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Images of Research 2017



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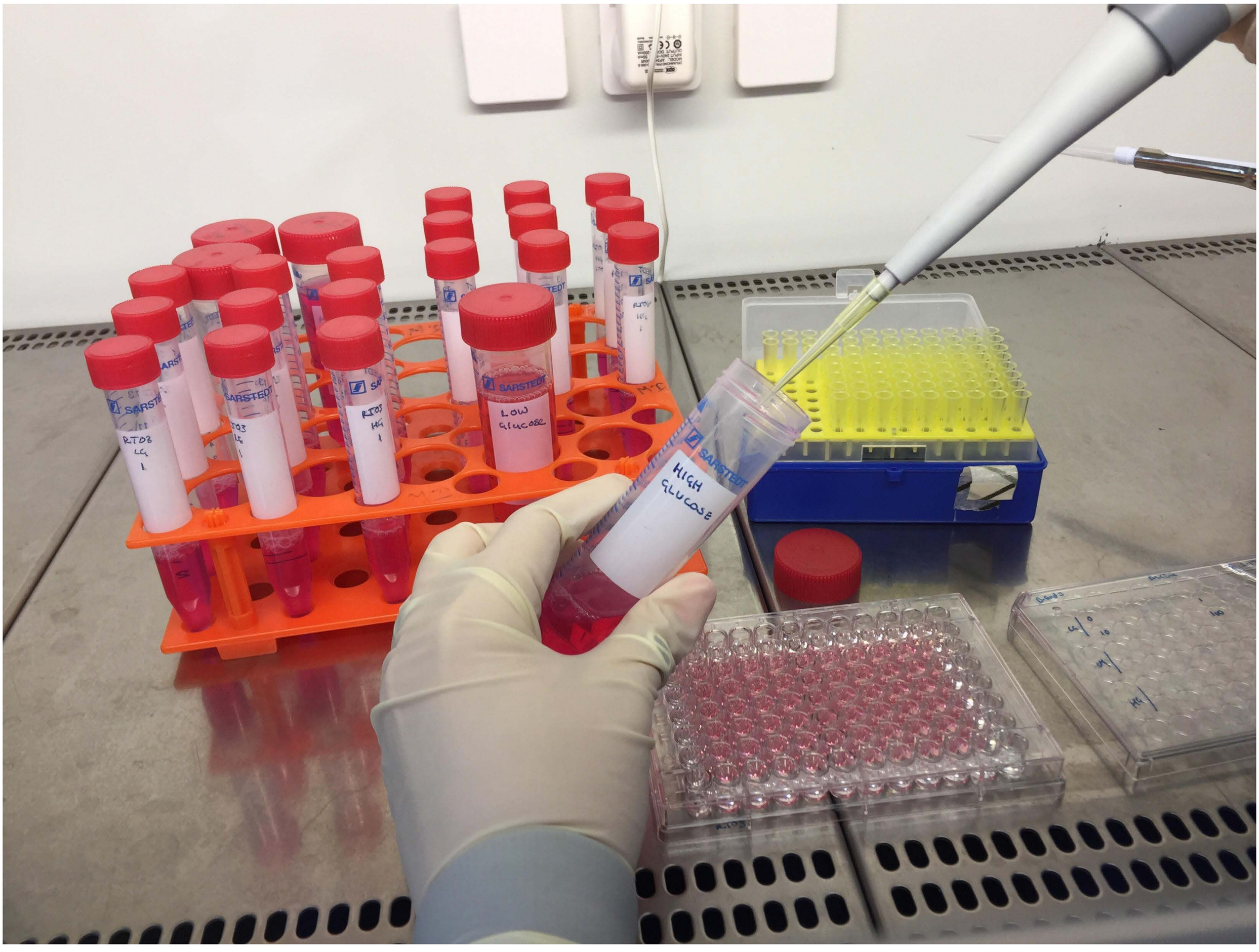
2016ESE | 71

In the “Hood”

Alicia Waters



This image demonstrates the research being undertaken to combat diabetes, an increasingly prevalent condition in society. As diabetes progresses, associated problems with the eyes and kidneys are common. This is as a result of endothelial cells, the cells that line the blood vessels in our body, becoming stressed. In this experiment endothelial cells are exposed to low and high glucose for short bursts of time in order to try and mimic that seen in patients with diabetes. This results in the cells becoming stressed. Hydrogen sulfide, the smelly gas best known for its odour of rotten eggs, has been shown to reverse some of this stress. The different tubes show different doses of different hydrogen sulfide compounds in the different glucose conditions. Our work aims to find a future therapeutic to treat some problems associated with the blood vessels in diabetes.

