Annual Joy Welch Post-Doctoral Grants Fund 2024/25

In January 2025, Lancaster University proudly hosted the fourth round of the annual Joy Welch Post-Doctoral Grants Fund. This funding initiative was accessible to all researchers at Lancaster University, aiming to support research projects across various fields and disciplines. According to the agreement between the Joy Welch Educational Charitable Trust and Lancaster University, a total of £100,000 was allocated to award at least 12 research grants.

Researchers from Lancaster University's four faculties were invited to submit a research proposal of up to 1,000 words, along with a brief application form. The scheme received 64 eligible applications. A review panel, consisting of four research-active academics from each of Lancaster University's faculties, was assembled to evaluate the applications. Panel members cast their votes for the most promising projects.

The panel included:

- Professor Michaela Benson, Department of Sociology, Faculty of Arts & Social Sciences (Chair)

- Professor Nancy Preston, Associate Dean for Research, Faculty of Health and Medicine

- Professor Nicholas Race, Associate Dean for Research, Faculty of Science and Technology

- Professor Maria Piacentini, Associate Dean for Research, Management School

After thorough consideration, the panel was able to distribute 13 awards, totalling £100,000, to researchers at different career stages and from various disciplines. The panel expressed the University's deep appreciation to the Trust for its generous support, which provides a unique and valuable resource for Lancaster University researchers. The panel members were highly impressed by the number and quality of applications received this year and are excited that 13 awards have been granted to colleagues to pursue original research. We eagerly anticipate the outcomes of their projects in the coming year.

The percentage of applications received:

2024-25	Eligible Applications assessed by the panel (64)	%
FASS	17	27%
FHM	13	20%
FST	29	45%
LUMS	5	8%
Total	**64**	**100%**

The percentage of awards provided:

2024-25	Awards (13 No.)	%
FASS	5	38%
FHM	3	23%
FST	4	31%
LUMS	1	8%

Awarded Projects

Dr Johnson Bailey

Physics   **Amount requested and awarded £10,567**

Tracking icebergs with artificial intelligence techniques

Shipping in the Arctic is a large commercial operation. The presence of icebergs in Arctic regions poses a hazard to such operations. Of particular interest are icebergs within sea ice. Climate science would also benefit from large-scale iceberg databases. There is also a need for greater automation of detection methods. In this work, we are utilising a convolutional neural network (CNN) for iceberg detection with Sentinel-1 SAR data for icebergs in fast ice environments within the Franz Josef Land (FJL) region. We will validate this data using Sentinel-2. An iDPolRAD filter will be applied to the SAR data to produce training images for a YOLO v8 detection model. In our previous work, we performed training for 50 epochs using a batch size of 32 and a learning rate of 0.002. For our past model evaluation, we obtained a precision, recall and F1 score, giving the model an accuracy of 79%. These results are acceptable for operational use. However, the main limitations amount to a lack of an available automated iceberg training dataset, which can be addressed by the creation of a manual dataset, and the continued lack of simultaneous optical and SAR coverage for icebergs in the FJL region. To create a larger manual dataset, we will repeat the steps we have already carried out, utilising several Sentinel-1 SAR images over the FJL region, with corresponding Sentinel-2 data. A labelling package will then be used to manually label icebergs in each of these images, increasing the size of the dataset to a level where our CNN should show an improvement in detection performance. This increase in performance should help bring the model towards TRL7, making it more viable for the commercial market.

Dr Jo Carruthers and Dr Tajinder Hayer

English Literature and Creative Writing   **Amount requested and awarded £9,523**

