Annual Joy Welch Post-Doctoral Grants Fund 2022/23

In January 2023, Lancaster University was delighted to be able to run the second round of the annual Joy Welch Post-Doctoral Grants Fund. This funding scheme was open to all Lancaster University researchers, with the aim of supporting research projects across all areas of research and all disciplines. Under the provision of the agreement between the Joy Welch Educational Charitable Trust and Lancaster University, a total amount of £107,668 was available in 2021 to award a minimum of 12 research grants.

To apply, Lancaster University researchers from across four faculties were required to complete a research proposal no longer than 1,000 words, alongside a short application form, and 36 eligible applications were received under the terms of the scheme. A review panel of four research-active academics, representing each of Lancaster University's Faculties, was convened to consider all the eligible applications. Panel members voted for their preferred projects.

The panel comprised of:

- Professor Stephen Wilkinson, Associate Dean for Research, Faculty of Arts & Social Sciences ***(Chair)***
- Professor Nick Race, Associate Dean for Research, Faculty of Science and Technology
- Professor Nancy Preston, Associate Dean for Research, Faculty of Health, and Medicine
- Professor Katy Mason, Associate Dean for Research, Management School

Following panel consideration, sufficient funds were available to make 14 awards, totalling £107,668.36 for researchers at various career stages and across a variety of disciplines.

The percentage of applications received:

2022-23	**Eligible Applications assessed by the panel (36)**	**%**
FASS	12	33%
FHM	1	3%
FST	22	61%
LUMS	1	3%
Total	**36**	100%

The percentage of awards provided:

2022_23	**Awards (14 No.)**	**%**
FASS	6	43%
FST	6	43%
FHM	1	7%
LUMS	1	7%

Professor Stephen Wilkinson would like to express the University's gratitude to the Trust for its generosity in providing this distinctive and important resource to support Lancaster University researchers. Panel members were extremely impressed by the number and quality of the applications received this year and are thrilled that 14 awards have been made to colleagues to undertake original research. We look forward to hearing about their results over the coming year.

Awarded Projects

John Childs

Lancaster Environment Centre **Amount requested and awarded £5,070**

The Political Geography of the Atlantic Deep Seabed: Decolonising Environmental Knowledge

This project seeks to develop alternative ways of describing, analysing, and mapping the Atlantic Ocean's floor. There is an unprecedented push to map the earth's entire seabed by the end of 2030. Rich scientific work, which can be seen as early contributions to the 'UN Decade of Ocean Science 2021-2030', is no doubt valuable as they develop mapping data that will be useful for a range of beneficiaries – from navigation to climate science, and from resource extraction to ocean conservation. Yet there has been little thought given to how such forms of knowledge production might come together with other ways of 'knowing' the seabed, notably from indigenous and decolonial perspectives, whose ancestors were lost to the violence of historic slavery in the Atlantic 'middle passage' (the forced voyage of enslaved Africans across the Atlantic). Challenging mainstream scientific accounts changes the way the deep seabed's legal-political understanding as 'the common heritage of mankind' might be evaluated. Intellectual development like this is crucial, in moving beyond *transatlantic* critiques with their emphasis on thinking *across* the ocean and towards thinking *with* it, towards a politics that includes *relevant* actors. Against this background, the project will use a combination of archival research and interviews to fulfil two related aims. Firstly, to analyse and reconfigure understanding of the mid-Atlantic seabed by connecting science with decolonial thought. Secondly, to analyse the political possibilities for understanding and mapping the mid-Atlantic through an engagement with decolonial creative practice. It is anticipated that the work generated by this project, while substantive, will lead to the development of a much larger, multi-partner funding proposal with The Leverhulme Trust focused on the seabed at a global scale.

