



Research. Innovation. Impact.

US
UNIVERSITY OF
SUSSEX
BRIGHTON

Welcome to *Research, Innovation, Impact*, which celebrates some of the most exciting and impactful research by our staff and students.

From groundbreaking advances in quantum technology and vital efforts in wildlife restoration to shaping safety policies that protect children, our researchers are tackling many of the pressing challenges of our time.

Since our founding in 1961, Sussex has built a global reputation for pioneering research. With six Nobel Prize winners amongst our academic community, we have always championed bold ideas and brilliant projects that have the power to improve lives.

Our strategy, *Sussex 2035: Creating Progressive Futures – flourishing, sustainability and progress for the whole world*, is shaped around three transformational themes: digital and data futures, environmental sustainability, and human flourishing. In the pages that follow, you will find inspiring examples of how we are delivering on this vision. A catalyst for this is the Sussex School for Progressive Futures – a new, cross-University hub that brings people, ideas and disciplines together across these themes.

Collaboration is at the heart of how Sussex research drives real-world change. We connect academics with industry, public services, and charities, offering consultancy and knowledge exchange support. On campus, Sussex Innovation helps spinouts and start-ups turn discoveries into products, services, and policy, providing space, advice, and investor networks.

We are also committed to nurturing future research leaders – from undergraduates and postgraduates to independent fellows and senior academics. Our Junior Research Associate Scheme, for example, empowers our bright and innovative second-year undergraduate students to undertake their own research projects, equipping them with the skills and confidence to launch successful research careers.

For those starting a doctorate, building their first research group, or leading a large multidisciplinary programme, Sussex offers a collegial, supportive and intellectually exciting environment in which the most difficult questions can be asked and answered, where brilliant research thrives, and progressive futures are created. I invite you to read on to learn more about the research, innovation and impact of the University of Sussex.



Professor Sasha Roseneil
Vice-Chancellor and President
University of Sussex

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Sussex in numbers

Our greatest successes since 1961.

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Nobel Prize
laureates

Sussex has been home to six Nobel Prize laureates, each recognised for their transformative contribution to scientific knowledge for the benefit of humankind:

Archer Martin

1952 Nobel Prize in Chemistry

shared with Richard Synge

Sir John Cornforth

1975 Nobel Prize in Chemistry

shared with Vladimir Prelog

Sir Harry Kroto

1996 Nobel Prize in Chemistry

shared with Robert Curl and Richard Smalley

Sir Paul Nurse

2001 Nobel Prize in Physiology or Medicine

shared with Leland Hartwell and Tim Hunt

Sir Anthony Leggett

2003 Nobel Prize in Physics

shared with Alexei A. Abrikosov and Vitaly L. Ginzburg

Geoffrey Hinton

2024 Nobel Prize in Physics

shared with John Hopfield



12

British Academy Fellows

12 of our academics have been honoured with Fellowships from the British Academy for their contribution to the humanities and social sciences:

Andrew Hadfield

Early Modern Languages and Literatures to 1830

Ben Highmore

Culture, Media and Performance

Margaret A. Boden

Philosophy, Psychology

Andy Clark

Philosophy, Psychology

Susie Scott

Sociology, Demography and Social Statistics

Liz James

History of Art and Music

James Fairhead

Anthropology and Geography

Gurminder K. Bhambra

Sociology, Demography and Social Statistics

Lord Briggs

Modern History from 1850

Michael Lipton

Economics and Economic History

Gabriel Josipovici

Modern Languages, Literatures and other Media from 1830

Josef Perner

Psychology

John Maynard Smith was awarded the 1999 Crafoord Prize by the Royal Swedish Academy of Sciences for work on evolutionary biology.

The world's **first transatlantic email was received** at Sussex's Richmond Building during a 1973 computer science conference, marking a pioneering moment in digital communications.

In 1985, **a new form of carbon was discovered at Sussex, revolutionising nanotechnology.** This carbon 60 molecule was named the Buckminsterfullerene.

In the **2021 Research Excellence Framework (REF)**, the UK's national system for judging quality of university research:

89% of our submitted research was categorised as 'world-leading' (40.6%) or 'internationally excellent' (48.4%)

93% of our research impact was assessed to be 'outstanding' or 'very considerable' – up from 80.7% in 2014.

1st

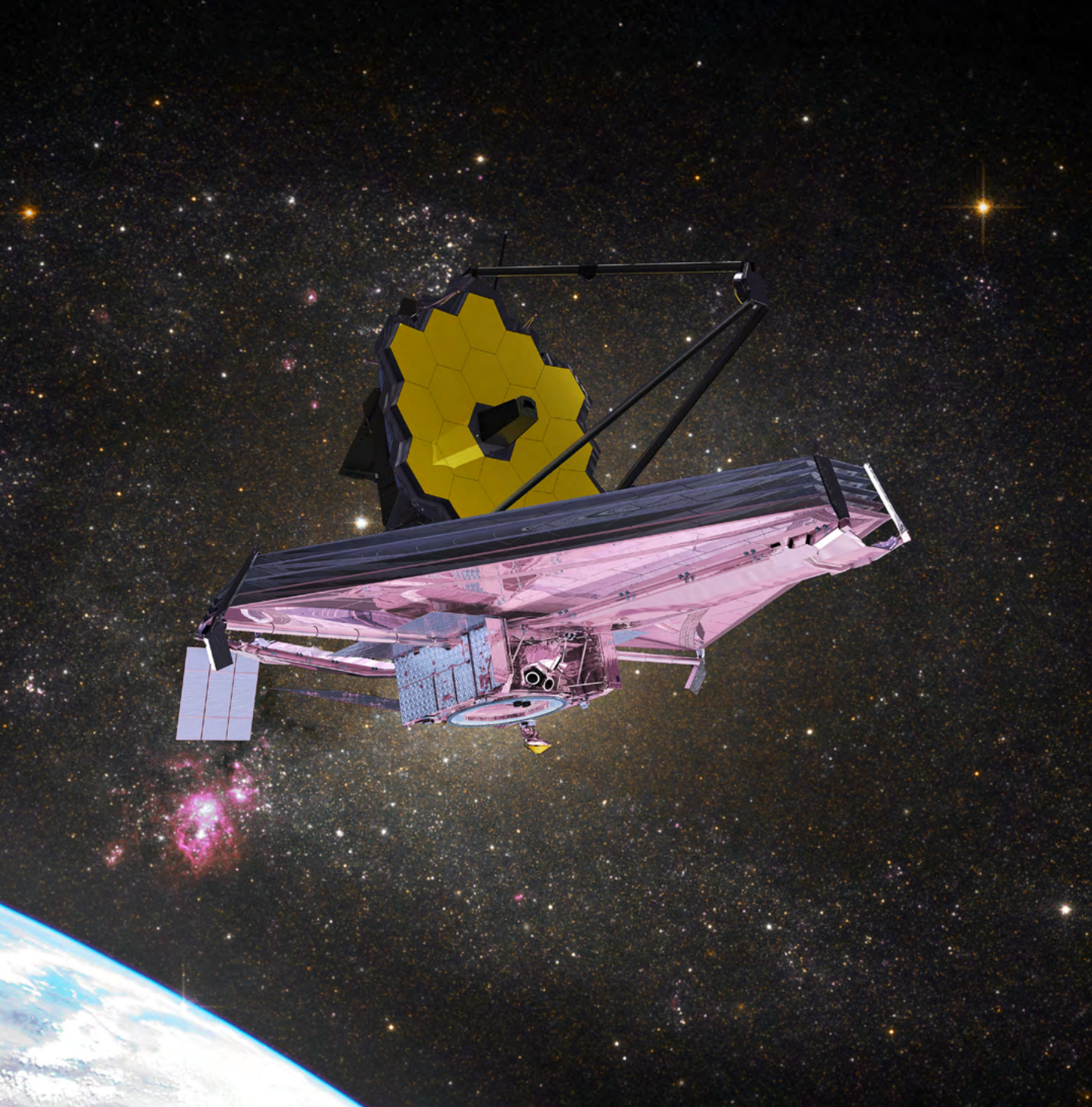
Together with our campus partner, the Institute of Development Studies, we have been ranked **first in the world for Development Studies** for nine years running. (QS World University Rankings 2026)

