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Evidence to the Science, Innovation and Technology Committee from the University of Cambridge on the economic value of PPAN-trained researchers

Summary

The Committee has rightly identified the need to attribute value to “PPAN people” as well as scientific outputs. We present quantitative evidence, based on a data-science analysis of career destinations of recent graduates, that PPAN-led research training programmes at Cambridge produce a substantial pipeline of talent into the UK technology, finance and AI sectors – areas that the government has identified as priorities for economic growth. Cuts to PPAN grant funding do not simply reduce the volume of academic research; they constrict a nationally significant supply of advanced technical skills into UK industry. We also present case studies of PPAN science generating impact through entrepreneurship.

Background

The University of Cambridge runs two programmes in data-intensive science that are led by PPAN researchers and draw their research content from PPAN topics: an MPhil (one-year master's, 2023-2024 cohorts) and a CDT (doctoral training programme, 2018–2022 cohorts). These are joint initiatives between the Departments of Physics, Applied Mathematics and Theoretical Physics, and the Institute of Astronomy. The training equips students with advanced skills in statistical inference, machine learning, scientific computing and large-scale data analysis – developed through direct application to frontier research problems in particle physics, astrophysics and cosmology.

Evidence: where PPAN-trained researchers go

We have used a data science approach to map the career destinations of recent alumni from both programmes, based on an analysis of Linked-In profiles. The results are summarised in the Sankey diagrams on the next page.

Key findings

- 45% of MPhil alumni and 39% of CDT alumni have moved into UK technology, finance, or AI/ML roles in industry. Employers include internationally recognised companies/organisations (Deutsche Bank, JP Morgan, Cambridge Consultants, Faculty) as well as a diverse range of established/emerging start-ups.
- From the CDT cohort a further 35% have transitioned into academic research positions at leading global universities, sustaining the UK’s international scientific standing.
- The CDT pipeline shows particularly strong flows in quantitative finance and AI – sectors where the UK faces acute skills shortages and international competition for talent.

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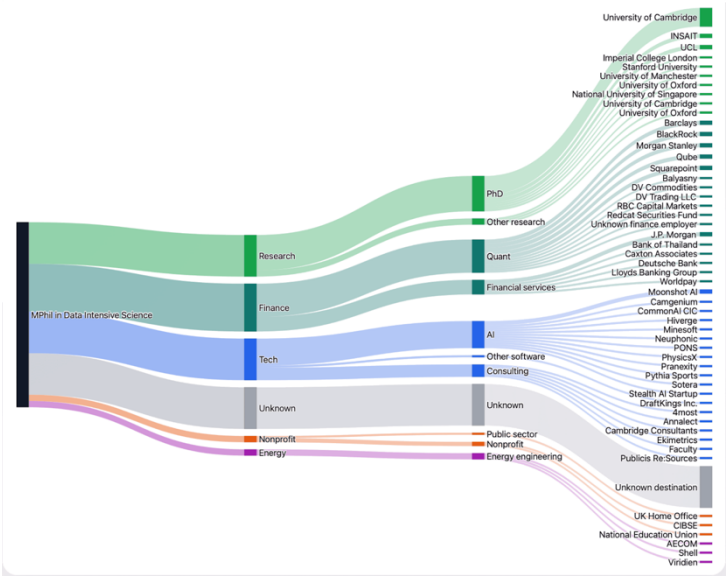
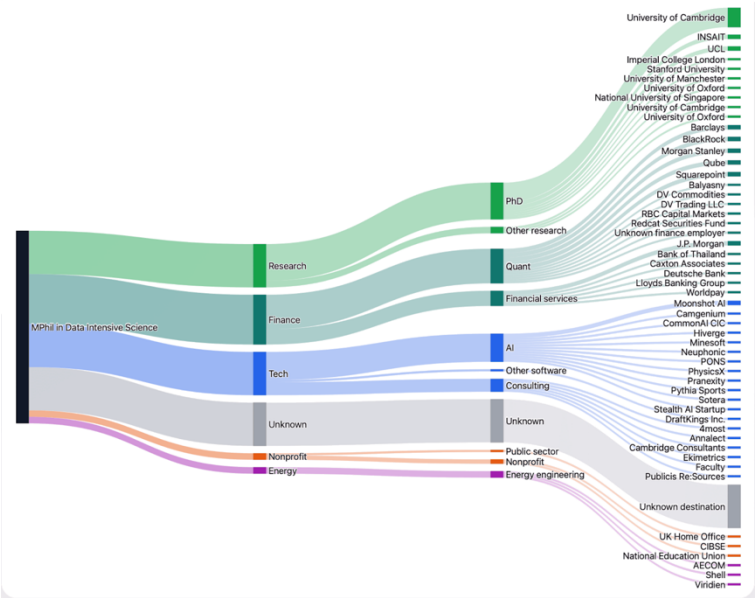
MPhil in Data-Intensive Science (89 data points from 123 alumni):



