Grants in focus in this issue include:

- Beetlebums, buried kidneys and the art of drinking through one’s rectum
- A fizzle or a bang: how fast was the Cambrian ‘explosion’?
- Communication and community in medieval Norway, c. 1000–1250
- Menstruation and the media: reducing stigma and tackling period poverty
- Moving, making, meaning: manuports in the archaeology of the Bronze Age Aegean

Accessing ancient solar records on the moon
Director’s Note

Just Ask

This issue of the Newsletter features listings and articles from recent recipients of Study Abroad Studentships, Research Project Grants, Early Career and Emeritus Fellowships. The range of topics to be investigated is truly impressive. Such breadth seems to be welcomed by the academic community.

However, for those who are new to Leverhulme, I should emphasize that there are limits to eligibility for Trust funding. In particular we do not support activity in any of the following areas:

- Medical research into disease, illness and disabilities in humans and animals, or research that is intended to inform clinical practice or the development of medical applications.
- Policy-driven research where the principal objective is to assemble an evidence base for immediate policy initiatives.
- Research of which advocacy forms an explicit component.
- Research which is aimed principally at an immediate commercial application.
- Applications in which the balance between assembling a database and the related subsequent research is heavily inclined to the former.
- Applications in which the main focus is on capacity building, networking, or the development of the skills of those involved.

There is a specific justification behind each of these exclusions. What they have in common is that such activities are already well supported by other agencies. By contrast, discovery-led research (curiosity-driven or ‘blue-skies’ work) often finds itself being squeezed out, as the demand for ‘relevance’ or ‘impact’ steadily grows. In that context, higher-risk fundamental or speculative inquiry may seem to have little to contribute, beyond a (perhaps) better understanding of our world and ourselves. Outcomes are uncertain. The Trust has a keen appetite for this type of proposal.

All of which leads me to the simple injunction that, if you think your proposal may fall into one of the subject areas or activities that the Trust does not fund, please do approach us informally by email before settling down to prepare your application. A couple of indicative paragraphs at this stage may spare everyone involved a great deal of wasted effort further down the line. Here in the office, we cannot comment on the quality of your intended bid, but we can at least offer applicants an authoritative ruling on whether or not their bid for funding will be eligible for consideration.

Professor Gordon Marshall

Scheme News

Recently opened funding rounds

The Trust is currently processing applications for the following grant schemes:

**Visiting Professorships** – maintenance, travel expenses and research costs for between three and 12 months, awarded to UK institutions that wish to invite an eminent researcher from overseas to enhance the knowledge and skills of academic staff or the student body within the host institution.

Closing date: 10 October 2019

**Research Fellowships** – up to £55,000 for three to 24 months, for experienced researchers, particularly those whose day-to-day responsibilities have prevented them from completing a programme of research.

Closing date: 7 November 2019

**International Academic Fellowships** – up to £45,000, for established researchers to spend three to 24 months in overseas research centres.

Closing date: 7 November 2019

**Study Abroad Studentships** – maintenance costs of £21,000, a dependant allowance and travel costs for between 12 and 24 months to support advanced study or research at a centre of learning in any overseas country, except the USA.

Closing date: 13 January 2020

**Emeritus Fellowships** – research expenses of up to £24,000 for three to 24 months for senior researchers, retired from an academic post, to complete a research project and prepare the results for publication.

Closing date: 30 January 2020

**Research Project Grants** – up to £500,000 for up to five years, for researchers based at universities, institutions of higher education or registered charities with university-equivalent research capacity based in the UK, to undertake an innovative and original research project.

Outline Applications are welcome at any time: there are no deadlines

For full details on eligibility and how to apply, see [www.leverhulme.ac.uk/schemes-at-a-glance](http://www.leverhulme.ac.uk/schemes-at-a-glance)

Cover image: geological sampling of the lunar regolith by commander David Scott during the Apollo 15 mission (image: NASA AS15-82-11146).
Communication and community in medieval Norway, c. 1000–1250

Dr Ben Allport
Study Abroad Studentship

As a visiting researcher at the University of Bergen in Norway, Ben Allport’s exciting new project will extend modern methods of social analysis to the High Medieval period.

When we think of medieval society, we often imagine feudal structures and hierarchies of kings, barons, tenants and serfs, but – as medievalist scholars have increasingly recognised – these models don’t explain how the stability of emerging medieval kingdoms was established in the collective minds of the communities that comprised them, particularly in an age where mass media did not exist to constantly promote unity. How were the leaders of medieval society able to maintain their social role and a sense of unity even among people whom they did not regularly see: people they might never meet, or might never meet one another? This is a particularly interesting question to apply to medieval Norway – my own area of specialisation – because the fjord-riven coastline and mountainous interior of western Scandinavia posed unique challenges to communication and centralised royal control. In order to bring a new approach to discourse on this topic and find new models of social cohesion, I am applying a method known as Social Network Analysis (SNA) to the corpus of texts known as the Kings’ sagas: contemporary narratives written by Icelanders with lofty Norwegian connections.

SNA involves creating a database for a given social group in which every individual and every relationship they have within the group is recorded. The sagas are ideal for analysis of this sort because their authors were obsessed with recording every minute connection between the individuals they mentioned. This data can then be analysed to identify the most ‘central’ individuals in a social group: those with the greatest number of relationships, or those who are connected to everyone else by the fewest degrees of separation. Using this methodology, I hope to determine who occupied the most prominent positions in the regional communities of Norway: was it the king and his representatives, or perhaps the traditional nobility who had been prominent even before the unification of Norway in the eleventh century? How (and through whom) was power mediated from the crown?
Understanding the ability of Herdwick sheep to thrive in harsh environments

Professor Dianna Bowles
University of York
Emeritus Fellowship

Many of us, walking in the high fells of Cumbria have seen Herdwick sheep often in the toughest terrains of the landscape; Dianna Bowles’ project investigates how they are thriving in conditions too hostile to support other breeds.

Herdwicks exist in large numbers – some 60,000. They are not a ‘rare breed’, but more than 90% live within a single geographical region and are recognised as an essential contribution to the Lake District UNESCO World Heritage Site.

