Maxwell Catmur

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# Profile

Physics MPhys (expected First) seeking Graduate Civil and Structural Engineer role at Tony Gee (Stonehouse). Strong numerical modelling and engineering-calculation experience using MATLAB, Python and Simulink, with proven teamwork, technical documentation and a proactive approach to professional development and progression towards MICE chartership.

# Education

**MPhys Physics – University of Warwick October 2022 – July 2026**

**Grade:** First (expected)

* Relevant modules: fluid mechanics, advanced mathematical methods, scientific and high-performance computing; strong foundation in numerical methods and engineering calculations (finite differences, Monte Carlo).
* Numerically solved partial differential equations in C via finite-difference methods to model heat flow through industrial pipes (95%).
* Investigated metastability of nucleation in the 2D Ising model using dozens of Monte Carlo simulations in MATLAB; co‑authored a paper with two students.
* Co-developed a PID stabilisation algorithm in LabVIEW for a nodding-donkey system, improving stability and adding angle-control functionality (86%).
* Led two group research projects (6 members each) on photovoltaic materials and photocathodes; scheduled and chaired meetings and ensured equitable task delegation (70%+).

**A-levels – Forest School September 2020 – July 2022**

**Grade:** A\*A\*A\*A\*A\* (Maths, Further Maths, Physics, Chemistry, Extended Project)

* Sixth form valedictorian award for best academic performance.
* Produced a 5000-word extended project on renewable energy, nuclear power and geoengineering to mitigate climate change (100%).
* Presented project findings to a cohort of 160+ students and staff, demonstrating clear verbal communication and public speaking.

# Work Experience

**Undergraduate Researcher**

Warwick Mathematics Institute **June 2025 – October 2025**

* Modelled finite-difference methods for wave propagation across 100+ aeroacoustics simulations, applying numerical analysis to engineering problems.
* Analysed performance of 10 maximal-order and dispersion-relation-preserving schemes in MATLAB, optimising for accuracy and computational cost.
* Produced a technical poster outlining methods and results; presented findings at a departmental poster event.

**Project Manager**

Warwick Aerospace Society **January 2024 – March 2025**

* Managed a 12-member student team developing a UHF satellite ground station proof-of-concept; oversaw procurement, design and assembly within a 10-week schedule.
* Established four specialised sub-teams, chaired 30+ weekly meetings and produced weekly status reports to senior leadership, demonstrating strong prioritisation and organisation.
* Authored 30+ pages of technical documentation including Pugh matrices for antenna selection and a bill of materials to support design decisions.
* Initiated MATLAB/Simulink modelling of a half-duplex UHF ground station with rotator control, applying systems-level analysis and simulation.
* Implemented GitHub-based version control for model development and coordinated contributions across the team.

**Academic Coordinator**

Warwick Physics Society **March 2024 – March 2025**

* Delivered seven revision lectures for end-of-year exams, communicating complex concepts clearly to diverse student groups.
* Organised a 10-year anniversary talk featuring Prof Dame Athene Donald, attended by 100+ students and academics.
* Ran weekly academic support sessions, providing one-to-one guidance and improving peers' understanding of technical material.

**RF Seekers Summer Intern**

MBDA UK **June 2024 – August 2024**

* Interned 10 weeks in the Modelling and Algorithms team working on synthetic aperture radar (SAR) imagery chains within AESA radar systems.
* Optimised a matched-filter algorithm in MATLAB by implementing FFT methods, reducing runtime by 85% and improving system performance.
* Co-developed a data-analysis application enabling six colleagues to rapidly analyse range–Doppler images during campaigns, streamlining post-processing.
* Integrated a mid-fidelity range–Doppler imagery algorithm for quick sanity checks against higher-fidelity results; researched relevant AESA/SAR literature.
* Contributed 50+ commits using version control and presented a placement review to 20+ colleagues summarising technical outcomes and contributions.

# Projects

**Drinks Ordering Web App August 2018 – September 2018**

* Developed a web app to enable customers to order drinks at a party of 100+ guests, removing queues and improving service delivery.
* Processed 80+ orders over 6 hours using asynchronous updates (Ajax) to inform customers when orders were ready.
* Designed and implemented front-end and back-end interactions, ensuring reliable order handling under peak load.
* Received exceptional feedback from event staff and two software engineers, demonstrating practical delivery and user-focused design.

# Skills

**Languages**: Python, MATLAB, Simulink, C, SQL.

**Libraries:** NumPy, SciPy, Matplotlib.

**Tools:** Microsoft Office (Excel, Word, PowerPoint), Git / GitHub, LabVIEW, Origin Pro.

**Soft Skills:** Teamwork and collaboration, Verbal and written communication, Organisational skills and prioritisation, Proactive learning and adaptability, Client-focused professionalism.

**Interests:** Amateur radio, Tennis, Debating.