UNIVERSITY OF PLYMOUTH

Advancing knowledge, transforming lives

ANNUAL REVIEW

2023

Welcome to the University of Plymouth's 2023 Annual Review

I'm delighted to welcome you to this look back over another year of tremendous success for the University of Plymouth.

As you'll see in this *Annual Review*, our University makes a difference in all kinds of ways that truly benefit our students and the wider communities we serve – regionally, nationally and globally – through excellence in the quality of our teaching and research, alongside our civic responsibilities in the city we are proud to call home.

These are challenging times for higher education in the UK, yet in the face of significant economic headwinds, including the cost-of-living concerns that affect us all – from individuals to multi-million-pound institutions – our financial position remains robust.

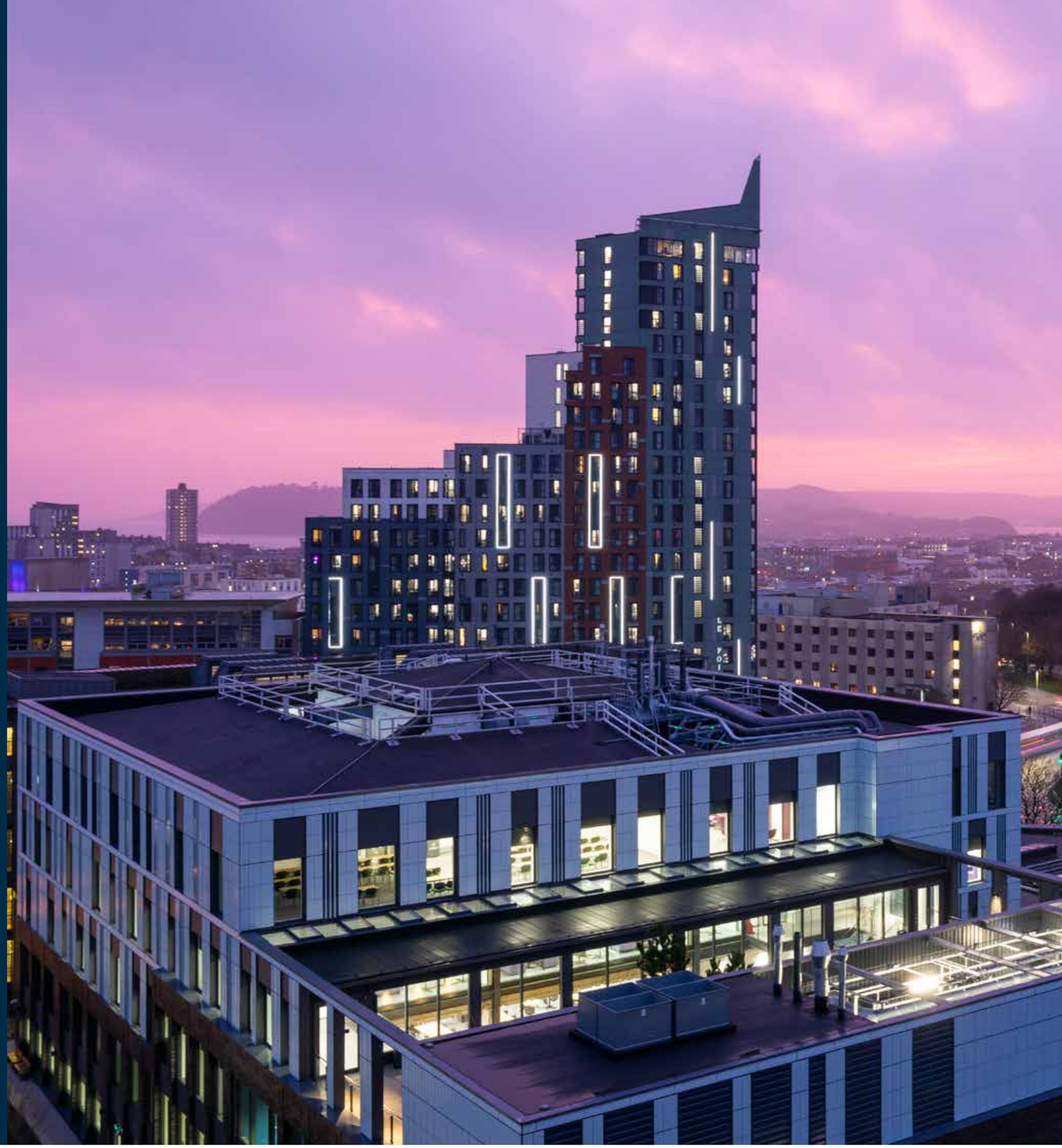
At Plymouth, we continue to deliver world-class research and you can find out more about a wide selection of extraordinary – often award-winning – advances and achievements in this review.

Meanwhile, the energy and investment we put into making sure Plymouth's students receive an exceptional education and experience have been rewarded through a triple Gold rating in the Office for Students' Teaching Excellence Framework; an achievement everyone at the University should be proud of, as we are one of a select number of institutions to receive this accolade.

All of this is underpinned by our deep commitment to sustainability; 2023 was the year in which we became only the second university in the country to be verified as carbon neutral. A key element of this success is our approach to delivering our decade-long £250 million Campus Masterplan, which saw £100 million of developments open in 2023. Both InterCity Place and the Babbage Building have been transformed into world-class, sustainable structures fit for the 21st century and beyond.

I would like to thank everyone here at the University of Plymouth, along with our many supporters and funders, for making this success possible, and I hope you enjoy this review of 2023.

Professor Judith Petts CBE
Vice-Chancellor and Chief Executive



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A year of celebration

The University is constantly exploring ways to enhance the experiences available to its students. That was rewarded in 2023, when it was awarded triple Gold – one of only 27 institutions to achieve such recognition – in the latest round of the Teaching Excellence Framework (TEF).

The government's Office for Students (OfS), which runs the TEF, praised the student experiences offered by the University as being of outstanding quality. An independent panel highlighted outstanding provision across the majority of courses and subjects in relation to student outcomes. It also praised the University's vision for advancing knowledge and transforming lives within local, national and global contexts.

"We have always made a commitment to our students to provide a first-class student experience enriched by research, professional work and self-development opportunities. Being rated TEF triple Gold reaffirms that approach is yielding results, and providing our graduates with the knowledge and skills they need to succeed in their careers."

Professor Judith Petts CBE, Vice-Chancellor

The University has also been recognised for its work to inspire and support future generations of entrepreneurs, and its commitment to engaging with the business community in the South West and beyond. In the third edition of the Knowledge Exchange Framework (KEF), Plymouth was listed among the highest ranked universities for its work to commercialise its intellectual property into spin-out companies now tackling many of the key global challenges of our time. It is also one of the highest ranked universities for the support it provides to graduate startups, and for its ongoing efforts to enable small and medium-sized companies (SMEs) to benefit from its expertise and facilities.

For more about the University's awards and achievements in 2023, see page 28.

TEF 2023

Overall: **Gold**

Student experience: **Gold**

Student outcomes: **Gold**

Teaching Excellence Framework

A year of transformation

2023 has been a year of almost unprecedented change on the University's city centre campus. Continued investment through the Campus Masterplan has resulted in the completion of two significant refurbishments, with work also starting on a number of other major projects.

The state-of-the-art spaces within the Babbage Building have been specifically envisioned to inspire creativity, innovation and collaboration from the engineering and design pioneers of tomorrow. The building embodies the University's systems thinking approach by bringing STEAM – science, technology, engineering, arts and mathematics – subjects together to support academic collaboration and innovation. It now houses specialist equipment and laboratories dedicated to clean energy, autonomous systems, virtual engineering, precision manufacturing, digital fabrication, high performance computing, and much more.

InterCity Place, overlooking the city's railway station, has created a cutting-edge space in which to train and develop the next generation of nurses, midwives, allied health professionals, optometrists and social workers. Within the 11-storey building, students can hone their skills in brand new teaching facilities using a range of health technologies and digital innovations. At a time when future generations of healthcare professionals have never been in greater demand, InterCity Place strengthens the University's position at the forefront of healthcare education in the South West.

Both buildings have been completed using the latest low-carbon technologies, furthering a commitment to sustainability which saw the University become only the second in the UK to secure carbon neutral status. Similar innovations are also being applied in the transformation of the Fitzroy Building, which will in 2025 become the new home of the Plymouth Business School.

InterCity Place

Leading Marine Science and Innovation

Our marine and maritime excellence is unrivalled in the UK. Through our world-leading research, we are advancing the development and delivery of offshore renewable energy as well as the understanding of the ocean, and developing innovative new ways of diagnosing the threats facing it and how they can be addressed. That directly informs our teaching, enabling future generations of ocean guardians to be inspired and empowered, while our engagement with businesses and policy makers ensures the work we are doing has a positive impact on economies and societies locally and globally.

A clean energy revolution in the Celtic Sea

Long respected for its pioneering research into clean energy, the University's expertise in the sector has never been in greater demand. In 2023, the Crown Estate launched its latest leasing round for the Celtic Sea, with a view to it becoming an epicentre of floating offshore wind (FLOW) innovation. In line with this, the University has continued to work on initiatives across academia, industry and policy to deliver the real and lasting change required to meet the UK's net zero ambitions.

Through the Great South West, a new pan-regional partnership, the University played a key role in launching the Clean Energy Powerhouse Prospectus. It revealed that with the expansion of large-scale energy projects, the region could achieve an 800% increase in low carbon generation capacity, equivalent to 11% of predicted UK generation capacity needs, by 2035.

"Take off of the floating offshore wind capacity in the Celtic Sea is imminent, while our abundant natural resources – geothermal, tidal, wave – can deliver locally to support self-sufficiency and be scaled up to wider net zero advantage."

Professor Judith Petts CBE, Vice-Chancellor

In 2023, the University secured an investment of £7.5 million from the Engineering and Physical Sciences Research Council to create the Supergen Offshore Renewable Energy (ORE) Impact Hub. Having led Supergen ORE for many years, the new funding will accelerate the impact of current and future ORE devices and systems, and drive the UK towards its net zero commitments.

A grant of £650,000 from the Heart of the South West Local Enterprise Partnership is enabling the University to combine its ORE and cyber security expertise to create a new research and development facility that will ruggedise the technology against cyber attacks. Meanwhile, research published in 2023 showed the UK's renewable energy sector is well placed to take advantage of the expected boom in floating offshore wind technology. Another study demonstrated that adopting tidal power alongside other forms of renewables can enhance energy security by around 25%.

The ORE expertise is also yielding successes for students. MEng (Hons) Civil Engineering student Nilesh Jeetah earned the Institution of Civil Engineers (ICE) South West Emerging Engineers Award for 2023 for a paper exploring the scalability and upper limits of the cylindrical steel shells that make up the floating platforms for offshore wind turbines.

"The University and Supergen ORE Hub have been instrumental in uniting researchers, industry and policy makers. That will be essential if we are to ensure our innovation leads to lasting environmental, economic and social impact."

Professor Deborah Greaves OBE FREng, Director of the Centre for Decarbonisation and Offshore Renewable Energy

Driving marine and clean maritime innovation

The University played a leading role in securing significant government investment that will drive the South West's future marine and maritime innovation. The Great South West, the pan-regional partnership working to build the region's economy and prosperity, was chosen as the country's Marine and Maritime Launchpad, recognising its leadership in the sector. As part of the programme, the region is set to receive up to £7.5 million of investment to drive innovation and business growth.

"The Marine and Maritime Launchpad will enable us to expand on what is already a world-class ocean economy cluster, creating commercial solutions to the challenges facing our marine and maritime sector. It will create a cleaner, high growth and digitally enabled sector right here in the South West."

Kevin Forshaw, Director of Industrial and Strategic Partnerships

The University is also integral to a new initiative that will deploy the world's largest network of electric workboats. The £5.4 million Zero Emission Network of Workboats (ZENOW) project brings together 15 UK marine businesses and organisations that will ultimately deploy 20 electric workboats, powered by five new chargers.

The project will also code the boats ready for service and then, during and after a three-year period, analyse the data to provide evidence, advice and support for any of the circa 10,000 small harbours and marinas across the world getting ready to go electric. It is also central to a consortium that has secured £3.2 million of UK government funding to deliver critical marine charging infrastructure. Ten sites along the south coast of England are being plugged into the UK's clean maritime revolution as part of The Electric Seaway project. It will create the infrastructure necessary to power the region's ever-growing fleet of electric maritime vessels, and will be targeted at leisure and commercial vessels under 24m in size, boats which are a common feature of the UK's 120 commercial ports and 400 non-cargo handling ports.

