Tom Macauley

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Education and Certifications

Durham University   **Sep. 2023 – Present**
Bachelor of Science in Mathematics
- 1st year final mark - 83% (Class I)
- 2nd year final mark - 84% (Class I)

The Hong Kong University Of Science and Technology   **Dec. 2024 - Jan. 2025**
Python and Statistics for Financial Analysis
- Overall mark - 90%

Prince Henry's Grammar School   **Sep. 2021 - Aug. 2023**
A - Levels
- Mathematics - A*
- Further Mathematics - A*
- Physics - A

Projects and Juvenilia

Analysis of the WKB eigenfunction approximation for the linearised   **Aug 2025 - Sep 2025**
Swift–Hohenberg operator

I use operator theory, PDE theory, spectral theory, and quasimodes to show that with some assumptions, WKB eigenfunctions for the linearised Swift-Hohenberg operator form an asymptotically orthonormal basis.

Applications of Analytic Continuation to PDE's, Topology, Theoretical Physics   **Aug 2025 - Sep 2025**
and More

A fellow peer and I delve deep into a cornerstone of Complex Analysis and its applications: Analytic Continuation. The paper aims to provide intuition, examples and applications to anyone who has taken an undergraduate course in Complex Analysis.

From the 840-Term Functional Equation to Goncharov's 22-Term Relation for   **Aug 2025 - Sep 2025**
the Trilogarithm

This paper investigates the reduction from the 840-term functional equation satisfied by the trilogarithm to Goncharov's 22-term relation. The work highlights the underlying algebraic structures and cancellations that allow such a dramatic compression, giving further insight into the role of functional equations in the study of higher polylogarithms.

Full details, preprints, and PDFs of these projects are available at: TomMacauley.github.io

Previous work and experience

TMTutoring | *Owner*   **Sep 2021 - Present**
- Founded and scaled a national maths and physics tutoring business.
- Delivered tuition at GCSE, A-Level, and university entrance level in mathematics and physics.
- Recruited, trained, and managed a team of 10 tutors, supporting 30+ students across the UK.

Wharfedale Grange | *Hospitality and Event Staff*   **2020-2024**
- Developed teamwork and communication skills

Extracurricular

Durham University Amateur Boxing Club | *Boxer*   **Sep 2023 - Present**
- Competed for DUABC on multiple occasions, this includes having bouts in England and Ireland.
- Planned and delivered boxing sessions for club members, fostering discipline, teamwork, and fitness.
- Designed, ordered and organised payments for kit for DUABC.