Morecambe Ebbs and Flows: Loss and Renewal on the Coast

Often associated with deprivation and viewed as 'past their prime', seaside towns are among the most under-resourced in the UK. Seaside towns are also often vibrant hubs of creative activity, and one recommendation by a House of Lords Select Committee (2019) focused on 'arts-led regeneration'. With a Morecambe focus, this project seeks to look at coastal narratives of loss and renewal simultaneously to consider the coast as a site that enables a specific form of self-reflection and engagement with the environment, as well as being a site of past, ongoing and anticipated renewal. Jo Carruthers (editor of *Sandscapes: Writing the British Seaside*, 2020) and Tajinder Hayer (author of audio play 'Tidelands', 2020) will lead a group of writers to produce critical and creative work that draws on community participation. In the first phase, we will record interviews with residents of Morecambe, responding to questions that address memorialization, displacement/migration, and ecological anxieties and hopes for the future. Hayer will then script an audio play set in Morecambe that incorporates and is inspired by the interviews (produced by Ragged Edge Productions). Academics and creative writers working on the coast will then gather for a symposium and writing workshop to share and co-produce work that ties together the creative and critical strands of the project and make plans for publication. Research on climate anxiety has identified a 'dystopian fluency' among young people that draws them to stories of crisis; this project seeks to produce a set of academic and public writings that face loss with a focus on hope and renewal.

Dr Kathy Chandler

Education Research   **Amount requested and awarded £6,533**

Enhancing the well-being of Online Doctoral Researchers

This research examines the issue of wellbeing among doctoral researchers who complete their studies via online programmes, a group whose health risks and support needs are underexplored. They are thought to form a significant but unknown proportion of those completing doctorates within UK institutions. There are currently more than 700 at Lancaster University. The wellbeing of doctoral researchers generally, especially their mental wellbeing, is a growing concern. Around 40% of doctoral researchers in the UK experience depression and anxiety, and doctoral researchers are more at risk of suicide than the general population. Poor health has come to be seen as a normal part of doctoral study. This is concerning in itself, but also has far-reaching implications for the quality of UK-based research and its contribution. Some factors associated with poor wellbeing among doctoral researchers, such as being isolated from peers, are particularly relevant to those completing online programmes. One underexplored factor is the mode of study itself, with the research undertaken at UK universities to date not differentiating between campus-based researchers and those studying online. The needs of online doctoral researchers may be different, and yet university services often tend to be designed around the needs of undergraduates and/or those who are campus-based. For those studying online, services are sometimes perceived as poorly articulated. This study aims to explore the impacts of online doctoral study on wellbeing, both positive and negative, identify ways in which the wellbeing of online doctoral researchers is already supported and identify potential enhancements by universities, supervisors, and the doctoral researchers themselves. It will do this through a UK-wide survey and a participatory narrative study involving five co-researchers with an interest in narrative approaches registered on Lancaster University PhD programmes.

Dr Fidelis Chibhabha

Lancaster Medical School   **Amount requested and awarded £9,455**

Football in the era of climate change: exploring heat experiences, preparedness and mitigation strategies among African women football players

As the effects of climate change continue to worsen, the African continent is warming faster than the global average. In sports, exposure to extreme heat affects athletic performance and can cause mild to severe exertional heat-related illness (EHI) and death. To mitigate the effects of extreme heat in football, the Fédération Internationale de Football Association (FIFA) instituted mandatory cooling breaks or match cancellation when the wet-bulb globe temperature (WBGT) reaches 32°C. However, the International Federation of Professional Footballers (FIFPRO) consider the breaks inadequate in protecting the health and performance of players. This view is supported by serious cases of EHI reported during the Confederations of African Football (CAF) competitions in recent years. These include players collapsing due to dehydration and a referee ending a match prematurely after suffering from heatstroke. It is clear from these examples that there are negative consequences of playing in extreme heat, even for men's national team players who, fortunately, have medical personnel on standby during major CAF competitions. However, the situation is dire for most African women football players when training or participating in their domestic leagues because they do not always have adequately trained medical personnel. Given the already existing underrepresentation of African women athletes in research and the need for context-informed policies, the study will gather evidence

on heat-related experiences and practices in current and previous competitions among players participating in the West Africa Football Union A (WAFU A) zonal qualifiers of the 2025 CAF Women's Champions League. In addition, the study will determine the level of knowledge their medical personnel possess to effectively identify and manage exertional heat-related illnesses. The preliminary findings from this study will be used to develop a UKRI New Investigator Award application for a larger study involving football players in all six CAF zones.

Dr Philip Donkersley

Lancaster Environment Centre   **Amount requested and awarded £5,721**

Sting-Free Spaces: A Novel, Effective Wasp Repellent Device

Sting-Free Spaces is an innovative project that aims to create a safe, non-lethal solution for managing wasp activity in outdoor spaces. Wasps are important for our ecosystem as they help control other pests and contribute to pollination. However, their increasing presence around places like outdoor dining areas and beekeeping sites can cause discomfort and even safety concerns for people. At the same time, traditional pest control methods, like chemical sprays and jam-traps, may harm beneficial non-target insects like bees.