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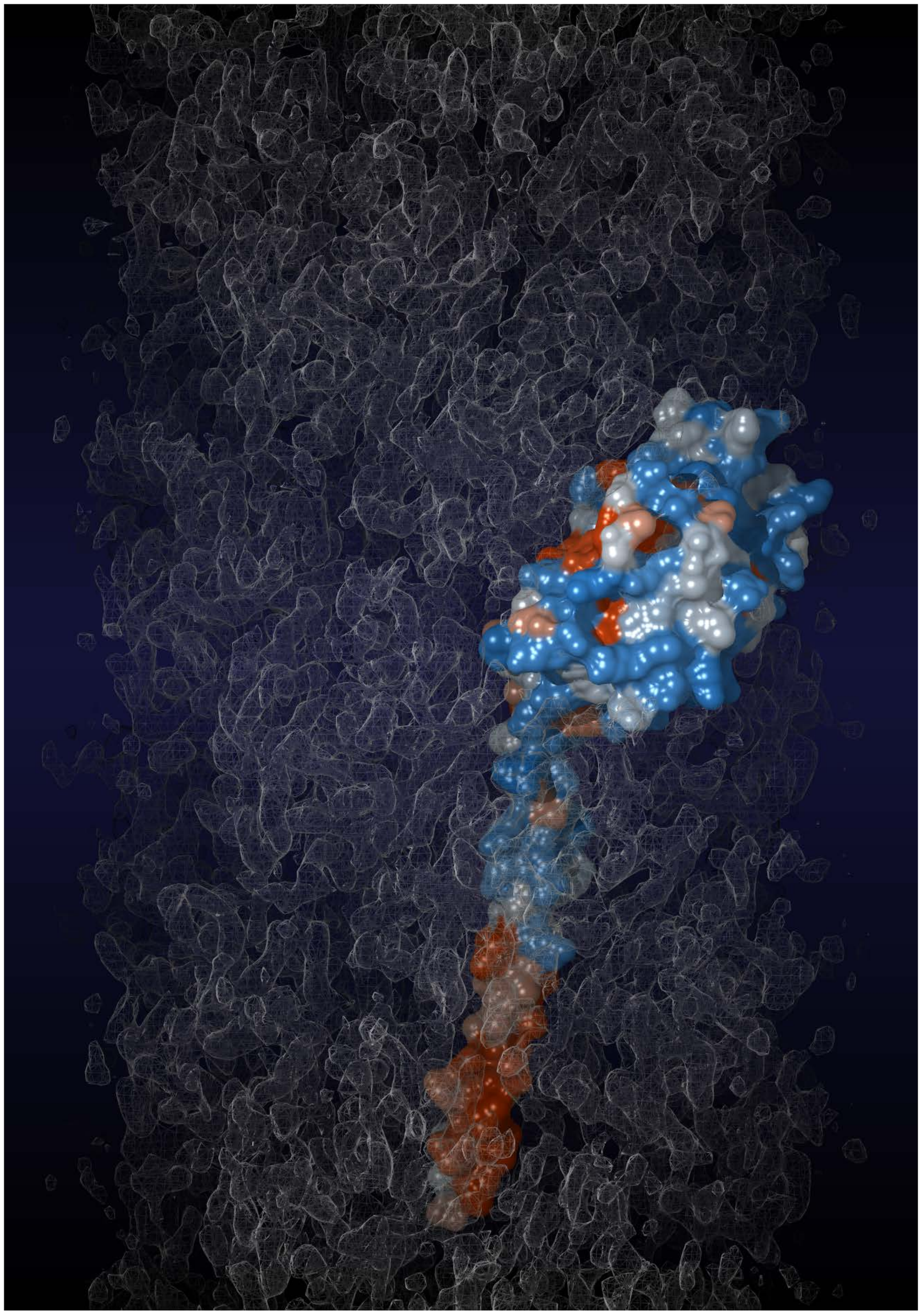
Building Blocks of Flagella Visualised by High-resolution Electron Cryo-microscopy

Bertram Daum



Microorganisms such as bacteria and archaea are found everywhere on our planet. Billions of them – some beneficial, some harmful – populate the human body. Many microorganisms assemble long, thread-like cell appendages called flagella. These microorganisms use their flagella as propellers to swim, as anchors to stick to surfaces or to form colonies and even to communicate with each other. Understating flagella in detail holds the key for new medial strategies to fight microbial infection. Electron cryo-microscopy uses electrons to visualise frozen biological samples at a resolution close to atoms.

I have used this technology to investigate flagella from the microorganism Pyrococcus furiosus and found that they consist of thousands of lollipop-shaped proteins. Each of these proteins has unique chemical properties (shown in blue, red and white), which enable their rope-like assembly. These findings facilitate our understanding of how flagella work and will inform new biomedical approaches to understand and cure disease.

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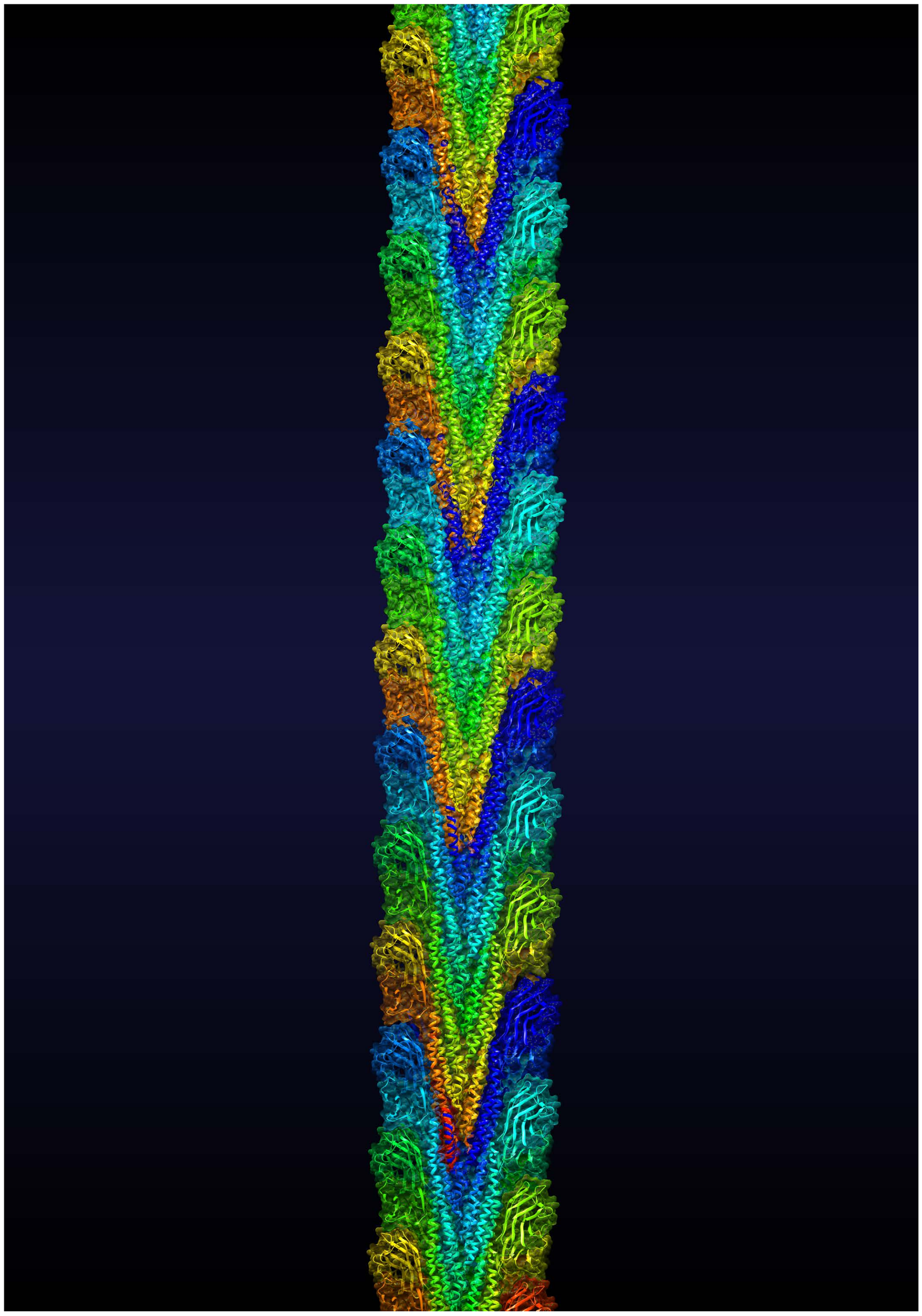
Flagella Visualised by High-resolution Electron Cryo-microscopy

Bertram Daum



Microorganisms such as bacteria and archaea are found everywhere on our planet. Billions of them – some beneficial, some harmful – populate the human body. Many microorganisms assemble long, thread-like cell appendages called flagella. These microorganisms use their flagella as propellers to swim, as anchors to stick to surfaces or to form colonies and even to communicate with each other. Understating flagella in detail holds the key for new medial strategies to fight microbial infection. Electron cryo-microscopy, a state-of-the-art imaging technique, uses electrons to visualise frozen biological samples at a resolution close to atoms.

