James **Alvey**

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James Alvey

Computing Skills

Expert: Python, Mathematica
Proficient: C++, C, Matlab, LaTeX, HTML, CSS, UNIX Bash
Intermediate: Julia, Docker
Basic: R, Javascript, SQL

Publications

[1] Improved BBN Constraints on the Variation of the Gravitational Constant. *J. Alvey, N. Sabti, M, Escudero, M. Fairbairn* (Oct 19)

[2] Refined Bounds on MeV-scale Thermal Dark Sectors from BBN and the CMB. *N. Sabti, J. Alvey, M, Escudero, M. Fairbairn, D. Blas* (Oct 19)

[3] Light Dark Matter from Inelastic Cosmic Ray Collisions. *J. Alvey, M. Campos, M. Fairbairn, T. You* (May 19)

[4] Linking Scalar Dark Matter and Neutrino Masses with IceCube 170922A. *J. Alvey, M. Fairbairn* (Feb 19)

Presentations

›Big Bang Nucleosynthesis with Light Thermal Dark Sectors, *Uni. of Manchester*, Dark Matter UK (Oct 19)

›Python for Efficient Research, *King's College London*, Github Sponsored Hack Day (Oct 19)

›The Atmosphere as a Proton Beam Dump, *Uni. of Glasgow*, BUSSTEPP (Jul 19)

›Neutrinos at IceCube, *King's College London*, Dark Matter Horizons (Dec 18)

›Primordial Non-Gaussianity, *Uni. of Cambridge*, Seminar Series (Dec 17)

Interests

Triathlon, Running, Hiking
Science Communication
Jazz Guitar

Profile

I am a PhD student at King's College London studying Theoretical Physics. I have strong analytical and technical skills, coupled with the ability to present my findings clearly. I have experience across multiple sectors within research, data science, consultancy, and teaching. A portfolio of my work is available on my website.

Education

PhD - Theoretical Physics — King's College London
Oct 2018 —
Advisor: Prof. M. Fairbairn

Teaching:
1st Year Astrophysics
1st Year Labs
2nd Year Stellar Structure
4th Year Dark Matter

Research into phenomenological aspects of Dark Matter. Author of four articles on topics including Big Bang Nucleosynthesis, Direct Detection, Neutrino Astrophysics, and Cosmic Rays. Current work is investigating the application of graph neural networks to the Cosmic Microwave Background. Helped to organise a Github sponsored hack day for fellow PhD students.

MMath, BA Hons. — University of Cambridge
Oct 2014 — Jul 2018
Distinction (89%)
St John's College

Finished in the top 15 of students in Part III of the Maths Tripos. Awarded the Horne Scholarship (St John's College) and Part IA Cavendish Laboratory Practical Prize.

Relevant Experience

Quantitative Analyst — ECTP
Jul 2018 — Oct 2018
Developed a machine learning training, testing, and development library for the UK desk (written in Python). Built and distributed a research analytics dashboard using Flask and Docker.

Statistics Consultant — Shift Learning
Jul 2019 — Sep 2019
Analysed and produced a report on the impact of e-Learning with regards to university student performance.

Student Researcher — DAMTP, University of Cambridge
Aug 2017 — Sep 2017
Produced Fisher error forecasts for feature-type non-Gaussianity in the Cosmic Microwave Background. Code written in C with MPI support.

Other Professional Experience

Science Editor — Varsity Magazine
Jan 2017 — Apr 2017
Edited, commissioned, wrote, and conducted interviews for over 40 science based articles across 9 weekly issues on topics ranging from education to artificial intelligence.

Risk Intern — Deutschebank AG
Jul 2016 — Sep 2016
Report and presentation on the effect of central bank interest rate policy on global markets.

Intern — L & Q Housing Association
Jul 2015 — Sep 2015