Commercial fell farming of Herdwick helps sustain the local economy and is essential for the continued management of the natural environment and the biodiversity supported by hill farming, sheep and a way of life that has worked with nature for generations.

I am a molecular scientist by training with a career studying the unique abilities of plants. But, I have also lived in the Uplands for 30 years and have become intrigued to learn more of native sheep breeds and how they can be farmed successfully with far greater sustainability than the systems required for ‘high input’ mainstream continental breeds.

A feature of each native breed is their adaptation to the environment within which they flourish. For Herdwick, this local adaptation is to the high fells of the Lakes – the ewes produce and rear a lamb with ease in harsh environments with only grass to eat. She can ‘hold her own’ even under these conditions. And now, farming, science and technology coming together can provide the means to understand this unique adaptive capability.

Building on the fact we showed that Herdwick sheep have features of an ancient genome not found in other UK breeds, The Sheep Trust gained funding to study their genetics within the landscapes the sheep inhabit. This combined the sheep, their hill farmers and science specialists. My project is bringing this foundation work to fruition.

Genome-wide association studies can pinpoint links between single molecular changes within a gene of an individual sheep and the external conditions within which that sheep exists. Also, tens of thousands of these changes, different ‘single nucleotide polymorphisms’, have already been discovered in many different sheep breeds across the world, associated with climatic variables and features such as resistance to parasites, type of fleece, muscle and fat gain.

We will be using these data, targeted DNA sequencing and machine learning to identify genes and explore the causal biochemical pathways that will enable us to ‘know a Herdwick’ for the first time.
Menstruation and the media: reducing stigma and tackling period poverty

Dr Maria Tomlinson
University of Sheffield
Early Career Fellowship

Maria Tomlinson’s timely and interdisciplinary study will evaluate whether the increasing visibility of menstruation in traditional and social media has positively impacted young women’s attitudes towards and experiences of menstruation.

During 2015, which was later dubbed “The Year of the Period” by women’s magazines, menstruation became an increasingly visible topic in both social and traditional media alike. Menstrual activists across the globe have used these media to both challenge menstrual stigma and to raise awareness of period poverty. In India, for example, the #HappyToBleed movement was launched as a protest against a temple chief who stated that he would not allow women into his shrine because they menstruate. This hashtag went viral and became a banner under which women celebrated menstruation and shared their personal experiences. In 2016, the musician Kiran Ghandi gained worldwide media attention by running the London marathon whilst visibly menstruating onto her leggings. She claimed that she was not wearing menstrual products in order to raise awareness of period poverty and challenge stigma. Members of the LGBTQ+ community have also joined in the conversation on social media so as to raise awareness that it is not solely cis-gender women who menstruate. We have witnessed the success of menstrual activism in England with the recent announcement by the government that free menstrual products will be supplied in all English secondary schools.

It is less clear, however, if menstrual activism has had an impact on how menstruation is perceived by the UK population. Has the increasing visibility of menstruation in the media actually engendered British people to see menstruation in a less stigmatised and more positive light? As someone who has been following this wave of activism since it began in 2015, due to my doctoral research on representations of menstruation in French literature, I am intrigued to find out the answer. Teenagers will be the focal point of my project because they are often targeted by menstrual activists and are particularly vulnerable to period poverty since it can lead to their missing school. I will conduct focus groups with a diverse group of 15–18 year olds across schools in Yorkshire, which is an area in which period poverty is particularly pronounced. I will also interview teachers, community leaders and menstrual activists. At the end of my project, I look forward to sharing my findings with the schools in order to promote body positivity. If young adults feel less embarrassed about their menstrual experiences, they are more likely to openly discuss any related issues they may be facing and they will feel more confident within themselves.
How convicts connected the world: unfree labour on British and imperial dockyards

Dr Katherine Roscoe
University of Liverpool
Early Career Fellowship

Quantifying convicts’ economic contribution, Katherine Roscoe’s project places penal labour into histories of globalisation, industrialisation and technological modernisation

In the mid-nineteenth century, steam-power technology transformed the speed at which ships could travel across oceans. To meet these new technological requirements, tens of thousands of convicted British and Irish men were coerced into labouring on projects to modernise the dockyards at home and across the Empire. In sites of military and commercial importance, convicted felons quarried thousands of cubic metres of stone, which they moved in barrows and barges to build essential maritime infrastructure, like breakwaters and dry docks. I will analyse the contribution of convicts to these maritime public works projects. By foregrounding the convicts’ role in fostering global connectivity, this project asks us to rethink how unfreedom helped create conditions of modernity.

Convicts, housed on prison hulks, had worked on naval projects along the Thames since 1776. However, the 1830s steam revolution required the mass deployment of able-bodied men to maritime public works across Britain and Ireland – to places like Portsmouth Convict Prison (1852–1894) and Portland Admiralty Works (1848–1903) in the south of England; and Spike Island and Haulbowline Dockyard (1847–1883) in Co. Cork, Ireland. After working on maritime public works at home, long-sentence men were transported abroad. In 1853, Australia finally closed its doors to convicts, but the British government continued sending able-bodied male prisoners to work on the Royal Naval Dockyards in Bermuda (1824–1864) and Gibraltar (1842–1875).