For the third year in a row (2025), our Business School **ranked first for Business and Management income.** (UK's Chartered Association of Business Schools (CABS))

We are ranked **first in the world for research impact in Physics.** (ShanghaiRanking's Global Ranking of Academic Subjects 2025)

“Even with the small amount of data we’ve analysed so far, we’re gaining new insights into how the Universe works”

– Stephen Wilkins, Professor in Astronomy and Public Understanding



New technology for the good of humanity

We are making a distinctive contribution to digital and data futures, leading the fields of data sciences, astronomy and digital policymaking.



Sussex's role in the past, present and future of AI

The University of Sussex has been at the forefront of research and development in artificial intelligence (AI) for six decades.

Professor Margaret Boden led the development of the world's first academic programme in cognitive science in the 1970s. Her groundbreaking interdisciplinary work has inspired generations of scientists to incorporate ethical and philosophical questions into their research.

Professor Geoffrey Hinton, who was awarded the Nobel Prize for Physics in 2024 for foundational discoveries and inventions that enable machine learning, was also among those AI pioneers at Sussex.

AI has introduced us to new ways of living and working, but alongside the benefits there are risks. Sussex researchers are continuing to examine and explore how this technology affects our lives and our futures.

Jobs, not bots?

The development of AI has raised critical questions about which jobs will be replaced, and which remain secure.

However, while some occupations disappear, others – perhaps ones not yet conceived – will become prevalent and necessary.

Researchers at the University of Sussex Business School received over £18 million from the Economic and Social Research Council (ESRC) to establish the Research Centre for Digital Futures at Work (Digit).

This is jointly run by the University of Sussex and the University of Leeds, together with colleagues from Universities of Cambridge, Manchester, and Monash University in Australia, and with the Institute for the Future of Work, FutureDotNow, and the Institute of Development Studies. This group of researchers is focusing on the economic and social impacts of digital technologies on people's working lives.

Jacqueline O'Reilly, Professor of Comparative Human Resource Management at the University of Sussex Business School and co-director of Digit, explains: "We know that employers' investment in digital technologies is poor and polarised.

"The challenge is to successfully navigate this transition, building an inclusive digital work ecosystem that supports improved economic performance, wellbeing, and job quality."

Digit's aim is to provide insights into vital partnerships between government, businesses, trade unions, and civil society communities.

Some of the award-winning impact from this research includes informing the government on labour regulation, collaborating with the NHS on their 10-year plan and engaging with organisations implementing the four-day week.

Bringing these different strands of research together has been marked by the inauguration of the Margaret Boden Annual Lecture in Interdisciplinary AI launched in June 2025.

Why we need to make AI more energy efficient

It is astonishing how quickly AI can answer questions and create solutions, but the reality is that – like our internet usage – each interaction consumes a tremendous amount of energy.

Recognising the urgent need to create a different kind of AI, Professor Thomas Nowotny, co-director of Sussex AI – a Centre of Excellence – is focusing on developing models that work in a similar way to energy-efficient human brains.

"The data flow in neural networks is what causes computers to use enormous amounts of energy," he explains. "But organic brains operate differently – neurons work more in isolation for longer periods and only exchange information occasionally through what we call 'spiking'. The human brain uses just 20 watts of power, which is equivalent to a low-energy lightbulb, compared with 1,000 watts for answering a chatbot query."

Professor Nowotny and his team have created neural networks that simulate how organic brains process and select information. The expectation is that these 'neuromorphic' systems will compete at the same level as current artificial neural networks while being far more sustainable.

"This is a fast-moving and exciting area of research. We are close to developing AI systems that, inspired by the properties of organic brains, will efficiently complete the tasks we want AI to perform without depleting Earth's natural resources as much."

– Professor Thomas Nowotny



Record-breaking quantum research changing the way we work and live

Quantum technology involves harnessing the mysterious phenomena of quantum physics to perform seemingly impossible tasks. From solving problems that today's superfast computers would take a billion years to answer, to rapidly advancing healthcare treatments and systems critical for national security, quantum technology is predicted to revolutionise all of our lives.

At Sussex, our world-class research in areas such as quantum computing, sensing, clocks, imaging and networks has led to transformative breakthroughs. Sussex is also invested in creating a new quantum technology industry sector in the region, with its spin-out company Universal Quantum already attracting around £100 million in funding.