Our project, a collaboration between Lancaster University and ProScience Ltd, focuses on developing and testing a new electronic device designed to gently encourage wasps to move away from specific areas.

We will be working with 30 partners from the beekeeping and hospitality sectors across Northwest England. These partners will help us by installing the devices in their outdoor spaces and providing feedback on their performance. We will monitor bee and wasp activity using pan traps, while also gathering feedback from users through surveys and interviews.

The data collected will allow us to assess whether the device effectively reduces wasp numbers without affecting non-target species, such as bees. The goal of Sting-Free Spaces is to develop a reliable, environmentally friendly method for managing wasp populations, ensuring outdoor areas remain safe and enjoyable for everyone, while also protecting our vital pollinators.

Dr Paul Hendrickse

Lancaster Medical School   **Amount requested and awarded £9,330**

The impact of a weight loss drug on muscle structure and function in ageing

Drugs like Ozempic, known as glucagon-like peptide-1 receptor agonists (GLP-1RAs), are a hot topic in the press. This is for good reason; in addition to their initial purpose in managing Type 2 diabetes, they induce substantial weight loss and have been approved for this purpose in obese people. As of 2022, 29% of the UK population lives with obesity; therefore, these drugs are in such high demand that the number of prescriptions of GLP-1RAs has grown dramatically, and there have been shortages of GLP-1RA treatments. Prevalence of obesity is highest in older people; 35% of people aged 65-74 live with this condition, and many of these people will be prescribed GLP-1RAs.

Currently, little is known of the effects of GLP-1RAs on muscle in older people. Maintaining muscle size, structure, and function is essential for enabling daily activity, maintaining blood sugar levels, and for longevity; low muscle mass and muscle strength are associated with a shorter lifespan. Recent preclinical studies have demonstrated that GLP-1RAs maintain muscle mass and muscle function in conditions like chronic kidney disease, polymyositis and dexamethasone treatment. However, early evidence indicates treatment of GLP-1RAs in obese people induces greater muscle loss than dieting alone. Therefore, due to the uncertain role that these drugs play in muscle health in ageing, this

preclinical study aims to determine how muscle size, structure and function are affected by GLP-1RA treatment in older mice, to support larger grant applications to study the effects of these drugs in the muscle of older people.

Dr Eva Li
Sociology   **Amount requested and awarded £6,022**
Unlikely Allies: Digital Pathways to Far Right Ideologies Among Hong Kong Migrants in the UK

This project examines the unexpected political alignment of Hong Kong migrants in the UK with far-right ideologies, investigating how digital platforms shape this shift. Far-right politics, often rooted in exclusionary nationalism, are typically seen as contrary to migrant interests. However, this research challenges such assumptions by focusing on UK Hongkongers who arrived through the BN(O) visa scheme, fleeing Chinese authoritarianism. Frustrated by perceived inconsistencies within liberal democracies, some have embraced reactionary narratives—an irony with profound implications for migration, integration, and democracy. The study analyses social media content from platforms like YouTube and Facebook to map the digital pathways driving this ideological shift. The research reveals how digital platforms facilitate complex political transformations among migrants who ironically seek refuge from one form of oppression while potentially embracing another. It explores how political identities are constructed online and the broader role of social media in migration politics. With many Hongkongers opting for British citizenship by 2027, their political engagement raises urgent questions about UK democracy amid rising polarisation. The project includes community workshops to enhance digital literacy, academic collaborations, and the development of a digital literacy toolkit for migrant communities. Funding will support fieldwork, multimodal discourse analysis, and workshops, contributing to democratic resilience and the integration of migrants in multicultural societies.