In this project, I place British convict labour within a global context. Using digital methods to create ‘life-geographies’, tracing how convicts and prison staff moved across the British Empire and what kinds of work they were engaged in at different locations (whether under punishment or after release). This will help me understand how new ideas about managing convict labour travelled globally and how ‘rehabilitative’ maritime public works projects actually were for convicts as they travelled through the imperial penal system. Did convicts gain useful skills in maritime industries and if so, did they help them find work after release? Were these skills most in demand at home, or were convicts more likely to emigrate abroad after serving their sentence? This project shrinks the personal and the global into one frame, showing how individual convicts both enabled global journeys for others, by updating dockyards for the steam revolution and travelled overseas themselves.
‘Once Upon a Time …’: exploring colonial narratives in the Brexit campaign

Miss Alice Beazer
Study Abroad Studentship

Alice Beazer seeks to uncover the way in which historical references to WWII and colonialism were used and abused throughout the pro-Brexit campaign

“The trouble with the English is that their history happened overseas, so they don’t know what it means”
– Salman Rushdie, The Satanic Verses

Three years on from the divisive 2016 Brexit referendum, alongside exhaustive media coverage, an abundance of academic studies have speculated, explored and uncovered several factors contributing towards the unexpected outcome of the vote. So far, research has identified the presence of anti-immigration attitudes, long-standing negative attitudes towards European integration, increasing economic inequality and the distrust of an out-of-touch socio-political elite as factors motivating the decision to ‘Vote Leave’. Whilst these studies are indeed useful and can help to shed light on the causes of the vote, key elements of the debate continue to be neglected. Namely, the way in which historical narratives of colonialism were used and abused within the campaign.

Many European nations have colonial histories, but the extent to which the collective memory of this historical period continues to influence contemporary political discourse is arguably a uniquely British phenomenon. What’s more, the outcome of the Brexit vote served to legitimise extreme attitudes – and in some cases, racist attacks – across the country, warranting critical academic attention. Moving beyond UK borders, it is arguable that the case of Brexit represents a much larger process of rising right-wing, nationalist attitudes across Europe.

The speeches, imagery and social media posts used by pro-Brexit campaigners frequently referenced colonialism, WWII and celebrated nationalist ideals, constructing a narrative of the UK as a dominant and ‘noble’ power. This deeply romanticised notion of an imperial past – and present – needs to be thoroughly and critically investigated. Examining the text and material used by pro-Brexit campaign groups will shed light on the ideological motivations underpinning the campaign and expose the specific ways in which the collective memory of the UK’s colonial past was used to persuade voters to choose ‘Leave’ at the ballot box.

My research will draw upon and contribute to studies of nationalism, identity, collective memory and populism, bridging the gap between sociological, political and cultural studies. It will also build upon my previous research which explored colonial discourse in the right-wing press.
Many of us have made manuports. At one point or another, upon visiting a shingle beach, we have reached down and gathered a pebble or two, before bringing them home to place in our garden, on our windowsill, or in our collection.

It is in this way that the pebble becomes an example of a ‘manuport’, defined in archaeology as ‘an artefact or natural object that is transported, but not necessarily modified, and deposited by humans’. It is ‘made’ by human action, yet not through the processes of manufacture or physical modification we usually associate with production. Rather, it is changed through its conscious movement from one place to another, a process which in turn enacts a conceptual transition between (our) categories of ‘natural’ and ‘artificial’.

Whether pebble, shell or stone, manuports are found at sites of ritual, social and political importance across the Bronze Age Aegean (3100–1100 BCE). However, although concentrations of manuports are present at a range of sites including tombs, peak sanctuaries, shrines, residential areas and ‘palatial’ complexes, it speaks to manuports’ under-representation that they are frequently excluded from interpretative analyses and the term’s definition and substantial interpretative implications have yet to be examined.

In its application of a range of interdisciplinary approaches – from anthropological theory to digital mapping – my research will investigate the potential journeys which led to the manuports’ deposition at these sites, both in terms of geographical distance, route and points of origin and in relation to embodied experience and repeated, communal action.

Based at the British School at Athens, my research will encourage the recognition of manuports as significant and meaningful artefacts in the archaeology of the Minoan, Mycenaean and Cycladic worlds. Through the cataloguing, contextualisation and interpretative discussion of manuports from these interrelated Bronze Age civilisations, my project will emphasise the importance of manuports as items which were socially and symbolically produced, affording renewed insight into prehistoric practices and perspectives.
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To understand one of the most
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Insects can live and thrive in some of the most inhospitable
environments on earth, including exceptionally desiccating
conditions such as deserts. In order to make a living in such
places some species have evolved specialised anatomical and
physiological tricks to avoid dehydration. One of them – a
powerful water-extraction system used to recover water
from excreta in the rectum and recycle it back to the body
– is the ‘buried kidney’ (or cryptonephridial) complex. This
complex is so efficient it can extract every trace of water
to produce powder-dry excreta. For species living in arid
conditions it is a crucial mechanism to conserve water.

The buried kidney complex is widespread in insects, but
beetles harness its power in a novel and impressive way—they
use it to take-up water from their environment. For example,
there are beetle species, such as those living in the Namib
desert in Africa where it rains less than half an inch a year,
that seize the chance to harvest water from fog-laden winds
that blow in from the sea. Basking in the fog with their rear
ends protruding, the beetles use the cryptonephridial complex
to absorb water vapour directly through their rectum.

The most important feature of the system is the
arrangement of the kidney tubules and rectum. The tubules
are arranged along the rectum but in opposite orientation,
so that fluid flow through the tubules is counterflow
through the rectum. The tubules concentrate very high
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Despite having an important role in insect physiology,
ecology and evolution there is still much to learn about
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In collaboration with Kenneth Halberg’s lab at the
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*Beetlebums, buried kidneys and the art of drinking through one’s rectum*

Dr Barry Denholm
University of Edinburgh
Research Project Grant

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The Sun is a 4.56 billion year (Ga) old G-type main sequence star. It emits electrons, protons and charged particles from its upper atmosphere (corona), forming a flow of solar wind out into the surrounding Solar System. Our understanding of the Sun’s past activity comes from modelling efforts and astronomical observations of the life cycles of similar mass stars. The young Sun likely first went through a highly active ‘T-Tauri’ phase that lasted for approximately 2 million years. By the time the Sun was 700 million years old, although it was 30% less luminous than the present day, powerful solar flares and coronal mass ejections (CMEs) may have been much more common and energetic than today. It has been postulated that such dramatic space weather might have contributed to the composition of Earth’s early atmosphere and could have had a heating effect, possibly creating a habitable terrestrial environment prior to 3.8 Ga ago suitable for the development of life. Thus, it is important that we understand the early evolution of the Sun, in order to understand the evolution of planetary surfaces, atmospheres and habitability in the early Solar System.

