

# WILLIAM CAIGER

## PERSONAL PROFILE

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- Interdisciplinary interests across physical sciences and philosophy
- Interface between theory and experiment and route to tech applications
- Agile and collaborative problem-solver
- Diverse experience in industry and academic groups

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## EDUCATION

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### MSci Physics and Philosophy

2021 - 2025

UNIVERSITY OF BRISTOL

**First Class honours (77%)**, finding special interest in **quantum information theory, condensed matter topology** and **high performance computing** for simulation.

Notable examined modules: Quantum Information Theory, Advanced Quantum Physics and Magnetism & Superconductivity. Took further courses outside my degree requirements: Biophysics, Nanophysics, Advanced Computational Physics, Semiconductor Devices, Quantum Computation.

Physics master's thesis on **simulating the properties of Majorana states in 1D quasicrystals**. I confirmed a range of quasicrystals hosted Majorana states and exhibited previously unaddressed fractal topological phase transitions.

Philosophy gave space for a deeper understanding of my science and the connection between theory and experiment. I developed critical analysis of complex arguments, creativity and abstract conceptualisation. I wrote my thesis on **the metaphysical status of quantum mechanical Weak Values**.

### International Baccalaureate

2019 - 2021

SEVENOAKS SCHOOL

**Overall score of 45/45**; studied Maths Analysis & Approaches, Physics and Chemistry at higher level.

## CONFERENCES, TALKS & PRESENTATIONS

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- **Imperial Theory of Topological Matter Group** – Imperial College November 2025  
Invited to give talk on *Hofstadter's Butterfly and the Fractal Topology of Majoranas in Quasicrystals*.
- **SDIQT25** – Superconductors, Disorder, Interactions & Quantum Technologies Conference June 2025  
Presented work in poster session. *Abundance of Majorana Bound States in Quasicrystals*.
- **Lancaster CMT Group** – University of Lancaster May 2025  
Invited to give talk to the condensed matter theory group. *Majorana Bound States in Quasicrystals*.
- **Master's Thesis Poster Session** – University of Bristol February 2025  
Presented my master's dissertation work in poster session.
- **Grimm Network** – University of Glasgow December 2024  
Attended conference of the Grimm Network in Aperiodic Order.
- **Master's Thesis Outlay** – University of Bristol November 2024  
Delivered talk on the literature review and initial findings of master's dissertation.

## SKILLS SUMMARY

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### Soft Skills

- Self-motivation
- Strong independent workflow
- Adaptability when working under pressure
- Efficient oral communication
- Collaborative

### Technical Skills

- Numerical modelling (Python, Julia, MPI & OpenMP, C++, Qiskit) •
- High Performance Computing (Linux OS) •
- Data collection & equipment control (Python, ARTIQ) •
- Design & 3D CAD (SolidWorks, HTML, JSX) •
- Scientific writing (L<sup>A</sup>T<sub>E</sub>X) •

## ACADEMIC WORK EXPERIENCE

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### Research Associate (Hon.)

Summer 2025 - present

HIGH-LEVEL RESEARCH AND PUBLISHING

**Supervisor: Felix Flicker.** Working on two publications spun out from my master's dissertation on Majorana bound states (MBS) in 1D quasicrystals. They will be linked on [my website](#) once in pre-print. Engaging with theoretical research group dynamics in the Felix Flicker Condensed Matter Theory group.

### National Quantum Computing Centre (NQCC) Internship

Summer 2024

INDEPENDENT RESEARCH AND PROJECT MANAGEMENT

**Supervisor: Alex Owens.** Worked in the Trapped Ion Quantum Computing (TIQC) team as an experimental researcher. Created an automated fibre coupling alignment system from scratch to be implemented on all lab laser systems – outperforming the best manual alignment and simultaneously aligning all lab systems in < 20 mins. Constructed a Bayesian ML algorithm to run natively on ARTIQ real-time control environment; it synthesised theoretical knowledge of the alignment problem and practical limitations of the piezoelectric actuators to arrive at alignment quickly, and maintain it through a non-trivial loss landscape. Engaged in development series on scientific writing and project management as well as maximising learning from experts in TIQC and algorithms.

### KETS Quantum Security Internship

Summer 2023

COLLABORATION, PRESENTATION AND PROJECT PLANNING

**Supervisor: Robert Starkwood.** Worked as an R&D engineer creating an automated calibration system for integrated photonics chips within KETS' Quantum Key Distribution (QKD) system. Rapidly familiarised myself with the QKD system during on-boarding; this required centralising disjointed company information, planning and justifying my proposed project plan to the team. Designed and fabricated test apparatus and software before presenting my work to the entire company; concisely communicating technical work to an audience with a wide range of expertise.

## SELECTED VOLUNTEERING AND PROJECTS

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### Western Keelboat Association (WKA) Chairman

2024 - present

PROJECT PLANNING, PRACTICAL LOGISTICS AND CORPORATE FUNDRAISING

Led the formation of the WKA, a brand new CIO which manages a fleet of keelboats – the first of its kind in the South-West UK – with an innovative business model which hosts collaboration across 6 regional universities and more. Managed full stack of company organisation from legal frameworks to funding calls to media campaigns.

### Extended Essay

2020 - 2021

CRITICAL THINKING AND ACADEMIC RESEARCH & COMMUNICATION

*An investigation into the complex behaviour of nonlinear dynamic systems and their application to natural systems through the Malkus Waterwheel experiment.* Exploring chaos demanded in-depth understanding of PDE systems, showing my ability to effectively tackle tasks outside my current level of knowledge; honing my ability to clearly and concisely communicate technical material.

### Catalyst Science Magazine

2020 - 2021

CROSS-DISCIPLINE COLLABORATION AND SCIENTIFIC COMMUNICATION

Co-founded Sevenoaks School's first science magazine which won the Shine School Media Awards 'Rising Star' 2020. Our team of four people assembled writers, editors and visual designers, coordinating a regular publication. I led a philosophy of science section; writing on the interface between quantum and macroscopic models and determinism.