Henry Yip

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Third year Mathematical Physics student with strong background in both Mathematics and Physics, with experience in Python Programming. A passionate learner who is willing to take risks. Interested in pursuing physics at a higher level after university, particularly in Classical Mechanics or Differential Geometry.

Education

○ **BSc Mathematical Physics, The University of Edinburgh (2021-2025) (Year 3)**
○ Year 3 Course Choices:
  - Geometry, Principles of Quantum Mechanics (Whole Year), Electromagnetism and Relativity (Whole Year), Lagrangian Dynamics, Computer Modelling (Whole Year), Numerical Ordinary Differential Equations and Applications, Honours Complex Variables, Thermal Physics (Whole Year)

Academic Achievements

○ **Consistent First-Class Performance**
  - Several Variable Calculus and Differential Equations (93 %), Mathematics for Physics 2 (91 %), Introductory Astrophysics (91 %), Introduction to Linear Algebra (89 %), Physics 1A (89 %), Modern Physics (86 %), Probability (82 %), Fundamentals of Pure Mathematics (81 %)
○ **Pre-Honours Certificate of Merit**
  - Awarded for excellent performance in Year 1 of the BSc Mathematical Physics with a high average first-class mark.
○ **Active in Programme Representation**
  - Programme Representative in all years in university
  - Sole Programme Representative for BSc Mathematical Physics in Year 2
  - Met with lecturers to discuss course/exam structures. Met with external examiners from other universities in a lunch meeting to explain common student concerns.
  - Participated in meeting with Institute of Physics Panel to discuss degree structure.
  - Participated in "Student Assessment & Feedback Workshops" to discuss with academics across the STEM department about improving the structure and method of feedbacks to assessments.

Projects

○ **Summer Research Project on Three-body Gravitational Problem (Jun 2024 - Aug 2024)**

- Supervised summer project under Dr Jennifer Smillie , for a duration of around 8 weeks.
- Will focus on both coding and analysis. First, I will code and visualize some famous examples of three body problem (for example the figure-8 orbit). Next, I will explore the series expansions in the analytic solutions of the three-body problem.
- If time permits, I will look at its connection with quantum effects and thermodynamics.

○ **Leader of Group Research in Edinburgh Scientific Researchers Association (ESRA) (Sept 2023 - Mar 2023)**
- Research Topic title: Pendulum models for the oscillation of confined liquid.
- We are motivated by a paper which models liquid slosh using a single pendulum. We attempt to improve the model via a multi-pendulum model to more accurately model the surface behaviour of the oscillation of the liquid.
- Lagrangian Formalism, as well as numerical methods such as Runge-Kutta are implemented, will continue research next year using the wave function.
- Presented results, with a poster , in a conference.

○ **Founder and main contributor of Math Blog** (2022-Now)
- Ongoing project that has required a substantial commitment of approximately 800-1000 hours
- Short posts offering insights into contemporary Physics and Mathematics . Topics include Classical Mechanics, Fractal Geometry, Group Theory, Multivariable Calculus, while hosting topics (including special relativity, numerical methods) from STEM students from other regions in the world (Asia and North America).
- Detailed tutorials on the use of LaTeX .
- Expanded upon high-school physics and explained the intuition behind concepts .

Work Experience

○ **Mathematics Tutor (Jan 2022-Now) (2 years)**
- Provided dedicated mathematics tutoring (1-1.5 hrs of online tutoring per week) to high-school student in Hong Kong, delivering exercises and math help through Whatsapp, offering exam feedback. Assisted in F2 (Year 8) Second Semester, F3 (Year 9) Both Semesters, F4 (Year 10) Both Semesters.

○ **HYPED Research Team Research Analyst (2022-2023) (1 year)**
- Focusing on the research of liquid ring pump as the role of a Research Analyst. .
- Joined weekly meetings within the Research Group and the whole HYPED team to collaborate with other researchers regarding the feasibility of liquid ring pumps in Hyperloop.

○ **HYPED Outreach Team Coordinator (2021-2022) (1 year)**
- Contributed to conference preparation, delivered physics and Hyperloop concepts to high school students as the role of a Outreach Team Coordinator.
- Joined weekly meetings to discuss conference preparations (such as naming conferences, assist in drafting emails, etc)

Conferences attended

- **In-person talk and lunch with Nobel Prize Laureate - Donna Strickland** (Edinburgh, JCMB building)
- **London Mathematics Society Meeting: Mary Cartwright Lecture 2023** (Edinburgh, Bayes Center)
- **Kelvin Buzzard - Can Computers do your Problem Sheets?** (Edinburgh, Appleton Tower)