"There are a number of challenges we need to overcome if we are to meet the government's target of having a zero emission maritime fleet by 2050. However, our existing work in this area has provided a number of solutions and shown what can be achieved through collaborations between industry, research, boat owners and other agencies."

Dr Richard Pemberton, Lecturer in Mechanical and Marine Engineering Design

Shifting global attitudes to plastics

In a year when world leaders met twice to discuss the United Nations Treaty on Plastic Pollution, the University has been instrumental in a number of critical initiatives emphasising the solutions required to bring about worldwide change. Its researchers also took part in the discussions, held in Paris and Nairobi, about the differing global impacts of plastics and how the University's research can deliver solutions.

Professor Richard Thompson OBE FRS was among the recipients of the 2023 Blue Planet Prize, acknowledging his pioneering and continued work on microplastics. He was also among the scientists on the Minderoo-Monaco Commission on Plastics and Human Health, which generated a never-before-seen analysis showing plastic as a hazard at every stage of its life cycle.

"Twenty years ago there was denial that plastics presented an environmental issue. We now have a consensus about the threats exemplified in the UN Global Plastics Treaty, providing a mandate for global change. What is critical now is that we have the same quality of independent scientific evidence to guide the way to solutions as we have had in defining the problem."

Professor Richard Thompson OBE FRS, Head of the International Marine Litter Research Unit

Some of the University's latest research into microplastics – the environmental impact of tyre particle pollution – was featured on BBC News, nationally and internationally, when presenter and journalist Sophie Raworth spent a day broadcasting live from our Marine Station, following an expedition up the River Tamar with Professor Thompson and his team.

Meanwhile, research involving the University cautioned against a reliance on mechanical cleanup devices as a means of addressing the plastic pollution crisis. Academics took part in Parliament's Evidence Week, briefing politicians and parliamentary staff on latest evidence that could be used to inform future policy making. Their expertise was also in demand when the BBC chose to broadcast its main evening news live from the University's Marine Station, a bulletin that highlighted work taking place to advance understanding and awareness of the threats posed by tyre particles.

The University's research has also extended beyond the realms of our planet, leading calls for a legally binding treaty to ensure Earth's orbit isn't irreparably harmed by the future expansion of the global space industry. A study was published in *Science* in the week when nearly 200 countries agreed to a treaty to protect the High Seas after a 20-year process, with the experts suggesting society needed to take the lessons learned from one part of our planetary system to another.

Revealing the deepest known evidence of coral reef bleaching

Scientists from the University discovered the deepest known evidence of coral reef bleaching, more than 90 metres below the surface of the Indian Ocean.

The damage – attributed to a 30% rise in sea temperatures caused by the Indian Ocean dipole – harmed up to 80% of the reefs in certain parts of the seabed, at depths previously thought to be resilient to ocean warming. A study published in *Nature Communications* pointed to the stark warning of the harm caused in our ocean by rising ocean temperatures.

"Deeper corals had always been thought of as being resilient to ocean warming, because the waters they inhabit are cooler than at the surface and were believed to remain relatively stable. However, that is clearly not the case and – as a result – there are likely to be reefs at similar depths all over the world that are at threat from similar climatic changes."

Dr Phil Hosegood, Associate Professor in Physical Oceanography

Showing that coral reefs are spawning earlier

The light pollution caused by coastal cities can trick coral reefs into spawning outside of the optimum times when they would normally reproduce. Coral broadcast spawning events – in which lunar cycles trigger the release of eggs on certain nights of the year – are critical to the maintenance and recovery of reefs following mass bleaching and other similar events.

However, using a combination of light pollution data and spawning observations, researchers were able to show for the first time that corals exposed to artificial light at night (ALAN) are spawning one to three days closer to the full moon compared to those on unlit reefs. Spawning on different nights could reduce the likelihood of coral eggs being fertilised and surviving to produce new adult corals that help reefs to recover after bleaching events and other disturbances.

"Corals are critical for the health of the global ocean, but are being increasingly damaged by human activity. If we want to mitigate against the harm this is causing, we could perhaps look to delay the switching on of night-time lighting in coastal regions to ensure the natural dark period between sunset and moonrise that triggers spawning remains intact."

Dr Thomas Davies, Lecturer in Marine Conservation

Revealing how the UK's shipwrecks are providing a refuge for marine life

An estimated 50,000 shipwrecks can be found around the UK's coastline, and a study by the University has shown they have been acting as a hidden refuge for fish, corals and other marine species in areas still open to destructive bottom-towed fishing.

Many of these wrecks have been lying on the seabed for well over a century and have served as a deterrent to fishers who use bottom-towed trawling to secure their catches. As a result, while many areas of the seabed have been damaged significantly in areas of heavy fishing pressure, the seabed in and around shipwrecks remains largely unblemished.

"The UK has made significant strides in terms of measures to protect the marine environment. This study highlights an impact of past human activity that is having a positive impact on the seabed today. It is unquestionably something that should be factored into future marine management plans."

Dr Emma Sheehan, Associate Professor of Marine Ecology

Creating a space for nature along the coastline of Plymouth Sound

Plymouth is now home to a living seawall after organisations across the world united in an attempt to enhance biodiversity along its waterfront. A series of specially designed concrete panels were installed on the edge of the Plymouth Sound National Marine Park to provide new habitats for a variety of marine flora and fauna.

The panels, developed as a result of extensive scientific research, were fixed to the seawall close to the Mayflower Steps memorial. They cover an area spanning 12×2 metres and will be monitored over the coming months to assess any different species of flora and fauna which have taken up residence. The hope is that they could become home to limpets, barnacles, anemones, seaweeds, sponges and other species commonly found in natural habitats along the South West coastline.

"The Living Seawall in Plymouth is the first large, real-world-scale installation of its kind in Britain. We are very excited to work with the global community to build the evidence about the ecological benefits for both new and existing artificial structures."

Dr Louise Firth, Associate Professor of Marine Ecology

Highlighting the true scale of UK's nature loss

Researchers from the University played an important part in a major report highlighting the scale of nature loss across the UK. The *State of Nature* 2023 report provides a detailed picture of how nature is faring across towns, cities, the countryside and seas.

It shows that the abundance of species has on average fallen by almost a third (32%) since 1970 and, overall, the UK is one of the most nature-depleted countries globally owing to human activity, with less than half of its biodiversity remaining. Among the scientists involved were Dr Abigail McQuatters-Gollop and Dr Matt Holland, who contributed a section that highlights the importance of plankton to both the marine food web and to other wildlife, such as seabirds.

"This is only the second time plankton have been included within the RSPB's State of Nature report, and it is just recognition of their significance. We may not be able to see them with the human eye, but plankton are critical for the health of our entire planet."

Dr Abigail McQuatters-Gollop, Associate Professor of Marine Conservation

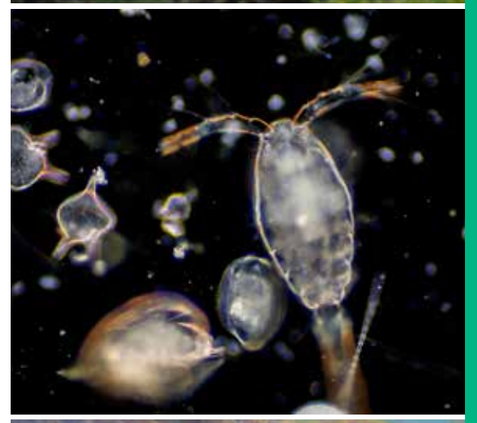
Restoring nature to counter climate change

Researchers are contributing to a £7 million project which aims to make coastlines and communities more resilient in the face of flooding, erosion and the impacts of climate change. The Stronger Shores initiative will explore the most effective ways to use the power of nature to restore the ocean's health while cementing a more sustainable, healthy and prosperous future for coastal communities.

The project brings together a network of experts to test a range of restoration approaches, and how these will benefit communities along the coast of the North Sea. This will include understanding how any restoration interventions can reduce erosion and structural damage, help to stabilise shorelines, reduce wave impacts, protect against climate change, and extend the lifespan of man-made coastal defences.

"Over many years, we have shown that nature has the potential to be a powerful tool in the fight against climate change and biodiversity loss. The findings from this research will deliver progress in enabling us to understand the role of natural and restored kelp, seagrass and oyster beds in protecting our coasts, and boosting biodiversity."

Dr Sian Rees, Associate Professor of Social-Ecological Systems



Demonstrating the vulnerability of England's only resident bottlenose dolphins

A study led by the University showed that England's only resident population of bottlenose dolphins is under serious threat from a combination of human activity, environmental pollution and difficulties in rearing young that survive into adulthood. For almost a decade, scientists, students and conservation groups based along the English Channel coast have been working together with citizen scientists to monitor the movements and distribution of this population.

Writing in the journal *Animal Conservation,* the researchers report that as a result of their ongoing research they estimate the pod currently consists of just 48 individuals. That is less than half the size of most coastal bottlenose dolphin populations, and around ten times smaller than a pod known to inhabit the Channel coast of France. Their fight for survival is made even more challenging in that they inhabit some of the busiest shipping lanes in the world and coastal waters known to suffer from repeated and prolonged spells of pollution and fishing pressure.

"Bottlenose dolphins are highly intelligent and social animals with complex cultures. But because they live in the sea and not on land, they go unseen by most people and we fail to appreciate quite how amazing yet vulnerable they are. To see the south coast population decline to extinction would be a local tragedy for the dolphins and for us."

Dr Simon Ingram, Associate Professor of Marine Conservation

Securing a prestigious diving scholarship

Lucy Penny, who had just finished the second year of an MNurs (Hons) Nursing (Adult Health and Child Health) degree, was chosen as the 2023 European Scholar of the Our World-Underwater Scholarship Society (OWUSS).

The year-long scholarship, sponsored by ROLEX, is enabling her to travel to various locations across the world, including attending a series of events hosted by The Explorers Club in New York as part of World Oceans Week. Through her travels and conversations with those she meets, she hopes to gain a better understanding of dive medicine and the mental and physical benefits diving can provide.

"Diving in Plymouth's seagrass beds and kelp forests opened my eyes to a new world, connected me with a community of like-minded people and inspired me to develop as a person. I feel incredibly privileged to be an OWUSS scholar, learn from ocean experts and enthusiasts, and integrate further into a community that cares not only for the ocean but also for the people that work there."

Lucy Penny, MNurs (Hons) Nursing student

Driving Sustainability and Climate Action

The key challenges facing our planet, as described in the United Nations Sustainable Development Goals, inspire all our research and teaching and our own operations. That means our world-leading researchers are constantly looking for means to develop climate solutions for our planet. They are also using their expertise to inspire future generations who will be responsible for Earth's long-term health, along with the businesses developing innovative new techniques that could have benefits for the whole of society. Sustainability is embedded in all our operations and our teaching.

Sustainability Solutions: securing a cleaner, greener future

The University launched Sustainability Solutions at an event in London in December 2023. The initiative embodies the University's commitment to delivering on the promise of securing a greener, cleaner future.

It also provides an avenue through which it will further its partnership working with communities, industry, policy makers and individuals to bring about the paradigm shifts and cultural changes our world needs to thrive. With its mission to advance knowledge and transform lives, a spirit of enterprise and a deep commitment to sustainability are at the core of everything the University does.

The United Nations Sustainable Development Goals inform and inspire all its research and teaching, whether that is by raising aspirations through education, powering the growth of renewable energy, tackling the threat of antibiotic resistance, or driving action for clean and health oceans.

"The vast array of interconnected issues facing our world require action, locally, regionally, nationally and internationally. Investing in sustainable operations is a win-win; it is good for the planet, our business partners, our communities, our students and our staff. It is also important to us that we are delivering tangible, real-world benefits through the practical application of our strategy both in the UK and overseas."

Professor Judith Petts CBE, Vice-Chancellor

Achieving full net zero after carbon neutral verification

The University was verified carbon neutral in further recognition of its pioneering efforts in net zero innovation, research and teaching.

The awarding of PAS 2060 verification, an independent and internationally recognised standard for carbon neutrality, acknowledges the University's ongoing work to reduce the carbon impact of its campuses and operations. It becomes only the second UK university to achieve the status.