I have used this technology to investigate flagella from the microorganism Pyrococcus furiosus and found that they consist of thousands of lollipop-shaped proteins (shown in different colours) with unique chemical properties. These findings facilitate our understanding of how flagella work and assemble, and will inform new biomedical approaches to understand and cure disease.

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High Resolution Image of a Brain Capillary

Charlie Jeynes

This is an electron micrograph of a capillary in brain tissue. The red blood cells (seen in red) are squeezing through the surrounding cells that make up the wall of the capillary. These cells (endothelial cells in purple and pericytes in torqoise) form a very tight barrier, stopping unwanted substances getting into the brain. Unfortunately in many diseases, like Alzheimer's, this protective mechanism starts to break down leading to death of brain cells. This image came about from a collaboration between a team of scientist specialising in neurodegenerative disorders (Prof Andy Randall, Dr Francesco Tamagnini), Biophysics (Dr Francesca Palombo) and Microscopy (Dr Charlie Jeynes, Dr Christian Hacker). Ultimately by studying the brain at this level of detail, we hope to discover key mechanisms that bring about the onset of diseases like dementia, leading to better drugs and treatments.

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Cuts, Ideas and Smiles

Christopher Elphick

This image is of me, a researcher here at Exeter. A cut is clearly visible on my finger, and it is for you to think about what this cut represents. I am holding a tarnished, but still bright, light-bulb, again it is for you to think about what this symbolises. These parts of the image are in the foreground – I am blurred in the background. However, you can clearly see that despite the cut, and the bulb being the most prominent features of the image, I am clearly very happy to have them both.

(Photo Credit Daniele Carrieri)

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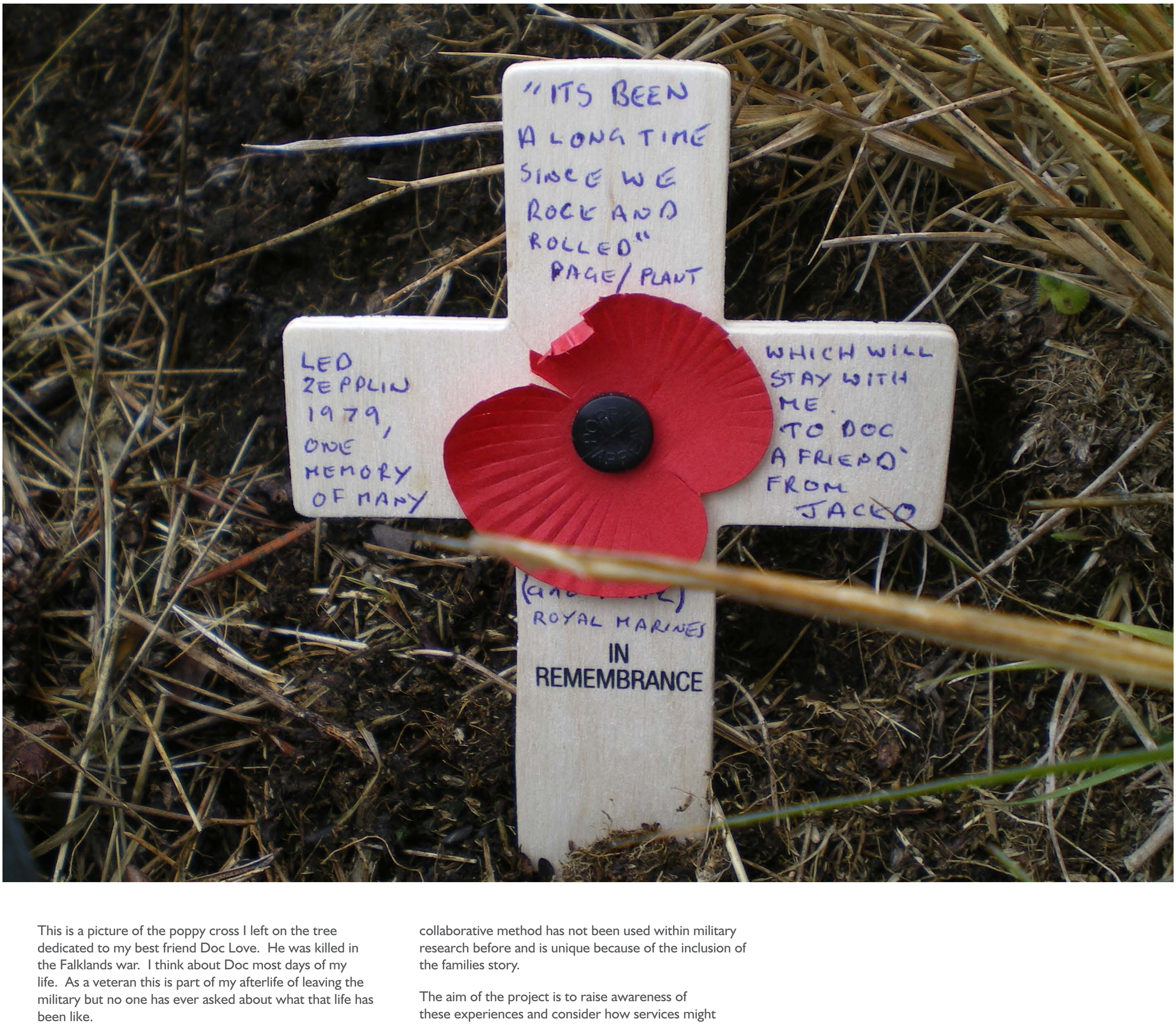
Military Afterlives:
In Remembrance of a Friend

David Jackson



This is a picture of the poppy cross I left on the tree dedicated to my best friend Doc Love. He was killed in the Falklands war. I think about Doc most days of my life. As a veteran this is part of my afterlife of leaving the military but no one has ever asked about what that life has been like.