It is not easy to use the Earth itself to test models of energetic solar wind emission because our planet’s surface is too geologically active to have preserved such ancient (> 3.8 Ga old) rock records. The Moon, by nature of its closeness to the Earth, ancient surface and lack of persistent atmosphere or magnetosphere, may better preserve records of the early solar wind implanted directly into the rocks and soils on its surface. However, interpretation of this archive is complicated by geological heterogeneity and Space–Moon interface processes such as regolith (soil) formation and impact gardening, diurnal heating cycles, sputtering effects and loss of volatiles from high energy solar wind implantation and contributions of radionuclides formed from spallation reactions from solar and galactic cosmic rays in the near lunar surface environment.

In our new Leverhulme Trust research project we will focus on noble gas isotopes records within different Apollo rock and soil samples to better understand the physiochemical reactions that trace the Moon’s surface as an interface with the solar wind through time. The ultimate aim of the project’s long-term goal is to compare the solar wind records archived within different types of lunar samples, with the view to answer the important science question of whether the solar wind (and by proxy the solar radiation) has changed over time. The analytical techniques developed through the project will help to enhance extra-terrestrial sample analysis capabilities in preparation for future sampling missions.

Using samples collected by the Apollo astronauts, Katherine Joy and her team will investigate how the Moon’s surface is an archive of the Sun’s past activity.
The ensemble music of Pierre Boulez

Dr Peter O’Hagan
Roehampton University
Emeritus Fellowship

Peter O’Hagan’s study will provide fresh insights into the development of the musical style and technique of Pierre Boulez during the second half of the twentieth century and beyond.

Of the generation of European composers who emerged during the post-war period, Pierre Boulez is arguably the pre-eminent figure. During his long career as composer, conductor and commentator, he left an indelible mark on the music of the second half of the twentieth century. Following the composer’s death in 2016, his personal archive was divided between the Paul Sacher Stiftung Basel (music manuscripts and sketches) and the BNF Paris (book collection, letters and documents).

My programme of research is based on an investigation of this recently available material and the possibilities it offers for fresh insights into Boulez’s music – both the compositional process itself and the literary and artistic background to the works. It will be focused specifically on two representative works for ensemble chosen from different periods in the composer’s career; the early masterpiece, Le Marteau sans maître and the late sur Incises, a large-scale work written for an ensemble featuring three pianos. Material now available at the Paul Sacher Foundation, Basel includes the extensive sketches for the latter work and a study of this material will form the basis of an investigation into Boulez’s stylistic development during the final two decades of his life. This research will be complemented by an examination of the artistic relationship between Boulez and the work’s dedicatee, Paul Sacher, based on a study of their unpublished correspondence.

Although Le Marteau sans maître is one of the most celebrated works of the post-war period, there has been no full-length study in English for over thirty years. It is intended to make a fresh study of the genesis of the work, focusing on the impact of Boulez’s journeys to Brazil during the period and including a study of the relevant annotated texts from his library and of the unpublished letters between Boulez and René Char.

In addition to these specific areas of research, there remains the status of the various ‘works in progress’, which were left unfinished at the time of Boulez’s death. There is some evidence from interviews with the composer that work continued on some of these compositions and it is intended to make a preliminary study of the material as it becomes available over the course of the next two years. It is anticipated that an outcome of the research will be to offer new perspectives on the achievement of one of the most significant creative figures of his era and more generally on the development of musical style during the second half of the twentieth century.
Women of power have long been perceived as problematic figures, able to threaten social frameworks and defy traditionally assigned gender roles. This has caused them to be celebrated as well as reviled from before classical times to the present, but they played particularly potent roles in the late medieval and early modern period. The aim of my research project is to investigate the literary and iconographic tradition of famous women from antiquity who challenged the social expectations of medieval and Renaissance Europe by exercising ‘masculine’ virtues or vices. These heroines provide examples of strength, courage and ambition, qualities which were not in line with the virtues traditionally required of a woman in medieval and Renaissance society; moreover, the deeds that made them famous were performed by means of morally ambiguous behaviour, which tended to confound the categories of virtue and vice, praise and blame. Despite this, these controversial heroines were included in fourteenth- to early-seventeenth-century catalogues of famous women, discussed in the educational literature and depicted in the visual arts.

What model did they provide for medieval and Renaissance women? Were they merely offering an example of how not to behave or did they also somehow offer a positive model? Most crucially, what kind of contribution did they make to the developing notions of female identity between the medieval and early modern periods?

By focusing on the most popular heroines of this type, taken from ancient myth and history, as well as from the Old Testament (e.g., Medea, Penthesilea, Cleopatra and Judith), my research discusses the vast tradition of famous women as most notably developed in France and Italy from c. 1350 to 1620 – from the emergence of a female canon in the writings of Giovanni Boccaccio and Christine de Pizan to the women-filled art of Artemisia Gentileschi. My project argues that ambiguous models from antiquity had a more significant and multifaceted impact on the formation of female identity than has previously been acknowledged. Not only will it reorient the focus in the field, which in art history, gender studies and material culture concerns mainly positive, rather than problematic, female characters (e.g. the Roman Lucretia or the Biblical Susannah); but it will also demonstrate the complexity of the interplay between the re-appropriation of ancient models and their manipulation to suit contemporary concerns and societies, contributing to the debate about women and power that still resonates so strongly today.
A fizzle or a bang: how fast was the Cambrian ‘explosion’?

Dr Martin Smith
Durham University
Research Project Grant

Our understanding of the Cambrian ‘explosion’ is fundamentally incomplete; Martin Smith’s team aim to fill in the gaps, developing mathematical techniques to establish the rate at which animal biodiversity arose.

Earth’s oceans teem with animal life. The rapid appearance of this great biodiversity in the Cambrian period, some 530 million years ago, seems to eclipse all other evolutionary radiations in pace and magnitude; it rewrote the geological rules that govern Earth’s atmosphere, oceans and sediments. Most animal body plans trace their origins to this time and those lost to extinction have never been replaced.

