

Yeeka Yau

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Nationality: Australian

[Personal webpage](#)

Learning Hub (mathematics)

The University of Sydney, Australia

Employment History

Learning Success Advisor (Mathematics) <i>Learning Hub Mathematics, The University of Sydney, Australia</i>	2024 - Current
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 , <i>The University of Sydney, Australia</i> – Advisor: A/Prof. James Parkinson – Thesis: Automatic Structures for Coxeter Groups (link)	2017–2021
BS.c. (Adv Maths) Honours in Pure Mathematics , <i>The University of Sydney, Australia</i> – Grade: Honours Class I – Advisor: A/Prof. James Parkinson – Thesis: Automata for Coxeter Groups	2012–2016

Publications and Preprints

- A pair of Garside shadows** 2024
([P. Przytycki](#) and Y. Yau) [pdf](#)
(accepted) To appear in *Algebraic Combinatorics*
- An artificial neural network approach to finding the key length of the Vigenère cipher.** 2023
(C. Millichap, Y. Yau) [online version](#)
Cryptologia, 1-17, 2024
- Modifying twist algorithms for determining the key length of a Vigenère cipher.** 2023
([C. Millichap](#), Y. Yau, A. Pate and M. Carns) [online version](#)
Cryptologia, 1-16, 2023
- 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

Research Grants and Funding

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

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

Teaching Experience

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

- DATA1001/1901 - Foundations of Data Science Sem 1 - 2024
- PSYC2012 - Statistics and Research Methods for Psychology Sem 1 - 2024

Courses taught at UNC Asheville:

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

Alyssa 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. <i>Cryptology Educators Seminar, online</i>	Nov 2023
The Mathematics of Hearing Math & Munchies Series <i>Furman University</i>	Nov 2022
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
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

- 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.