The Military Afterlives Project will give war veterans and their families an opportunity to tell their story in their own words about leaving the military into civilian street. This collaborative method has not been used within military research before and is unique because of the inclusion of the families story.

The aim of the project is to raise awareness of these experiences and consider how services might be improved. There will be a public workshop on completion of the project.

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Military Afterlives: Afterlife 35 years on

David Jackson

This is a picture of the cast of Minefield a play which brings together 3 Malvinas veterans and 3 British Falklands war veterans who tell their stories of their war and its afterlife. It gives these six veterans the opportunity to tell their stories in their own words.

Realising the importance of storytelling the Military Afterlives Project will give war veterans and their families an opportunity to tell their story in their own words about their afterlives. What it is like leaving the military into civilian street. This collaborative method has not been used within military research before and is unique because of the inclusion of the families story.

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Military Afterlives: Reflections

David Jackson

This is a picture of me, a Falklands war veteran stood in quiet reflection by the war memorial in Saltash, Cornwall. It could be an image seen in many towns and villages on Remembrance Sunday, a veteran in quiet reflection. However like myself, everyone of these veterans and their families have a story of the afterlife of being in the military.

The Military Afterlives Project will give war veterans and their families an opportunity to tell their story in their own words about leaving the military into civilian street. This collaborative method has not been used within military research before and is unique because of the inclusion of the families story.

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A Mediterranean Banquet

Emily Selove

This painting represents Ancient Greeks and Medieval Arabs at a party together. I based it on an image of an Ancient Greek symposium and an illustration of a banquet in al-Harīrī's *Maqāmāt*, Arabic trickster tales from the 11th century. My research examines the interaction of various ancient and Medieval literary traditions around the Mediterranean Sea, and especially focuses on books about parties, as well as medicine and magic. Because so many languages and cultures interacted in these literary traditions, it is essential for me to collaborate with colleagues from many different disciplines. Just as the characters in the books I study gather around a meal and a goblet of wine to talk about many different subject, I hope to gather experts of the Classics, Medieval Europe, and Middle Eastern literature to collaborate with me in the exciting fields of magic, medicine, and banquet literature.

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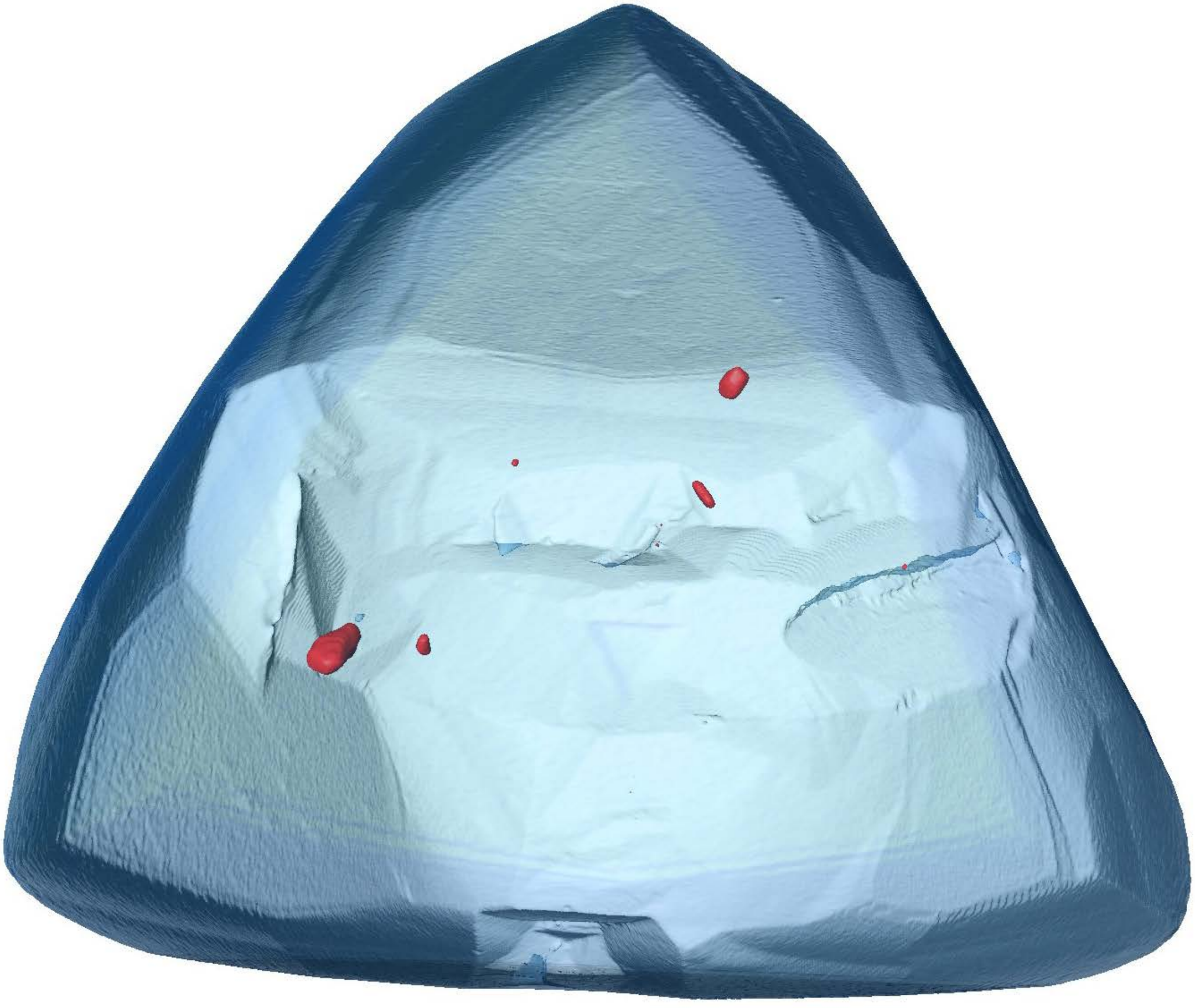
Diamonds: Time Capsules for Precious Metals from the Deep

Hannah Hughes



Diamonds form under immense pressure, typically in the Earth's mantle at depths of more than 150km below the world's oldest rocks. As they grow, diamonds can include other neighbouring minerals. These are seen as 'inclusions' within the diamond and such impurities are unwanted in gemstones. But these inclusions tell a story.

Sulphide minerals (such as pyrite or "fool's gold") are commonly found as inclusions within diamonds and these host precious metals (such as gold and platinum). By analysing sulphide inclusions using X-ray Computed Microtomography (micro-CT scanning, adapted from medical applications) and lasers, we gain an understanding of how much precious metal there is in the Earth's mantle through time and space. We're beginning to find patterns in the distribution of precious metals and think that this might influence mineralisation in the Earth's crust.