Now plans are underway to establish a 'Quantum Silicon Valley' in Sussex, positioning the region as a global hub for quantum innovation.

The University of Sussex has developed one of the most comprehensive quantum technology training programmes in the world, meeting growing demand as the sector expands.

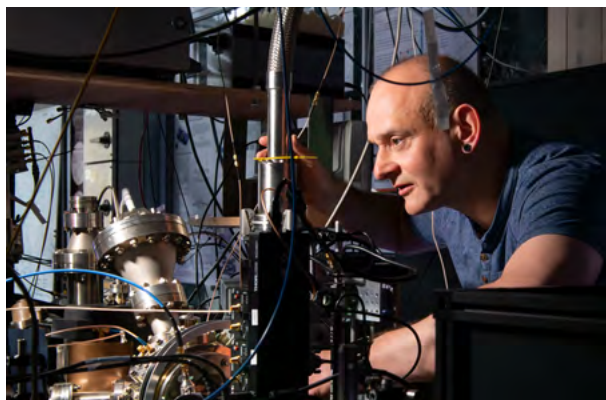


Quantum computers powerful enough to solve some of humanity's biggest challenges

Quantum computing, using trapped ions, is typically carried out by aligning individual laser beams onto individual ions, with each ion forming a quantum bit. A utility-scale quantum computer would need millions of quantum bits, requiring millions of precisely aligned lasers. But Sussex scientists have invented a much simpler method that applies voltages to quantum computer microchips in order to carry out calculations.

In 2017, quantum physicist Professor Winfried Hensinger led a team from Google, and the universities of Aarhus, Siegen and Riken to create the first industrial blueprint for a quantum computer with millions of qubits.

They also proposed a technique to use electric field links between microchips to allow quantum bits to move with extreme speed between adjacent quantum microchips. Demonstrating the merit of this new approach using one of their quantum computer prototypes, Sussex researchers improved the world record, previously held at Oxford University, in connecting quantum-computing microchip modules by more than an order of magnitude in speed (180 connections per second at Oxford to more than 2,400 connections per second at Sussex) while reducing the errors transmitting information from one chip to another by more than a million.



While researching ways to reduce errors when carrying out calculations within a quantum computer, Professor Hensinger's team invented the most sensitive way to detect electric fields at low frequencies. This discovery has been hailed as having the potential to revolutionise brain scanning as well as underwater communications and geological prospecting.

Using a single charged atom held inside a vacuum system, coupled with the ground-breaking measurement technique, the team have broken the previous world record, enabling 100 times more sensitive measurements.

“We set out to develop a powerful tool to reduce errors in trapped-ion quantum computers, and as a direct result of that effort, we now have a powerful quantum sensing capability.”

– Professor Winfried Hensinger

The Quantum Internet and Quantum Navigation

Sussex has also made important breakthroughs towards creating the quantum internet. Professor Matthias Keller's team carried out the world's first demonstration of coupling a charged atom to a particle of light, a photon, in order to transmit quantum information using light.

To reduce reliance on GPS navigation, the Royal Navy's Disruptive Capabilities and Technologies Office teamed up with Dr Fedja Orucevic's

group to test new navigation quantum sensors. The ultra-sensitive quantum sensors measure tiny variations in the earth's magnetic field, offering a new way to pinpoint locations when satellite signals are jammed or unavailable. Their quantum sensing work is also transforming energy storage. They have pioneered the use of quantum sensors to image electrical currents inside batteries.

The darker side of growing up online

Social media and digital platforms have become spaces where children and young people build friendships, explore their identities, and express themselves creatively.

Yet alongside these opportunities lie significant risks, as recognised by the Online Safety Act 2023.

At the University of Sussex, researchers in childhood and youth studies have long been at the forefront of shaping policy and guiding child wellbeing practitioners.

Creating digital tools *with* children, not *for* them

“Involving young people in shaping digital environments is essential for creating safer, more empowering online spaces,” says Dr Liam Berriman, director of the Centre for Innovation and Research in Childhood and Youth (CIRCY).

As a leading interdisciplinary research hub focused on improving the welfare of children and young people, CIRCY explores key themes such as digital childhoods and the emotional wellbeing of young people.

Parents and carers are also involved in CIRCY’s work, helping to explore generational differences and digital consent.

Public sector data collected on children is an area that Dr Berriman feels would benefit from greater consultation with families, with government approaches to data not always meaningfully reflecting young people’s views and needs.

Treating young people as a diverse group whose voices are worth listening to, is important in ensuring our rapidly changing digital world works for them, he says.

“A digital ‘safe space’ for an autistic young person will be very different from one for an LGBTQ+ young person.”

Dr Berriman and his colleagues plan to explore how safeguarding works in primary and secondary schools in a digital context, consulting with teachers, parents and children.



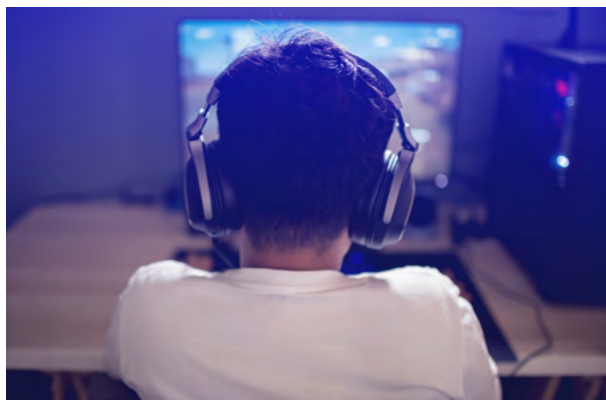
Exploring the link between video games and terrorism

There has long been concern about the effects of video games on young users, and whether it engenders dangerous and violent behaviour.

Dr Suraj Lakhani, Associate Professor of Sociology and Criminology, explores the intersection between video games, gaming-adjacent platforms, and violent extremism.

He says: “We have learned from terrible attacks on communities across the world, such as the massacre by a far-right violent extremist in Christchurch, New Zealand in 2019, that video games and gaming-adjacent platforms have been widely used by bad actors for nefarious purposes linked to violent extremism.”

Dr Lakhani, who has authored reports for the Home Office and European Commission, has recently been appointed to the EU Knowledge Hub on Prevention of Radicalisation’s Thematic Panel on New Technologies and the Online Dimension.