Was the earliest Cambrian a unique period of evolutionary experimentation? If so, the Cambrian explosion of diversity was a singular event requiring special explanation, beyond the laws that govern evolution today. Alternatively, could the ‘unparalleled’ rate of Cambrian evolution be an artefact of preservation bias, imprecise correlation and outdated classification practices? As these factors obscure the timeline of Cambrian evolution, it is difficult to compare the rate of innovation to that of subsequent evolutionary radiations, or to disentangle environmental and evolutionary causes from effects.

This research project will map the evidence of palaeontological, sedimentological and geochemical change from the global rock record onto a common timeline, seeing beyond preservational biases to reconstruct the true evolutionary trajectory of the Cambrian radiation.

To establish the relative ages of rock sequences in the Cambrian, we will adapt established archaeological techniques for use in deep time. We will also develop a new model of morphological evolution, allowing us to link fossil finds of known ages to points in the tree of life. In concert, these models will reveal when new animal lineages originated and how rapidly they accumulated morphological innovations – ultimately establishing the feedbacks and interactions between early animal life and the planetary-scale environment changes that characterise the Cambrian period.

The alien-looking life-forms of the Cambrian underline the surprising diversity of early and modern life. The unexpected richness of early animal communities touches on many big questions, such as the origins and value of complex life and biodiversity and whether the broad path of evolution is inevitable or indeterminable. Darwin himself considered the Cambrian explosion to be a major obstacle to his theory of evolution and the fossil record has been pressed into service in opposition to and defence of this point. A new perspective on this iconic period will illuminate these questions that fascinate the public imagination and will open up the Cambrian explosion to the level of investigative rigour that can be applied to more recent evolutionary radiations.

Clockwise from top left: a fossil of Halkieria, characterising the strange appearance of Cambrian organisms; the distinctive teeth and burrows of Ottoia and related worms are widespread in Cambrian rocks and will help to chronicle the spread of new body types and modes of life; a fossil of Wiwaxia another characteristically unusual Cambrian organism.

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Grants Awarded between May and August 2019

Research Project Grants

**Sciences**

**Professor Dave Adams**  
University of Glasgow  
*Spatially- and temporally-controlled photothermal gels*  
£180,491

**Dr Donna Arnold**  
University of Kent  
*Designing magnetic materials with new frustrated topographies*  
£142,016

**Dr Patric Bach**  
University of Plymouth  
*Social perception as Bayesian hypothesis testing and revision*  
£462,995

**Dr Rebecca Bell**  
Imperial College London  
*Why do subduction zones exhibit widely-contrasting seismic behaviour?*  
£232,968

**Professor Robert Angus**  
University of Manchester  
*Electrowetting on conductors: fundamentals and applications*  
£181,225

**Dr Thomas Dyer**  
University of Dundee  
*Engineering harbour surfaces to limit colonisation by invasive species*  
£59,157

**Dr Peter Ellis**  
University of Kent  
*Mechanisms of meiotic drive: how do genes break Mendel’s laws?*  
£282,184

**Dr Katie Jayne Field**  
University of Leeds  
*Friend or foe; who wins in the competition for plant resources?*  
£464,540

**Professor David Goulson**  
University of Sussex  
*Beyond traditional molecular replication*  
£292,249

**Professor Mark Pagel**  
University of Oxford  
*The fabric of macroevolution*  
£183,262

**Professor Phillip Poole**  
University of Oxford  
*Imaging bacterial chemotaxis to roots: role of the global regulator PTSNtr*  
£122,616

**Professor Vivek Ranade**  
Queen’s University Belfast  
*Oxidative desulphurisation without using any catalyst and external oxidant*  
£199,097

**Dr Neil Rees**  
University of Birmingham  
*Recycling critical metals: making catalysts directly from waste*  
£261,387

**Professor Thomas Nowotny**  
University of Sussex  
*Peripheral olfactory coding: information processing outside the brain*  
£293,703

**Dr Cian O’Donnell**  
University of Bristol  
*Generalisable neural learning from noisy synapses*  
£207,224

**Dr Sheehan Olver**  
Imperial College London  
*Constructive approximation theory on and inside algebraic curves and surfaces*  
£243,114

**Dr Teusa Piliota**  
University of Edinburgh  
*How do membranes communicate with their molecular partners?*  
£292,249

**Professor Dave Adams**  
University of Glasgow  
*Ultraclean contacts between 2D semiconductors and 3D metals*  
£119,233

**Dr Mingyuan Chu**  
University of Aberdeen  
*Giving cognition a helping hand: how gesture facilitates spatial thinking*  
£122,236

**Dr Rachel Crespo Otero**  
Queen Mary, University of London  
*Understanding the effect of aggregation in light-emitting organic crystals*  
£230,791

**Professor Fabio Cuzzolin**  
Oxford Brookes University  
*Theory of mind at the interface of neuroscience and AI*  
£273,366
Dr Philipp Seib
University of Strathclyde
Engineered substrates for the isolation and expansion of mesenchymal stem cells
£271,652

Dr Martin Smith
Durham University
A freeze or a bang: how fast was the Cambrian ‘explosion’?
£499,986

Dr Pavel Tumarkin
Durham University
Reflections and mutations
£197,605

Professor Robert Upstill-Goddard
Newcastle University
Control of air–water gas exchange rates in lakes by natural surfactants
£173,221

Professor Dr Gerbenvan Ooijen
Imaging of lectins
£270,114

Professor Michael Ward
University of Warwick
Complexes for luminescent natural surfactants
£219,045

Dr Jonathan Wilden
University of Cambridge
Activation of molecular oxygen for C–H activation
£180,472

Dr Elizabeth Wonnacott
University College London
Impact of microplastic pollution on marine biodiversity
£124,981

Dr Martinus Antonius Zwijnenburg
University College London
Exploring metal-free pathways for hydrogen evolution by polymer photocatalysts
£114,893

Professor Jocelyn Alexander
University of Oxford
Global soldiers in the cold war: making southern Africa’s liberation armies
£393,789

Dr Matthew Haigh
Northumbria University
Does “Scientists believe...” imply “All Scientists believe...”? £67,642

Professor Clare McManus
University of Cambridge
Engendering the stage: the records of early modern performance
£51,659