This image shows 3D micro-CT data – a diamond (blue) containing several sulphide inclusions (red).

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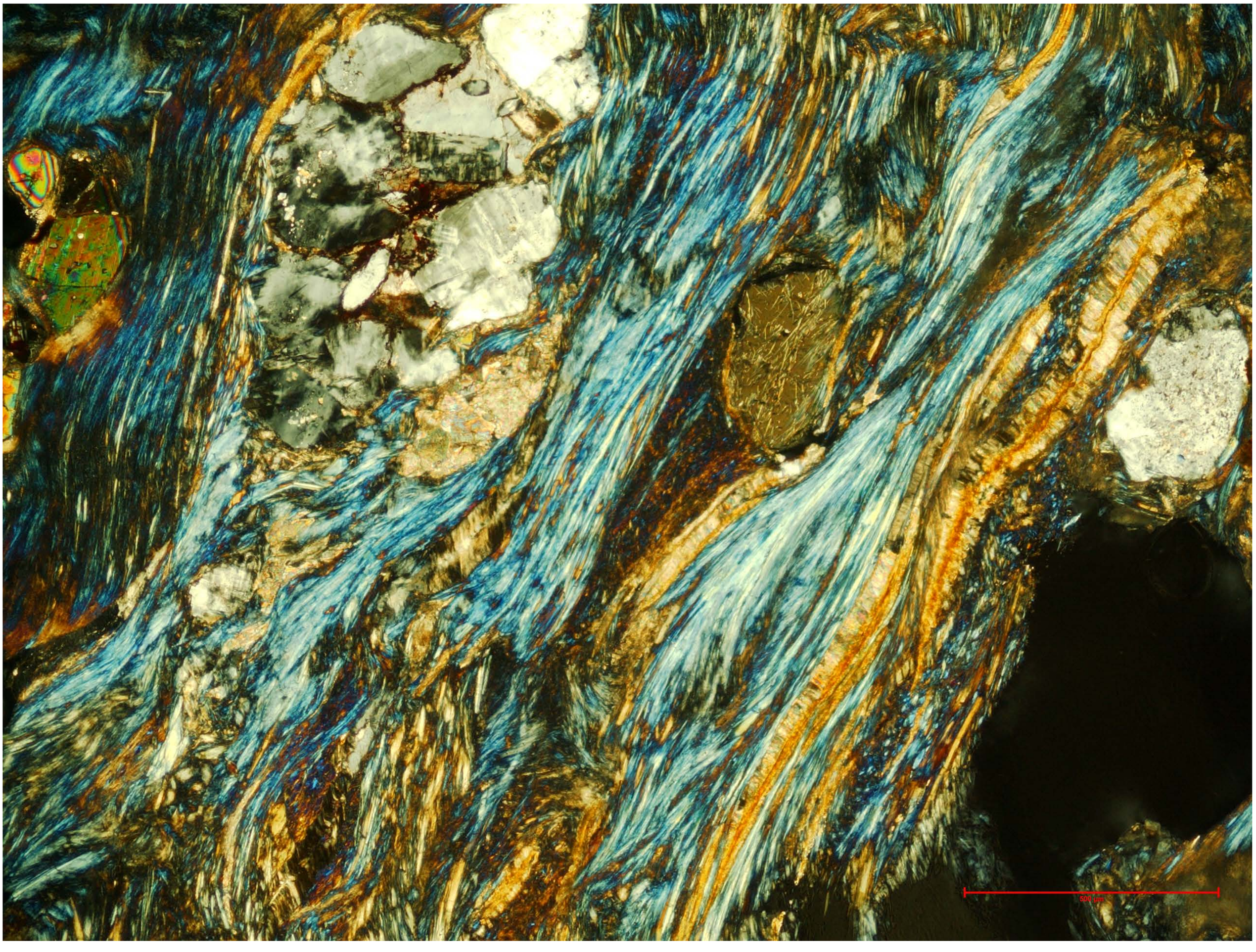
The Secret Tales of Rocks – Exploration Tools

Holly Elliott



This optical microspcopy image shows amphibole (blue) and calcite (yellow-orange) mineral veins brecciating the host rock (white-grey). These veins precipitate from fluids emanating from the famous rare earth (REE) deposit, Mountain Pass, California. Small concentrations of REE in these veins could help us pinpoint other REE-rich deposits around the world. REE are important for the UK's technological advancement, as they are incorporated in green technologies such as hybrid cars, wind turbines and long-life batteries. China currently monopolises the world's demand for REE, creating a large risk to supply. HiTech AlkCarb is an EU H2020 funded collaboration of academic institutes and industrial parties from all over the world that are trying to understand how these deposits are formed. This understanding will allow more efficient exploration, to ensure a sustainable future with a guaranteed supply of these metals to negate the risk to the world's new green technologies.

