

WILLIAM CAIGER

PERSONAL PROFILE

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While maintaining diverse interests across the physical sciences and philosophy, I am driven to understand deeply. I have a strong interest in the interface between theory and experiment; particularly how technological applications emerge from this. Extending my studies across subjects has made me an agile and intrinsically collaborative problem-solver. Diverse experience in industry and research groups, as well as years of competing in, and organising sailing has shaped my resilient yet cooperative character.

EDUCATION

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. Full transcript on my website. Took further courses outside my degree requirements: Biophysics, Nanophysics, Advanced Computational Physics, Semiconductor Devices, Quantum Computation.

Wrote my 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**.

Intentional Baccalaureate

2019 - 2021

SEVENOAKS SCHOOL

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

CONFERENCES, TALKS & PRESENTATIONS

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

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 (LinuxOS) •
- Data collection & equipment control (Python, ARTIQ) •
- Design & 3D CAD (SolidWorks, html, JSX) •
- Scientific writing (L^AT_EX) •

ACADEMIC WORK EXPERIENCE

Hon. Research Associate

Summer 2025 - present

HIGH-LEVEL RESEARCH AND PUBLISHING

Developing the results obtained during my master's dissertation on Majorana bound states (MBS) in 1D quasicrystals in order to publish our findings on abundance of MBS and fractal topological phase transition. Exposure to research group dynamics and procedures in the Felix Flicker Condensed Matter Theory group.

National Quantum Computing Centre (NQCC) Internship

Summer 2024

INDEPENDENT RESEARCH AND PROJECT MANAGEMENT

Worked in the Trapped Ion Quantum Computing (TIQC) team as an experimental researcher. Created an automated fibre coupling alignment system to be implemented on all lab laser systems. Planned and assembled novel test apparatus; designed systematic benchmarking processes; created suitable ML optimisation algorithms; and implemented this on the ARTIQ experimental control environment. My solution outperformed the best manual alignment and allowed for simultaneous alignment of all lab systems in < 20 mins. Piezoelectric actuators required an integrated hysteresis correction protocol; once implemented, I laid out plans for numerous future developments, e.g. continuous alignment maintenance and high frequency vibrational damping. I gained a functional understanding of TIQC and engaged in wider project planning training programs run by the NQCC.

KETS Quantum Security Internship

Summer 2023

COLLABORATION, PRESENTATION AND PROJECT PLANNING

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. My project allowed me to work across departments; participating in meetings at all levels of management. Maintaining perspective on task difficulty to carefully balance independent work with collaboration was critical.

VOLUNTEERING, PROJECTS AND OTHER WORK

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.

University of Bristol Sailing Club (UBSC) Treasurer

2023 - 2025

GROUP MANAGEMENT, LEADERSHIP AND PROBLEM SOLVING

Elected twice to manage the finances of the UBSC which has an annual turnover of over £100k and 4 distinct sub-groups catering for up to 150 members. Collaborate with internal partners and external organisations for day-to-day running and organising large charity and for-profit events. Work together with the committee to maintain short-term financial stability whilst managing the upkeep of high-value assets, forecasting up to 10 years in the future. Our continued aim to bring good value sport to our members requires me to plan and implement continually innovative solutions.

British University Sailing Association (BUSA) Match Racing Chair & UBSC Captain

2022 - 2023

COMMITTEE ORGANISATION AND FUND LOBBYING

As BUSA Match Racing Chair I organised national training and racing events, bringing together university teams, coaches/event officials and the necessary physical resources, as well as lobbying for event funding. Simultaneously, as UBSC Captain I delivered weekly training and organised competition entries for 5 teams whilst also competing myself.

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 4 assembled writers, editors and visual designers, coordinating a regular publication. I lead a philosophy of science section; writing on the interface between quantum and macroscopic models and determinism.

National-Level Sailing Coaching

2018 - 2020

PRESENTATION, INTERPERSONAL SKILLS AND LEADERSHIP

Coached part of the UK National Squad for two years. Developed interpersonal skills dealing with young people and individuals with potentially disruptive learning disorders. Gained significant experience in oral and visual presentation both solo and with supporting coaches, and communication of knowledge to others in challenging environments.

AutoNaut Design & Marketing Project

2018 - 2019

3D CAD MODELLING AND MARKETING

Worked with AutoNaut to redevelop their branding, producing a report and display presentation. Gained experience using SolidWorks 3D CAD software and fabrication techniques to create a model of the unmanned vehicle.

Competitive Sailing

2014 - Present

HIGH PRESSURE ENVIRONMENT AND WORKING RELATIONSHIPS

My experience competing at an international level translates to an ability to work well under significant pressure. Building close working relationships with my sailing partners has prepared me for building and maintaining productive professional relationships with co-workers.