James Faulkner

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SUMMARY

Private tutor with 4 years' experience. A 4th-year Cambridge PhD researcher, using analytical and computational methods to investigate energy storage mechanisms in Li-ion batteries, with professional experience using ML models for scientific discovery.

ACADEMIC EXPERIENCE

PhD, University of Cambridge   Oct 2021 - October 2025

Developed computational (DFT/DFPT) models to predict the affect of ions on lattice mode spectra of intercalated graphite and validated these models against experimental data.

Technical skills:
- Python programming for data analysis (spectral fitting) and visualisation (plotting volumetric spatial data);
- experience with computational methods (DFT and DFPT);
- knowledge of a range of topics across physics, including EM, quantum and nuclear physics;
- teaching skills through supervising undergraduate students.

Transferable skills:
- organisational and inter-personal skills (from balancing personal workloads with College meetings as part of my role as MCR President);
- professional consulting skills, having completed a 10-week project with the Cambridge Consulting Network offering services to a battery technology start-up;
- problem-solving and critical thinking skills, developed from scrutinising data and outputs from computational models to verify accuracy;
- the ability to consolidate and explain results, using technical language, typeset using LaTeX;
- the ability to communicate and explain concepts clearly.

MPhys, University of York   Sep 2017 - Jul 2021

- Graduated with the O. S. Heavens prize for the highest-achieving MPhys degree (87% total)
- Completed a Master's project investigating spintronic devices created from graphene grown on SiC, both experimentally (using a metastable He beam) and theoretically (by modelling the intercalation process in DFT)
- Gained experience in public speaking & teamwork through both presentations and group projects
- Joined the RAF Reserves as part of the University Air Squadron, attending weekly training sessions to develop teamwork skills and resilience when faced with unseen & challenging tasks. Pursuing a strict flying training syllabus at the same time as a degree was intellectually challenging, whilst a military lifestyle has given me a mindset for excellence

WORK EXPERIENCE

Private Tutor   Jan 2022 - Present

Worked with students at a range of levels from pre-GCSE to university undergraduate. Helped students to improve conceptual understanding and exam technique by targeting specific topics using a student-led approach.

Research Scientist, Radiela — Apr - Dec 2024

Developed and validated ML models for solving the equations of quantum physics, with applications in molecular interactions. Wrote Python code for visualisation of highly-dimensional electron density data and maintained documentation for the code in Markdown. Prepared technical reports (in LaTeX) on the validity of the ML models and successfully saw the company through to pre-seed funding during my PhD.

Consultant, Cambridge Consulting Network — Feb - Apr 2022

Worked as a market entry consultant for a battery start-up as part of one of CCN's renowned Flagship Projects. This work involved market research and analysis, resulting in a list of best market-entry proposals being delivered to the client. The opportunity provided a unique insight into the battery technology industry and honed my ability to communicate with inter-disciplinary and wider audiences.

Patent Attorney Intern, Carpmaels & Ransford — Jun - Jul 2020

A position on the prestigious summer internship at Carpmaels & Ransford has provided me with invaluable insight into the profession of intellectual property — invaluable experience for translating science into the real world. Group and individual exercises, including a mock arbitration and work on real-life cases, refined my communication and interpretation skills.

Research Project, University of York Photonics Group — Jul - Aug 2019

Researched the viability of guided-mode resonance gratings for detecting water-borne bacteria during a six-week project. Working on this potentially marketable device gave a crucial insight into the technology development process. Delivering presentations to colleagues further improved my public speaking, whilst discussion sessions demanded deep physical understanding and justification of ideas under pressure. Organisation skills were also developed.

EDUCATION

2021 - Present	PhD at the **University of Cambridge**	
2017 - 2021	MPhys in Physics at the **University of York**	(First Class with Distinction: 87%)
2015 - 2017	A-levels at Kenilworth Sixth Form	Physics A*, Chemistry A, Maths A, French B
2013 - 2015	GCSEs at Kenilworth School	13 GCSEs, 9 A-A* including English and Maths

SKILLS

Technical Skills

– Excellent understanding of physics across a wide range of topics
– Critical mindset from extensive experimental and computational work
– Programming skills for scientific research and the ability to perform complex computational calculations

Transferable Skills

– Excellent inter-personal and communication skills
– The ability to teach students effectively over a range of levels and abilities
– Confidence and resilience, from delivering presentations at international meetings and conferences
– Language skills, including working proficiency in French and GCSE-level Spanish and Latin
– Effective time management through handling PhD deadlines with College committee responsibilities
– An enthusiasm for effective scientific communication, demonstrated by 7 years' experience in teaching and private tutoring roles