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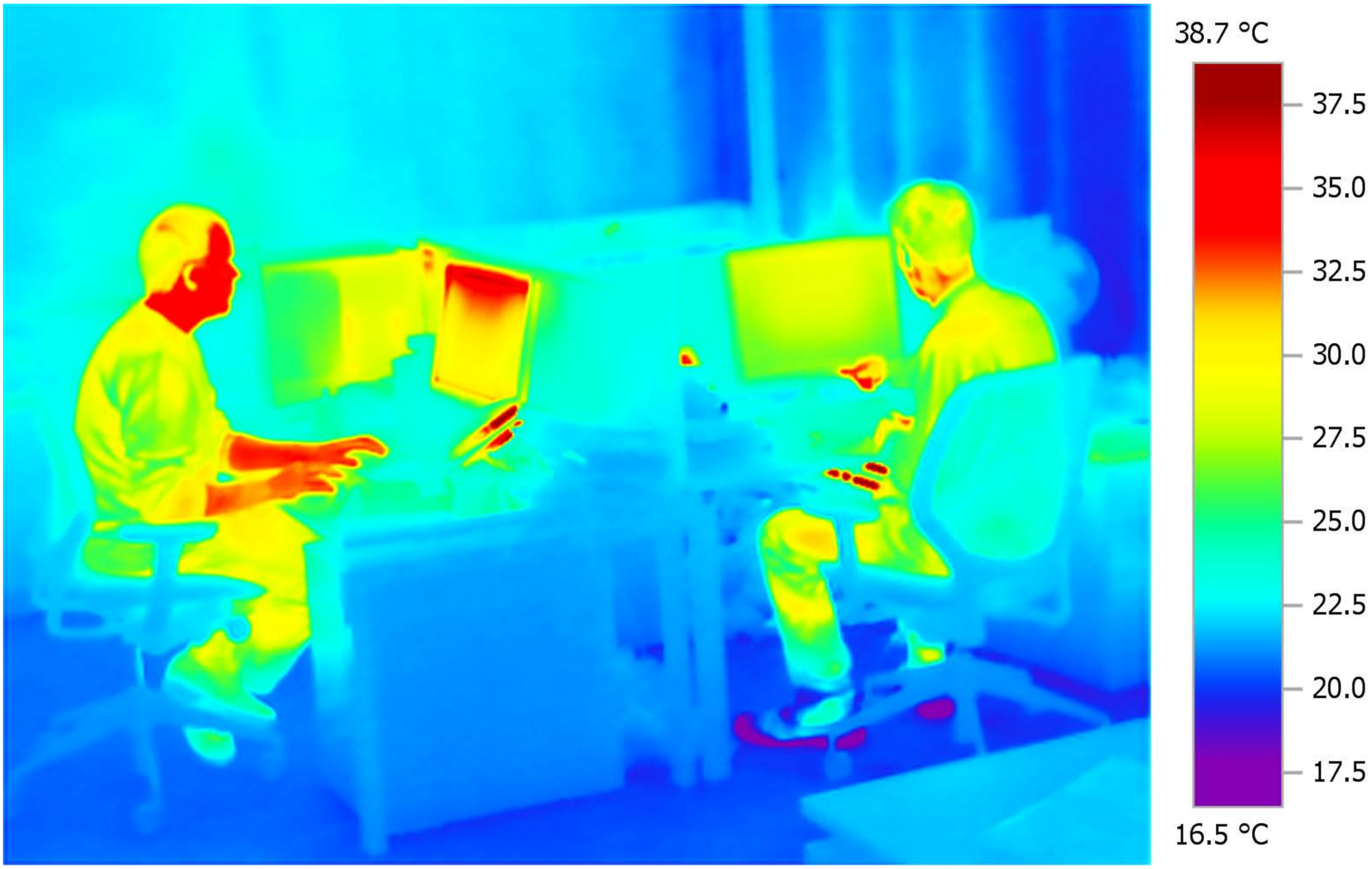
22 Degrees

Jake Barnes



22 degrees has over the last century become the standard office temperature. There is no ‘natural’ reason for this. Instead 22 degrees has been socially and culturally constructed. This image, taken with a specialist thermal imaging camera, shows the temperature variation of objects and people within an office: dark red indicates hot spots, the blue hues cover the range of 20 to 25 degrees and purple,
cooler areas.

My research – a partnership with Devon County Council – explores new ways to reduce the amount of energy used for heating and cooling offices. Rather than looking at technical fixes such as insulation or LED lighting, our approach focusses on the experiences and practices of office workers and aims to develop new strategies for Devon County Council to achieve its energy reduction and sustainability targets.

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Exploring Virtual Blue Spaces

James Grellier

Rapid advances in virtual reality technology are opening up new and exciting applications in many fields, including healthcare. As part of a pan-European project called *BlueHealth*, our team of researchers at the University of Exeter is trying to understand how we might 'bottle' some of the health and wellbeing benefits of the natural world. The team are testing a range of water-related virtual environments to gauge which experiences are best at stimulating and relaxing participants. We hope our results may one day be used to directly improve the quality of life of those who can't easily visit natural environments themselves such as elderly people in care homes, or terminally ill patients with reduced mobility. In this photograph, a participant explores a virtual deep sea environment and tries to catch an elusive jellyfish.

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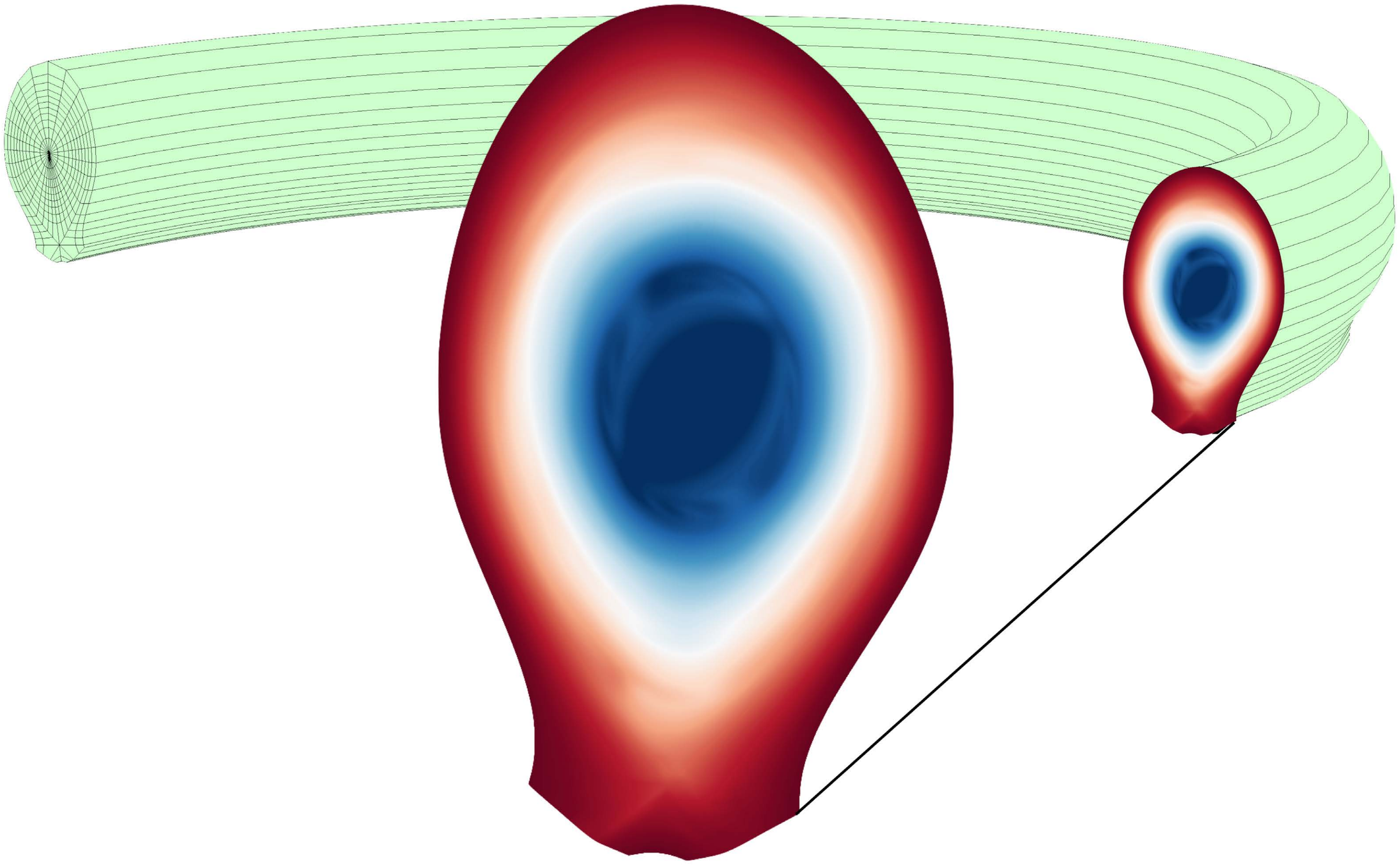
A Stable Solution – Fusion Energy

