

Jack Morse

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Online bio: <https://jmorse2020.github.io>

Education

BSc in Mathematics and Physics with First-class honours, *University of Bath* (2020 - 2024)

- **Notable modules:** Lasers, Electromagnetism, Quantum and Atomic, Condensed Matter, Vector Calculus, ODEs and Control, Algebra, Analysis.

A Levels, *Townsend C of E School* (2018 - 2020)

- Physics (A*), Mathematics (A*), Chemistry (A), Further Mathematics (A).

Publications

1. **Sub-10-attosecond Fibre-length Stabilisation using Phase-locked Spectral Interferometry.***
2. **Automated Long-Term Stability of a High Energy Laser** (DOI: <https://doi.org/10.3390/opt4040044>).

* Currently submitted to journal and under review, awaiting publication (access via my online bio).

Research Experience

Vulcan High Power Laser Industrial Placement, *Central Laser Facility* (July 2022 - September 2023)

- Operated and maintained the Vulcan laser system, identifying and fixing damage and misalignment, computing energies based on experimenters' requests, and collecting diagnostic information.
- Designed and fully implemented a path-length stabilisation system by a novel approach using spectral interferometry. Included an in-fibre interferometer and diagnostics with zero-delay monitoring and control with a slow (commercial) spectrometer and motor; and tuned a two-level PID loop to stabilise delay changes (< 10 as) in the system.
- Produced internal statistics reports on the laser success for each experiment by developing a bespoke software to collate shot energy data for each shot into target areas.
- Developed a software to regulate pump-laser energy prior to injection into a OPCPA system to prevent damage.
- Hands-on experience with spectrometers, autocorrelators, oscilloscopes, flash-lamp amplifiers, OPA, and CPA.

Computing Skills

Experience using: MATLAB, Python, C#, Excel, L^AT_EX, GitHub.

Numerical techniques: FFTs, minimisation, integration and differentiation, linear algebra, solving PDEs.

Extra-curricular Experience

Science Student Council, *University of Bath* (2023 - 2024)

- Provided feedback to the university above the departmental level which influences improvements to the delivery of science courses.

Head Boy, *Townsend C of E School* (2019 - 2020)

- Implemented multiple initiatives of my own (including a school-wide recycling system, student voice suggestion box, digital card readers for charity event donations, organised weekly community litter picks) and listened to the ideas of others.

Royal Marines Cadets, *St Albans Division* (2012 - 2020)

- Experience and qualifications such as leadership, Silver D of E, offshore boating, teamwork, ceremonial drill, fieldcraft and reaching the highest rank of Sergeant, coming first in a national selection process
- Developed methodical thinking, problem solving and the ability to present to large audiences.

References

1. **Dr Pedro Oliveira**, Researcher at Central Laser Facility
2. **Dr Marco Galimberti**, Researcher at Central Laser Facility
3. **Dr Peter Mosely**, Senior Lecturer at University of Bath