Charlotte Baker

Languages and Cultures **Amount requested and awarded £9,590**

Advantage Africa, Autism Society of Kenya: Understanding the Educational Experiences of Children with Autism in Kenya

In East Africa, Autism Spectrum Disorder (ASD) is scarcely researched and often overlooked because of a tendency for disability studies in the region to concentrate on physical disabilities, deafness, and visual impairments, whilst side-lining learning disabilities, neurodiversity, and mental health conditions. Full participation in education for children with ASD is a challenge for countries throughout the world. In sub-Saharan Africa, the challenges are magnified by factors such as negative social attitudes and beliefs concerning disability, limited teacher training, and scarce educational resources. Our project aims to hear the voices of young people with ASD and their families in Kenya, to better understand the experiences of children with ASD and their families in gaining access to and participating in effective primary education. Disabled Persons' Organisations routinely report that the gap between policy goals and reality remains huge. Therefore, this project aims to contribute to the knowledge base by establishing and communicating the lived experiences, opinions, and perceptions of people with ASD, and their families, concerning their experiences of primary education.

Tom Web and Suzanne Hodge

Law School and Health Research **Amount requested and awarded £7,668**

Searching for the Community in the Mental Health Act 1983: Hospital Manager Panels, Local Justice, and Legitimacy

The Mental Health Act 1983 grants immense power to the state to constrain the liberty of mental health service users, potentially indefinitely. This multi-disciplinary project will provide the first empirical investigation – through a national survey – into the role of the community in legitimizing the system of compulsory care established by the Act. The community is brought into the Act through Hospital Manager Panels (HMPs), staffed by specially appointed local people; Associate Hospital Managers (AHMs). HMPs form one of several safeguards in the Act which are intended to monitor whether a compulsory care order (colloquially: a 'Section') requiring detention in a hospital or a Community Treatment Order, continues to be legally justified. AHMs sit in panels of three people; hear evidence from the service user, health and social

care professionals, and others; ask questions; and provide oral and written reasons for their decisions. Thousands of HMPs are convened by individual healthcare organisations (NHS Trusts, independent hospitals) every year. There is little data about how HMPs operate, who the panellists are, or how those subject to their decisions experience the panels. Through the survey we plan to address this and develop an understanding of HMPs from the perspective of AHMs and HMP users with regards to AHM demographics, values, experience, and knowledge; understanding of the function of HMPs; and how HMPs and AHMs are perceived by HMP users. Our findings will be shared with healthcare organisations, policymakers, service user groups, and other stakeholders to improve understanding of this process for the benefit of those subject to the Act.

Dawn Goodwin and Garrath Williams

Medical School and Politics, Philosophy & Religion **Amount requested and awarded £6,904**

'Inside Inquiries' in health and social care: scoping and preparatory work

In the UK, independent inquiries (I.I.) have become a key tool in governments' responses to high-profile organisational failures, disasters, or flagrant abuses of professional standards. Yet, despite their growing influence in society, there has been little investigation into the processes, experiences, and effects of inquiries. Existing research is fragmented across different fields of social science and takes an external view, being based on inquiry reports and media reporting. Little is known about the 'inside view' of I.I.: their internal workings, participants' expectations and experiences of them, and the human consequences associated with involvement. This project aims to establish what is known and what is not known about I.I. It will bring together the fragmented academic literature to consolidate the view from the outside. Doing so will strengthen our claim that 'the inside view' of I.I. is missing from the research literature and that the processes, experiences, and consequences of I.I. are poorly understood. We will undertake a systematic literature search and scoping review to 'map' the literature and the predominant concerns of each field with the intention of identifying and articulating where the gaps in understanding lie.

Racheal Heah and Gary Potter

Lancaster Law School **Amount requested and awarded £4,479**

The Animal Welfare (Sentience) Act 2022: What does it mean for Animal Welfare in practice?