The Hub brings together policymakers, practitioners, and researchers working towards preventing radicalisation and violent extremism across Europe. One of its core areas is New Technologies and the Online Dimension, which aims to address online radicalisation.

“Studying extremism is a fast-moving landscape, exacerbated by the evolution of technology.”

– Dr Suraj Lakhani

Censoring the cult of thinness

When pro-anorexia online spaces emerged at the end of the 20th century, they incited a moral panic says Dr Gemma Cobb, Assistant Professor in Digital Culture at Sussex.


As the author of the *Negotiating Thinness Online: The Cultural Politics of Pro-Anorexia*, Dr Cobb has studied how these spaces, which started out on websites and forums and now populate social media platforms, have been blamed for fuelling disordered eating and perpetuating young women’s body image issues.

However, it is more complex than this argues Dr Cobb: “Eating disorders can affect people of any age and gender, and thinness as an ideal existed long before pro-anorexia online.

“Broadly speaking these spaces seek to provide users with support on living with anorexia nervosa: from recovery advice, through to ‘thinspiration’, which comprises the posting of images of thin models, celebrities, and content creators themselves with the intention of inspiring weight loss.”

Although there have been attempts to remove such content, users deploy a range of innovative tactics to circumvent censorship.

Her work urges policymakers to look beyond censorship and to the culture that perpetuates such phenomena.



Probing how the Universe began – and how it could end

Since its inception in 1965, the Astronomy Centre at Sussex has been involved in world-leading projects to understand the cosmos.

Our researchers focus on the theory and observation of clusters of galaxies, on galaxy formation and on many areas of theoretical and observational cosmology.

In the 2025 QS University World Rankings, Sussex's Physics and Astronomy Department was ranked second in the UK for citations per staff member, demonstrating the international influence and visibility of its research.

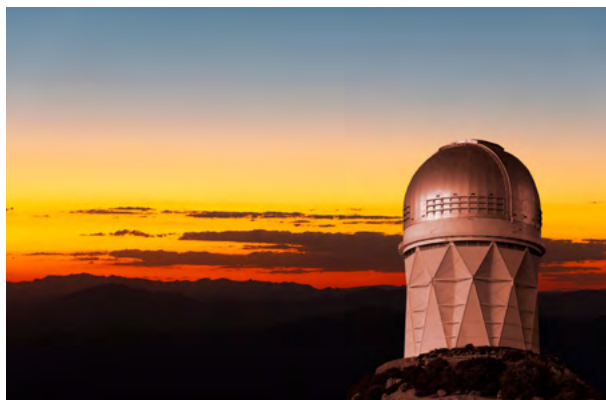
'First light' of the Universe

The James Webb Space Telescope, which launched in 2022, offers the most advanced window to the Universe.

Stephen Wilkins, Professor of Astronomy and Public Understanding, is leading the Sussex group involved in analysing observations from Webb and using it to refine and test super-computer simulations of the Universe.

"Even with the small amount of data we've analysed so far, we're gaining new insights into how the Universe works," he says.

"Webb will show us almost the entire history of the Universe, from the first couple of hundred million years after the Big Bang, which happened around 14 billion years ago. What we're hoping – and what I work on specifically – is that we will see examples of the first stars forming in the galaxy. We call this field 'first light' because that's what we're seeing: the first time the Universe was lit up."



He is working with collaborators across the world to find objects that we don't already know about. "We point the telescope at as blank an area of sky as possible and wait to see what emerges. We're expecting to see that it's not empty at all and that it contains thousands of galaxies, each of which contains billions of stars."

Much of his recent work has involved predicting how galaxies are formed through supercomputer simulations. The hope is that information from the Webb telescope confirms these predictions. "If they don't, that would be just as exciting as it would tell us that we have something fundamentally wrong in our model and will need to work out what that is."

The powerful force of 'dark energy'

Dark energy, the mysterious force driving the accelerated expansion of the Universe, has puzzled scientists since its discovery in 1998. Despite its elusive nature, dark energy is believed to constitute almost 70% of the energy density of the Universe.

Kathy Romer, Professor of Astrophysics, is a world expert in the discovery and exploitation of X-ray clusters of galaxies. She is principal investigator of the XMM Cluster Survey collaboration and is senior member of the Dark Energy Survey collaboration.

She says: "Understanding dark energy is crucial. It influences the fate of the universe, and it challenges – and could potentially revolutionise – our understanding of fundamental physics."

There are several ways to explore dark energy. Dr Eva-Maria Mueller works with data from the Dark Energy Spectroscopic Instrument (DESI), which uses the statistical analysis of enormous catalogues of galaxies. The latest results from the DESI experiment in Arizona shook the foundations of what was known about dark energy.

Professor Romer says: "We had come to accept the notion that dark energy was associated with a mathematical concept – the Cosmological Constant – first proposed by Albert Einstein. But the latest results don't agree. We are now having to adjust our thinking again – Dark energy may be even weirder than we thought."

Professor Romer hopes that new experiments will start to provide answers, rather than throwing up yet more questions.

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“Insects are vital to the functioning of healthy eco-systems, yet we are seeing a catastrophic decline in their numbers”

– Dave Goulson, Professor of Biology



Protecting the planet

We are at the forefront of global efforts to address the most urgent environmental sustainability challenges of our time.

Climate change and global economics

Sussex is a powerhouse for sustainability research and policy work that is driving change across the world. Our experts are carrying out research that supports the UN's Sustainable Development Goals, working in partnership with government, communities and global partners to improve health and education, reduce inequality, and spur economic growth. Projects from the Sussex Sustainability Research Programme are driving positive change in over 30 countries in the Global South and informing government policy that will improve lives for generations to come. The University is also home to the Sussex Energy Group, focused on studying transitions to net zero energy systems in the UK that are fair to everyone.

Along with the University of Sussex Business School, these collective efforts are tackling the escalating challenges of the global climate crisis and building a strong business case for sustainable practice. Through a range of disciplines and a variety of partnerships from the local to the global level, we are providing the evidence and insights driving us towards a more sustainable and prosperous future.



