CHRISTOPHER N. EVERETT

cn.everett@outlook.com | personal website | cneverett | 0000-0001-5181-108X

Education

D.Phil. Gamma Ray Astronomy **Oct. 2022 – present**
University of Oxford, St Anne's College, United Kingdom

M.Sc. Space Systems Engineering **Sept. 2021 – Sept. 2022**
University of Southampton, United Kingdom *Classification: First-Class*

M.Phys. Physics **Oct. 2017 – June 2021**
University of Oxford, Keble College, United Kingdom *Classification: First-Class*

Research

Gamma Ray Astronomy *D.Phil. Project* **Oct. 2022 – present**
↪ Prof. Garret Cotter *University of Oxford*

- Development of the DIPLODOCUS framework, a mesoscopic model of jetted astrophysical sources (with a focus on blazars) and the associated `Diplodocus.jl` code.
- Using `Diplodocus.jl` 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.

Magnetic Reconnection Plasma Thruster *M.Sc. Project and Continuation Thereafter* **Dec. 2021 – present**
↪ Prof. Charlie Ryan *University of Southampton*

- 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.

Micro-Bipropellent Rocket Engine *M.Phys. Project* **Oct. 2020 – July 2021**
↪ Prof. John Gregg *University of Oxford*

- 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

Beams, Bursts and Biscuits *Organiser* **Oct. 2023 – present**

- 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.

Exeter College, Oxford *Stipendary Lecturer* **Sept. 2024 – Sept. 2025**

- Tutoring 1st and 3rd year undergraduate physics students
- Courses included: electromagnetism, optics, circuit theory, nuclear and particle physics, and general relativity

Magdalen College, Oxford *Non-Stipendary Lecturer* **Jan. 2021 – Sept. 2024**

- Tutoring 2nd and 3rd year undergraduate physics students
- Courses included: mathematical methods, nuclear and particle physics, and fluid dynamics

Oxford Physics Teaching Laboratory *Lab. Technician* **July 2020 – Aug. 2020**

- Designed a new practical for the 3rd year undergraduate physics course, involving the analysis of a shear-layer instability generated in a differentially rotating water tank.

Publications

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, 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

Invited Talks

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"

Awards

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

Technical Skills

Programming Languages Julia, C, LaTeX **Software** `Diplodocus.jl, PLUTO, Mathematica, COMSOL`