Oisín Davey

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Education

Cambridge University | Cambridge, United Kingdom | Starting October 2025.
MASt of Mathematics in Theoretical Physics

Maynooth University | Kildare, Ireland | September 2021 – June 2025
First Class Honours, BSc in Theoretical Physics & Pure Mathematics.

- Awarded the Hamilton Prize for the top 9 undergraduate students of mathematics in Ireland along with all 7 other prizes available in my course. Founded the Physics & Chemistry society.

Skills

- **Programming language acquisition:** Comfortable and practiced adapting to languages to suit the needs of a project; incorporated **C, C++, Python, Go**, Typescript, C#, and CSS in major projects.
- **Tutoring:** Annually contracted by University College Cork training our international Programming Olympiad team; academic tutor for 1st science at Maynooth University; volunteer training the national Maths Olympiad class. My work in education resulted in my membership within the Irish Mathematical Trust.
- **Pattern spotting:** Most satisfied when uncovering hidden structures in a task/problem: exploitation thereof enables optimisation and novel perspectives, applicable to nearly all types of analytical problem solving.
- **Data structures & Algorithms:** Represented Team Ireland for three consecutive years in the International Olympiad of Informatics, winning a bronze medal in Singapore 2021. Placed 1st in the All-Ireland Collegiate Programming contest in 2023. Represented Maynooth University at UKIEPC (Edinburgh University) and NWERC (TU Delft) in ICPC regionals.

Experience

Software Development Intern | CERN – Geneva | June 2024 – September 2024

- Developed the proprietary graphical tool "Vis-à-Gis" using the geodesy api PyQGIS and Qt to aid the beam surveyors in analysing the results of "Logiciel Général de Compensation", detailing the measurement network precision data from surveys of the Large Hadron Collider.
- Created, for Vis-à-Gis, a novel computational method for displaying projections of confidence ellipsoids using spectral approaches.
- Studied theoretical physics, specifically quantum field theory, within a summer programme delivered by the world's foremost lecturers on QFT, optics, cosmology and phenomenology.
- Learned French, the operative language of the section for internal documentation.

Research Fellow | Tyndall - Cork | June 2023 – September 2023

- Produced original C++/Python model of the spectra of quantum-confined stark effect based electro-absorption modulators, based on Elliott theory.
- Using time complexity analysis, I optimised the efficiency (From cubic to log-linear) of the program using a krylov-subspace eigenvector algorithm, now computing 4.8 wavefunctions per second, each with 100,001 nodes.
- Rephrased a component of the model as a discrete convolution, enabling further improvement in speed using fast fourier transforms.

Mathematics Research Intern | Maynooth University - Maynooth | June 2025 – August 2025

- Studying Besicovitch sets, fractal geometry, and measure theory.