Since declaring a climate emergency in 2019, the University has held the ambition of delivering net zero emissions from scope 1 and 2 – which cover gas, electricity and a number of other fuels – by 2025.

Its latest *Sustainability Report* shows it has achieved that target three years ahead of schedule through reducing those emissions by 78% since 2005.

Playing a significant role in the United Nations climate report

Dr Souran Chatterjee was among the core research team invited to develop the first United Nations report on climate and Sustainable Development Goal synergies.

Published in September 2023, it outlines the steps governments should take to maximise the impact of their policies and actions by creating such synergies. It demonstrates that aggressively acting on climate and development in an integrated and synergistic way is an important opportunity to achieve the course correction needed to protect our planet now and in the future. It also highlights some of the challenges but also the opportunities.

"We know that tackling climate change is not solely about reducing global warming and protecting the environment. If we are to properly address it, we need to identify the synergies between the environment, society, behaviours and global development."

Dr Souran Chatterjee, Lecturer in Energy Transitions – Environmental Management and Sustainability

Showing the critical challenges facing tropical forests

A study involving the University, and published in *Nature*, found some tropical leaves are already reaching temperatures at which they can no longer function.

The research combined high-resolution data from a thermal imaging instrument on the International Space Station and in situ warming experiment data from across the world's tropical forests. It demonstrated for the first time that a small percentage of tropical leaves are already reaching, and occasionally exceeding, the temperatures at which they can no longer function. It also suggests that as climate change continues, entire canopies could die.

The study's authors say their findings have serious implications because tropical forests are home to most of the world's biodiversity and are key regulators of our climate.

"Trees are a critical part of our planet's response to climate change, and tropical forests play a key role in housing species diversity and regulating the planet's climate. If they are damaged by increases in temperatures, we are losing a key line of defence and limiting nature's ability to mitigate the impacts of human activity."

Dr Sophie Fauset, Associate Professor in Terrestrial Ecology

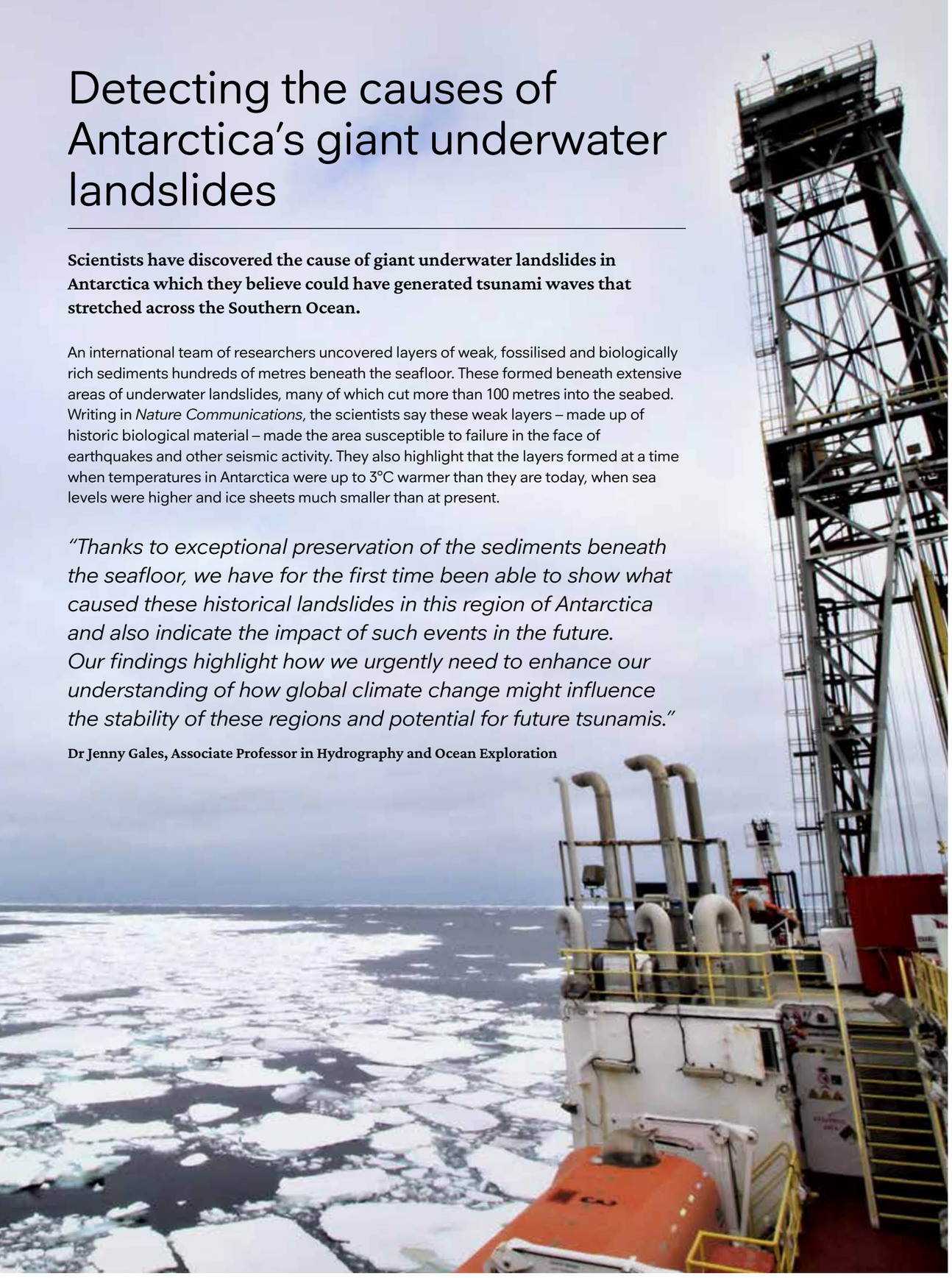
Detecting the causes of Antarctica's giant underwater landslides

Scientists have discovered the cause of giant underwater landslides in Antarctica which they believe could have generated tsunami waves that stretched across the Southern Ocean.

An international team of researchers uncovered layers of weak, fossilised and biologically rich sediments hundreds of metres beneath the seafloor. These formed beneath extensive areas of underwater landslides, many of which cut more than 100 metres into the seabed. Writing in *Nature Communications*, the scientists say these weak layers – made up of historic biological material – made the area susceptible to failure in the face of earthquakes and other seismic activity. They also highlight that the layers formed at a time when temperatures in Antarctica were up to 3°C warmer than they are today, when sea levels were higher and ice sheets much smaller than at present.

"Thanks to exceptional preservation of the sediments beneath the seafloor, we have for the first time been able to show what caused these historical landslides in this region of Antarctica and also indicate the impact of such events in the future. Our findings highlight how we urgently need to enhance our understanding of how global climate change might influence the stability of these regions and potential for future tsunamis."

Dr Jenny Gales, Associate Professor in Hydrography and Ocean Exploration



Understanding the impacts of past global warming

Fossilised beaches along the UK coastline enabled scientists to demonstrate for the first time how melting Antarctic ice sheets impacted global sea levels during a period of pronounced climate warming more than 100,000 years ago.

A study in the journal *Science Advances* analysed ancient sediments from raised beaches in Cornwall, Devon and elsewhere across Western Europe. The scientists believe the raised beaches – characterised by flat surfaces, often with fossilised beach sands and stones, and typically found around 4–6m above current sea levels – could provide an invaluable insight into the local and global impacts of melting ice sheets in the future.

By combining new and existing data with a series of novel analysis and modelling techniques, the team of researchers from the UK, USA and Canada were able to demonstrate that the melting of the Antarctic ice sheet would have caused a rise in global sea levels of up to 5.7m.

"Our findings show that the English Channel is roughly neutral for sea-level change from the northern hemisphere, with the rising sea levels from melt and the rising land from the effects of rebound cancelling each other out. As a result, the historic changes which saw sea levels along the UK coastline rise by up to 6m can be attributed solely to the melting of Antarctic ice."

Dr Matt Telfer, Associate Professor of Physical Geography

Uncovering hidden moles in hidden holes

Scientists identified two types of mole which they believe have been living undiscovered in the mountains of eastern Turkey for as many as three million years. The new moles – named *Talpa hakkariensis* and *Talpa davidiana tatvanensis* – belong to a familiar group of subterranean, invertebrate-eating mammals found across Europe and Western Asia.

The researchers – using cutting-edge DNA technology – have confirmed the new forms are biologically distinct from others in the group. Both inhabit mountainous regions in eastern Turkey, and are able to survive in areas with surface temperatures of up to 50°C in summer and being buried under up to 2m of snow in winter.

"Superficially, the new moles we have identified in this study appear similar to other species. Our study highlights how we can under-estimate the true nature of biodiversity, even in groups like mammals, where most people would assume we already know all the species with which we share the planet."

Professor David Bilton, Professor of Aquatic Biology

Turning waste wood into nutritious food

Researchers from the University hoping to rebrand a marine pest as a nutritious food have developed the world's first system of farming shipworms.

The long, white saltwater clams are the world's fastest-growing bivalve and can reach 30cm in length in just six months. They do this by burrowing into waste wood and converting it into highly nutritious protein, which has led to them being eaten by coastal communities for centuries.

In a series of tests, detailed in a study published in the journal *Sustainable Agriculture*, researchers found that levels of vitamin B12 in the Naked Clams were higher than in most other bivalves, and almost twice the amount found in blue mussels. With the addition of an algae-based feed, they can also be fortified with omega-3 polyunsaturated fatty acids – nutrients essential for human health.

"We urgently need alternative food sources that provide the micronutrient-rich profile of meat and fish but without the environmental cost. Our system offers a sustainable solution and may well become a fantastic way to reduce your carbon footprint."

Dr Reuben Shipway, Lecturer in Marine Biology

Highlighting the threat of carbon loss from northern peatlands

A study involving the University found that the harm caused to the northern hemisphere's peatlands as a result of wildfires could lead to greater quantities of carbon dioxide being released into the atmosphere.

The research, published in *Nature Climate Change*, estimated for the first time how degradation, wildfire combustion and post-fire dynamics influence carbon emissions from non-permafrost peatlands across vast areas of the northern hemisphere. When peatlands are drained, typically to convert them to agriculture or forestry, they release carbon back to the atmosphere as carbon dioxide.

The study estimated that these emissions are enhanced by as much as 10% when taking wildfire into account. Using a modelling approach, the researchers found that while northern peatlands are still currently sequestering carbon, small increases to the drained area, fire severity or burn area can all switch the system to a net source of greenhouse gases.

"Our study adds further evidence to the need to deploy peatland restoration at pace and at scale. It is a cost-effective tool that can help minimise the wider impacts to northern peatland carbon stocks and the associated significant costs to society."

Dr Scott Davidson, Lecturer in Ecosystem Resilience

Driving the development of water testing technology

Molendotech, an award-winning University spin-out company, secured an investment of more than £1.2 million to push forward the development of its pioneering water testing technology.

The new funding has enabled the company to create an operational unit based in the Health and Wellbeing Innovation Centre in Truro, in addition to its base at the Brixham Laboratory. It will also support the company on the commercialisation and development of its product BacterisK+, an easy-to-use, portable and rapid test to monitor and detect pathogens found in water. Current water testing methods can take more than 48 hours to assess the safety for use. The 25-minute test invented and developed by Molendotech is being used by water utilities, regulators and other interest groups to minimise the exposure of the population to bacteria and to track sources of pollution.

"Being able to detect pathogens quickly and accurately is vital when working to keep communities safe from harm. Our testing solutions can be used quickly and by anyone who has had basic training, meaning rapid action can be taken to address a poor-quality environment or danger."

Professor Simon Jackson, Chief Scientific Officer at Molendotech

Demonstrating young people's demands for climate education

A report by the University and the British Science Association found that secondary school pupils feel the climate change education they receive is too focused on passing exams and doesn't equip them with the skills they need to tackle the climate crisis.

The research showed that 14- to 18-year-olds believe climate change is the most important issue that needs to be addressed if their lives are to be improved in the future. Despite that, just over a quarter (26%) of pupils surveyed feel strongly that any actions they currently take to combat climate change might make a difference. Also, more than 7 out of 10 pupils (72%) say they would welcome the opportunity for broader lessons about climate change in school, rather than simply learning facts and associated impacts. A similar number (68%) believe climate change education should be included across all subjects, in addition to science and geography where most currently learn about how the climate is changing.