Dr Justin Lo
Linguistics and English Language   **Amount requested and awarded £7,169**
Tracking human detection of deepfake speech in real time

Putting words in other people's mouths is now easier than ever. The advent of generative AI and machine learning techniques has transformed the landscape of speech synthesis technology and given rise to a proliferation of audio deepfakes. Through low-cost and easy-to-use web platforms, state-of-the-art technology has become highly accessible to bad-faith actors, who use deepfake speech to spread disinformation and perpetrate fraud through impersonation. Victims convinced by the identity of deepfake voices not only stand to lose huge sums of money but may also unwittingly share sensitive information and compromise data security. As evidence is mounting that such deepfakes may no longer be readily distinguishable from real human speech by human listeners, understanding how listeners process and attribute identity to deepfake voices is a pressing issue. This project seeks to advance our understanding of identity perception in real and deepfake voices and how listeners process voices in real time. This study will employ the technique of eye tracking in a perceptual experiment to track participants' eye gaze during listening, to gain insights into the time course of identity perception in voices. This experimental evidence may shed light on any underlying mechanism that distinguishes deepfakes from real voices in perception. Findings from this study will be used to raise public awareness of the risks of deepfake speech, as well as lay the foundation for developing toolkits and guidance to support potential targets of fraud.

Dr Katie Morris
The Law School   **Amount requested and awarded £1,277**
A rights-based assessment of university students' experiences of food and housing insecurity in the United Kingdom

University students in the United Kingdom (UK) are increasingly forced to choose between paying rent and eating. This project aims to examine food and housing insecurity among university students in the UK through a human rights-based framework, emphasising state obligations under Article 11 of the International Covenant on Economic, Social and Cultural Rights. It will analyse the extent and impact of these insecurities, highlighting students' lived experiences. The project seeks to influence policy and contribute to practical changes that strengthen protections for students, a population vital to the nation's future.

Using a socio-legal perspective, the study will adopt a mixed-methods approach combining questionnaires and interviews. The target population is undergraduate students enrolled at UK universities, including home and international students. The Joy Welch funding will be utilised to recruit participants and to undertake visits to 5 Higher Education Institutions to organise the survey rollout.

Participants' experiences will be evaluated against key international standards defined by the Committee on Economic, Social and Cultural Rights: availability, accessibility, and affordability. The project will showcase the systemic inequalities underlying these insecurities and critically examine how national policies, such as student finance systems and housing market deregulation, exacerbate these challenges. By proposing targeted policy reforms, it aims to improve students' well-being, enhance equity in Higher Education and inspire broader systemic change in the UK.

Dr Samantha Oates and Dr Mathew Smith
Physics   **Amount requested and awarded £5,100**
Detecting and identifying pests during RHS plant trials

As our global climate changes, our reliance on pesticides to grow crops is ever-increasing. One method to reduce the overuse of pesticides may be the age-old tradition of "companion planting", where a second plant is grown alongside the first to either confuse the pests or attract predators that eat them. To determine if this approach can be applied at scale, we have partnered with RHS Wisley. If shown to be successful, this method can be applied to fruit and vegetable crops to improve both food security and food sustainability.

However, we must track how pest numbers change across the growing season to determine if this approach effectively reduces pest infestation. Traditionally, this requires regular, by-hand 'bug counts': a highly inefficient technique that isn't applicable at scale. To optimise this process for wide-scale use, we will combine high-resolution photography with source detection techniques developed in astronomy.

We will construct a training set using citizen scientists to identify and count insects in photographs taken during plant trials. This training set will be used to develop AI algorithms to automate the detection and identification of insects. The astrophysics group at Lancaster has already developed and applied such techniques to a diverse range of challenges spanning global security, healthcare

and catastrophe management. In this study, we will develop the framework required to store and analyse each image collected by the RHS, to initiate the citizen science project on the 'Zooniverse' platform and to determine the success of companion planting in this year's plant trials. If successful, the companion planting technique, together with the automated insect identification, will be rolled out across the RHS to quantify the importance of companion planting across all types of crops.