With the passing of the Animal Welfare (Sentience) Act 2022, the UK has become one of about 33 countries in the world that explicitly recognise the sentience of animals. The Act establishes an Animal Sentience Committee, tasked with scrutinizing the extent to which the formulation or implementation of government policy has paid 'due regard to the ways in which the policy might have an adverse effect on the welfare of animals as sentient beings' (s.2(2) Animal Welfare (Sentience) Act 2022). The Animal Sentience Committee therefore has a broad mandate to scrutinise governmental policies in terms of their impact on animal welfare and could potentially make significant improvements to the way animals are treated in the UK. However, the term 'sentience' is not defined in the Act, although the focus on the 'adverse effect' of policies appears to indicate that more attention will be paid to pain and suffering, rather than to the consciousness of animals or their capacity to feel pleasure. Moreover, the Animal Sentience Committee is not mandated to scrutinise all government policies and therefore has wide discretion to select which policies it scrutinises. The Committee can then produce reports on the policies it scrutinises, and the reports may contain recommendations for the relevant government body (s. 2(3)), but nothing in the Act requires government bodies to accept or act on these recommendations. This project therefore seeks to set up a network of key actors in research, policy, and practice around animal rights and to facilitate discussions about the impact and significance of the 2022 Act via a 2-day workshop. We hope to be able to develop further thinking around questions such as the definition of animal 'sentience', the scope of the Animal Sentience Committee, and the impact that the Act could have on animal welfare and rights.

Fiona Edmonds and Chris Donaldson

History **Amount requested and awarded £6,810**

The Victoria County History of Cumbria: Diversifying Coverage and Volunteer Participation

The Victoria County History (VCH) of Cumbria is the regional element of a longstanding project to write an encyclopaedic history of every place in England. The Cumbrian project is a partnership between the Regional Heritage Centre at Lancaster University and Cumbria County History Trust (CCHT), which provides a community focus for volunteer activity and fundraising. Since 2010, VCH Cumbria has pioneered a

participatory research method that enables volunteers to write the histories of their chosen places under the guidance of Lancaster University's historians. So far, over 100 volunteers have been involved; we are now ambitious to diversify our volunteer network across Cumbria. The Joy Welch scheme will enable the project's Research Associate, Dr. Sarah Rose, to conduct a feasibility study in Carlisle and Whitehaven, with three objectives: (1) to consult local organisations (we aim to diversify the volunteer network by involving new groups); (2) to produce scoping reports for the future regional publications (known as 'Red Books') for Carlisle and Whitehaven; (3) to assist Cumbria County History Trust in developing a major grant application for the next phase of the VCH Cumbria project.

Rachel Platel

Chemistry **Amount requested and awarded £7,747**

New Biodegradable Plastics for Packaging Applications in a Circular Economy

Our society faces a plastic waste crisis, coupled with the urgent need to reduce our dependence on oil and gas and transition to a circular economy. However, plastics are integral to our lives due to their appealing properties and find applications in all areas of everyday life. In the past few decades there has been increased research interest in making plastics that are biodegradable and that can be made from renewable feedstocks, showing the transition to a circular economy in plastic production is possible. Some biodegradable plastics are now produced commercially. However, the field of research is still in its infancy, and critical properties (e.g., mechanical, gas, and moisture transport properties) of such plastics are often inferior to those of conventional polymers, preventing them from being used very widely (e.g., in food packaging). In this project we will make polymers that combine two different monomer building blocks with complementary properties, using catalysts developed previously in our research group. By controlling the distribution of the monomer building blocks in the polymer chains, polymers with different properties will be prepared. The properties of these materials (thermal, physical, mechanical, and gas barrier properties) will be evaluated using a range of characterisation techniques, and their suitability for a variety of applications evaluated.

Dayo Eseonu

Politics, Philosophy, and Religion **Amount requested and awarded £5,840**

Co-designing the racially just city

The global #BlackLivesMatter movement and the COVID-19 pandemic have refocused our attention on the deepening racial inequalities that persist in the UK. Increasingly practical solutions to addressing these inequalities are being sought but the pertinent question of how racial justice can be achieved remains. This project aims to explore one possible solution, a racially just city. Extending Fanstein's work, a racially just city is one in which racially minoritised people who bear the brunt of racial inequalities are involved in the governance processes which determine public policy priorities to ensure that they benefit from the city's political, economic, and social resources. Consequently, this project will be using co-production with young people and with urban practitioners, an innovative use of a combination of creative and participatory methods in the city of Manchester, United Kingdom. This project will centre young people's views of racial inequalities and their aspirations for a racially just city because youth is a critical moment when life courses are established. By convening spaces where policymakers and young people can work together, this project seeks to collectively co-design what racially just policies in Manchester could look like. It is anticipated that this project will provide substantive content of policies and policy priorities that can address racial inequalities. It will also identify the governance institutions that facilitate or constrain the realisation of a racially just city which could serve as a journey planner for other places who wish to become racially just.

