CHRISTOPHER WHITTALL

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EDUCATION

2020 – present: University of Southampton: PhD in Mathematical Sciences

- Project title: *Frequency-domain approach to self-force in hyperbolic scattering*
- Supervisor: Leor Barack
- Project: developing frequency-domain techniques for calculating the self-force in hyperbolic black hole scatter events.
- Teaching: undergraduate computer labs; face-to-face marking and teaching mathematical methods to first year undergraduate engineers; marking undergraduate problem sheets.

2019 – 2020: University of Cambridge: MMath in Mathematics

- 92% in final examination. Pass with Honours*
- Courses including: General Relativity, Black Holes, Cosmology and Quantum Field Theory.
- Essay project reviewing spontaneous scalarisation of neutron stars in scalar-tensor theories of gravity, and the resulting smoking gun gravitational wave signatures.

* Please note conventional classifications were not awarded due to the onset of the coronavirus pandemic.

2016 – 2019: University of Cambridge: BA in Mathematics

- Class I in the 3rd year of the Mathematical Tripos
- Courses covering a wide range of pure and applied mathematics and theoretical physics.
- 145/150 in the 3rd year Computational Projects module.

2014 – 16: Barrow Hall College, Warrington: A Levels

- A2: Mathematics (A*), Further Mathematics (A*) and Physics (A*)
- AS: Chemistry (A)
- Extended Project Qualification (A*): project investigating the security of RSA encryption and its implementation in internet communications.

OTHER RESEARCH EXPERIENCE

2019: DAMTP, University of Cambridge: Summer Research Student

- 8 week summer research project under Dr Joseph Keir: numerically investigated the stability of non-linear wave equations obeying the classical null condition on compact manifolds.
- Successful applications for funding from the Faculty of Mathematics and St John's College.

2018: UK Meteorological Office: Visiting Scientist

- 8 week project under Malcolm Kitchen at the Met Office: developed and implemented a model of atmospheric refraction of ADS-B radio transmissions from aircraft, and applied this to analyse the sensitivity of angle of arrival information to changes in weather profile.
- Successful application for part-funding from the Faculty of Mathematics.

COMPUTING EXPERIENCE

- Strong command of computing skills, including **Bash** scripting, version control using **Git**, and the use of **high performance computing** resources.
- Highly competent **C** and **C++** programmer, with particular emphasis on numerical calculations, including the use of the **GSL** and **Boost** libraries and parallelisation using **OpenMP**.
- Extensive experience using **Python** and **MATLAB** for numerical calculations and data analysis and visualisation.
- Proficiency with **Mathematica** for symbolic and numerical calculations.
- Demonstrated capability to produce a wide variety of technical documents and presentations using **LaTeX**.

PRIZES AND AWARDS

- Wright prize (2019, 2020), Ian Hall Year Prize (2019), College prize (2018) and Horne scholarship (2018-20) a*warded by St John's College, Cambridge for examination results.*

PUBLICATIONS

- C. Whittall and L. Barack, "*Frequency-domain approach to self-force in hyperbolic scattering*", Phys. Rev. D **108**, 064017 (2023), arXiv:2305.09724. **Chosen as an Editors' Suggestion in Physical Review D.**

TALKS AND PRESENTATIONS

- "Self-force in hyperbolic black hole scattering", Satellite seminar, Asymmetric Binaries meet Fundamental Astro-Physics, Gran Sasso Science Institute, 20th September 2023.
- "Self-force in hyperbolic scattering: a frequency-domain approach", Conference talk, 26th Capra Meeting on Radiation Reaction in General Relativity, Niels Bohr Institute, 4th July 2023.
- "Self-force in hyperbolic scattering: a frequency-domain approach", Conference talk (online), 23rd International Conference on General Relativity and Gravitation, Chinese Physical Society, 5th July 2022.
- "Self-force in hyperbolic scattering: a frequency-domain approach", Conference talk, 25th Capra Meeting on Radiation Reaction in General Relativity, University College Dublin, 22nd June 2022.
- "Frequency domain approach to self-force in hyperbolic scattering", Conference talk (online), 24th Capra Meeting on Radiation Reaction in General Relativity, Perimeter Institute, 10th June 2021.

OTHER EVENTS ATTENDED

- Gravitational Memory Effects: From Theory to Observation, Queen Mary University of London [attended online], 5th - 9th June 2023.
- From Scattering Amplitudes to Gravitational-Wave Predictions for Compact Binaries, Universität Zürich & ETH Zürich, 4th - 15th July 2022.
- BritGrav21, University College Dublin [attended online], 12th – 16th April 2021.

REFERENCES

Available on request.

Updated: 13/10/2023