"The findings serve as a clear and loud call for agency and empowerment from young people. Only by engaging with the next generation can we develop a successful climate education strategy, giving young people the confidence and knowledge to tackle environmental challenges."

Professor Alison Anderson, Professor in Sociology

Connecting people with stories from our changing planet

The Plymouth Nature Film Festival, founded by six students from the University, was held in the city's Market Hall in April 2023. Open to people of all ages, it showcased grassroots works of film and photography from all around the world that encourage people to think globally and act locally.

The creative pieces aimed to raise awareness around key issues and enable those attending to see the individual impact they can make through connecting with local environmental organisations. The 2023 festival carried the theme of 'change', how it impacts our relations with the world around us and whether the planet is best served by adapting or resisting it. In addition to things to watch and view, there were also interactive workshops and opportunities for people to speak to those who share their passion for nature.

"In recent years, there has been a lot of conversation about how people all around the world connect with nature, and how the whole planet is in serious trouble. We felt it was something that needed to be explored here in Plymouth, by giving people a chance to better understand their relationships with nature but also providing them with the connections they need to take action."

Shivani Rajani, BSc (Hons) Marine Biology and Coastal Ecology student

The Plymouth Nature Film Festival organising committee

Experiencing conservation challenges

Students and staff from the University worked with community organisations in the Azores to reduce the impact of invasive species on the islands' landscapes.

The second year Biological Sciences students travelled to the region in the summer of 2023 for an annual field course studying the unique geography and exceptional biology of the remote volcanic island of São Miguel. The trip enabled exploration of topics ranging from evolution and conservation, to the habitats favoured by extremophiles and the effects of human behaviour on fragile ecosystems such as invasive plants and animals. While there, the students collaborated with local agencies to better understand some of the native plant species found on the islands, and how to create an environment in which they can survive and thrive in the future.

"We have been running this field course since 2007 and have seen some of the massive pressures that have been put on the island environment. Our aim is a field course that has a positive impact on the island while creating a space for conversations with our students about responsible global citizenship."

Dr Richard Billington, Associate Professor of Biology

Combatting the fishing nets stranded on our beaches

MA Design student Chris Fronebner designed a new tool to help clear fishing nets from our beaches – and received national recognition for his efforts. He created a beach cleaning tool that comprised a telescopic hook with a built-in knife and a collection bag made from a net.

The main tool is made by 3D printing using filament from discarded nets, and Chris's work saw him named as one of the UK's Green Grads, a national initiative that celebrates graduates with 'ideas to heal the planet'. Seen as a key threat to marine wildlife, fishing nets account for an estimated 25% of the ocean's plastic waste. Chris designed the tool in the first module of his masters and now wants to make it available to everyone.

"I'm passionate about marine wildlife and attended local beach cleans to help combat marine litter. While I was able to physically pick up several items, I'd noticed difficulties in collecting fishing nets, so designed a tool to help."

Chris Fronebner, MA Design student

Awards and Successes

INSTITUTIONAL AWARDS

Winning a Times Higher Education Award

The University's work to combine first-rate dental training with outstanding community care saw it win the Outstanding Contribution to the Local Community category at the Times Higher Education Awards 2023.

Earning plaudits at the Green Gown Awards

The University won the Reporting with Influence award, and was also Highly Commended in the 2030 Climate Action category, both accolades acknowledging the long-held commitment to carbon reduction.

Award shortlisting for sustainability leadership

The University was shortlisted in the Public Sector Local Leadership category of the Regen Green Energy Awards 2023.

Silver awards for gender equality

The School of Health Professions and the School of Nursing and Midwifery each achieved a silver Athena Swan Award.

Drake's Place retains Green Flag Award

The University retained the Green Flag Award for Drake's Place Gardens and Reservoir. First presented in 2015, the accolade recognises ongoing work to ensure the area remains a well-managed park and green space.

King's Award for Enterprise

Ultramed, a digital health company that received support from the Acceleration Through Innovation programme, earned a King's Award for Enterprise in recognition of its excellence in medical innovation.

CobBauge Building earns sustainable construction award

The CobBauge Building earned Best Commercial Sustainable Construction project at the Plymouth City Council Building Control LABC awards.

Accolade for medical innovation

An ongoing partnership between the Cornwall Intellectual Disability Equitable Research group and med-tech start-up Neuronostics earned the Partnership with Academia category at the Medilink UK Healthcare Business Awards.

Medilink South West Awards

Spin-out company Molendotech Ltd won the Innovation category at the Medilink South West Awards.

STAFF HONOURS

Dr Darren Aoki was part of a team shortlisted for a Governor General of Canada History Award for Excellence in Community Programming.

Professor Mel Austen has been appointed to the Board of Natural England for the next three years. Mel has served on the government's Joint Nature Conservation Committee.

Dr Richard Ayres was elected to membership through distinction to the Faculty of Public Health, the body that represents public health practitioners in the UK.

Kevin Forshaw was appointed the new chair of Maritime UK South West, and has also taken a place on the Maritime UK National Council Board.

Dr Stavros Karamperidis and his team won the Best academic paper award from the International Association of Maritime Economists.

Professor Bridie Kent was chosen by Sigma Nursing to join its International Nurse Researcher Hall of Fame.

Dr Pete Keohane and Dr Lealah Hewitt-Johns were part of a team that secured the Best Educational Programme for the NHS accolade at the recent Health Service Journal (HSJ) Partnership Awards.

Professor Ewen McColl was elected as the new chair of the Association of Dental Hospitals.

Dr Daniela Oehring was accepted as a member of the World Council of Optometry.

Dr Clare Pettinger earned the Nutrition, Food Science or Dietetics Lecturer of the Year at the annual Caroline Walker Trust Awards.

Professor Georgy Shapiro was re-appointed to the UKRI Talent Panel College to support the Future Leaders Fellowship (FLF) scheme in the area of ocean science.

Professor John Summerscales was declared the 2023 winner of the Institute of Materials, Minerals and Mining (IOM3) Leslie Holliday Prize.

Professor Richard Thompson OBE FRS was named a recipient of the 2023 Blue Planet Prize, in recognition of his significant contributions to the resolution of global environmental problems.

HONORARY DEGREES

The honorary degrees and fellowships awarded in 2023 were:

Sir Roger Alexander Deakins CBE
Doctor of Arts

Colin Irwin John Hamilton Drummond OBE DL
Doctor of Business

Dame Suzi Leather DBE MBE DL
Doctor of Health

Professor Shijun Liao
Doctor of Engineering

Sir Michael Morpurgo OBE FRSL FKC
Doctor of Letters

Philip Jonathan Clifford Mould OBE
Doctor of Arts

Captain Mohd Salleh Ahmad Sarwan
Honorary Fellow

Dame Judith Weir CBE
Doctor of Music

Professor Sir Duncan John Wingham Kt PhD
Doctor of Science

Transforming Health and Care

Our expertise across health and care has the fundamental aim of transforming lives. Our world-leading research is addressing today's most pressing healthcare and psychological challenges, unlocking innovative new treatments for conditions including cancer, dementia, Parkinson's disease, and all manner of mental health issues. At the same time, our commitment to research-informed teaching and real-world learning means our students are acquiring both the personal and professional skills they will rely on in their future careers.

Celebrating our contribution to community dental care

The University's work to combine first-rate dental training with outstanding community care was acknowledged at the Times Higher Education Awards 2023.

The pioneering work of the Peninsula Dental School and the Peninsula Dental Social Enterprise (PDSE) won the Outstanding Contribution to the Local Community category at the awards ceremony in Liverpool. It is recognition of the efforts of more than 100 staff and 400 students working and studying with the Plymouth Dental School, and in communities and clinics run by PDSE across Devon and Cornwall. Over the past year, they saw almost 5,600 patients in the course of 28,000 appointments. 418 dental and dental therapy students were able to deliver crucial primary care to many of the more vulnerable members of society, including those experiencing homelessness and other forms of social exclusion. This activity marked a significant rise both in the number of patients seen, and appointments delivered, at the Dental Education Facilities in Plymouth, Exeter and Truro.

"To have our work recognised at a national level is further evidence that our approach is delivering positive change across our community. It is the result of an amazing team effort that continues to benefit our students and staff, and the people of Devon and Cornwall."

Professor Ewen McColl, Head of the Peninsula Dental School

Joining forces to deliver pharmacy degree

The University is working with the University of Bath to address the urgent need for more pharmacists, nationally and in south-west England. From September 2024, Bath's MPharm (Hons) Pharmacy course will also be delivered in Plymouth.

The collaboration will give students more opportunities to study pharmacy and increase the number of pharmacy graduates in the South West, significantly contributing to healthcare within the region. The partnership brings together the University of Bath's longstanding expertise in pharmacy education and research with the University of Plymouth's excellence in providing health and social care education. It will be delivered in close collaboration with NHS England and many local stakeholders. The move comes at an exciting time for the profession, as changes to pharmacy education will allow all pharmacists to prescribe on registration from 2026, increasing the diversity of roles within the career.

"Plymouth is already home to more than 4,500 health and social care students. Adding the pharmacy degree to the options available in Plymouth means we now offer an even broader suite of pathways into careers that will make a tremendously positive difference to the health and wellbeing of people in our region and beyond."

Professor John Curnow, Deputy Vice-Chancellor, Education and Student Experience

Using targeted ultrasound to change brain functions

Research by neuroscientists at the University found the targeted use of ultrasound technology can bring about significant changes in brain function that could pave the way towards the treatment of conditions such as depression, addiction or anxiety.

The study explored the impacts of an emerging technique called transcranial ultrasound stimulation (TUS). Writing in *Nature Communications*, the researchers said a study involving 24 healthy adults showed that TUS can induce significant changes in GABA (gamma-aminobutyric acid) concentration within the brain's posterior cingulate cortex in the hour following ultrasound treatment. As such, they believe it represents an important first step in the generation of clinical applications that could use ultrasound to treat mental health disorders.

"We already know that specific regions of the brain (and some of their connections) are dysfunctional in certain conditions but other regions can work perfectly well. This study provides us with the genuine potential to think about using ultrasound for more targeted interventions in people with a range of mental health conditions."

Dr Elsa Fouragnan, Associate Professor of Neuroscience

Uncovering the genetic mutations that cause neurodegenerative disease

Scientists have discovered an additional potential cause of the genetic mutations that result in rare conditions such as Huntington's disease (HD).

The neurodegenerative diseases, which also include most spinocerebellar ataxias (SCAs), are known to be caused by an expansion in the CAG (cytosine-adenine-guanine) repeats within a gene, which in turn leads to an expanded polyglutamine (polyQ) tract in a protein. Previously, it had been thought the damage in these genetic diseases was caused solely by increased protein aggregate toxicity. However, a new study published in *Nature Chemical Biology* has found that an additional source – ribonucleic acid (RNA) – can generate levels of toxicity that cause damage to the brain in these diseases.

"Conditions such as Huntington's disease currently have few treatments and no known cure. If we are to make the significant steps needed to directly benefit patients and their families, we need to fully understand the nature of the conditions we are dealing with."

Professor Shouqing Luo, Professor of Neurobiology

Shedding new light on the challenges of killing superbugs

One of the primary chlorine disinfectants currently being used to clean hospital scrubs and surfaces does not kill off the most common cause of antibiotic-associated sickness in healthcare settings globally, according to a new study.

Research by the University showed spores of Clostridioides difficile, commonly known as C. diff, are completely unaffected despite being treated with high concentrations of bleach used in many hospitals. In fact, the chlorine chemicals are no more effective at damaging the spores when used as a surface disinfectant than using water with no additives.

Writing in the journal *Microbiology*, the study's authors say susceptible people working and being treated in clinical settings might be unknowingly placed at risk of contracting the superbug. As a result, and with biocide overuse fuelling rises in antimicrobial resistance (AMR) worldwide, they have called for urgent research to find alternative strategies to disinfect C. diff spores to break the chain of transmission in clinical environments.

"Far from demonstrating that our clinical environments are clean and safe for staff and patients, this study highlights the ability of C. diff spores to tolerate disinfection at in-use and recommended active chlorine concentrations. It shows we need disinfectants and guidelines that are fit for purpose and that work in line with bacterial evolution."

