

# CHRISTOPHER N. EVERETT

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## Education

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<b>D.Phil. Gamma Ray Astronomy</b> University of Oxford, St Anne's College, United Kingdom	<b>Oct. 2022 – present</b>
<b>M.Sc. Space Systems Engineering</b> University of Southampton, United Kingdom	<b>Sept. 2021 – Sept. 2022</b> <i>Classification: First-Class</i>
<b>M.Phys. Physics</b> University of Oxford, Keble College, United Kingdom	<b>Oct. 2017 – June 2021</b> <i>Classification: First-Class</i>

## Research

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<b>Gamma Ray Astronomy</b> <i>D.Phil. Project</i> → Prof. Garret Cotter	<b>Oct. 2022 – present</b> <i>University of Oxford</i>
• Development of the DIPLODOCUS framework, a mesoscopic model of jetted astrophysical sources (with a focus on blazars) and the associated <code>Diplodocus.jl</code> code.	
• Using <code>Diplodocus.jl</code> to assess the robustness of single-zone model parametrisation of blazars to the inclusion of asymmetric physics: global jet electromagnetic structure and anisotropic particle acceleration inspired by theory.	
• Feedback insights of this assessment into constraints on the theory of these sources, what field structures can they have and what particles and methods of particle acceleration are best supported by the models in comparison to observed spectra.	
<b>Magnetic Reconnection Plasma Thruster</b> <i>M.Sc. Project and Continuation Thereafter</i> → Prof. Charlie Ryan	<b>Dec. 2021 – present</b> <i>University of Southampton</i>
• Exploration of using magnetic reconnection as a plasma acceleration mechanism for spacecraft propulsion, inspired by astrophysical eruptions on the solar surface (solar flares and coronal mass ejections)	
• Modelling (using the PLUTO and COMSOL software packages) and experimental assessment of this novel concept and ongoing expansion of the concept of using high energy astrophysical phenomena to inspire terrestrial propulsion systems.	
<b>Micro-Bipropellant Rocket Engine</b> <i>M.Phys. Project</i> → Prof. John Gregg	<b>Oct. 2020 – July 2021</b> <i>University of Oxford</i>
• Development of a performance envelope for an oxygen-ethanol bi-propellant micro-rocket engine based on advances in small-scale additive manufacturing technology.	

## Teaching & Experience

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<b>Beams, Bursts and Biscuits</b> <i>Organiser</i>	<b>Oct. 2023 – present</b>
• Organising the Beams, Bursts and Biscuits discussion group in the sub-department of astrophysics at the University of Oxford. The group brings together researchers from all fields with an interest in high-energy astrophysical sources/phenomena.	
<b>Exeter College, Oxford</b> <i>Stipendary Lecturer</i>	<b>Sept. 2024 – Sept. 2025</b>
• Tutoring 1 <sup>st</sup> and 3 <sup>rd</sup> year undergraduate physics students	
• Courses included: electromagnetism, optics, circuit theory, nuclear and particle physics, and general relativity	
<b>Magdalen College, Oxford</b> <i>Non-Stipendary Lecturer</i>	<b>Jan. 2021 – Sept. 2024</b>
• Tutoring 2 <sup>nd</sup> and 3 <sup>rd</sup> year undergraduate physics students	
• Courses included: mathematical methods, nuclear and particle physics, and fluid dynamics	
<b>Oxford Physics Teaching Laboratory</b> <i>Lab. Technician</i>	<b>July 2020 – Aug. 2020</b>
• Designed a new practical for the 3 <sup>rd</sup> year undergraduate physics course, involving the analysis of a shear-layer instability generated in a differentially rotating water tank.	

## Publications

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- Everett C. N., Klinger-Plaisier M., Cotter G., 2025, DIPLODOCUS II: Implementation of transport equations and test cases relevant to micro-scale physics of jetted astrophysical sources, arXiv:2510.12505, (Submitted to the Open Journal of Astrophysics)
- Everett C. N., Cotter G., 2025, DIPLODOCUS I: Framework for the evaluation of relativistic transport equations with continuous forcing and discrete particle interactions, arXiv:2508.13296, (Submitted to the Open Journal of Astrophysics)
- Everett C. N., Cotter G., 2024, Computational forms for binary particle interactions at different levels of anisotropy, RASTI, 3, 548
- Everett C. N., Ryan C. N., 2023, A Linear Magnetic Reconnection Based Plasma Thruster for Spacecraft Propulsion, in AIAA SciTech Forum 2023. p. 448

## Invited Talks

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- Extragalactic Jets at all Scales: a Cretan View, Heraklion, Greece** Aug. 2025  
“DIPLODOCUS: going beyond isotropic, single zone blazar emission model”
- High Energy Phenomena in Relativistic Outflows IX, Rio de Janeiro, Brazil (remote)** Aug. 2025  
“DIPLODOCUS: going beyond isotropic, single zone blazar emission model”
- DESY Workshop on Numerical Multi Messenger Modelling, Berlin, Germany** Feb. 2025  
“DIPLODOCUS: an anisotropic Boltzmann equation solver designed to model AGN jet dynamics and emissions”
- National Astronomy Meeting, Hull, United Kingdom** July. 2024  
“Developments Towards a New Kinetic Jet Model”

## Awards

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- Johnson Memorial Prize, University of Oxford** 2021  
Best M.Phys. project in the subject of Atmospheric, Oceanic and Planetary Physics

## Technical Skills

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Programming Languages      Julia, C, L<sup>A</sup>T<sub>E</sub>X    Software      Diplodocus.jl, PLUTO, Mathematica, COMSOL