Modelling 'green flight paths'

Joao Uratani, based at our Bennett Institute for Innovation and Policy Acceleration, has envisioned a way for the aviation industry to achieve net zero emissions by 2050. His innovative solution focusses on the creation of 'green flight paths' (GFPs).

GFPs are busy long-distance flight routes between major international airports which could create reliable demand for sustainable aviation fuel (SAF), an alternative to current petroleum-based jet fuel, and encourage investment in its production and future."

He proposes the London-Dubai route as an ideal busy long-haul candidate to demonstrate his model.

Reducing food waste

Across the South Coast region, our sustainability projects involve partners as far away as Indonesia. Dr Shova Thapa Karki, Senior Lecturer in Entrepreneurship and Sustainability, has worked with communities, businesses, NGOs and policymakers in both Sussex and Java to understand how to integrate local knowledge with relevant science to develop solutions.

Science Policy Research Unit (SPRU) researchers Professor Adrian Ely and Dr Katerina Psarikidou are working with Brighton & Hove City Council and other local organisations, to develop a citywide strategy to hardwire sustainable food standards into council contracts. This aims to reduce food waste, improve equal access to food, and encourage community gardens.

Monitoring deforestation

Demand for everyday products such as soy for animal feed, coffee, cocoa, palm oil and wood is responsible for ongoing deforestation in developing nations. Through the Sussex Sustainability Research Programme, our researchers are working to ensure that new anti-deforestation laws can be upheld and effectively monitored. Dr Anthony Alexander, Associate Professor of Operations Management, found that governments currently lack sufficient



Decarbonising ports

Around 90% of the world's traded goods are still shipped by sea, and the English Channel on our doorstep is the busiest shipping lane in the world. Of that enormous volume of commercial cargo, some two million tonnes pass through the Shoreham Port Industrial Cluster in West Sussex every year.

Professor Andrew Davies, RM Phillips Freeman Chair and Professor of Innovation Management in SPRU, played a key role in developing their ambitious Local Industrial Decarbonisation Plan. This aims to boost our region's economy, improve local quality of life, enhance air quality, reduce noise pollution, and create new green energy jobs. Shoreham's best practices are now being shared with other industrial clusters and ports, helping to accelerate the global transition to sustainable port operations through the use of renewable energy generation and the use of alternative fuels, such as hydrogen and biofuels.

capability and data to do this. To tackle this, he brought together data experts in business, government and NGOs to reach consensus for the potential business benefits of compliance.

He says: "New cost-effective and potentially value-creating data systems could make corporate compliance and due diligence a benefit and not just a burden for business."





Repairing Earth

Four Sussex academics explain how their research is helping to protect and rejuvenate our planet.



Safeguarding our seas

Alice Clark, PhD candidate in Ecology

“In March 2021, a trawling ban was introduced along the Sussex coast after it was shown that fish stocks and nearshore habitats, including kelp forests – dense areas of seaweed that protect marine life – had been severely depleted.

By using baited video cameras to record what is happening under the water and collecting environmental DNA samples, we are tracking changes in the presence and abundance of marine species over time, and have recorded species that are of conservation concern, including tope shark, European eel and short-snouted seahorse.

Our survey is funded by Blue Marine Foundation, Sussex Wildlife Trust (Pebble Trust), Sussex Bay, Sussex Sustainability Research Programme and Natural England, and contributes to the partnership with Sussex Bay and to the collaboration with Sussex Kelp Recovery Project and Sussex Inshore Fisheries and Conservation Authorities.

Our long-term dataset will not only inform marine policy but also empower communities to reconnect with and steward their local seas.”

Averting an insect apocalypse

Dave Goulson, Professor of Biology

“Insects are vital to the functioning of healthy eco-systems, yet we are seeing a catastrophic decline in their numbers because of a range of human-led factors, particularly the intensification of farming and increasing use of pesticides.

My work, with the support of my team, involves measuring the harms done by pesticides and challenging governments and businesses to reduce these harms.

I also recognise the value of individual actions to support insect diversity. In 2006, I founded the Bumblebee Conservation Trust, a charity now with 12,000 members who are creating habitat for wild bees, collecting long-term data on bee populations, and influencing environmental policies. More recently, I founded the Buzz Club, a citizen science club with over 1,000 active participants, focussed on working out how best to encourage urban biodiversity.

I also have my own YouTube channel to promote insect-friendly gardening, and I have written several best-selling popular science books.”



Measuring ecosystem health through soundscapes

Alice Eldridge, Professor of Sonic Systems

“We explore new ways to listen to the acoustic environment, or soundscape, to support nature recovery, connection and protection.

Organisms across the tree of life use sound to survive – birds, bees, bats, beetles, whales, fish, frogs all vocalise; even coral polyps and plants are sound-sensitive. By analysing digital recordings, we can measure soundscape patterns to infer ecosystem health.

Our projects include Bird Bath, which fills cultural venues with immersive recordings and invites audiences to ‘bathe’ in local birdsong. Wilding Radio livestreams from Knepp’s rewilding project, with more than 31,000 people from 120 countries tuning in to listen to the thriving wetlands.

In parallel, we are working with communities in Ecuador, helping to safeguard indigenous heritage by highlighting the biocultural value of soundscapes. The film *Sacha Taki (Songs and Voices of the Forest)* was co-created with the Pueblo Ancestral Kichwa Kawsak Sacha (PAKKS) peoples as part of a project which helped them to register Sacha Taki as National Intangible Biocultural Heritage – a first of its kind.”



Tracking land management

Dr Chris Sandom, Associate Professor of Biology

“Biodiversity is in crisis, and land use is under growing pressure to deliver food, climate resilience, and nature recovery in the face of environmental change. To make informed decisions, policymakers and land managers need reliable, standardised, and long-term biodiversity and ecosystem services data.

This is why I’ve worked with colleagues to set up Nature Sense – a new research and enterprise initiative designed to support land managers across the South Coast.

We’re building a network of monitoring stations to track the state of nature, the benefits it provides, and how it responds to different land management strategies – from farming to rewilding. Using drones, camera traps, sound recordings, ecological surveys, and citizen science, we’re generating data and resources to help land managers adapt their practices, engage communities, and access funding.

By standardising biodiversity and ecosystem service monitoring across key habitats and land uses, we can better understand the trade-offs, synergies, and trends of different approaches.”