Dr Tina Joshi, Associate Professor of Molecular Microbiology

Pinpointing the causes and treatments of autoimmune diseases

Scientists have developed a potentially transformative new technique that could aid in the discovery and development of new therapeutics for globally prevalent autoimmune diseases.

Conditions such as lupus, rheumatoid arthritis and inflammatory bowel disease (IBD) – as well as failures within transplanted cells – are all caused by altered cytokine secretion of immune cells within the human body. To find treatments for such diseases, experts need to identify the genetic regulators of the secretion so they can explore the most effective ways of inhibiting them. An international team of researchers, led by the University, detailed a method of doing so in a study published in *Nature Biomedical Engineering*. They demonstrated the method is accurate in sorting hundreds of millions of CRISPR-edited cells based on their secretion patterns, and in identifying the genetic regulators of cytokine secretion in an autoimmune condition. In addition, the method takes into account the detailed profiles of approved treatments to establish whether therapies already in existence can be reapplied in new ways.

"This is an incredibly novel approach that can potentially deliver huge benefits. It gives us the ability to sort a large number of cells based on their secretion patterns and identify therapeutic targets that could be applied to help those with conditions for which there are currently few therapeutic options."

Dr Mahmoud Labib, Lecturer in the Peninsula Medical School

Highlighting the challenges of enabling smokers to quit

Promoting physical activity and other behavioural support can help people wanting to reduce their smoking to quit in the short term.

However, after nine months, physical activity delivers no noticeable benefits – compared with offering no additional support – in the rates of people stopping smoking, according to the findings of a major national study led by the University. The Trial of physical Activity and Reduction of Smoking (TARS) study took place across four cities – Plymouth, Nottingham, Oxford and London.

Its aim was to provide a definitive answer as to whether future NHS services should be adapted to provide additional support to smokers not ready to quit but who do wish to reduce their smoking. The study showed that engaging with the motivational support had some short-term benefits; however, just 2% of those receiving the support had abstained from smoking for between three and nine months. In addition, while after three months people receiving the additional support took part in 81 minutes more physical activity each week than those receiving no support, researchers found no evidence of sustained differences in physical activity at nine months.

"Generally, the smokers in our study were enthusiastic about the support they received, but they were unable to maintain increases in physical activity, and smoking reduction did not lead to more smokers giving up completely. Helping smokers to move from wanting to reduce to quitting completely is far more challenging than other less rigorous studies had suggested."

Professor Adrian Taylor, Professor in Health Services Research

Helping people with respiratory health conditions to find their voice

Physiotherapists from the University are working with a Devon-based charity to explore how singing can improve breathing and overall wellbeing.

The Singing for Wellness project, run by Wren Music, has received funding from the National Lottery Community Fund to run sessions for the next three years. It follows a successful NHS-funded pilot in Torbay before the pandemic, with the new sessions taking place in East Devon, West Devon and Torbay. Singing can be of particular benefit to people with respiratory conditions and those suffering the effects of long COVID, but many in this vulnerable group are anxious about attending group events and remain socially isolated. The Singing for Wellness sessions aim to overcome some of those barriers.

"We are constantly looking for techniques that can help patients to manage a respiratory condition, and singing has been shown to have a number of benefits. It will be fascinating to explore that through this project, and to see how the sessions they are running are having positive impacts for people and their families."

Kath Donohue, Lecturer in Physiotherapy

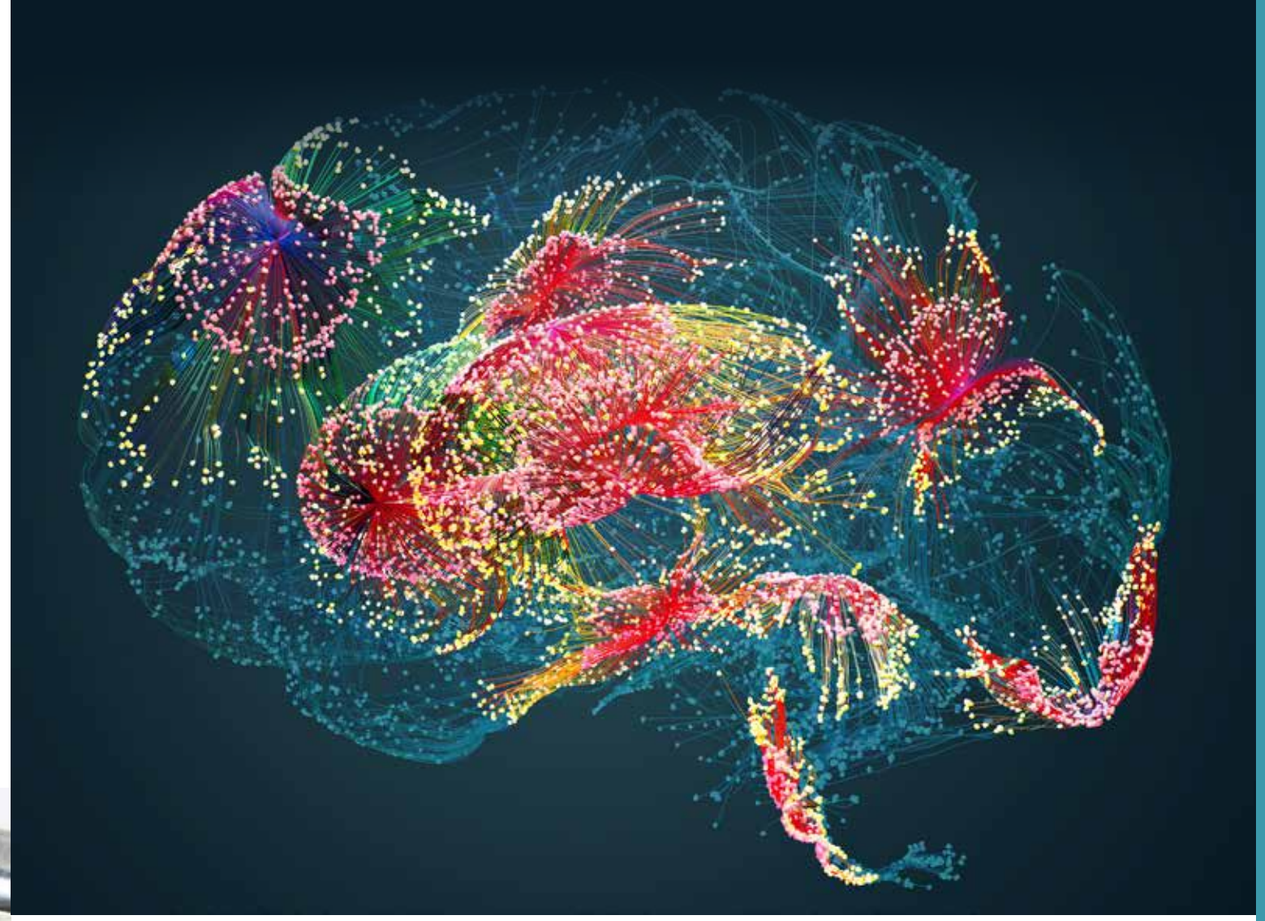
Exploring the signs of dental patients' anxiety

Experts in dentistry and filmmaking are working in tandem to find ways to support patients who suffer from extreme anxiety when visiting the dentist. The University was awarded funding by the MPS Foundation to assess and then develop ways to manage dental anxiety.

They are also looking to establish a novel approach to detecting subtle signs or 'tells' of anxiety in the dental clinic by building a partnership between patients, clinicians, filmmakers, ethnographers, researchers and the public. The AngST project builds on a decade of work by researchers from the University's Transtechnology Research Group and colleagues at the Torbay and South Devon NHS Foundation Trust. It will see a pilot study conducted using video recordings of dental treatment, which will be used to analyse patients' emotional experiences during dental visits. The ultimate aim of the project will be to encourage all the parties to respond in a way that helps to reduce anxiety, and thereby improve the provision and take-up of dental care and the wellbeing of dentists.

"For many people, just the thought of going to the dentist evokes all manner of anxieties that they choose to avoid. That can lead to dental issues going unmanaged, so it is essential for us to find better ways of managing people's anxieties, and give clinicians and patients themselves the tools to manage them."

Professor Mona Nasser, Director of the Plymouth Institute of Health and Care Research



Exploring whether online arts and culture can enhance young people's mental health

Young people across Cornwall are helping to create an online museum and explore whether it can improve their mental health, as part of a groundbreaking project. The £2.6 million five-year ORIGIN project, funded by the National Institute for Health and Care Research (NIHR), is a collaboration between NHS trusts and universities, working in partnership with museums and charities.

It will see diverse communities of young people aged 16 to 24 co-designing an online arts and culture intervention aimed at reducing anxiety and depression. Its effectiveness will then be tested in a trial of nearly 1,500 young people, including LGBTQ+ and autistic young people, ethnic minorities and those who live in some of the most deprived areas of the UK. The ORIGIN project involves the University, Cornwall Museums Partnership, Cornwall Partnership NHS Foundation Trust, Cornwall-based Making Waves, the Dreadnought Centre, Speak Up Cornwall, and Imagineear.

"By engaging young autistic people as research partners, we will ensure their opinion is heard regardless of their preferred method of communication. Also, by listening to parents, teachers, allied professionals and other family members, we can identify the ways in which existing online interventions are currently delivered and received, and how we can improve their impact through empathy, kindness, care, respect and compassion."

Professor Rohit Shankar MBE, Professor in Neuropsychiatry

Assessing changes to midwifery models of care in England

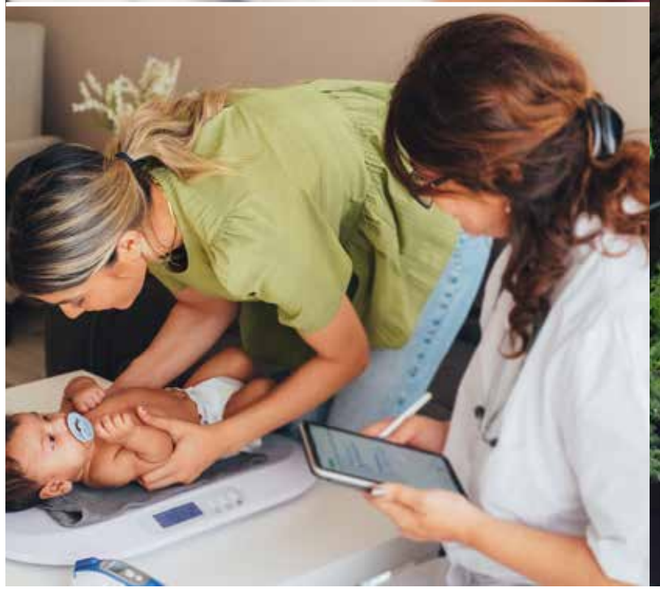
Researchers have launched the largest study to date in the world of a model that aims to improve the quality and safety of midwifery care. Midwifery Continuity of Carer (MCoC) is a major policy initiative in NHS England, aimed at ensuring a woman's care before, during and after birth is led by the same midwife, or a small team of midwives.

This represents a significant shift in usual approaches to care, which often meant that women saw different midwives through pregnancy, labour and early motherhood. This could lead to gaps in care that resulted in poorer outcomes and experiences for women and their babies.

The Studying Implementation of Midwifery Continuity of Carer (SIMCA) project, led by the University, is exploring where implementation of MCoC is going well and where its implementation is creating challenges. It also involves partners across the UK – including Cardiff University, the University of Birmingham, Imperial College London, Imperial College Healthcare NHS Trust, leading pregnancy charity Tommy's and The Mosaic Community Trust.

"Midwives invariably deliver first-rate care for women and their babies. However, several reports into safety failures in England and internationally have demonstrated where that isn't always the case. Better understanding of how implementation of MCoC works best and what factors influence implementation is imperative, and by the end of this study we plan to deliver that."