Radka Newton

Entrepreneurship and Strategy **Amount requested and awarded £6,380**

Regenerative place stewardship in local entrepreneurial ecosystems

Consider that the armchairs you sit on at university are likely made from recycled security uniforms from a local company set up by a Lancaster entrepreneur. Most entrepreneurs show great commitment to the place of their business, pride, and emotional sentiment that has come with their sense of giving back to the community. We see many embedded in local communities and recently there has been a more conscious effort to connect within the place-based ecosystems and join forces to ensure the places around them thrive and flourish. One of our local entrepreneurs who is fifth generation in her business pointed out:

"Entrepreneurs are wealth creators and I think they need to understand where they sit in the ecosystem of their place and where they sit in their supply chains and not over-extract from it." This quote inspired this research project that aims to enquire how the place-attachment of these conscious entrepreneurs leads to regenerative enterprise activities contributing positively to place-making and demonstrating more than sustainable actions. We will explore how entrepreneurs care for, utilize knowledge, and apply agency within their entrepreneurial activities to actively regenerate places around them and cultivate a network of personal and societal relationships. Our objective is to enhance our understanding of regenerative entrepreneurship practices and how these contribute to sustainable regional development. In more depth, we will consider the process through which entrepreneurs translate knowledge and agency to the places in which they operate to create novel relationships to place and pursue sustainable place-making practices.

Frederick Otu-Larbi

Lancaster Environment Centre **Amount requested and awarded £9,510**

Biosphere-Atmosphere Interaction in the Tropics (BAIT): Ozone Impacts on Tropical Forest Carbon Storage

Tropical forests are important in global climate change mitigation strategies due to their massive carbon storage capacity. However, these tropical forests face unprecedented environmental and biological threats that negatively affect their growth and limit their ability to capture and store carbon dioxide from the atmosphere. Rising surface concentrations of ozone (O_3) are one of these threats. Ozone damages leaves reducing photosynthesis rates and plant growth. In this project, ozone concentrations will be monitored at multiple heights within a tropical forest ecosystem in Ghana, West Africa, using a fast ozone analyser. These measurements will complement ongoing research in Ghana to monitor carbon dioxide and water vapour fluxes within a moist tropical forest. The data obtained will be used to investigate the impact of ozone damage on forest carbon capture with the help of land surface models. The outcome of this project will allow for projections of how ozone damage may reduce the future capacity of tropical forests to sequester carbon dioxide and any impacts this may have on global climate change mitigation efforts.

Isobel Hook

Physics **Amount requested and awarded £6,300**

Supernovae and the accelerating universe: commissioning and first data from 4MOST

The field of cosmology is about to be revolutionised by a torrent of data from new instruments and telescopes. A primary goal of these facilities is to gain a better understanding of the properties of the mysterious "dark energy" that is believed to be responsible for the accelerating expansion of the universe. Lancaster University has previously invested 100kEuro in the 4MOST instrument, which will be capable of obtaining spectra of up to 2400 astronomical sources simultaneously. This investment enabled me to join colleagues from 3 other UK universities in the creation of the Time Domain Extragalactic Survey (TiDES) project. TiDES will use 4MOST over a period of 5 years to obtain spectra of supernovae and their host galaxies for use as calibrated "standard candles" (or distance indicators) for cosmology. Construction of the 4MOST instrument is nearing completion, and it will be shipped from its current location in Germany to the VISTA telescope in Chile in late 2023 or early 2024. This grant provides travel funds for a Lancaster graduate student and me to join the 4MOST commissioning team in Chile, where we will test the instrument on the telescope and prepare it for scientific observations. In the following months, we will work with our collaborators in the UK to obtain and analyse the first spectra and begin using the spectra to improve the power of supernovae as cosmological distance indicators. The grant will also fund travel to present initial results at an international meeting in the summer of 2024. This project covers the first phase of the TiDES survey that will then run for 5 years, with the ultimate goal of measuring the properties of dark energy to the highest precision yet thereby constraining models for the nature of dark energy.

