



## Academic positions

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**Doctoral Prize Senior Research Assistant**, University of Southampton Jun 2022 – Present

- Research: Modelling of hyperbolic orbits of binary black holes with back-reaction in the extreme-mass-ratio limit using perturbation theory focusing on calculating the scatter angle to first-order in the mass ratio and the formulation of second-order self-force calculations for unbound orbits.

**Research Assistant**, University of Southampton Jan 2022 – Mar 2022

- Research: Modelling of hyperbolic orbits of binary black holes with back-reaction in the extreme-mass-ratio limit using perturbation theory focusing on calculating the scalar self-force correction to the scatter angle.

## Education

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**PhD in Mathematical Sciences**, University of Southampton Sep 2018 – April 2022

- Viva outcome: Pass without corrections.
- Project title: Self-force in hyperbolic black hole encounters.
- Supervisor: Prof. Leor Barack.
- Project: Modelling of hyperbolic orbits of binary black holes with back-reaction in the extreme-mass-ratio limit using perturbation theory focusing on the derivation and development of a model to calculate the self-force correction to the scatter angle.
- Teaching: Running of undergraduate problem classes and helping with assessment.

**MPhys in Physics**, The University of Manchester Sep 2014 – Jun 2018

- Final degree grade: First-class honours with an average of 80.4%.
- Modules: Gravitation, The Early Universe, Quantum Field Theory, Electrodynamics, etc.
- Master's project: Using Markov chain Monte Carlo methods on power spectra of the cosmic microwave background to resolve various tensions in the data through the use of different cosmological models.

**A levels**, Hereford Sixth Form College Sep 2012 – Jun 2014


- A2 levels: Physics (A\*), Mathematics (A), Chemistry (A) and Biology (A).
- AS levels: Further Mathematics (A).

**GCSEs**, Lacon Childe School Sep 2007 – Jun 2012

- Eleven level 2 awards including GCSEs in English language and German.

## Computing

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- Extensive experience with **Mathematica** including tensor algebra, data analysis and graphics.
- Extensive experience with **C++** including numerical calculation and data analysis.
- Extensive experience with **Python** including data analysis and graphics.
- Extensive experience with **L<sup>A</sup>T<sub>E</sub>X**.
- Contributor of scatter orbits to the KerrGeodesics package of the Black Hole Perturbation Toolkit. 

## Prizes

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- **Doctoral Prize**, Engineering and Physical Sciences Research Council. 2022
- **Best Student Talk Runner Up**, 25th Capra Meeting on Radiation Reaction in GR. 2022

## Publications

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- O. Long & L. Barack. Time-domain metric reconstruction for hyperbolic scattering. *Phys. Rev. D*, 104(024014), July 2021. [🔗](#)

## Conference presentations

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- “Self-force in hyperbolic black hole encounters”, 25th Capra Meeting on Radiation Reaction in General Relativity, University College Dublin, 22nd June 2022. [🔗](#)
- “Self-force in hyperbolic binary-black-hole encounters”, BritGrav22, University of Glasgow via Zoom, 4th April 2022. [🔗](#)
- “Time-domain metric reconstruction for hyperbolic scattering”, 24th Capra Meeting on Radiation Reaction in General Relativity, Perimeter Institute via Zoom, 10th June 2021. [🔗](#)
- “Towards a self-force calculation of the scatter angle in hyperbolic encounters”, BritGrav21, University College Dublin via Zoom, 13th April 2021. [🔗](#)
- “Towards a self-force calculation of the scatter angle in hyperbolic encounters”, 13th LISA Symposium, 1st – 3rd October 2020. [🔗](#)
- “Towards a self-force calculation of the scatter angle in hyperbolic encounters”, 23rd Capra Meeting on Radiation Reaction in General Relativity, University of Texas at Austin via Zoom, 24th June 2020. [🔗](#)

## Conference posters

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- “Time-domain metric reconstruction using the Hertz potential”, 3rd meeting of the GWVerse COST action, Institute for Fundamental Physics of the Universe, International School for Advanced Studies, 13th – 16th January 2020.

## Other events attended

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- Advances and Challenges in Computational Relativity Workshop (Online), The Institute for Computational and Experimental Research in Mathematics, Brown University, 14th – 18th September 2020.
- Black Hole Perturbation Toolkit Workshop (Online), Astronomical Institute of the Academy of Sciences of the Czech Republic, 25th – 27th May 2020.
- Kavli RISE Summer School on Gravitational Waves, University of Cambridge, 23rd – 27th September 2019.
- 22nd International Conference on General Relativity and Gravitation and 13th Edoardo Amaldi Conference on Gravitational Waves, Palau de congressos de Valencia, 8th – 12th July 2019.
- 22nd Capra Meeting on Radiation Reaction in General Relativity, Centro Brasileiro de Pesquisas Físicas, 17th – 21st June 2019.
- LISA Waveform Working Group Meeting, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), 13th – 15th May 2019.
- BritGrav19, Durham University, 15th – 16th April 2019.
- Black Hole Perturbation Toolkit Workshop, University College Dublin, 19th – 21st March 2019.

## LISA Consortium

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- Full member of the LISA Consortium since October 2018.
- Member of the Waveform Working Group and LISA Early Career Scientists (LECS).
- Current work is part of LISA Science Group’s Work Package 1.2.2.

## References

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Available upon request.