

Yeeka Yau

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Nationality: Australian

[Personal webpage](#)

Department of Mathematics & Statistics

University of North Carolina Asheville, NC, USA

Education

- Ph.D. in Pure Mathematics**, *University of Sydney, Australia* 2017–2021
- Advisor: [A/Prof. James Parkinson](#)
 - Thesis: Automatic Structures for Coxeter Groups ([link](#))
- BS.c. (Adv Maths) Honours in Pure Mathematics**, *University of Sydney, Australia* 2012–2016
- Grade: Honours Class I
 - Advisor: A/Prof. James Parkinson
 - Thesis: Automata for Coxeter Groups
- BS.c. Business Management**, *University of Mount Olive, North Carolina* 2006–2009
- Grade: 3.97/4 gpa, Summa Cum Laude
 - Honors Scholar, completed 4 year degree program in 3 years

Employment History

- Assistant Professor** July 2023 -
UNC Asheville, Asheville, North Carolina, USA
- Visiting Assistant Professor** August 2022 - July 2023
Furman University, Greenville, South Carolina, USA
- Postdoctoral Research Associate** 2021-2022
University of Sydney, Australia
- Associate Lecturer** 2019-2020
Mathematics Learning Centre, University of Sydney, Australia
- Summer Intensive Lecturer** 2018, 2020
University of Sydney, Australia

Visiting Positions

- Visiting Researcher** April/May 2022
LaCIM Université du Québec à Montréal, Canada
Mentor: [Professor Christophe Hohlweg](#)

Publications and Preprints

- A pair of Garside shadows** 2023
([P. Przytycki](#) and Y. Yau) [pdf](#)
(Submitted)
- Modifying twist algorithms for determining the key length of a Vigenère cipher.** 2023
([C. Millichap](#), Y. Yau, A. Pate and M. Carns) [pdf](#)
To appear in Cryptologia
- Cone types, automata and regular partitions in Coxeter groups** 2022
(J. Parkinson and Y. Yau) [online version](#)
Advances in Mathematics, vol 398, 2022
- Coxeter Systems for which the Brink-Howlett automaton is minimal** 2019
(J. Parkinson and Y. Yau) [online version](#)
Journal of Algebra, vol 527, p437-446 (June 2019)

Research Grants and Funding

- Functional Identities, Nilpotent Rings and Garside Shadows** 2023-2025
NSF LEAPS-MPS Award: \$197,154
Jordan Bounds (Primary Investigator)
Yeeka Yau (Primary collaborator and Senior Personnel)

Awards

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

Students Supervised

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

Teaching Experience

I am currently teaching the following courses at UNC Asheville:

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

I have taught the following courses at Furman University:

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

Courses taught as instructor at the University of Sydney (duties include giving lectures, setting all tutorials, assignments and exams, course administration and student consultations):

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| - 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/teaching assistant for the following courses at the University of Sydney (duties include leading tutorial and practice classes, explaining homework problems and solutions and marking assignments):

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| - 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 |

Selected Talks

Modifying twist algorithms for determining the key length of a Vigenère cipher. <i>Cryptology Educators Seminar</i>	Nov 2023
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The Mathematics of Hearing Math & Munchies Series <i>Furman University</i>	Nov 2022
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Cone Types, Automata and Regular Partitions in Coxeter groups Spring Topology and Dynamics Conference <i>Rhodes College (online)</i>	Mar 2023
Algebra and Combinatorics Seminar <i>LaCIM Université du Québec à Montréal, Canada</i>	Apr 2022
Groups and Geometries (MATRIX Conference) Australia	Dec 2021

Coxeter Systems for which the Brink-Howlett automaton is minimal Symmetries in Newcastle (invited) <i>University of Newcastle, Australia</i>	May 2020
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Algebra and Combinatorics Seminar <i>North Carolina State University, USA</i>	Feb 2019
62nd Annual Meeting of the Australian Mathematics Society <i>University of Adelaide, South Australia</i>	Dec 2018
Introduction to Automatic Groups Student Algebra Seminar <i>University of Sydney</i>	Apr 2019
The classification of finite Coxeter groups Student Algebra Seminar <i>University of Sydney</i>	Aug 2018
Automata for Coxeter Groups Postgraduate Student Seminar Series <i>University of Sydney</i>	Oct 2017

Service

- 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.

Other Professional Experience

Data Analyst (Customer Data Science Team) <i>Zip Co., Sydney, Australia</i>	Mar - May 2021
<ul style="list-style-type: none"> – Developed new quantitative metrics for the Customer data science team. – Built a proof of concept recommendation engine for the Zip mobile app. 	
Data Analyst (Part-time) <i>The Shepherd Centre for Deaf Children, Sydney, Australia</i>	2012–2017
<ul style="list-style-type: none"> – Support senior management with actionable statistical data insights across fundraising and clinical business, present insights and build decision tools using Python, R and SQL. 	

Technical Skills

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

Other Interests/Skills: Undergraduate mathematics education, history of mathematics, statistics and machine learning.