Dr Karen Milek
Durham University
Cohabiting with Vikings: social space in multi-species communities
£311,848

Professor Janet Montgomery
University of Cambridge
Engendering the stage: the records of early modern performance
£314,137

Dr Rosalind Love
University of Cambridge
Latin Arthurian literature and the rise of fiction
£194,821

Professor Claire McManus
Roehampton University
Engendering the stage: the records of early modern performance
£194,821

Professor Dr Martinus Antonius Zwijnenburg
University College London
Exploring metal-free pathways for hydrogen evolution by polymer photocatalysts
£114,893

Humanities

Dr Karen Milek
Durham University
Cohabiting with Vikings: social space in multi-species communities
£311,848

Dr Richard Staley
University of Cambridge
Making climate history
£499,958

Dr Luca Bridgestock
University of Cambridge
Tracing weathering and erosion using barium isotopes
£272,475

Dr Salvatore Butera
University of Warwick
Dynamics of quantum systems: beyond the standard model
£272,475

Dr Richard Staley
University of Cambridge
Making climate history
£499,958

Social Sciences

Professor Dr Andreas Yafaev
University College London
Diophantine problems related to Shimura varieties
£312,448

Professor Marco Mariotti
Queen Mary, University of London
Economic choices and cognitive diversity: a window to the human soul
£352,071

Dr Ben Worth
Birkbeck, University of London
Who’s watching parliament? Monitory democracy at Westminster
£51,659

Dr Deanie Allen
University of Strathclyde
Looking back for the future through archives of airborne microplastic pollution
£270,114

Dr Miguel Anaya
University of Cambridge
Light management in confined ABX3 perovskite based light-emitting devices
£219,045

Dr Tobias Barker
University of Warwick
Symmetry and boundary effects for the Navier-Stokes equations
£219,045

Dr Anna Bobak
University of Stirling
Amalg models of quantum fields and their background
£219,045

Dr Bipasha Chakraborty
University of Warwick
Search for doubly-heavy exotic mesons using lattice QCD
£219,045

Dr Thomas Clements
University of Birmingham
Understanding the polar whale: Tackling taphonomic biases of targetsof the plant O₂-sensing protein VRN2
£219,045

Dr Thomas Elsdon
University of Leicester
Resonating magnetic field lines: a process for energy transfer at Earth/Mercury
£219,045

Early Career Fellowships

Sciences

Dr Deanie Allen
University of Strathclyde
Looking back for the future through archives of airborne microplastic pollution
£270,114

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Dr Thomas Elsdon
University of Leicester
Resonating magnetic field lines: a process for energy transfer at Earth/Mercury
£219,045

Dr Marina Escalera Zamudio
University of Oxford
Detecting parallel evolution in RNA viruses to forecast virulence emergence
£219,045

Dr Emrys Evans
University of Cambridge
A radical step change for next-generation organic electronics
£219,045

Dr Kayn Forbes
University of East Anglia
Quantum theory for advanced molecular photonics: structured light and plasmonics
£219,045

Dr Sudeep Kumar Ghosh
University of Kent
Dynamics based characterisation of topology in superconductors
£219,045

Dr Tim Greenfield
University of Cambridge
Tectonic structure and earthquake hazard in Sulawesi and Kalimantan, Indonesia
£219,045

Dr Nicholas Hedger
University of Reading
Spatial and temporal aspects of social attention
£219,045

Dr Alexander Iveson
Durham University
Fluorine in magmas: how does it control critical metals and leaching potential?
£219,045

Dr Michael James
University of York
Enantioselective charge-transfer organocatalysts
£219,045

Dr Minkyung Kang
University of Warwick
Artificial photosynthesis: from fundamentals to design of a new platform
£219,045

Dr Martin Kleppmann
University of Cambridge
Security and resilience of collaborative applications
£219,045

Dr Amit Kumar
University of St Andrews
New directions in catalysts for sustainable organic synthesis and energy storage
£219,045

Dr Anne Marie Labandera Nadeau
University of Birmingham
Interactome and methylated targets of the plant O₂-sensing protein VRN2
£219,045

Dr Adrien Lefauve
University of Cambridge
Turbulent mixing and structures in stratified shear flows
£219,045
Dr Jingwei Liang  
University of Cambridge  
Geometry based adaptive acceleration for non-smooth optimisation

Dr Xuan Liang  
University of Cambridge  
Caderin adhesion in de novo polarisation of epithelial tubes

Dr Charles Malleson  
University of Warwick  
Electrolytically-modulated quaterystals to enable room temperature hydrogen storage

Dr Charles Malleson  
University of Warwick  
Electrolytically-modulated quaterystals to enable room temperature hydrogen storage

Dr Caitlin Newport  
University of Cambridge  
Animio – tracking and understanding animal motion in the wild

Dr Elena Mates  
University of Cambridge  
Unravelling the role of volcanic ash in sulphur chemistry in the atmosphere

Dr Davide Micheletto  
University of Edinburgh  
Topologically active polymers

Dr Robert Mok  
University of Cambridge  
Organising knowledge for intelligent behaviour across cognitive domains

Dr Caitlin Newport  
University of Oxford  
Impact of sensory pollution on the ecology and navigational behaviour of fish

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University of Birmingham  
The ontology of peripersonal spatial representation in human infancy

Dr Kadi Saar  
University of Cambridge  
Physical basis for single cell proteomics

Dr Madeleine Seale  
University of Oxford  
The mechanical impact of dehydration on plant growth and development

Dr Shiwani Singh  
University of Warwick  
A new class of multiscale models for polymeric fluid dynamics

Dr Luke Wilkinson  
University of York  
Paddlewheel-porphyrin conjugates for molecular electronics and solar harvesting

Dr Qian Yang  
University of Manchester  
Molecular transport through angstrom-size artificial channels

Dr Pedro Correa Martin-Arroyo  
Royal Holloway, University of London  
The allied policies of relief and rehabilitation in French North Africa, 1940–1947

Dr Claudia Daniotti  
University of Warwick  
Morally ambiguous ancient women in European art, c. 1350–1620