Professor Aled Jones, Head of the School of Nursing and Midwifery



Examining the impacts on humans of space flight

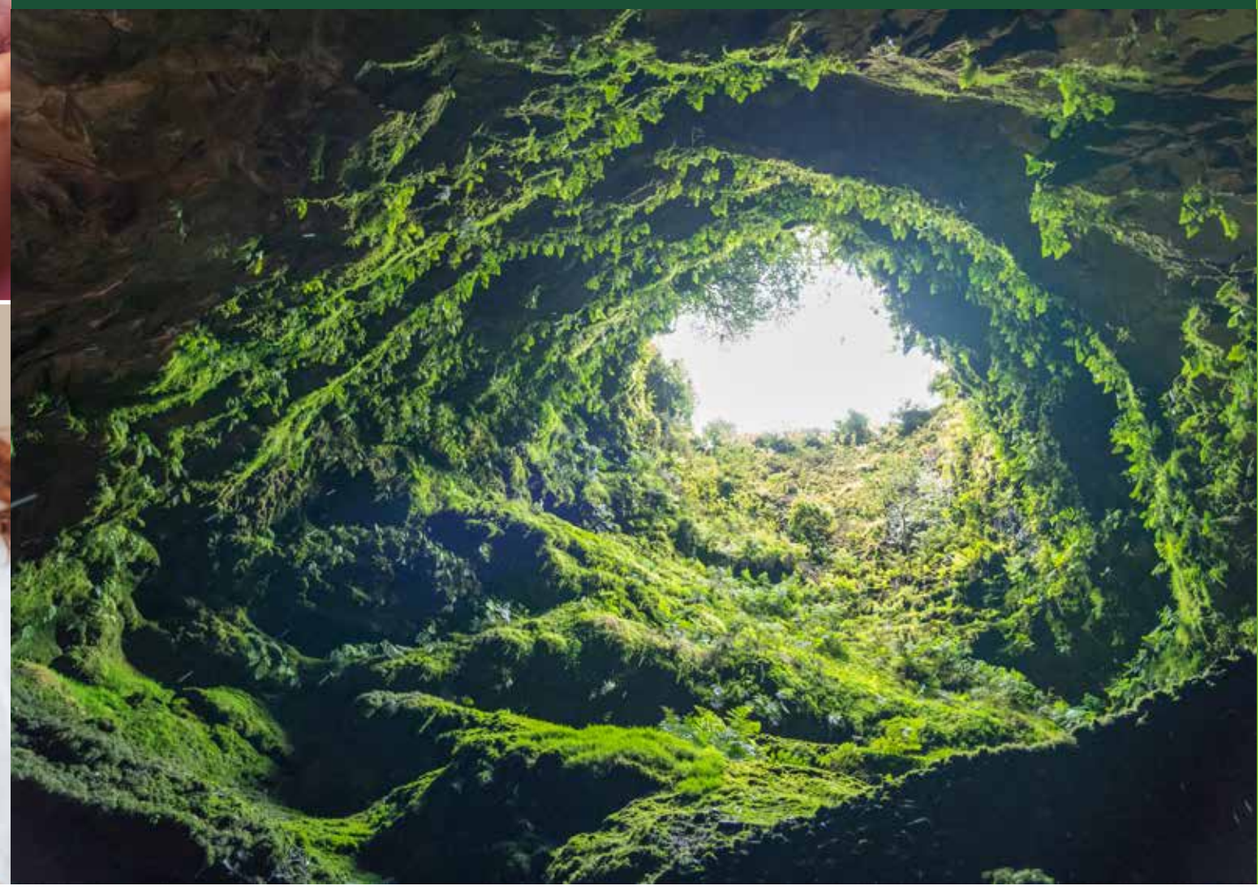
Researchers from the University are taking part in a major international project using cave systems in the Azores to explore the impact of space missions on the human body.

The Caving Analog Mission: Ocean, Earth, Space (CAMões) project is bringing together a team of experts to develop and implement research programmes that will be critical for improving conditions on future space flights. For a week in November 2023, seven members of the team lived and worked inside a cave on Terceira Island, a lava tube cave which they believe will enable them to recreate conditions to be found on the moon.

The project has been developed by the Institute for Systems and Computer Engineering, Technology and Science (INESC TEC) in Portugal. The work involves researchers from the School of Health Professions, School of Psychology, Peninsula Dental School, and the School of Geography, Earth and Environmental Sciences.

"This is a fascinating way to investigate human adaptability in environments mimicking extraterrestrial conditions. We're exploring aspects like vision, cognition, oral health and environmental empathy in a location that offers an ideal research context due to its geological features and facilities. That makes it a suitable stand-in for lunar and Martian missions, with any findings therefore relevant to long-duration space flights."

Dr Daniela Oehring, Associate Professor in Optometry



Supporting doctors of the future thanks to £1.1 million donation

A game-changing legacy will support University students into medical careers for generations to come. The new bursary will benefit around a quarter of the University's aspiring doctors, as they progress from a foundation year to the first year of their degree.

As part of a drive to open up access to careers in medicine, the fund is targeting undergraduates from underrepresented and disadvantaged backgrounds. The £1,158,644 bequest from Jean Johnston is in memory of her late son James, who studied at Plymouth in the 1980s. The University already awards a bursary of £1,000 to students who undertake a foundation year of study as preparation for five years of study on its Bachelor of Medicine and Bachelor of Surgery course. The funding can be the difference between students being able to join the course or not, and the new James Johnston Bursary Fund will see each cohort of students who progress from the foundation year to their degree in medicine awarded a further £500.

"We are passionate about making the medical profession more accessible and diverse. The fact we are able to offer bursaries and other financial support on a rolling basis has a huge impact on our efforts in encouraging students who might not normally consider a career in medicine because of their background or personal situations."

Professor Laura Bowater MBE, Head of the Peninsula Medical School

Enrolling 10,000 participants to life-saving trial

A clinical trial which researchers hope could lead to improved survival rates among intensive care patients has achieved a significant milestone. Running at almost 100 UK intensive care units (ICUs), the UK-ROX trial has signed up its 10,000th participant.

Each year, around 184,000 patients are admitted to NHS ICUs and over 30% require help with their breathing using a ventilator (breathing machine). Giving oxygen through the ventilator is an essential part of this treatment; however, the most effective concentration of oxygen that should be administered is still not known as both too much, and too little, may cause harm. The UK-ROX trial, funded by the National Institute for Health and Care Research, is testing whether giving a lower concentration of oxygen than usual to people on ventilators may be beneficial. If this is shown to reduce mortality rates compared to the current standard care, the study will recommend immediately changing clinical practice in ICUs throughout the NHS.

"In the past we assumed people needed more oxygen than usual when unwell, thinking oxygen couldn't be harmful. We now know that giving too much oxygen to patients might cause harm. Given how many patients we treat with oxygen on ICUs every day in the UK, any adjustments that might be delivered from the study have the potential to save thousands of lives."

Professor Daniel Martin, Professor of Perioperative and Intensive Care Medicine

Empowering People, Places, Culture and Society

The University is a hub of creativity – of thought, of practice, and of ambition. Nowhere is that more evident than our research and teaching across the creative arts, and in the impact of our cultural research and teaching on a regional, national and international level. Through our creative practice and innovation, and our wide-reaching partnerships, we are building a culture of ingenuity, diversity and distinctiveness that has far-reaching benefits in the community, industry and economy at large.

Celebrating the connection between lives and landscapes

A collage of 483 images – each taken at sunrise in Plymouth for every day of the UK's COVID-19 restrictions – sat at the heart of a new exhibition based on the work of Dr Heidi Morstang, Associate Professor in Photography.

Featuring photographs and films created over the past two decades, the works served as an observation of a fragile natural environment, and the increasing changes in the climate that have now become a global emergency. Amid visions from across the world is Himmelbilder / Skies of Dawn – a 5m collage of images taken from Dr Morstang's garden in Plymouth. It includes 69 columns of seven pictures, one column for each week that the UK lived under restrictions, and focuses solely on the sky as it appeared on each of those 483 days.

"When the pandemic started, my plans changed very quickly, but continuing with my idea gave me a sense of personal stability. I hope people who see it realise that although it was a turbulent time, the skies during those months were very often clear and blue. Despite what was going on, the sun – like the tides – still rose and fell every day."

Dr Heidi Morstang, Associate Professor in Photography

Helping people cope with loneliness or isolation

Reading, writing and sharing poetry can help people cope with loneliness or isolation and reduce feelings of anxiety and depression.

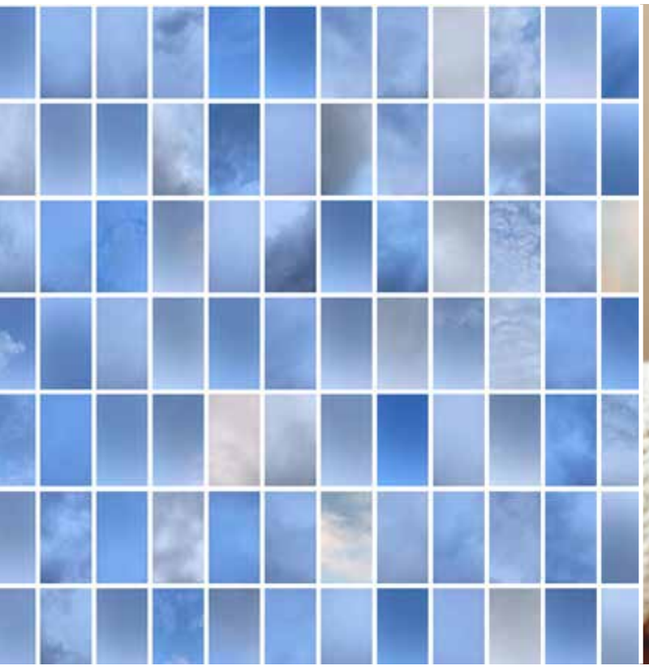
Research led by the University, funded by the Arts and Humanities Research Council, found that many people who took to sharing, discussing and writing poetry as a means to deal with the COVID-19 pandemic experienced 'demonstrable positive impact on their wellbeing'.

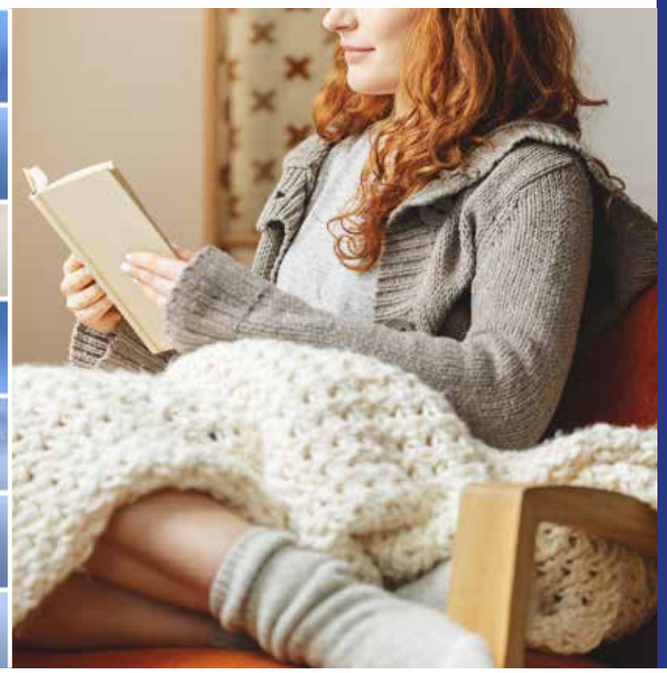
The findings are based on a survey of 400 people which showed that poetry helped those experiencing common mental health symptoms as well as those suffering from grief. Just over half (51%) of respondents indicated that reading and/or writing poetry had helped them deal with feelings of loneliness or isolation, and for a further 50% it had helped with feelings of anxiety and depression.

"These results demonstrate the substantial power of poetry. In addition to supporting health and wellbeing, our website now provides an historical archive for how people around the world used English language poetry to navigate the crisis."

Professor Anthony Caleshu, Professor of Poetry and Creative Writing

Himmelbilder/Skies of Dawn: Heidi Morstang





Mapping the experience of lives impacted by the invasion of Iraq

March 2023 marked two decades since the invasion of Iraq. In the years since, the nation's people have tried to come to terms with the devastation it brought to their cities and towns, their communities and lives.

That initial fight for survival, and subsequent struggle, is being revealed in never-before-seen detail thanks to an ongoing project taking place at the University. Supported by funding from the British Institute for Study in Iraq, Dr Sana Murrani interviewed 15 Iraqi citizens from across the country, using their memories to create a visual archive of how they survived the invasion and the impact it has had on their lives in the two decades since. Some of the resulting material is now available through a digital archive, with the stories featured in an exhibition at the LSE Middle East Centre, and a book due to be published by Bloomsbury in 2024.

