

Matthew Doyle

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Education

2020–2025 **PhD, Physics**, *The University of Manchester*, Quantum Fluids Group
Thesis Title: "Numerical Simulation and Experimental Visualisation of Quantum Turbulence in the Zero-Temperature Limit"

Developed large-scale numerical codes (Python, Fortran) to model fluid flow and vorticity dynamics, employing boundary-type methods and custom mesh-generation routines. Designed and executed laser-induced fluorescence imaging experiments using cryogenic platforms; processed and analyzed high-resolution field data (Python, MATLAB). Designed a superfluid pipe flow experiment to utilize electromagnetic fields to activate the flow by electromagnetically compressing bellows in situ. Leveraged FEM in pressure sensing diaphragm design. Built and automated data-processing pipelines for live signal monitoring, calibration, and uncertainty quantification of custom-built sensors (lab-view, Python). Authored a peer-reviewed paper; won Best Poster at Quantum Fluids and Solids Conference 2023.

2016–2020 **MSci, Physics**, *The University of Bristol*, First-class (Hons)
Thesis Title: "Particle Track Reconstruction in a Proposed CERN Linear Collider"

Evaluated efficiencies of track reconstruction algorithms (C++, Python) for tracing particle motion immediately after high-energy electron-positron collisions within a simulated CERN detector geometry to inform on detector design optimization. Achieved top marks in advanced modules: Cosmology (93/100), Particle Physics (95/100), Physics of Phase Transitions (94/100). Awarded Final Year Project Commendation.

2009–2016 **A-Levels**, *South Nottinghamshire Academy Sixth Form*
Maths (A*), Further Maths (A) and Physics (A).

Experience

Vocational

2025–Now **Expert AI Trainer**, *Pareto AI (Independent Contractor)*
Prompting LLMs to complete spreadsheet and general computing tasks within a MacOS environment, correcting and providing feedback for the model when it attempts incorrect actions.

2024–Now **Private Maths, Physics, and Coding Tutor**, *Luminary (Independent Contractor)*
Designs personalised lesson plans tailored to each student's strengths and weaknesses, ensuring targeted support in challenging areas with a strong focus on exam technique and problem-solving strategies. Use of educational software such as Google classroom and Kami.

2021–2024 **Graduate Teaching Assistant**, *The University of Manchester*

- ⇒ *Foundations of Physics*: Delivered tutorials to foundation level physics students in class-sizes of around 20.
- ⇒ *Foundations of ICT*: Assessment of student EXCEL assignments.
- ⇒ *Programming in Python*: Demonstrated Python workshops to assist 2nd year students in learning to code and develop their projects. Assessment and feedback on coding assignments.
- ⇒ *Laboratory Physics*: Demonstrated physics experiments to 2nd year students and assisted them with their own experiments. Assessment of students via interview and observation with detailed feedback. Additional responsibility: Graduate Teaching Assistant Mentor for the Physics Labs, assisted in organisation, training and development of colleagues.

2023 **Visiting Researcher**, *Aalto University, Helsinki*

Performed statistical analysis of extensive prior data sets, using MATLAB, to gain insights for guiding experimental activity over a month-long visiting researcher placement. This work was funded by the European MicroKelvin Platform and should result in several future publications.

2019 **Research Intern**, *University of Bristol*

Summer internship in the theoretical physics group. FORTRAN-based programming project which enhanced the resolution of electronic structure (density of state) calculations and produced visualizations of 3D Fermi-surfaces.

Skills and achievements

Problem Solving	Comfortable adapting approaches and methodology as challenges are encountered, which has been a pivotal part of my PhD. Self-teaching guitar has further developed my creative thinking skills in completion of projects.
Communication	Confident in speaking and presenting to audiences, both with and without technical backgrounds. Attendance and participation at both national and international conferences has involved the presentation of my research via poster presentations, providing invaluable experience in tailoring presentation content to the technical level and interests of an audience. Additionally, organization of an international conference on Quantum Fluids and Solids involved liaising with several international speakers and University staff, greeting delegates and preparation of conference information booklets.
Teamwork	Successful collaborations, internal and external to my research group has resulted in several publications, including a first author paper in a highly acclaimed journal. Work has additionally been well-received during conference presentations and a series of publications are in review at current time. A member of the physics 5-a-side football team throughout my postgraduate studies. House captain responsibilities during 6 th form.
Programming	Python (pandas, numpy, matplotlib, seaborn, open-cv, scikit-learn, scipy, ...) FORTRAN, MATLAB, SQL, HTML, CSS, JavaScript, reactJS, nodeJS, TypeScript, Tailwind, XML, bashscript, various API's and libraries.
Software	Git, Microsoft Packages, VS Code, LaTeX, Notion, OriginLab, VNC services, Blender, DaVinci Resolve, AWS hosting, Zapier

References

References available upon request.