

## EDUCATION

**University of Oxford**, Worcester College

Sep 2024 – Present

Master of Science in Mathematical Modelling and Scientific Computing

The **Worcester College Mathematical Sciences Scholar** and recipient of a Mathematical Institute bursary for academic excellence. The MSc includes a 20 page technical report on **Mathematical Models of Financial Derivatives**, and both a 20 page technical report and 50 page dissertation on **Deep Learning**.

**University of Warwick**

Bachelor of Science in Mathematics and Physics

Sep 2021 – Jun 2024

Founder and president of *The Poincaré Project* which produced a yearly magazine focussed on the intersection of mathematics, physics, and computer science. **First Class Honours**

## EXPERIENCE

**University of Warwick**, Department of Physics

May 2023 – October 2024

URSS Researcher

Received funding for a self-directed machine learning (ML) research project to demonstrate that electron diffraction patterns can be generated from crystal structure data using ML. (supervisor: Prof. Rudolf A. Römer.)

**Self-Employed**

Jan 2017 – Aug 2021

Electrical Inspector

London, UK

Contracted electrical inspecting and testing of financial institutions and data centres in Central London.

**UK Government**, Department of Digital, Culture, Media & Sport

Jun 2021

Information Technology Support Technician

London, UK

Provided 1st- and 2nd-line support and produced technical documentation.

**The Economist**

Feb 2020 – Sep 2020

Information Technology Operations Analyst

London, UK

Created scheduled scripts to automate server tasks, and built software to optimise resolution of issues.

**Selfridges & Co.**

Feb 2019 – Oct 2019

Computer Services Analyst

London, UK

Improved our rollout speed by developing a GUI application to perform device management;

## PUBLICATIONS, ARTICLES & POSTER SESSIONS

D. Bayo, B. Çivitcioğlu, **Joseph J. Webb**, A. Honecker, R. A. Römer, Machine learning of phases and structures for model systems in physics. arXiv:2409.03023 [Disordered Systems and Neural Networks] (2024). [↗](#)

**Joseph J. Webb**, R. Beanland, R. A. Römer, Large-Angle Convergent-Beam Electron Diffraction Patterns via Conditional Generative Adversarial Networks. [Preprint] (2024).

**Joseph J. Webb**, “How to Win Games with Quantum Strategies”. *Poincaré Magazine* **2**, 23-27 (2024). [↗](#)

**Joseph J. Webb**, “A Walk in the Quantum: Reinventing a World-Changing Algorithm”. *Poincaré Magazine* **1**, 29-36 (2022). [↗](#)

“AI’s Bridge Between Structure and Pattern”. *Institute of Physics Theory of Condensed Matter Group Meeting* (2024).


## SKILLS


**Concepts:** Machine Learning, Deep Learning, High-Performance Computing, Numerical Analysis, Numerical Linear Algebra, Computational Physics, Optimisation, Data Analytics and Visualisation


**Programming Languages:** Python, Julia, C, Bash, Fortran, Matlab, PowerShell

**Tools and Technologies:** PyTorch, TensorFlow, Git, Slurm, MPI, CUDA, NumPy, Numba, SciPy, Scikit-learn, Pandas, Matplotlib, Jupyter Notebooks, LaTeX, Arduino, HTML, CSS, SQL

## SELECTED OPEN-SOURCE PROJECTS

 **Quantum Walk:** Emulator for quantum walks on directed graphs to speed up the classical PageRank algorithm. [↗](#)

 **Fractal Explorer:** An interactive app utilising CUDA processing to zoom into any fractal of choice. [↗](#)

 **Project Euler Solutions:** Solving Project Euler problems with extremely efficient and optimised code. [↗](#)