# Yeeka Yau

Email: yeeka.yau@sydney.edu.au | Phone: 0452213877 Nationality: Australian Personal webpage Learning Hub (mathematics) The University of Sydney, Australia

### **Employment History**

Learning Success Advisor (Mathematics) Learning Hub Mathematics, The University of Sydney, Australia	2024 - Current
Assistant Professor (Tenure-track) University of North Carolina Asheville, Asheville, North Carolina, USA	July 2023 - Dec 2023
<b>Visiting Assistant Professor</b> Furman University, Greenville, South Carolina, USA	2022 - 2023
Postdoctoral Research Associate The University of Sydney, Australia	2021-2022
Associate Lecturer Mathematics Learning Centre, The University of Sydney, Australia	2019-2020
Summer Intensive Lecturer The University of Sydney, Australia	2018, 2020
Visiting Positions	
<b>Visiting Researcher</b> LaCIM Université du Québec à Montréal, Canada Mentor: Professor Christophe Hohlweg	April/May 2022
Education	
<ul> <li>Ph.D. in Pure Mathematics, The University of Sydney, Australia</li> <li>Advisor: A/Prof. James Parkinson</li> <li>Thesis: Automatic Structures for Coxeter Groups (link)</li> </ul>	2017-2021
<ul> <li>BS.c. (Adv Maths) Honours in Pure Mathematics, The University of Sydney, Aus</li> <li>– Grade: Honours Class I</li> <li>– Advisor: A/Prof. James Parkinson</li> </ul>	tralia 2012–2016

– Thesis: Automata for Coxeter Groups

A pair of Garside shadows (P. Przytycki and Y. Yau) pdf (Submitted)	2023
An artificial neural network approach to finding the key length of the Vigenère cipher. (C. Millichap, Y. Yau) pdf To appear in Cryptologia	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>	2023
Cone types, automata and regular partitions in Coxeter groups (J. Parkinson and Y. Yau) online version Advances in Mathematics, vol 398, 2022	2022
Coxeter Systems for which the Brink-Howlett automaton is minimal (J. Parkinson and Y. Yau) online version Journal of Algebra, vol 527, p437-446	2019
Research Grants and Funding	
<b>Functional Identities, Nilpotent Rings and Garside Shadows</b> NSF LEAPS-MPS Award: \$197,154 USD Jordan Bounds (Primary Investigator) Yeeka Yau (Primary collaborator and Senior Personnel)	2023-2025
Start up Funding UNC Asheville: \$13,000 USD	2023
Awards	
- <b>T.G. Room Medal</b> for most outstanding Pure Mathematics PhD thesis University of Sydney, Australia	2021
– Australian Government Research Training Stipend (PhD) Full Scholarship	2017-2021
- The David G A Jackson Prize for originality and creativity in Pure Mathematics University of Sydney, Australia	2016
<ul> <li>Norbert Quirk Prize No. IV for best essay by an Honours student University of Sydney, Australia</li> </ul>	2016
- The Rolf Adams Prize for best Pure Mathematics Honours presentation University of Sydney, Australia	2016

#### **Teaching Experience**

As a Learning Success Advisor (mathematics) I am currently teaching the following Supplementary Learning Tutorials:

<ul> <li>DATA1001/1901 - Foundations of Data Science</li> <li>PSYC2012 - Statistics and Research Methods for Psychology</li> </ul>	Sem 1 - 2024 Sem 1 - 2024
Courses taught at UNC Asheville:	
<ul> <li>STAT225 - Calculus-Based Statistics</li> <li>MATH167 - Precalculus</li> </ul>	Fall 2023 Fall 2023
Courses taught at Furman University:	
<ul> <li>MTH120 - Introduction to Statistics</li> <li>MTH150 - Calculus I</li> <li>MTH145 - Calculus for Management, Life and Social Sciences</li> </ul>	2022, 2023 2022 2023
Courses taught at The University of Sydney:	
– MATH1002 Linear Algebra (1st year)	2020 Summer School

- 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):

– 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

Regan Richardson and Sam Dayton (joint with Jordan Bounds)	2023-ongoing
Functional Identities, Nilpotent Rings and Garside Shadows	
Furman University, SC, USA	
Alvssa Pate and Morgan Carns	Summer 2023
Finding the key length of Vigenère ciphers	

Furman University, SC, USA

## Selected Talks

Modifying twist algorithms for determining the key length of a Vigenère cipher. Cryptology Educators Seminar, online	Nov 2023
<b>The Mathematics of Hearing</b> Math & Munchies Series <i>Furman University</i>	Nov 2022
Cone Types, Automata and Regular Partitions in Coxeter groups	
Spring Topology and Dynamics Conference Rhodes College (online)	Mar 2023
Algebra and Combinatorics Seminar	Apr 2022
LaCIM Université du Québec à Montréal, Canada	
Groups and Geometries (MATRIX Conference) Australia	Dec 2021
Coxeter Systems for which the Brink-Howlett automaton is minimal	
Symmetries in Newcaste (invited)	May 2020
University of Newcastle, Australia	Ū
Algebra and Combinatorics Seminar	Feb 2019
North Carolina State University, USA	
62nd Annual Meeting of the Australian Mathematics Society University of Adelaide, South Australia	Dec 2018
Introduction to Automatic Croups	Apr 2010
Student Algebra Seminar	Mpi 2015
University of Sydney	
The classification of finite Coxeter groups Student Algebra Seminar	Aug 2018
University of Sydney	
Automata for Coxeter Groups	Oct 2017
Postgraduate Student Seminar Series	
University of Sydney	

- 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 **Other Interests/Skills**: Undergraduate mathematics education, cryptology, statistics and machine learning.