Carly Stevens, Ce Zhang, and Duncan Whyatt

Lancaster Environment Centre **Amount requested £13,562 and awarded £11,340**

Quantifying the spread of soft rush in the UK: A machine learning approach

Rushes are competitive plants that grow in areas of high rainfall, including Great Britain's upland grasslands and are fast becoming a problem in UK agriculture. Because grazing animals won't eat them and they spread quickly they are coming to dominate some areas of pasture, especially in upland areas. When rushes take over, they reduce biodiversity and agricultural productivity. The increase in rushes is most likely due to a

combination of climate change and a change in grazing practices but the expansion of rushes has not been fully documented. Our initial research, focussed on the Northwest Pennines showed an increase in rush cover of 82%. This project will build upon our initial work of looking at how rushes have expanded over a larger area and how this pattern has changed over time. To do this we will use machine learning techniques and apply them to satellite images. Machine learning can provide us with a robust method for image analysis. Similar techniques have been used to map different types of vegetation, but this approach has never been applied to rushes. We will download a large database of images from appropriate areas and use this to produce a dataset to train the machine learning software and then validate and test it. The output will be a series of maps for upland regions of the UK that show the probability of rush occurrence and how it has been changing over time. Ultimately, we hope that our research will inform agricultural land use policies and decision-making.

Hannah Stewart

Psychology **Amount requested and awarded £8,801**

Using virtual reality to test children's listening

Around 13% of the world's children (<18 y.o.) have disabling hearing loss, normally diagnosed with an audiogram. The history of measuring hearing goes back nearly 100 years, but it has always been constrained by testing conditions bearing little resemblance to life-like settings. This is especially true for children, who often perform differently in an unfamiliar lab or clinic environment where traditional hearing assessments require them (the listener) to sit alone in a sound-proof booth listening through headphones or loudspeaker(s). This project's overall aim is to use 4D audiovisual virtual reality (VR) to assess speech hearing more fully. This will allow more accurate diagnosis and more effective interventions. Typically, speech-in-noise (SiN) tasks are presented with a target talker in front of the listener and a distracting talker behind, and the listener is scored on how accurately they repeat back what the target talker said. Contrary to real-life listening experiences these assessments provide no variation in room reverberation, talker speed, or require the listener to integrate auditory information with visual. Currently, no child-friendly listening assessment can do this. VR environments look and sound real and feel natural and believable. Training conducted in VR translates back to real-world ability (e.g., surgery training) and the control and realism of VR scenarios allow for a more direct interpretation of results, thus enabling faster development of tests and effective interventions for children.

PI Ian Gregory

History **Amount requested and awarded £9,861**

A digital approach to analysing the medieval 'urban genome'

The project will develop new insights into the origins and evolution of medieval towns and will test the potential of applying Natural Language Processing (NLP) approaches to difficult sources, namely transcriptions of medieval documents. The project brings together cross-disciplinary expertise within Lancaster, namely in Digital Humanities (Gregory, History) and NLP (Rayson, SCC), with external expertise in Historical Geography (Prof K. Lilley, Geography, Queen's University Belfast). It will provide proof-of-concept for a large grant application provisionally to a joint AHRC-DFG (German Research Foundation) scheme. Europe's towns owe much to the medieval period, yet little is currently known about their origins and the human processes that materially shaped them. Historiography tends to divide medieval towns into two types: 'planned' and 'organic'. We hypothesise that this binary distinction is oversimplistic with various approaches and mechanisms being involved in early urban formation. Thus, the genesis of urban Europe requires more systematic and empirical study. This proof-of-concept analysis of the 'urban genome' is an essential first step that will result in the first major project to use digital technology to understand medieval textual sources and urban origins. It also has important impact potential as the long-term consequences of the medieval urban structure are still evident today, with relevance to UK enterprise organisations, heritage groups, and planners aiming to re-invigorate town centres through initiatives such as High Street Heritage Action Zones (HSHAZ).