Forecasting resilience: predicting drought, protecting lives

For centuries, agricultural communities have lived in tandem with the weather – adapting, yet vulnerable to its shifts.

As global warming intensifies the risk of devastating drought, Sussex researchers are working across disciplines to help communities predict, prepare for and withstand climate shocks.





When the rains fail

In the arid and semi-arid regions of Kenya, when rains fail, arrive late, or end early, crops wither and livestock die – leaving millions at risk of starvation.

“Currently, everybody waits for a disaster to happen, but anticipating these events can save lives and livelihoods,” explains Dr Pedram Rowhani, Reader in Geography at Sussex.

Working with the Kenya Red Cross, Dr Rowhani and fellow Sussex colleagues explored ways to improve drought forecasting. Together, they considered utilising a more direct measure of impact than rainfall: the condition of pasture and crops.

Satellite science meets local expertise

Researchers collaborated with Kenya’s National Drought Management Authority (NDMA) to develop robust vegetation monitoring and forecasting tools using satellite data – integrating the NDMA’s practical insights as the nation’s mandated drought risk authority with academic expertise.

Professor of Astrophysics, Seb Oliver, was also able to draw on his experience at the European Space Agency to provide specialist skills for meaningful satellite analysis. By comparing historical levels of landscape ‘greenness’, the project team developed machine learning models capable of forecasting droughts up to four weeks in advance with around 89% accuracy.

“The forecasts are remarkably precise, which makes people on the ground more willing to act,” explains Professor Oliver. “Accuracy helps people to make that mental shift.”

“Currently, everybody waits for a disaster to happen, but anticipating these events can save lives and livelihoods.”

– Dr Pedram Rowhani

Forecasts driving action

Since 2023, the research has expanded across Eastern Africa, with Sussex building capacity in local institutions to monitor and forecast vegetation conditions.

The team has also advanced a novel, local approach to anticipatory action by empowering communities through co-production and the integration of indigenous knowledge. By providing granular risk and vulnerability information, they have also enabled local stakeholders to implement early interventions themselves.

The project’s overarching goal remains to co-produce forecasts and community action plans, improve drought modelling, and support local government across the Greater Horn of Africa. By equipping communities to better anticipate climate shocks, more people can be supported to not only endure challenges, but also to flourish.

“[The project] drew me out of social isolation after the loss of my dear husband. It helped me to regain my confidence and ability to engage with others.”

– Pathways to Inclusive Heritage project participant



How to thrive in a changing world

We are pioneering new approaches
to physical and mental wellbeing
to support human flourishing for all.



What makes us human?

As a species, we're endlessly fascinated by our minds, behaviours and origins. The drive to understand ourselves fuels the work of three Sussex academics.

How did we evolve the power of language?

To better understand humans, we can look at our evolutionary cousins – the great apes.

Professor Gilly Forrester, Professor of Evolutionary and Developmental Psychology at Sussex, explores how we became the upright-walking, talking, tool-using great apes we are today.

As director of the Comparative Cognition Group, she investigates the behaviour and brain organisation of humans, gorillas and chimpanzees, focusing on how cognitive abilities evolve and develop over time and across species.

For example, her research shows that while other great apes haven't developed our vocalisations, they use hands and bodies to communicate in ways that mirror the structural foundations of language.

"In humans, overlapping brain areas are used for problem-solving, tool use, and speaking with our hands and mouth," she says. "Language is a set of hierarchical motor actions that must be sequenced correctly to make sense."

Her latest study on emotions, using facial thermal imaging, reveals that apes and humans share similar physiological responses to stress – our noses cool as blood flows to the eyes, which are vital for vigilance.

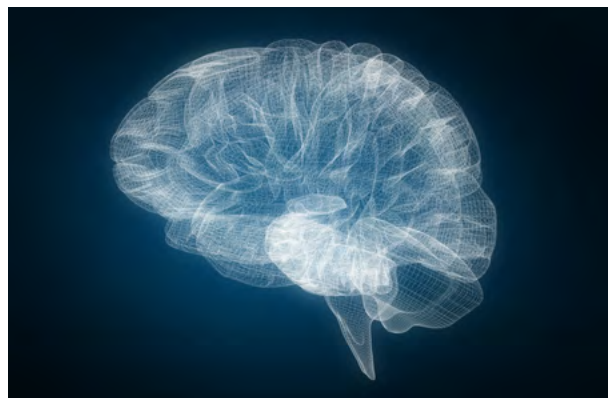
"These findings can help us make better decisions for animal welfare and apply to our own wellbeing too," she says.

What does being alive feel like?

“Our consciousness is the everyday miracle that makes life worth living,” says Anil Seth, Professor of Cognitive and Computational Neuroscience at Sussex. “It’s what it feels like to be something – in our case, human. That’s what sets us apart from AI. An AI doesn’t know what it feels like to be an AI!”

Professor Seth, director of the Centre for Consciousness Science at Sussex, has led pioneering research into the brain basis of consciousness for over 20 years. His theory describes perception as a “controlled hallucination”, where the brain constantly generates predictions about the world, updated by sensory input.

Using computational models, neuroimaging and psychophysics, Professor Seth explores phenomena such as visual hallucinations, perceptual diversity, and the bodily basis of consciousness, including investigating whether consciousness is a matter of computation, or a property of our biological inheritance.



A prolific science communicator and author of the *Sunday Times*’ bestseller *Being You: A New Science of Consciousness*, Professor Seth believes gaining a greater understanding of consciousness will offer vital insights – not just for treating neurological and psychiatric diseases, but for building more humane societies.

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“When we realise how varied individual perceptions and beliefs are, we can cultivate humility – and create new platforms for empathy and understanding.” – Professor Anil Seth

Why interacting with strangers is good for us

Our close relationships are the single greatest source of our wellbeing, but they aren’t the only relationships that matter. Brief, casual encounters with acquaintances and strangers can significantly boost happiness and belonging.

These are the findings of Dr Gillian Sandstrom, director of the Sussex Centre for Research on Kindness and author of *Once Upon a Stranger: The Science of How ‘Small’ Talk Can Add Up to a Big Life*.

Her studies show that people feel better on days when they engage more with casual acquaintances, such as chatting with a favourite barista or exchanging pleasantries with a colleague. Though fleeting and low in emotional intensity, these interactions foster connection

and community and inject novelty into our everyday.

