James McAllister – CV

PhD Researcher – Intelligent Systems Research Centre, Ulster University
Computational Neuroscience, Neural Dynamics, Machine Learning
Associate Member of the Institute of Mathematics & Applications

Email
LinkedIn
Webpage
GitHub

Education

PhD Theoretical & Computational Neuroscience 2023–2026
Intelligent Systems Research Centre, Ulster University
Visiting PhD Researcher at University of Bristol, Neural Dynamics Group (2024)

Associate Fellowship of Higher Education Authority (AFHEA) 2024–2025
Doctoral College, Ulster University

Masters of Research (MRes) 2022–2023
Queen's University Belfast, Distinction

PGCE (Mathematics) 2018–2019
Queen's University Belfast, GTCNI Star Award and E. Fulton Prize for Mathematics

MA (Dubl) Mathematics 2014–2018
Trinity College Dublin, First Class Honours with Gold Medal

Experience

Lecturing in Mathematics Modules 2024 – present
Linear Algebra, Differential Equations, Statistics

Co-Supervision of Final Year Undergraduate Projects 2024 – present
Computer science, machine learning, neuroscience, applied maths

Visiting Researcher: University of Bristol 2024
Neural Dynamics Group, School of Engineering Mathematics

Postgraduate Teaching Assistant 2023 – present
Undergraduate and postgraduate tutorials in mathematics, algorithms, and data science

Teacher of Mathematics: Wellington College Belfast 2019–2022
Mathematics, Further Mathematics, and Physics

Research

Linking structure & function in Recurrent Neural Networks 2024 – present
Ongoing PhD research in collaboration with University of Cambridge & Bristol

Mathematical modelling of synaptic maturation & circuit formation 2024 – present
Ongoing research collaboration with University of Bristol

Topological and simplicial features in reservoir computing networks 2024
Paper: McAllister, et al., UKCI, *https://doi.org/10.1007/978-3-031-78857-4_5*

The capacity and accuracy of a triple-well Hopfield model 2023
Research Project & Presentation: Intelligent Systems Research Centre

A discrete attractor model of decision making 2023
Research Project & Presentation: Using dynamical systems to model decision-making processes

A review & statistical analysis of the effect of formative assessment in mathematics 2023
Research Project & Dissertation, Distinction, Queen's University Belfast

A multilevel analysis of high-stakes examination results in mathematics 2021
Paper: Cantley, I., & McAllister, J. *https://doi.org/10.1007/s11199-021-01234-5*
Cambridge University: Talk at British Society for Research into Learning Mathematics (BSRLM) *2020*

Trigonometric series and the emergence of transfinite set theory 2018
Final Year Research Dissertation & Poster. First class (distinction). Trinity College Dublin

Talks, Posters, and Seminars

Invited talk: *Recent Trends in Rough Analysis & Dynamical Systems: Theory and Practice*	*July 2025*
Poster: *UK Neural Computation, Imperial College, London*	*July 2025*
Seminar: *Ignite Sessions, Intelligent Systems Research Centre*	*June 2025*
Invited talk: *Cambridge University, CBL Lab*, *https://talks.cam.ac.uk/talk/index/232441*	*June 2025*
Poster: *Festival of Research, Ulster University*	*June 2025*
Poster: *CoSyNe, Montreal & Mont-Tremblant*, *https://doi.org/10.5281/zenodo.15350011*	*March 2025*
Talk: *Intelligent Systems Research Centre*, COIN Club	*Feb 2025*
Talk: *Workshop UK Computational Intelligence*, UKCI 2024	*Sep 2024*
Talk: *Computational Neuroscience, Neurotechnology & NeuroAI Summer School*	*Aug 2024*
Poster: *UK Neural Computation, Sheffield*, *https://doi.org/10.5281/zenodo.13303677*	*July 2024*
Poster: *Int. Conf. Mathematical Neuroscience, Dublin*, *https://doi.org/10.5281/zenodo.13303384*	*June 2024*
Seminar: *Intelligent Systems Research Centre*	*May 2024*
Talk: *Intelligent Systems Research Centre*, COIN Club	*May 2024*

Skills and Interests

Languages: English, German, French, British Sign Language

Programming Languages: Julia (main), Python, MATLAB, R, SPSS

Other Developer Tools: High Performance Computing, LaTeX, Microsoft, Google Suite

Areas of Interest: Theoretical neuroscience, Network theory & dynamics, Mathematical modelling, Applications of topology, Functional analysis, Mathematics of Machine Learning, Assessment theory

Achievements and Awards

Best Poster Prize, PhD Festival of Research, Ulster University	*June 2025*
Travel Grant, Computational and Systems Neuroscience (CoSyNe)	*March 2025*
Best Student Paper Award, UK Computational Intelligence, Belfast	*Sep 2024*
Visiting Scholarship, University of Bristol	*Feb 2024*
E. Fulton Prize for Mathematics, QUB	*Sep 2019*
GTCNI Star Award, PGCE, QUB	*July 2019*
Gold Medal, Trinity College Dublin	*Nov 2018*
Trinity College Dublin First Class Prize	*2015, 2016, 2017*
Naughton Foundation Scholarship	*2014–2018*
Exhibition Award, Trinity College Dublin	*Sep 2014*
Trinity College Dublin Sizarship	*2014–2018*

Courses and Training

Hausdorff Mathematics Centre, Statistical mechanics of spin glasses, neural networks & learning	*2025*
Associate Fellow of the Higher Education Authority (AFHEA), First Steps to Teaching	*2024-25*
Computational Neuroscience Autumn School, Intelligent Systems Research Centre, UU	*2023, 2024*
Computational Neuroscience Neuromatch Academy Summer School	*2023*
INCF (International Neuroinformatics Coordinating Facility): Python-based modelling course	*2023*
British Sign Language Level 1	*2019*

Referees

References available on request.