CDT in Data-Intensive Science, 2018–22 (23 data points from 36 alumni):



Why this matters for the Committee's inquiry

The skills developed through PPAN research training — advanced statistical modelling, ML/AI, scientific software engineering, working with large complex datasets — are not incidental byproducts of curiosity-driven research. They are the core competencies demanded by the UK's fastest-growing economic sectors. This training works because it is embedded in genuine research problems of sufficient complexity to develop these skills at the highest level; there is no short-cut that substitutes a generic data-science curriculum for the depth that PPAN research provides.

The current funding pressures at STFC threaten this pipeline directly. Postdoctoral positions — the stage at which many researchers either continue in academia or transition to industry — are the first to be cut when grant funding is reduced. As the Committee heard in oral evidence, the pausing of grants has already caused the UK to miss internationally agreed hiring windows for theoretical physics, with immediate consequences for talent retention. A 30% reduction in the PPAN grants programme would not

produce a 30% reduction in scientific papers: it would eliminate a generation of researchers whose skills the UK economy needs[1].

Impact case studies

Cambridge PPAN researchers have also generated direct economic impact through entrepreneurship.

1. **Geomerics** (https://impactmap.cam.ac.uk/a-revolution-in-lighting-video-games/) was a spin-out led by PPAN researchers that used methods in geometric algebra (originally focussed on problems in theoretical physics, cosmology and astrophysics) to revolutionise lighting in the gaming industry. It was subsequently acquired by ARM in 2013. One of the PPAN founders, Dr Chris Doran, went on to be entrepreneur in residence at the University of Cambridge and now works with **Monumo** (featured in the Sankey chart above, and recently featured in the Sunday times as an AI company to watch https://monumo.com/latest/monumo-named-sunday-times-ai-one-to-watch). To quote him directly, "Students entering the work force with a PhD or beyond in one of the PPAN subjects are the lifeblood of many UK technology startups. A consistent flow of people with the skills learnt in PPAN research is essential to the UK's plans for growth."
2. **Supersharp** (https://www.supersharp.space/) was co-founded by researchers from the Institute of Astronomy, Cambridge and applies techniques in high resolution imaging in the thermal infrared, developed for astronomical purposes, to earth imaging. The wealth of applications include environmental monitoring (e.g. thermal loss from buildings/impact of wildfires) and data acquisition for defence purposes. Early stage funding was provided by the STFC impact acceleration account. The company, situated in the Cambridge Innovation Park, now employs 38 people. Two products are booked on Space-X missions in early 2027.
3. **Polychord** (https://polychord.co.uk/) is a spinout from the Astrophysics Group of the Cavendish Laboratory Cambridge which specialises in addressing data analysis challenges using cutting edge techniques developed through applying advanced Bayesian inference to large scale cosmological datasets. With a current staff of 11 highly skilled employees, its products span structural health monitoring for bridges, anomaly detection on rail networks, AI surrogates for industrial simulation, and optimal sensor placement for defence.
4. **Cambridge Electromagnetic Technology Ltd** (CEMTL: https://www.cemtl.co.uk/) is a Cambridge-based consultancy founded by Cavendish Laboratory researchers to commercialise expertise in electromagnetic modelling, antenna design, and radio instrumentation developed for astrophysics experiments such as SKA and global 21-cm cosmology. CEMTL deploys techniques from radio astronomy instrumentation in the context of scientific instrumentation, aerospace, and advanced RF engineering, with customers in both industry and academia.

Recommendation

We urge the Committee to recognise that the economic return on PPAN training is substantial, quantifiable, and at direct risk from the current funding situation. We would welcome the opportunity to provide further data or oral evidence on the career trajectories of PPAN-trained researchers and the mechanisms by which curiosity-driven research generates the UK's technical workforce.

Submitted on behalf of the PPAN community at the University of Cambridge by

Prof. Cathie Clarke, Institute of Astronomy
Dr Miles Cranmer, Department of Applied Mathematics and Theoretical Physics and Institute of Astronomy
Dr Matthew Kenzie, Department of Physics
Prof. Hiranya Peiris, Institute of Astronomy
Dr Sarah Williams, Department of Physics

[1]Whilst we have not traced these alumnae further, based on the typical conversion rates of postdoctoral researchers transitioning to permanent academic jobs (<50% based on studies like those in https://www.nature.com/articles/d41586-025-00142-y#ref-CR1) we can assert that many of these talented researchers will contribute directly to UK industry later in their careers.