“We’re living in a time of widespread loneliness,” she says.

“But small interactions with strangers are the building blocks of social connection. They can be meaningful, enjoyable and transformative. With practice, we can build our social skills so that we feel more confident and less fearful of rejection.

Talking to strangers benefits society too, she says, by making us more trusting and helping us see the goodness of others. “A simple exchange with a stranger is an act of kindness that acknowledges our shared humanity.”



Preserving culture for future generations

Universities create and share knowledge through teaching and research – but they are also its custodians.

In common with many universities around the world, Sussex holds collections of rare books, manuscripts, audiovisual recordings, and many other artefacts of historical and cultural significance.

They serve as rich resources for academic research and public engagement, and introduce students to research methods and primary source analysis, helping them to develop critical thinking skills.

Through its archives, collections, and innovative digital initiatives, Sussex ensures that stories, struggles, and achievements of the past remain accessible and meaningful for generations to come.

Stewards of fragile documents

The University of Sussex's Heritage Collections offer insights into the lives and legacies of some of the 20th century's most iconic figures.

Some 160 archives, mostly relating to 20th-century literary, political and social history, are held by the University at The Keep, a world-class archive centre close to the Sussex campus.

Among the most notable are the Monks House Papers, which include manuscripts, letters and diaries of Leonard and Virginia Woolf and other Bloomsbury Group figures, the papers of Rudyard Kipling, the *New Statesman* archive, and correspondence of Nobel Laureate Doris Lessing.

One of the largest collections is the Attenborough Archive, comprising thousands of items from film director Lord Attenborough's working life, including correspondence, personal letters, film scripts, photographs and posters, as well as his personal working files, including budgets cast lists and marketing material, relating to all of the major films that he directed.

Lord Attenborough was Chancellor of the University of Sussex from 1998 until 2008, but had a 40-year association with the University, which included enlisting Sussex students as extras for his anti-war musical, *Oh! What a Lovely War*.



As for more ordinary lives, the Mass Observation Archive (MOA) comprises personal diaries from anonymous contributors about life in Britain since the 1930s, covering key events such as King George VI's coronation, and life during the COVID-19 pandemic.

In addition, the University's Library staff have contributed to preserving the past since the 1960s and the Heritage Collections now contain pamphlets, reports, newsletters, flyers, election materials and other ephemeral items beyond the normal purview of an academic library.

Dr Fiona Courage, deputy director of Library, Culture and Heritage at Sussex, says: "Our Heritage Collections are an extremely valuable resource, not just for our students and academics, but for anyone who would like to learn more about some of the key publications and people in our 20th-century history."



"It is our role to act as stewards of often rare and fragile materials for future generations. Archives exist to be reviewed, interrogated and explored as they can help us to understand how lives and worlds have been shaped."

– Dr Fiona Courage

Collecting global digital Holocaust memory

The Landecker Digital Memory Lab, launched at Sussex in 2024, aims to explore how museums, memorial sites and archives can make better use of digital technologies to ensure the sustainability of Holocaust memory.

Drawing on expertise from the renowned Sussex Weidenfeld Institute of Jewish Studies and the Sussex Digital Humanities Lab, the team is developing a digital memory database that will collate details and links to digital Holocaust projects across the world.

This database is complemented wherever possible with video walkthroughs of digital experiences and interviews with those involved in their creation and dissemination.

The aim is to make it a dynamic 'living' space through interactive research features, user workspaces, and by offering the opportunity long-term for users to submit

their own walkthroughs and commentaries.

Lab director Professor Victoria Grace Richardson-Walden says: "This is the first time researchers and practitioners will be able to experience all digital Holocaust memory projects, and the experience of those who made them, in one easy-to-access place."

"We hope the platform will go some way towards supporting detailed studies and enhanced practice, enabling Holocaust memory to move forwards in more productive, connective and sustainable ways."

The archive is intended to support the work of practitioners in heritage, technology and the creative industries who are developing future digital Holocaust memory initiatives, along with that of academics studying the phenomenon.



Rebalancing power

Sussex is a global leader in understanding how power and rights shape people's lives – who has opportunities, and who faces barriers.

Our researchers from across the social sciences, humanities and business work together to turn these insights into action that tackles inequality, poverty and injustice around the world.

Our long-standing position as first in the world for development studies in the QS World Rankings reflects the collective excellence of research that spans the whole University and works alongside our campus partner, the Institute of Development Studies.



Stories beyond borders: the past and future of migration research

Migration tells a profoundly human story of resilience, transformation and belonging.

The Sussex Centre for Migration Research (SCMR) explores how and why people leave their homes to navigate new lands – tracing journeys across borders to reflect the present and shape a more inclusive future.

Sussex launched the UK's first MA and PhD programmes in migration studies in 1997 before establishing the Sussex Centre for Migration Research (SCMR) the following year. For almost three decades, the Centre has continued to champion creative, interdisciplinary approaches that drive academic enquiry, enrich public understanding and shape international policy.

“When Sussex founded the SCMR almost 30 years ago, migrants and refugees were far less visible in public debate. Now, there’s a massive gap between the facts and politics of migration – but our work continues to prioritise evidence over rhetoric.”

– **Professor Paul Statham, Centre Director**



Connected initiatives, global impact

One of the centre's defining strengths is its international collaborations. Longstanding work with Mahidol University in Thailand considers migration flows between Europe and Southeast Asia, with a focus on issues of gender and sexuality. Researchers examine phenomena including 'marriage migration', where marginalised women are targeted for partnership by Western men, alongside LGBTQ+ tourism that relies on vulnerable workers performing casual, intimate labour.

While often framed as opportunities for upward mobility, the partnership has revealed the realities of exploitation, fragile legal protections and the far-reaching impact on local communities.

Expanding international networks

SCMR also brings fresh perspectives by cultivating new connections.

Developed with the University of Peshawar in Pakistan, the Protracted Displacement Economies project explores mutual aid, gift-giving and care, providing policymakers with a holistic view of how displaced communities engage in economic activity.

Similarly, a new partnership with Nankai University in China will foster connections with its Global Mobility and Migration Research Centre.

A more inclusive dialogue

By enhancing our understanding of how people move, settle and belong, SCMR equips practitioners and policymakers to meet complex challenges with humanity. As new forms of mobility emerge, the Centre will continue to shape a future defined less by division, and more by shared possibilities.