Dr Lawrence Davies  
Newcastle University  

Dr Beatriz de Groot  
University of Edinburgh  
Economics of innovation: tracing the potter’s wheel in Iron Age southern Europe

Dr Allison Deutsch  
Birkbeck, University of London  
Impressionism beyond visuality

Dr Hajni Elias  
University of Cambridge  
The southwest Silk Road: cultural transmission in Southeast Asia

Dr Jay Emery  
University of Sheffield  
Geographies of alienation: class, affect and politics in post-industrial towns

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Northumbria University  
Negotiating modernism: experimental/expanded practice in the rural north, 1945–1980

Dr Edward Gillin  
University of Leeds  
The state of science: governing knowledge of nature in Victorian Britain

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University of Cambridge  
Pap, political resistance and sexual liberation in Latin America

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University of East Anglia  
The graphic turn: drawing in modern poetry and philosophy

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University College London  
Relief in philosophy and the criminal law

Dr Sarah Greer  
University of Oxford  
Embodving dynasties: remembering the past at royal tombs in the medieval west

Dr Arianna Gullo  
Newcastle University  
Ekphrasis and epigram in the Age of Justinian

Dr Rye Holmboe  
University of East Anglia  
Thinking in pictures: art and interiority in the work of Marion Milner

Dr Sarah Irving  
Edge Hill University  
The 1927 Palestine earthquake: environment, disasters and British colonialism

Dr Erin Johnson-Williams  
Dundee University  
Audible incarceration: singing communal religion in colonial concentration camps

Dr Radha Kapuria  
University of Sheffield  

Dr Nicola Elizabeth Kirkby  
Royal Holloway, University of London  
Infrastructure and entanglement in nineteenth-century British literary culture

Dr Roberta Klimt  
King’s College London  
A European English: Milton and the ‘questione della lingua’

Dr Michael Lover  
University of Glasgow  
Centre-periphery relations in flux: national politics in the Soviet borderlands

Dr Anna Maguire  
Queen Mary, University of London  
British refugee charities and refugee experience, 1951–2000

Dr Daniel Mann  
King’s College London  
Shooting the desert: cinema, conflict and desert landscapes

Dr Tommaso Mari  
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How did the Romans actually speak? Spoken Latin in records of Church gatherings

Dr Daria Mattingly  
University of Cambridge  
Jews in the 1932–1933 famine in Ukraine: perpetrators, bystanders, victims

Dr Erika Melek Delgado  
King’s College London  
Children of the slave trade, 1808–1864
Dr Kate Moffat
University of Warwick
Digital strategies for a translational Sami media culture

Dr Alex Moran
University of Oxford
Naive realism and physical reality

Dr Oliver Morgan
University of Cambridge
The poetry of reply in early modern England

Dr Nicolò Mugnai
University of Oxford
Building, living and experiencing urban spaces in the Greco-Roman world

Dr Hannah Rose Murray
University of Edinburgh
Daguerreotypy on my heart: African American visual and textual resistance

Dr Mathelinda Nabugodi
University of Cambridge
Translation and composition in Percy Shelley’s poetic practice

Dr Ethan Newk
King’s College London
Silencing and solidarity: a defence of the value of linguistic diversity

Dr Imogen Peck
University of Warwick
Almanacs and their annotators in the Atlantic world, 1545–1775

Dr Julia Peets
University of Warwick
Performing Anglo-American relations: exceptionalism, myth, identity

Dr Jose Perez Diez
University of Leeds
The circulation of Spanish books and their impact on English drama, 1604–1625

Dr Matthieu Pignot
Durham University
Augustine and the making of Christian practice, 400–1000

Dr George Potts
University of Oxford
Charlie Chaplin among the poets

Dr Michael Robinson
University of Liverpool
Disability, welfare and ageing: first world war veterans of the British Empire

Dr Katherine Roscoe
University of Liverpool
How convicts connected the world: unfree labour on British and Imperial dockyards

Dr Hannah Silva
Queen Mary, University of London
Analysing poetry in performance

Dr Simran Singh
University of Liverpool
The stage and the ring: music and boxing in London

Dr Stephen Spencer
King’s College London
Information dissemination and contested memory: The Third Crusade, 1187–1500

Dr Anastasia Stylianou
University of East Anglia
Transnational Anglo-Hellenic networks during England’s long reformations

Dr Justin Tackett
University of Warwick
Hearing pictures: poems, intertitles and the aftelives of silent film

Dr Natasha Tanna
University College London
Decolonial feminisms in contemporary Latin American literature

Dr Deniz Turker
University of Cambridge
Woven archaeologies: collecting Mediterranean emboideries, 1870–1950

Dr Layli Uddin
King’s College London
Red Islam: socialist internationalism and Islam in South Asia, 1930–1978

Dr Marc Volovici
Birkbeck, University of London
Dirty laundry: self-criticism and dissent in twentieth-century Jewish politics

Dr Kate Wadsworth
Guildhall School of Music and Drama
The flexible text: reuniting oral and written traditions in nineteenth-century music

Dr Nicole Willson
University of Central Lancashire
Fann Rebil: recovering the histories of Haiti’s women revolutionaries

Dr Toby Young
Guildhall School of Music and Drama
Transforming the operatic voice

Dr Lydia Zeldenrust
University of York
Continental connections: European bestselling romances in England, c. 1400–1600

Social Sciences

Dr Benjamin Abrams
University College London
Resistance to populism: a comparative study of Hungary, Turkey and the USA

Dr Farah Ahmed
University of Cambridge
Rethinking Islamic education for British Muslim children

Dr James Angel
King’s College London
Peer-to-peer power: re-writing social reproduction through energy trading

Dr Paula Arcari
Edge Hill University
The visual consumption of animals: challenging persistent binaries

Dr Alexander Baker
University of Sheffield
The globalisation of eviction enforcement

Dr Hanifi Barış
University of Aberdeen
Council democracy as a mode of autonomy: a comparative approach

Dr Rhys Crilley
University of Glasgow
Narratives of nuclear weapons: how emotions shape deterrence and disarmament

