Conor John Williams

Email: cw648@cam.ac.uk

Phone: +44 7479 476483

Address: Churchill College, Storey's Way, Cambridge, CB3 0DS

Education

2020–today: **PhD Computational Methods, University of Cambridge.**

Supervised by Professor James Elliott – due for submission in summer 2024.

Industrial collaboration with **sponsor, Rolls-Royce** - understanding the atomistic mechanisms of hydrogen-embrittlement.

My specialisations are: molecular modelling, numerical methods, massively parallel processing and invariant representation theory.

Reviewed after first-year probationary period as "**a very impressive candidate** [who] is well placed to make an impact in the field".

2019–2020: **MPhil, Distinction (83% average)**, Scientific Computing, University of Cambridge.

Courses in distributed computing, parallel programming, GPU programming and stochastic/dynamic modelling.

Distinction-awarded dissertation titled: Off-lattice kinetic Monte Carlo modelling and numerical methods.

2016–2019: **BA (Hons), 1st class in all years**, Natural Sciences Tripos (Physics), University of Cambridge.

2014–2016: **A-levels, straight A* grades**, in Mathematics, Physics, Chemistry and Biology, Colchester Royal Grammar School.

2009–2014: **GCSEs, eight A* grades**, Tendring Technology College.

Publications

C.J. Williams, E.I. Galindo-Nava, Accelerating off-lattice kinetic Monte Carlo simulations to predict hydrogen vacancy-cluster interactions in α-Fe, Acta Mater. (2022), doi: 10.1016/j.actamat.2022.118452

Conferences

Selected to **present at TMS2023** *Symposium of Computational Thermodynamics and Kinetics.* TMS is one of the largest and most prestigious materials-science conferences worldwide.

Employment

2022–today **Masters dissertation supervisor**. In this role I am guiding a student on their first novel-research: *modelling vacancy-cluster stability*. This involves bi-weekly meetings, reviewing their work and steering them towards a publication-quality dissertation.

2020–today I am entering my third year as an **undergraduate mathematics supervisor** at the University of Cambridge. This requires me to set, mark and teach eight students every week. This year one of my students ranked 2nd across all the Cambridge colleges. Feedback has included: "[Conor] pushed me to see the deep-connections between the topics we studied and always had the most (frustratingly!) elegant solutions".

2020-2021 While holding a senior role on the Churchill College MCR as the Bar Secretary I: transformed the bar's stock list; negotiated extended opening hours and recruited and trained one of the largest cohorts of staff in recent years. I was required to plan-ahead, work diplomatically and assertively with the MCR team and communicating with Senior College leadership.

Software projects - available on GitHub

2022–today I am currently undertaking the open-sourcing and documentation of my PhD codebase, the first open off-lattice kinetic Monte Carlo framework.

2021 Developed and maintained C++ implementations of concurrent data-structures and a lock-free continuation-stealing scheduler as part of my journey to understand parallel/asynchronous programming and memory models.

2021 As the MCR Computing Officer I designed and maintained a digital room-ballot system for the College, attempting to solve the *assignment problem*.

2018 Developed an optimisation algorithm in Python for eWATERservices to position water taps in African villages, which formed part of their successful World Bank investment bid.

Technical skills

- **Coding:** C++ (advanced); Python & Git (intermediate); MATLAB® & CUDA (basic).
- **Operating systems:** Linux, Windows.
- **Software/Libraries:** LaTeX, Eigen, Sphinx, Doxygen, Microsoft Office.
- **Presentations:** I regularly give engaging and informative talks to my non-expert industrial sponsors. Alongside, clear and precise technical-presentations to my research group and department.

Interests

- I am an avid ultralight-backpacker - completing multiple forty-day plus expeditions, carrying the minimum amount of equipment. These require extended planning and high self-motivation.
- I have rowed competitively for my college for four years, training as much as five times a week. This demonstrates my commitment and time management.
- I am an accomplished dinghy sailor; qualified Day Skipper; active member of the CUYC yacht club; amateur runner and surfer. These hobbies have taught me to work as a team in high-pressured environments.