Innovations in global healthcare

Sussex researchers are collaborating across the globe to improve human health from identifying disease-causing genes to democratising science and medical care.

Transforming access to healthcare technologies

Researchers in Sussex Neuroscience are supporting colleagues across Africa to build their own scientific equipment and transform access to research and healthcare technologies.

In many lower-income countries, access to modern tools for biomedical research, testing, and treatment remains a major challenge. Yet advances in affordable consumer electronics, 3D printing, and rapid prototyping now make it possible to create high-quality laboratory equipment at a fraction of traditional costs.

Sussex neuroscientists such as Dr André Maia Chagas have pioneered open-source, shareable lab designs – from microscopes to protective

equipment – while training African researchers to build and adapt these tools for local needs.

In Yobe State, Northeastern Nigeria, Sussex researcher Dr Mahmoud Bukar Maina established BioRTC, a new biomedical research centre producing low-cost microscopes for malaria diagnosis and community healthcare. Much of this success was made possible through TReND in Africa, a UK-registered charity co-directed by Sussex researchers Professor Tom Baden, Dr Maina, Dr Chagas and others, who share a passion for democratising science.

Professor Baden, recipient of the Nature-Tencent Award for Driving Global Impact, says: “Scaling this open, collaborative model empowers scientists everywhere and ensures that knowledge production truly becomes a global endeavour.”



Hunting genes that cause disease

Thousands of times each day the genetic material in our cells is damaged by natural chemicals in our cells and by environmental radiation and toxins. If not detected and quickly repaired, this DNA damage can lead to cell mutations and diseases such as cancer, neurodegeneration, and premature ageing.

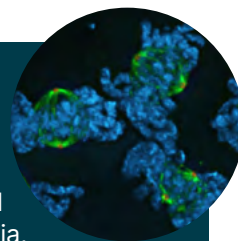
For the past two decades, the Genome Damage and Stability Centre (GDSC) has pioneered the identification and characterisation of genes involved in the repair of DNA damage, and uncovered human diseases caused by defects in these genes.

Professor Keith Caldecott, director of the GDSC and a fellow of the Royal Society, says: “We have already identified a number of human genes that previously were not known to exist.

One such gene, TDP2, protects our genomes from DNA breakage and thereby prevents neurological conditions such as cerebellar ataxia, which is characterised by seizure and neurodegeneration.”

Professor Caldecott’s work has enabled better clinical diagnosis and management of children and adults affected by this and many other related diseases worldwide. His work has uncovered promising new therapeutic avenues to explore.

He says: “The GDSC was one of the first of its kind in the UK. We are incredibly proud of the pioneering research that is conducted at the Centre, and which is already benefiting human health.”



Combating neglected tropical diseases

A long-neglected tropical disease that causes disability and extreme social stigma in rural African communities could soon be eradicated thanks to global health researchers at Sussex.

Professor Gail Davey, director of the Centre for Equitable Global Health Research (CEGHR), has spent over 15 years leading global research and advocacy on behalf of those with podoconiosis – a leg-swelling condition caused by exposure to irritant soils in tropical highland regions. Her work has transformed the understanding of a disease that severely disrupts livelihoods yet is treatable and preventable.

Until 2010, podoconiosis was absent from health policies and medical training. Now CEGHR has generated critical evidence on its causes, distribution, and treatment. This evidence has supported national programmes in Ethiopia and Rwanda, and provided information on disease distribution in Cameroon, Kenya and Uganda.

In March 2025, the World Health Organization approved the establishment of the AFRO Regional



Podoconiosis Elimination Platform, which is now working with national Neglected Tropical Disease programme managers in Burundi, Democratic Republic of Congo, Madagascar, São Tomé and Príncipe, Tanzania, Uganda, and Zimbabwe to identify affected districts and train healthcare workers to deliver targeted interventions.

Professor Davey says: “This initiative is expected to benefit an estimated 114 million people living in areas where podoconiosis is prevalent, giving national decision-makers access to vital data and tools to combat the disease.”

Art as a sensory narrative

Heritage connects us to the stories and places that shape our world. Yet for many people with disabilities, opportunities to engage with such spaces are limited by significant barriers.

For Sussex anthropologist Dr Karis Jade Petty, arts practice can open up landscapes and heritage sites for blind and partially sighted visitors – enabling more people to experience the natural world in richer, more inclusive ways.

Sussex is located close to major heritage sites including Wakehurst, Kew's wild botanical garden, which offered a natural partner for the Inclusive Heritage project. Supported by Blatchington Court Trust, East Sussex Vision Support, and Sight Support Worthing, the recent Pathways to Inclusive Heritage project invited participants to co-create activities that encourage a deeper connection with the environment.

Anne-Fay Townsend, Business Partnerships Manager at Sussex, explained that the project resonated with everyone involved.

"Our researchers, partners and participants all speak of the experience as transformative," she said.

For participants like Angie, the project moved beyond physical accessibility to cultivate a new sense of belonging.

"It drew me out of social isolation after the loss of my dear husband," she says. "It helped me to regain my confidence and ability to engage with others."

Along with inspiring a short sensory film, *Everybody's Garden*, the project also catalysed the Nature Unseen event for the 2025 Brighton Festival, where audiences connected with collaborators, immersed themselves in soundscapes, and explored a tactile forest crafted with foraged materials.

Pathways to Inclusive Heritage is now shaping inclusive practice at Wakehurst, while the Sussex team is pursuing funding to further expand its influence.

For Dr Petty, the project is as much about shifting mindsets as it is about changing spaces: "By exploring the perspectives of those who have historically been marginalised or excluded from heritage spaces, we'll not only learn how they can be more inclusive, but also how we can enrich everyone's experience."



Your support

At Sussex our research is taking on humanity's greatest challenges and helping to build a more progressive future for people and planet. But we could do more.

We are seeking support from people and organisations who share a belief that a better world is possible. With your support, our students and researchers can continue to tackle the questions that matter most, generating knowledge and solutions that drive meaningful change.

You might fund a scholarship that opens doors for a new generation of changemakers, foster a transformative research partnership, or contribute to the Sussex Fund and help more students to thrive.

The future is being shaped here at Sussex – help us make it a reality.

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