Dr Archie Davies
University of Sheffield
Re-thinking political ecology from the Northeast of Brazil

Dr Alexander Gagatsis
University of Cambridge
Musical trails as cognitive pathways: memories and practices of jazz culture

Dr Soudeh Ghaffari
Newcastle University
Muslim women refugees: post-traumatic healing via collective religious rituals

Dr Andrea Ghelfi
University of Nottingham
Politics of matter: agroecological farming between science and society

Dr Steph Grohmann
University of Edinburgh
Ethical capital: virtue, subjectivity and the changing face of welfare

Dr Ella Harris
Birkbeck, University of London
Navigating class tourism with interactive documentary

Dr Nicholas Jepson
University of Manchester
Debt, sovereignty and development along China’s Belt and Road

Dr Azezat Johnson
Queen Mary, University of London
Home-making in Brexit Britain: black women and the British grammar of race

Dr Javier Moreno Zacarés
University of Warwick
The origins of housing bubbles: historical pathways of property speculation in the UK, Germany and Spain

Dr Patrick O’Hare
University of Manchester
The ethics of socio-material transformation in the plastic economy

Dr Guilherme Orlandini Heurich
University College London
CODE, ANTH: language, learning and programming in computational culture

Dr Sarah Peck
Northumbria University
Deterrioralised responsibilities: diaspora, civil society and development

Dr Niranjan Ramesh
London School of Economics and Political Science
Coastal city: materialising subaltern geographies at the urban margins

Dr Alice Rees
University of Edinburgh
Pragmatic priming in children: from comprehension to production

Dr Bethany Rex
University of Warwick
Restructuring museum provision under austerity: a change in form and function?

Dr Marton Ribary
University of Surrey
Computational modelling of law—sustainable legal AI from Roman legal sources

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## Emeritus Fellowships

### Sciences

<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
<th>Project Description</th>
<th>Funding</th>
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<tbody>
<tr>
<td>Dr Ranjan Banerjee</td>
<td>City, University of London</td>
<td>Dynamic stiffness formulations for structural elements</td>
<td>£21,900</td>
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<td>Prof Dianna Bowles</td>
<td>University of York</td>
<td>Understanding the ability of Herdwick sheep to thrive in harsh environments</td>
<td>£19,974</td>
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<tr>
<td>Prof Bill Clyne</td>
<td>University of Cambridge</td>
<td>Indentation plastometry for evaluation of residual stresses</td>
<td>£19,870</td>
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<tr>
<td>Prof Amanda Cooper-Sarkar</td>
<td>University of Oxford</td>
<td>Determining parton distribution functions using ATLAS data from the LHC</td>
<td>£19,200</td>
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<td>Prof Hannah Gould</td>
<td>King’s College London</td>
<td>A role for human IgD in antibacterial defence</td>
<td>£20,587</td>
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<td>Prof Roger Grimshaw</td>
<td>University College London</td>
<td>Generation of wave groups by wind</td>
<td>£16,000</td>
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<td>Prof Peter Piper</td>
<td>University of Sheffield</td>
<td>A biomarker test system for the ecotoxicity of molybdate</td>
<td>£20,800</td>
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<td>Prof Elliot Shubert</td>
<td>University of Westminster</td>
<td>Developing a novel model to begin elucidating the origin of multicellularity</td>
<td>£22,000</td>
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### Humanities

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<tr>
<td>Dr David Berry</td>
<td>Loughborough University</td>
<td>An anorthodox revolutionary: the life of Daniel Guérin, 1904–1988</td>
<td>£2,666</td>
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<td>Prof John Bintliff</td>
<td>University of Edinburgh</td>
<td>Publication preparation: Valley of the Muses and Klimmataria crusader estate</td>
<td>£21,728</td>
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<tr>
<td>Dr Mark Bland</td>
<td>Independent Researcher</td>
<td>The world of Simon Waterson, stationer</td>
<td>£22,000</td>
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<tr>
<td>Prof Michelle Brown</td>
<td>Senate House Library, University of London</td>
<td>Catalogue of the Latin manuscripts of Saint Catherine’s Monastery, Sinai</td>
<td>£21,070</td>
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### Social Sciences

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<tbody>
<tr>
<td>Prof John Allen</td>
<td>Open University</td>
<td>Finance that defies maps: when the Global South turns up in the Global North</td>
<td>£7,123</td>
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<tr>
<td>Prof Terri Apter</td>
<td>University of Cambridge</td>
<td>Teenage girls’ social media use: a project to facilitate positive effects</td>
<td>£2,080</td>
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<tr>
<td>Prof John Clarke</td>
<td>Open University</td>
<td>Brexit and beyond: towards a transnational conjunctural analysis of turbulent times</td>
<td>£7,577</td>
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<tr>
<td>Prof Paul Cloke</td>
<td>University of Exeter</td>
<td>The role of third sector organisations in post-disaster</td>
<td>£16,680</td>
</tr>
</tbody>
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### Notes

- **Distributed governance: the management of unruly spaces in São Paulo**
- Embargo neutralised? How targets circumvent, breach or respond to arms embargoes
- **Envisioning forests past and future: contested earth observation in Mesoamerica**
- **Frontline land: the everyday life of international humanitarian law**
- **Global therapeutic networks: mapping the new disconnects between place and care**
- **Menstruation and the media: reducing stigma and tackling period poverty**
- **Imagining the future to dismantle the present: governing a ‘just transition’**
- **Reimagining air at all costs: A social justice perspective on urban air pollution**
- **Decolonisation and the origins of the European migration order**
- **Political life at the apex: governance and policy-making in an age of distrust**
- **Transforming political subjectivities in Somaliland**
Dr Christopher M Davis  
University of Oxford  
Elderly in Russia, China and the Koreas: changing capabilities and inequalities  
£15,738

Professor Brice Dickson  
Queen's University Belfast  
The impact of state-reporting mechanisms on human rights in the UK  
£7,730

Professor Janet Dine  
Independent Researcher  
Interrogating growth. The inefficiency principle  
£18,041

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