"Iraq suffered, and continues to suffer, from vast social and demographic change, with infrastructure and the health system in ruins and poverty and unemployment rife. I hope this ongoing work will amplify Iraqi voices but also their stories, memories and traumas."

Dr Sana Murrani, Associate Professor in Spatial Practice and Architecture

Making NHS space more welcoming for children

BA (Hons) Illustration students from the University worked to transform an NHS centre into a space that is more welcoming and friendly for children and families.

The second-year students were set the challenge of coming up with a fresh new look for the Plymouth Child Development Centre. The results are centred around an underwater theme featuring a range of marine creatures and some species not normally found in the ocean. It also includes interactive displays, providing further information on the creatures exhibited, as well as a seaweed QR code wall which signposts to other helpful resources for families. The scheme was developed in close collaboration with staff who work in the centre, and some of the children and families who use it regularly.

"Throughout their course, we give our students experience of real-world projects the like of which they will encounter through their careers. It gives them the opportunity to apply the skills they are developing to a set brief, and to then adapt their thinking and ideas in response to client feedback."

John Kilburn, Lecturer in Illustration

Four Tet performs in the midst of a Squidsoup light installation in 2019 (courtesy: Rikard Osterlund/Squidsoup)

Fashioning an immersive light show for sell-out musical performances

An artistic collective that creates innovative and immersive light-based experiences is preparing for a series of sell-out performances at iconic venues in the UK and the USA.

Squidsoup is an international group of artists, researchers, technologists and designers. Professor Chris Bennewith (Executive Dean of the Faculty of Arts, Humanities and Business) has had the opportunity to work with them for over 20 years. In May 2023, they worked alongside electronic music pioneer Four Tet to create a unique audio-visual experience for audiences in Los Angeles, New York and London.

For the shows, Squidsoup created its largest ever light installation, which was enjoyed by audiences during two sell-out concerts at London's Alexandra Palace. That work consisted of a 30m x 30m volume of lights, comprising over 40,000 individually addressable points of light, with both Four Tet and members of the audience immersed within the space.

"Nowadays, audiences are expecting a lot more from a live performance, and the blending of digital innovation with live experiences means we are in a great position to provide them with it. As technology continues to advance, the immersive space is really creating opportunities for us."

Professor Chris Bennewith, Executive Dean, Faculty of Arts, Humanities and Business

Creating unique experiences for artists and listeners

Professor Eduardo Miranda has reinforced his position as one of the key global pioneers unlocking the potential of quantum computer music.

Within the technological leap provided by quantum computers, Eduardo is at the forefront of an emerging innovation that unites these most complex of sciences with the arts. In 2023, he launched the first ever book on the subject – *Quantum Computer Music: Foundations, Methods and Advanced Concepts* – at a talk and performance hosted at the Goethe-Institut in London.

Like the advent of electronic music in the 1970s and 80s, and other great advances in music production before it, Eduardo firmly believes that quantum computing could herald the latest cultural shift in the constantly evolving music industry.

"You could start the composition process exactly as you do now, putting together notes or sounds and seeing how they blend. But if you then run music through your own programmed quantum software, it could give you results you had never even thought of."

Professor Eduardo Miranda, Professor of Computer Music

Celebrating the distinctiveness of early years education

The curriculum delivered in early years education and childcare is more focused around what children are interested in learning rather than the things they might need to learn, a new report led by the University found.

However, rather than prompting concerns, the report's authors said that is something which should be celebrated and preserved as it provides an inclusive and flexible approach that supports learning among younger children. The findings stem from a project conducted by academics at the University's Plymouth Institute of Education, supported by Montessori Global Education. It aimed to establish how children up to the age of five can get the most out of early years education, whether that is delivered at home, in day nurseries or in their first months at school.

"Those we spoke to also felt that the curriculum was delivered very much as a partnership between educators, families and the children themselves. In that sense, its uniqueness from other forms of education – and the innovative and inclusive way in which it is delivered – is something that should be celebrated and preserved."

Professor Verity Campbell Barr, Professor in Early Childhood Education

Launching the Plymouth Cold Case Unit

Created in 2023, the Plymouth Cold Case Unit (PCCU) investigates unsolved missing persons cases. Its mission is to uncover new evidence which can be used by the police to solve these cases while giving students the experience and skills – including investigative, analytical and social – to launch them into rewarding careers.

It functions as a student-led, expert-guided group with international connections and access to facilities and training at both the University and Locate International. The unit works out of the University's Crime Suite, and its work gives families of missing people comfort from knowing their loved ones have not been forgotten.

"Joining the PCCU has taught me how to work effectively online and in groups to deliver a report. By working cold cases, we have learnt to think outside the box, as everything may not appear as it seems."

Natasha Hughes, BSc (Hons) Criminology student

Charting the changes in concessionary bus travel

The COVID-19 pandemic led to significant reductions in the number of people taking advantage of concessionary bus travel, according to a report published in 2023.

Compiled by experts in transport logistics at the University for the Chartered Institute of Logistics and Transport, the report compared English National Concessionary Travel Scheme (ENCTS) and Active Card Data for the calendar years 2019 and 2022. It showed a 36% reduction in total ENCTS journeys across 18 regions studied, with the total number of journeys falling from 95 million in 2019 to 61.2 million in 2022.

This was in spite of the number of active passholders falling by just 2.6%. Across England, the report found that the average number of journeys per active card had fallen to an average of 48 single journeys per year. This included a reduction in the number of journeys by elderly passholders of 38% and disabled passholders by 28%. Those aged over 80 had the largest reduction, with male passholders making 43% fewer journeys per active card, and female passholders making 46% fewer journeys.

"Taking public transport can be more than just a journey. It can help people maintain contact and avoid loneliness and isolation. This research's confirmation that, since COVID-19, concessionary travel is down across England is a concerning one."

Dr Andrew Seedhouse, Director of Transport

Highlighting the growing crisis for renters

A major new report by the University and Citizens Advice shone a spotlight on the damaging effects of a freeze on Local Housing Allowance (LHA) rates for local private sector renters.

The report, *Sometimes I Sit on the Sofa and Cry*, tells the stories of local people struggling to keep up with soaring rents and eviction notices. It also contains suggestions to help ease the crisis, including an increase in LHA – an emergency cap on rents and the provision of more affordable homes. The research (which focused on the South Hams, Plymouth and South East Cornwall) found that average rents in the area have been outstripping the level of LHA support since 2015, but the gap has now grown to 12%.

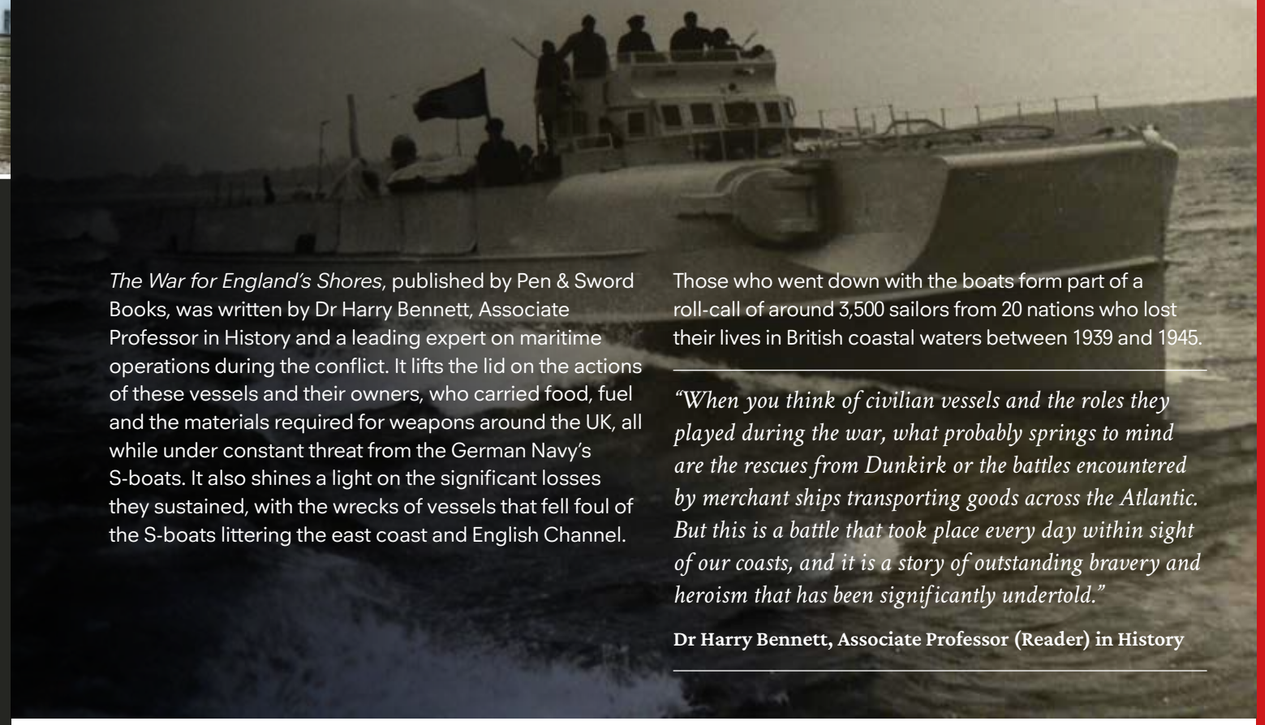
The increase in people facing eviction has also led to big increases in bills for temporary accommodation for local authorities. In Cornwall, the figure rose from £9.5 million in 2020–21 to £18.4 million in 2022–23, while for South Hams District Council the figure rose from £115,000 to £476,000 in the same period.

"From the outside, many people may look at Devon and Cornwall and perceive them as being relatively affluent. However, there are thousands of people having to make very difficult financial choices every day as they struggle to keep a roof over their head."

Dr Nigel Jackson, Associate Professor in Persuasion and Communication

Highlighting the hidden heroism of civilian sailors

The coastal convoys that sailed every day through some of the Second World War's most dangerous waters have been commemorated with the launch of a new book.



The War for England's Shores, published by Pen & Sword Books, was written by Dr Harry Bennett, Associate Professor in History and a leading expert on maritime operations during the conflict. It lifts the lid on the actions of these vessels and their owners, who carried food, fuel and the materials required for weapons around the UK, all while under constant threat from the German Navy's S-boats. It also shines a light on the significant losses they sustained, with the wrecks of vessels that fell foul of the S-boats littering the east coast and English Channel.

Those who went down with the boats form part of a roll-call of around 3,500 sailors from 20 nations who lost their lives in British coastal waters between 1939 and 1945.

"When you think of civilian vessels and the roles they played during the war, what probably springs to mind are the rescues from Dunkirk or the battles encountered by merchant ships transporting goods across the Atlantic. But this is a battle that took place every day within sight of our coasts, and it is a story of outstanding bravery and heroism that has been significantly undertold."

Dr Harry Bennett, Associate Professor (Reader) in History

Applying digital technologies to create inclusion and opportunities

As society becomes increasingly digital, older people across the South West have been faced with the growing prospect of isolation and exclusion.

The growth in the digital sector has also led in the past to younger people feeling they may need to leave the region in search of work in the industry. Now, the Intergenerational Codesign of Novel technologies In Coastal communities (ICONIC) project is looking to address both challenges by finding ways of engaging older generations with digital content – and encouraging younger generations to create it. Led by the University, it will work alongside more than 20 partners from the public sector and the arts, as well as farming, environmental, health, and other organisations. The project will recruit 80 older and 40 younger people, who will work with researchers to develop novel technologies that will help participants connect with their community and the cultural landscapes in the region.

"By supporting the collaborative design of novel technologies, the ICONIC project presents a unique opportunity to engage with local communities to address digital exclusion in Cornwall and Devon. Cultural, environmental, and heritage sites have also embraced the role of these novel technologies in promoting both wellbeing and digital inclusion."

Professor Sheena Asthana, Director of the Centre for Health Technology

Celebrating achievements through the Graduate Show

The Graduate Show is an inspiring exhibition of work from final-year students across the School of Art, Design and Architecture. Each year, it showcases the impressive creativity, innovation and talent of our students across disciplines from architecture and design, to media and photography.

Part of the show's aim is to boost employability for those about to graduate, with the public getting a chance to discover – and, if they want, to buy – new works, while businesses and employers are able to interact with potential new recruits. The 2023 show featured a range of striking physical and digital works, showcased at venues across the University and the city.

