

# 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: Distinction</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, and the associated <code>Diplodocus.jl</code> code (link to the <a href="#">code's website</a> ), for particle transport through phase space with arbitrary forces, interactions, and spacetime geometry.	
• Application of <code>Diplodocus.jl</code> to the modelling of jetted astrophysical sources, focusing on blazar emissions with self-consistent inclusion of large-scale jet structure and small-scale particle interactions, previously unattainable with existing models.	
• Identification of how the expanded physics contained within these <code>Diplodocus.jl</code> simulations of blazar emissions, in comparison to the traditional single-zone models, may lead to deviations from our current understanding of these objects.	
<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 bipropellant 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>Stipendiary 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-Stipendiary 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>Laboratory 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.	

## Awards

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<b>Johnson Memorial Prize, University of Oxford</b> Best M.Phys. project in Atmospheric, Oceanic, and Planetary Physics	<b>2021</b>
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## 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., 2026, DIPLODOCUS I: Framework for the evaluation of relativistic transport equations with continuous forcing and discrete particle interactions, [Open Journal of Astrophysics](#), 9
- Everett C. N., Cotter G., 2024, Computational forms for binary particle interactions at different levels of anisotropy, [RAS Techniques and Instrumentation](#), 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

## Contributed 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”
- AIAA SciTech 2023 Forum, Maryland, United States of America** Jan. 2023  
“A linear magnetic reconnection based plasma thruster for spacecraft propulsion”

## 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