 2023
Postdoctoral Research Associate <i>The University of Sydney, Australia</i>	2021-2022
Associate Lecturer <i>Mathematics Learning Centre, The University of Sydney, Australia</i>	2019-2020
Summer Intensive Lecturer <i>The University of Sydney, Australia</i>	2018, 2020

Visiting Positions

Visiting Researcher <i>LaCIM Université du Québec à Montréal, Canada</i> Mentor: Professor Christophe Hohlweg	April/May 2022
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Education

Ph.D. in Pure Mathematics, The University of Sydney, Australia – Advisor: A/Prof. James Parkinson – Thesis: Automatic Structures for Coxeter Groups (link)	2017–2021
BS.c. (Adv Maths) Honours in Pure Mathematics, The University of Sydney, Australia – Grade: Honours Class I – Advisor: A/Prof. James Parkinson – Thesis: Automata for Coxeter Groups	2012–2016

Publications and Preprints

Ultra-low elements and join-irreducible gates in Coxeter groups (Y.Yau) pdf (Preprint)	2025
A pair of Garside shadows (P. Przytycki and Y. Yau) pdf <i>Algebraic Combinatorics</i> , vol 7, no. 6, p1879-1885, 2024	2024
An artificial neural network approach to finding the key length of the Vigenère cipher. (C. Millichap, Y. Yau) online version <i>Cryptologia</i> , 1-17, 2024	2023
Modifying twist algorithms for determining the key length of a Vigenère cipher. (C. Millichap, Y. Yau, A. Pate and M. Carns) online version <i>Cryptologia</i> , 1-16, 2023	2023
Cone types, automata and regular partitions in Coxeter groups (J. Parkinson and Y. Yau) online version <i>Advances in Mathematics</i> , vol 398, 2022	2022
Coxeter Systems for which the Brink-Howlett automaton is minimal (J. Parkinson and Y. Yau) online version <i>Journal of Algebra</i> , vol 527, p437-446	2019

Research Grants and Funding

Functional Identities, Nilpotent Rings and Garside Shadows NSF LEAPS-MPS Award: \$197,154 USD Jordan Bounds (Primary Investigator) Yeeka Yau (Primary collaborator and Senior Personnel)	2023-2025
Start up Funding <i>UNC Asheville</i> : \$13,000 USD	2023

Awards

– T.G. Room Medal for most outstanding Pure Mathematics PhD thesis <i>University of Sydney, Australia</i>	2021
– Australian Government Research Training Stipend (PhD) Full Scholarship	2017-2021
– The David G A Jackson Prize for originality and creativity in Pure Mathematics <i>University of Sydney, Australia</i>	2016
– Norbert Quirk Prize No. IV for best essay by an Honours student <i>University of Sydney, Australia</i>	2016
– The Rolf Adams Prize for best Pure Mathematics Honours presentation <i>University of Sydney, Australia</i>	2016

Teaching and Educational Innovation

As a Learning Success Advisor (mathematics) I have taught the following Supplementary Learning Tutorials, duties include creating problem sets and solutions, detailed explanation of theory and tutorial problems:

- MATH1062 - Mathematics 1B (Differential Equations and Statistics) 2024
- DATA1001/1901 - Foundations of Data Science 2024
- PSYC2012 - Statistics and Research Methods for Psychology 2024

Courses taught at UNC Asheville:

- STAT225 - Calculus-Based Statistics 2023
- MATH167 - Precalculus 2023

Courses taught at Furman University:

- MTH120 - Introduction to Statistics 2022, 2023
- MTH150 - Calculus I 2022
- MTH145 - Calculus for Management, Life and Social Sciences 2023

Courses taught at The University of Sydney:

- MATH1002 Linear Algebra (1st year) 2020 Summer School
- MATH1004 Discrete Mathematics (1st year) 2018 Summer School

As an Associate Lecturer in the Mathematics Learning Centre at the University of Sydney, I have also taught the following courses as small group workshops (10-15 students) covering theory and example problems:

- Statistics Bridging course (preparatory course for students embarking on statistics intensive degrees)
- MATH1013 Mathematical Modelling (1st year)
- MATH1004 Discrete Mathematics (1st year)
- MATH1014 Intro to Linear Algebra (1st year)
- MATH1111 Intro to Calculus (1st year)

I have been a tutor for the following courses at the University of Sydney (duties include leading tutorial and practice classes, explaining homework problems and solutions and marking assignments):

- MATH1014 Intro to Linear Algebra (1st year Fundamental) 2016
- MATH1003 Integral Calculus and Modelling (1st year) 2016 Summer School
- MATH1002 Linear Algebra (1st year) 2017
- MATH1001 Differential Calculus (1st year) 2017
- MATH2968 Discrete Maths and Graph Theory (2nd year Advanced) 2017
- MATH2022 Abstract and Linear Algebra (2nd year) 2018, 2019
- MATH2023 Analysis (2nd year) 2018
- MATH3069 Geometry and Topology (3rd year) 2018
- MATH3066 Algebra and Logic (3rd year) 2019
- MATH1023 Multivariable Calculus and Modelling (1st year) 2019
- MATH1013 Mathematical Modelling (1st year Fundamental) 2019

Students Supervised

Devin Bryant, Sam Housand, Regan Richardson and Sam Dayton (joint with Jordan Bounds) 2023-ongoing
Functional Identities, Nilpotent Rings and Garside Shadows
Furman University, SC, USA

Alyssa Pate and Morgan Carns Summer 2023
Finding the key length of Vigenère ciphers
Furman University, SC, USA

Selected Talks

A pair of Garside shadows. Dec 2024
Joint meeting of the AMS, NZMS and AustMS
Auckland, New Zealand

Modifying twist algorithms for determining the key length of a Vigenère cipher. Nov 2023
Cryptology Educators Seminar, online

The Mathematics of Hearing Nov 2022
Math & Munchies Series
Furman University, SC, USA

Cone Types, Automata and Regular Partitions in Coxeter groups
Spring Topology and Dynamics Conference Mar 2023
Rhodes College (online)

Algebra and Combinatorics Seminar Apr 2022
LaCIM Université du Québec à Montréal, Canada

Groups and Geometries ([MATRIX Conference](#)) Dec 2021
Sydney, Australia

Coxeter Systems for which the Brink-Howlett automaton is minimal
Symmetries in Newcastle (invited) May 2020
University of Newcastle, Australia

Algebra and Combinatorics Seminar Feb 2019
North Carolina State University, USA

62nd Annual Meeting of the Australian Mathematics Society Dec 2018
University of Adelaide, South Australia

Introduction to Automatic Groups Apr 2019
Student Algebra Seminar
University of Sydney

The classification of finite Coxeter groups Aug 2018
Student Algebra Seminar
University of Sydney

Automata for Coxeter Groups Oct 2017
Postgraduate Student Seminar Series
University of Sydney

Service

- Accredited PASS (Peer assisted study session) supervisor
- Referee for Rocky Mountain Journal of Mathematics
- Committee member for Diversity, Equity and Inclusion in the Department of Mathematics & Statistics, UNC Asheville.
- Co-founder and faculty advisor for the Data Science and Machine Learning club, Furman University.
- Committee member for Diversity, Equity and Inclusion in the Department of Mathematics, Furman University.

Technical Skills

Programming Languages: Python, SageMath, Magma, Bash/Shell, R, SQL, LaTeX, HTML, CSS

General Interests/Skills: Undergraduate mathematics and statistics education, cryptology, statistics and machine learning.