Research funding

Here are some of the key research awards, in excess of £100,000, received by the University last year.

Principal Lead	Sponsor	Description	Award Value
Deborah Greaves	**Engineering and Physical Sciences Research Council**	Supergen Offshore Renewable Energy (ORE) Impact Hub	£3,430,927
Sheena Asthana	**NHS National Institute for Health and Care Research**	Plymouth Health Determinants Research Collaboration (HDRC)	£1,858,090
Elsa Fouragnan	**Biotechnology and Biological Sciences Research Council**	Multi-site and state-dependent effects of transcranial ultrasound stimulation on brain function and cognition	£949,947
Sarah Boulton	**Natural Environment Research Council**	EXCESS: exploring the role of excess topography and peak ground acceleration on earthquake preconditioning of landslides	£703,782
Sheena Asthana	**Economic and Social Research Council**	Understanding the research and policy needs of English coastal communities: towards a new coastal classification	£700,833
Jeremy Hobart	**Roche Pharma**	Use of Plymouth MS platform for head-to-head PRO comparison	£610,015
Oliver Tills	**Biotechnology and Biological Sciences Research Council**	EmbryoPhenomics: UKRI Future Leaders Fellowships follow-on funding	£595,551
Victoria Allgar	**Gilead Foundations Charity**	Erase long COVID – evaluating the efficacy of remdesivir for the improvement of lung function, perfusion and system on profile in long-COVID patients	£457,010
Mark Briffa	**Biotechnology and Biological Sciences Research Council**	Interactions between learning and non-learning plasticity in the beadlet sea anenome *Actinia equina*: a multidimensional reaction norm approach	£432,243
Richard Pemberton	**Innovate UK**	The Electric Seaway, delivering critical marine charging infrastructure	£412,764
Richard Pemberton	**Various UK government sponsors**	Regulator Pioneer Fund: Plymouth Marine Autonomy/Clean Propulsion	£364,265
Emma Sheehan	**Offshore Shellfish Ltd**	Offshore Mussel Farm – Phase 4	£329,773
Deborah Greaves	**Engineering and Physical Sciences Research Council**	Integrated wind-wave control of semi-submersible floating offshore wind turbine platforms (FOWT-Control)	£307,174
Oliver Hanemann	**Children's Tumour Foundation**	Children's Tumour Foundation	£284,753
Amy Baker	**NHS**	Down's syndrome screening Quality Assurance Support Service (DQASS) 2023–24	£281,500
James Daybell	**Swedish Research Council**	Moved apart: a history of separation in the 16th and 17th centuries	£275,337
Victoria Allgar	**NHS**	Down's syndrome screening Quality Assurance Support Service (DQASS) 2022–23	£274,000
Daniela Oehring	**Innovate UK**	UK–South Korea Digital Health CRD: patient-centred, biomechanics-based customisation for improved treatment of corneal conditions	£256,492
James Edwards	**Engineering and Physical Sciences Research Council**	Fresh perspectives for QED in intense backgrounds: first quantised techniques in strong-field QED	£239,421
John Summerscales	**Innovate UK**	Knowledge Transfer Partnership with SWMAS Ltd	£231,495
Deborah Greaves	**Engineering and Physical Sciences Research Council**	High End Computing Consortium for Wave Structure Interaction (HEC WSI)	£231,452
Victoria Allgar	**Janssen UK**	Extension of a study looking at ibrutinib for older people with mantle cell lymphoma (ENRICH)	£198,233
Deborah Greaves	**Innovate UK**	Development of an innovative, floating, dual-energy platform (60kW) for small island developing states	£176,336
Stephen Mullin	**Medical Research Council**	Using explainable artificial intelligence to predict future stroke using routine historical investigations	£171,092
Victoria Allgar	**NHS National Institute for Health Research**	Reducing steatosis prior to liver resection (RESOLVE)	£169,364
Richard Thompson	**UK Offshore Energies Association Limited**	Decommissioning and subsea plastics – Phase 2	£165,410
Gyorgy Fejer	**National Centre for the Replacement, Refinement and Reduction of Animals in Research**	Establishment of novel macrophage cell lines to study the pathogenesis of respiratory bacterial pathogens in lung alveolar macrophages	£163,379
Richard Pemberton	**Innovate UK**	Zero Emission Network of Workboats (ZENOW)	£162,086
David Jenkins	**Biotechnology and Biological Sciences Research Council**	A novel sensor platform as a tool to enable early detection of pancreatic cancer	£160,685
Charles Affourtit	**Innovate UK**	Development of a novel circular economy plant protein derivative as a readily digestible dietary ingredient to support healthy ageing	£157,052
Katherine Willis	**Various UK government sponsors**	iCornwall	£152,054
Rohit Shankar	**NHS National Institute for Health and Care Research**	Optimising cultural experiences for mental health in underrepresented young people online (ORIGIN)	£143,615
William Blake	**Cornwall and Isles of Scilly Good Growth Fund**	Resilient Catchment Communities (RCC)	£142,100
Richard Thompson	**Natural Environment Research Council**	The Future Fibres Network+ (FFN+)	£140,767
Eduardo Miranda	**Quantinuum**	Developing methods and systems for quantum computing applications in music and art	£130,000
Ben King	**Leverhulme Trust**	Cascade interference in strong-field quantum electrodynamics	£127,970
Deborah Greaves	**Natural Environment Research Council**	Enabling Sustainable Wind Energy Expansion in Seasonally Stratified Seas (eSWEETS3)	£117,302
Sally Abey	**Great Foundations**	Developing a person-centred decision aid to inform footwear choices in people at risk of diabetes-related foot ulceration	£116,298
Richard Byng	**Oxford Health NHS Foundation Trust**	Provision of an Evaluation of Community Mental Health Framework project	£113,357

Events

Celebrating success at Graduation Week

The cinematographer behind some of the most acclaimed movies of all time and the Master of the King's Music were celebrated alongside the achievements of more than 6,600 graduates at the University 2023 graduation ceremonies in September.

Sir Roger Deakins CBE – best known for films including *The Shawshank Redemption, A Beautiful Mind, No Country for Old Men* and *Skyfall* – was presented with an Honorary Doctorate of Arts in recognition of his outstanding contribution to film. Dame Judith Weir CBE – who has written music for national occasions including the Platinum Jubilee and the coronation of King Charles III and Queen Camilla – also received an Honorary Doctorate of Arts, acknowledging her outstanding contribution to music. Graduation Week featured a total of 15 ceremonies as well as a range of other events. These included the annual Civic Dinner in The Box, which gave the University an opportunity to celebrate its achievements over the past year with leading figures and partners from across the South West and beyond.

An alumni reunion event also took place in the Graduation Marquee, providing former students with the chance to catch up with old friends.

Engaging with world leaders at COP28

A team from the University attended the 28th United Nations Climate Conference – better known as COP28 – in Dubai. Politicians and scientists from all over the world had the opportunity to meet leading researchers and experts in the fields of offshore renewable energy, ocean science, plastics and more.

The University worked with Plymouth Marine Laboratory and Partnership for Observation of the Global Ocean to host a stand in the Education, Science and Technology Zone at Expo City. The team shared the latest developments in climate challenges, impacts and options towards sustainable ocean development. The aim was to connect science, industry, policy and society for the purposes of ocean action in the United Nations Framework Convention on Climate Change (UNFCCC) processes and strengthening Nationally Determined Contributions (NDCs). The centrepiece of the University's presence at COP28 was a side event focused on scaling up community knowledge within a whole-system approach for climate-smart solutions in energy and land transitions.

Highlighting the climate challenges facing coastal communities

The University hosted the UK's first Coastal Research Conference.

The three-day event, organised by the Coastal Processes Research Group (CPRG), highlighted many of the challenges facing coastal communities as a result of the changing climate. It was attended by more than 130 researchers, practitioners and representatives from bodies including the Environmental Agency and Natural England.

Developed in partnership with the National Network of Regional Coastal Monitoring Programmes, the event included 58 presentations, 15 research posters, two keynote addresses and a panel debate. The conference reinforced the University's position at the forefront of coastal research in the UK and internationally. Almost a third of the delegates at the UK Coastal Research Conference were University graduates, testifying to its significant contribution to the coastal research workforce.

Hosting an international dementia conference

Experts in dementia care from the UK and Europe were brought together for a conference at the University.

Chaired by David Fitzgerald from the BBC and Angela Rippon CBE, the aim was to share international, national, and regional thoughts on dementia care and research which have the potential to open up new ways of developing fresh perspectives and groundbreaking solutions that help overcome the challenges faced by people with dementia and carers every day.

The agenda included speakers from the World Health Organization, Alzheimer's Europe, Dementia in the Fishing Communities, Blind Veterans UK and USA, and the UK Dementia Research Institute. Among the highlights of the day was a presentation on 'Dementia Support in the Russia–Ukraine War' by Irina Shevchenko, founder and director of the Nezabutni Charitable Foundation in Kyiv.

Welcoming the Chief Nursing Officer

The University hosted a conference focused on the wellbeing of students who will become future nurses, midwives and nursing associates.

Dame Ruth May, Chief Nursing Officer for England, and Jess Read, Deputy Chief Midwifery Officer, NHS England, were the keynote speakers at the event. The University has around 1,500 nursing and midwifery students in Plymouth, Exeter and Cornwall.

The conference featured breakout workshops covering areas that affect wellbeing: music, movement, exploration and creation. Exhibitions stands representing sources of wellbeing strategies, including Thornbury Nursing Services, the Cavell Nurses Trust and the Laura Hyde Foundation, were also present, as well as regional wellbeing activities.

Showcasing expertise at London International Shipping Week

London International Shipping Week is one of the most important international shipping and maritime events in the world.

It has grown consistently – and rapidly – since its inception in September 2013, and creates a space where the varied elements from the shipping world can meet to discuss the range of challenges and opportunities it faces. The University has had an increasingly prominent presence at the event in recent years, showcasing its expertise in fields including clean maritime, maritime cyber security and maritime logistics to a global audience. In 2023, that included helping to launch the Global Maritime Trends 2050 report and participating in the Maritime UK AI Summit.

Staging a symposium with the International Maritime Organization

Almost 300 of the world's leading global figures in maritime cyber security attended an annual symposium to discuss some of the key cyber challenges facing the global shipping industry.

The two-day symposium on maritime cyber security and resilience was jointly organised by the University's Cyber-SHIP Lab and the International Maritime Organization (IMO). Experts from across the world shared details of the latest international maritime cyber risk evaluation and mitigation research. They also explored how governments, industry, researchers and NGOs can collaborate across fields including maritime autonomy, insurance, skills and training.

Talking plastics and cyber security in Parliament

Academics from the International Marine Litter Research Unit and the Maritime Cyber Threats Research Group took part in Parliament's Evidence Week, organised by Sense About Science.

They met with a number of MPs and peers to make them aware of recent research carried out by the two research groups and its potential impact at a national level. This included providing insights into the current challenges posed by plastic pollution, and some of the solutions they are developing to address them. Researchers also spoke about pioneering work to understand and address the threats posed by maritime cyber-attacks, including research being carried out in the University's world-leading Cyber-SHIP Lab.

Strictly star opens InterCity Place

In November, the University was delighted to welcome broadcasting legend, Angela Rippon CBE to open our new healthcare training facility, InterCity Place.

Fresh from her appearance as a contestant in *Strictly Come Dancing*, the TV presenter, proud Plymothian and recipient of an honorary doctorate from our University was guest of honour at the formal launch event.

After unveiling a plaque to mark the occasion, Angela took a tour of the iconic tower block, adjacent to Plymouth railway station – including a virtual dissection table and care home simulation suite – and described it as "one of the finest healthcare training centres in the country."

InterCity Place was originally built for British Railways in 1962 and, following years of disuse, has now been redeveloped as a new home for student nurses, midwives and allied health professionals.

The University's £33 million investment contains state-of-the-art clinical skills facilities to prepare them for careers in healthcare. Crucially, students are working alongside other practitioners, just as they will in the world beyond education.

"I have huge respect for healthcare professionals, and all the students being trained here will be making a major contribution to the health of the nation, and indeed the health of the NHS.

All the roles here are professions of which future students can be hugely proud and from which they will get enormous personal satisfaction.

This is one of the finest training centres in the country – all power to Plymouth for being in a position to train the next generation of healthcare professionals."

Angela Rippon CBE

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