Jane Pratt



Fusion promises a sustainable energy source for the future. A section of a fusion reactor, shaped like a torus, is shown in the background of this image. In a fusion reactor, plasma is trapped long enough for ions to fuse together and produce energy. However the magnetic fields that trap the plasma can produce instabilities. Here a cross-section shows the plasma pressure in a realistic tokamak reactor configuration, affected by a tearing instability. The tearing instability produces a magnetic island, which is evident as light blue regions of smaller pressure that intrude into the dark blue central plasma. Tearing instabilities can be prevented by carefully heating the plasma. Simulation data is produced with JOREK, a nonlinear magnetohydrodynamics code.

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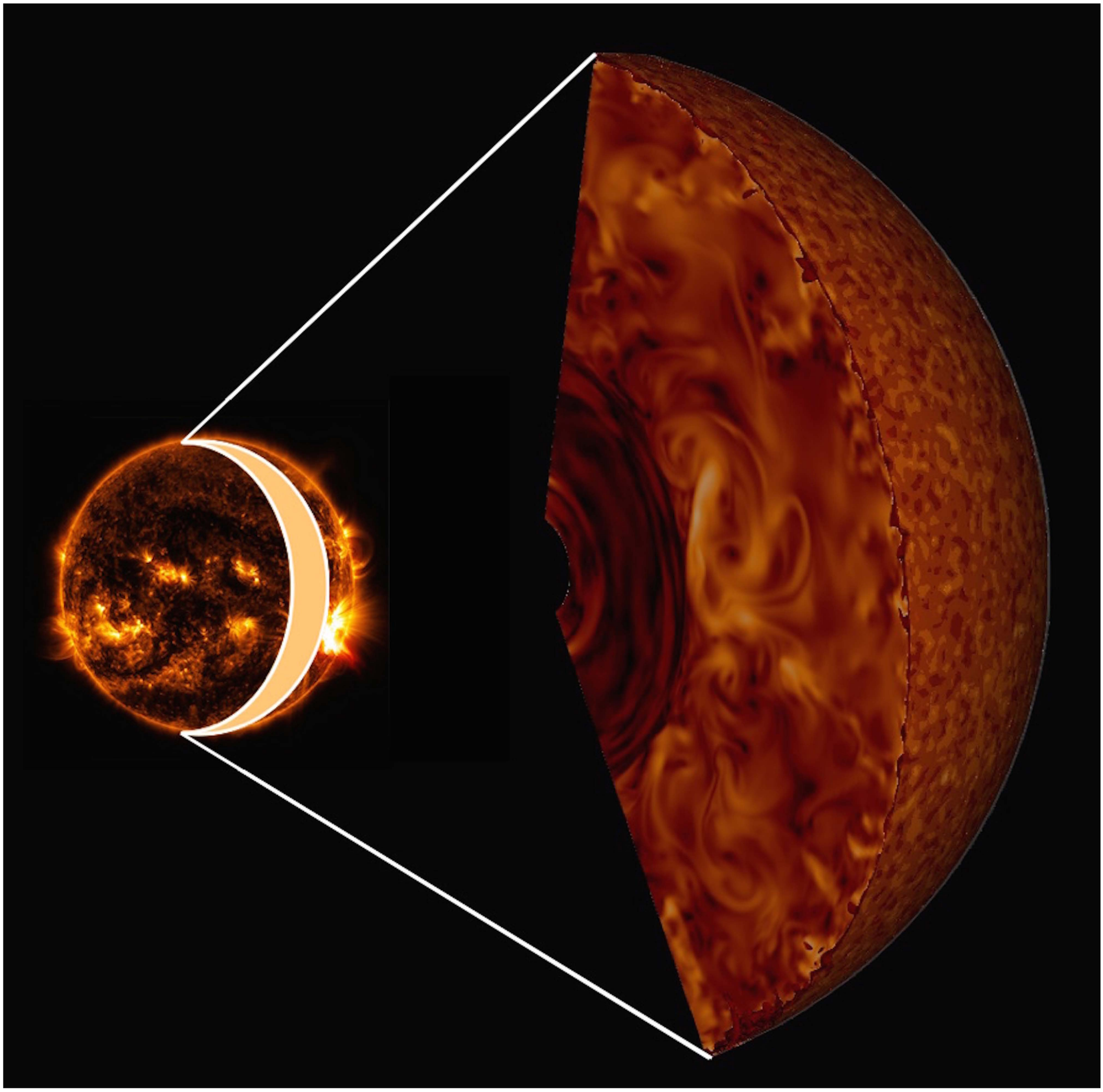
Journey to the Centre of the Sun

Jane Pratt



This image shows a simulation of a wedge of the Sun performed with the MUlti-dimensional Stellar Implicit Code developed at Exeter. The color scale represents the velocity of the hot plasma that convects inside the Sun. We study the interior of the Sun using simulation to understand how the density, temperature, and plasma flows change at depths that cannot be observed with a telescope. Simulation also allows us to model how the sun may have looked millions of years ago.

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The Unruly Sun – Supercomputing Turbulence

Jane Pratt

This image shows clouds that are dispersing due to high winds and atmospheric convection. Superimposed is a visualization of small particles dispersing in a turbulent, convecting plasma in a simulation of the interior of the sun. Plasmas are formed by heating a gas until it is completely ionized. When it is very hot, the plasma flow becomes turbulent. Magnetic fields change the way the particles move. Understanding the fundamentals of dispersion in hot plasmas is key both to achieving fusion energy and to predicting solar storms.