Dr Paul Rayson

School of Computing and Communications　　　　　**Amount requested and awarded £10,500**

Towards a copilot for understanding space and time narratives from Holocaust Testimonies

As we mark 80 years since the liberation of Auschwitz in 2025, remembering the voices of Holocaust survivors is more important than ever. Their stories—often shared through interviews, videos, and written testimonies—offer powerful insights into one of history's darkest chapters. But these stories can be difficult to analyse, especially when they include vague or fragmented references to time and place. This project introduces a new digital tool that uses artificial intelligence (AI) to help researchers, educators, and the public explore these testimonies more easily. The tool will act like a "copilot"—an intelligent assistant that helps users navigate complex information. It will automatically identify key people, places, and events in survivor stories and organise them into interactive maps and timelines. By using cutting-edge language technology, this tool will make it possible to ask meaningful questions like: Where did this event happen? Who was involved? What happened before or after? It will also support testimonies in more than one language and work with both text and audio/video recordings. The project will begin by building a prototype using publicly available archives from institutions like the United States Holocaust Memorial Museum and the USC Shoah Foundation. The goal is to create a multilingual, multimedia platform that makes Holocaust history more accessible, especially for younger generations and nonspecialists. This initiative not only preserves memory—it empowers people to explore it in new ways. By combining history, technology, and storytelling, we hope to deepen understanding, spark reflection, and ensure that the voices of survivors continue to be heard.

Dr Andreas Strobl and Dr Neil Shepherd

Entrepreneurship & Strategy　　　　　**Amount requested and awarded £9,940**

Strategic Foresight in SMEs: How Generative AI Can Secure SME Growth and Survival

Strategic planning helps businesses anticipate and prepare for future challenges and opportunities. While large corporations invest heavily in specialised teams and external consultants to manage their strategic foresight, small and medium-sized enterprises (SMEs) typically lack the resources, skills, and time needed for thorough strategic planning. Consequently, SMEs often struggle with long-term survival and growth. This research project explores how SMEs could leverage recent advances in artificial intelligence (AI), specifically self-learning AI tools like ChatGPT, to enhance their strategic foresight capabilities. AI technologies have become widely accessible and hold significant potential for SMEs to efficiently gather, analyse, and interpret large amounts of strategic information, which could help mitigate resource constraints. Through a carefully designed, five-stage research process involving interviews, workshops, scenario planning exercises, and reflective sessions with SME owner-managers, the project aims to: (1) understand business owners' attitudes and concerns regarding AI, (2) assess the advantages and barriers to AI adoption, (3) identify practical applications for AI in SME strategic planning, and (4) address ethical considerations and risks associated with AI usage. The ultimate goals of the project include developing clear guidelines for SMEs to integrate AI into their strategic processes and formulating policy recommendations to help regulate AI's implementation

effectively and ethically. Outcomes from this research will be widely shared with both the academic community and SMEs, fostering better strategic practices, informed policymaking, and improved long-term sustainability for small businesses.

Dr Caroline Weight

Biomedical and Life Sciences   **Amount requested and awarded £8,864**

What's in the air we breathe? Use of high-resolution imaging to assess how air pollutants affect our nose cells

4.2 million deaths every year are attributable to outdoor (particulate matter**),** and indoor (microplastics) pollution. By 2050, 12 billion metric tons of plastic waste will have accumulated globally, with microplastic absorption predicted as a leading cause of health complications in COPD, Asthma and Cystic Fibrosis patients. Pollutants are absorbed into the body through inhalation. Cells that line the respiratory tract maintain a functional barrier integrity to protect us from infection by environmental microbes. However, potential toxicity following absorption of microplastics and particulate matter can result in dysfunction of barrier integrity. Respiratory infectious diseases account for nearly 2.5 million deaths globally each year, and this burden is enhanced in areas suffering from high air pollution.

Detailed characterisations of what happens when respiratory pollutants enter the body are lacking, and the cellular and molecular mechanisms behind how air pollutants increase disease susceptibility have not been fully elucidated. Understanding these mechanisms will help develop new insights into the effects of air pollutants on human health.

We will incubate human respiratory cells with pollutants to visualise absorptive capacity using high-resolution Electron Microscopy. We will evaluate the effects of exposure by measuring cell inflammatory activation responses. Since older individuals are more susceptible to infection than healthy individuals, we will compare the effects of pollution exposure in an age-dependent manner. We will then infect pollutant-exposed respiratory cells with the bacteria *Streptococcus pneumoniae*, the causative agent of Pneumonia, to assess whether damage induced by air pollution increases susceptibility to infection.

These data will raise awareness of the impacts air pollutants have on our health, encourage manufacturers' policy changes to strive for cleaner environments, thereby reducing the burden of respiratory diseases overall. The results will support the creation of evidence-based interventions and regulations to manage air quality, benefiting society by ensuring safer living and working conditions.