

# Joseph Webb

Mathematician, Physicist, Programmer

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## EDUCATION

|   |                              |
|---|------------------------------|
| <b>University of Oxford</b> , Worcester College   | Sep 2024 – Present           |
| Master of Science in Mathematical Modelling and Scientific Computing  |                              |
| The <b>Masters in Mathematical Sciences Scholar</b> , awarded a scholarship by Worcester College covering tuition fees, and received the MMSC bursary for academic excellence and performance in interview. |                              |
| <b>University of Warwick</b>  | Sep 2021 – Jun 2024          |
| Bachelor of Science in Mathematics and Physics  | <b>First Class Honours</b> ↗ |
| Founder and president of <i>The Poincaré Project</i> which produced a yearly magazine focussed on the intersection of mathematics, physics, and computer science.   |                              |





## EXPERIENCE

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| <b>University of Warwick</b> , Department of Physics   | May 2023 – Present  |
| URSS Researcher  | Coventry, UK        |
| Received funding to carry out a self-directed machine learning research project.                           |                     |
| <b>Self-Employed</b>   | Jan 2017 – Aug 2021 |
| Electrical Inspector   | London, UK          |
| Contracted electrical inspecting and testing of financial institutions and data centres in Central London. |                     |
| <b>UK Government</b> , Department of Digital, Culture, Media & Sport                                       | Jun 2021            |
| Information Technology Support Technician  | London, UK          |
| Provided 1st- and 2nd-line support and produced technical documentation.                                   |                     |
| <b>The Economist</b>   | 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.   |                     |
| <b>Selfridges &amp; Co.</b>  | Feb 2019 – Oct 2019 |
| Computer Services Analyst  | London, UK          |
| Improved our rollout speed by developing a PowerShell GUI application to perform device management.        |                     |

## PUBLICATIONS, ARTICLES & POSTER SESSIONS

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| <b>J. J. Webb</b> , R. Beanland, R. A. Römer. 2024 preprint. “Large-Angle Convergent-Beam Electron Diffraction Patterns via Conditional Generative Adversarial Networks” | 2024           |
| D. Bayo, B. Çivitcioğlu, <b>J. J. Webb</b> , A. Honecker, R. A. Römer. 2024. “Machine learning of phases and structures for model systems in physics” ↗                  | 2024           |
| <b>Poincaré Magazine</b> , Issue 02: “How to Win Games with Quantum Strategies” ↗  | 2023           |
| <b>Poincaré Magazine</b> , Issue 01: “A Walk in the Quantum: Reinventing a World-Changing Algorithm” ↗   | 2022           |
| <b>Institute of Physics</b> : Theory of Condensed Matter. “AI’s Bridge Between Structure and Pattern”  | 13th June 2024 |

## OPEN-SOURCE PROJECTS

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|  <b>AI Diffraction</b> : A machine learning approach to electron diffraction, built on NVIDIA’s pix2pixHD.  |
|  <b>Quantum Walk</b> : A simulator for quantum walks on directed graphs to emulate and improve the classical PageRank algorithm, and an implementation on lattices to compare classical and quantum information processing. |
|  <b>Fractal Explorer</b> : An interactive explorer utilising CUDA processing to investigate any fractal formula.  |
|  <b>Project Euler Solutions</b> : Solving Project Euler problems with extremely efficient and optimised code.   |

## SKILLS

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| <b>Concepts</b> : Computational Physics, High-Performance Computing, Machine Learning, Numerical Analysis, Numerical Linear Algebra, Optimisation, Data Analytics and Visualisation |
| <b>Programming</b> : Python, Julia, Bash, Fortran, C, Matlab, PowerShell, SQL   |
| <b>Tools and Technologies</b> : Git, Slurm, MPI, CUDA, PyTorch, TensorFlow, NumPy, Numba, SciPy, Pandas, Matplotlib, LaTeX, Arduino   |