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Serving the Public Through Collaborative Research

Jane Smith

This picture shows researcher Rosy Armstrong undertaking a finger-prick test for blood sugar as part of an assessment with a participant in the Community-based Prevention of Diabetes (ComPoD) study, led by Dr Jane Smith. The ComPoD study, like much of the University of Exeter Medical School's applied health research, was dependent on collaboration. Its success relied upon building relationships with voluntary sector organisations (including Westbank Community Health and Care based in Exminster), other universities, GP practices and, as the picture shows, members of the public who volunteered to take part. The ComPoD study evaluated whether an existing community-based diabetes prevention programme helped people at risk of developing diabetes to lose weight, modify other risk factors for diabetes and improve their health. The collaboration contributed to the programme being selected as one of four adapted for use in a recently launched NHS Diabetes Prevention Programme. Study findings are informing this.

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Robo-bird

Jayden van Horik

The mobile phone industry is producing ever smaller and cheaper gadgets that, with a little creativity, can be used to address innovative questions.

Devices such as the GPS and Accelerometer units depicted above were specifically designed to collect data on location and movement patterns in humans. Whilst popular among the health conscious, such affordable technology also presents unique opportunities to answer novel problems and hence advance our understanding of the natural world.

In this photo, we show a male pheasant wearing a small backpack designed to map his movements and behaviours.

We use fine-scale movement data to reveal the duration and frequency of particular behaviours, such as foraging, vocalising or flying and even interactions with other pheasants, such as mating or fighting.

These data provide new insights into the energetic costs and consequences associated with movement patterns, ultimately revealing how an individual's behaviour may influence their survival and reproductive success.

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The Riemann zeta Function

Julio Cesar Bueno De Andrade

This image shows some complex calculations carried out in a paper of Jon Keating and Brian Conrey about moments of the Riemann zeta function. The Riemann zeta function plays a central role in number theory and in the study of prime numbers and is at the core of one of the Millenium Prize Problems, the so called the Riemann Hypothesis. This image is showing a very technical calculation involving the Riemann zeta function. The main aim is to try to understand how big the Riemann zeta function can be on the line where supposedly all its complex zeros are.

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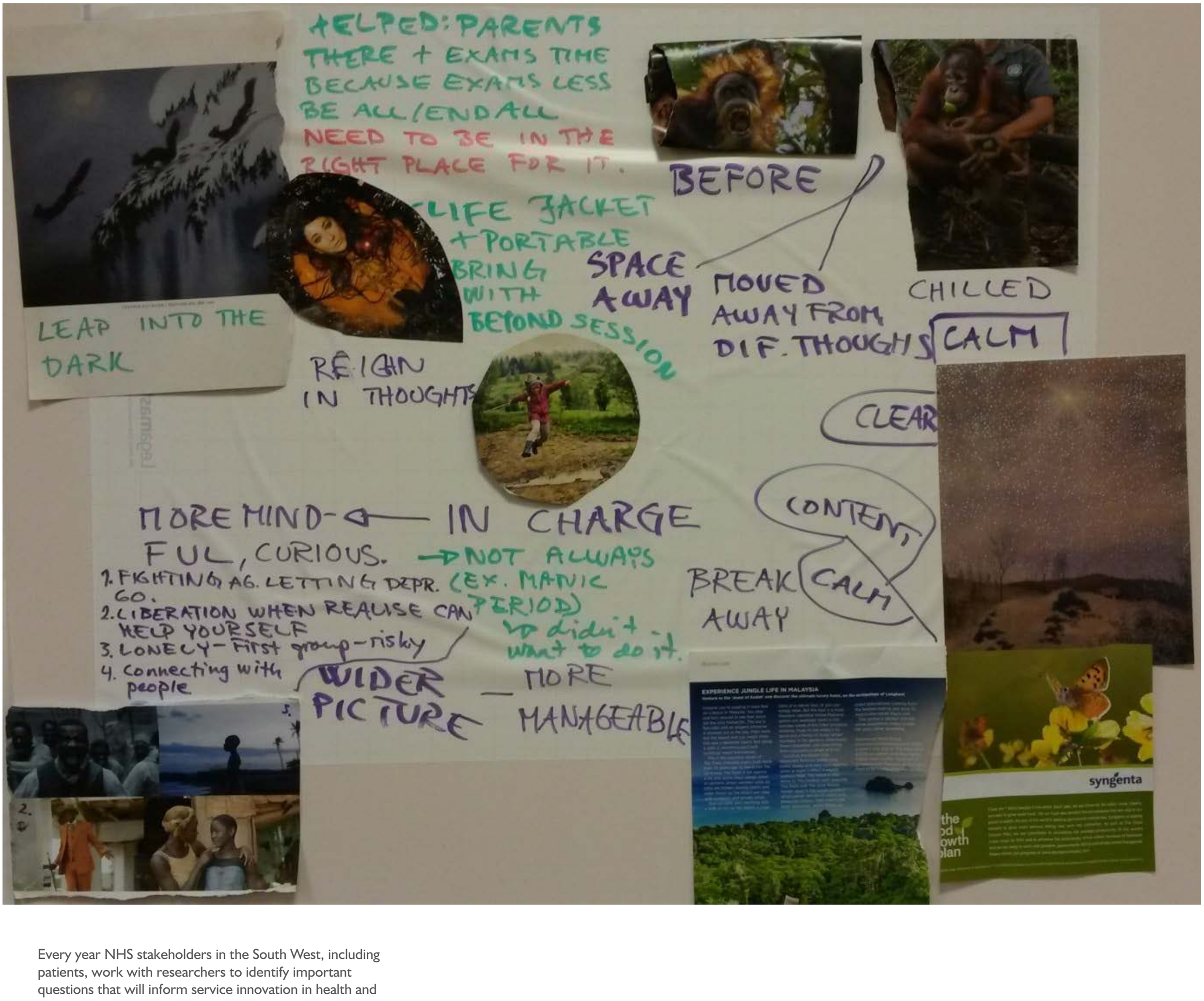
Kristin Liabo

Mindfulness Question Prioritisation



Every year NHS stakeholders in the South West, including patients, work with researchers to identify important questions that will inform service innovation in health and social care. The 'research question prioritisation' is led by the Collaboration for Leadership in Applied Health Research and Care South West Peninsula (PenCLAHRC).

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Rule of Law in Outer Space

Kubo Macak

The rapid development of technology over the past decades has led to an increasing reliance on space assets in time of international tension. However, international treaties governing the initiation and conduct of hostilities were drafted solely for terrestrial conflicts. Similarly, space law treaties from the Cold War era predominantly focussed on peacetime exploration of outer space. In my research, I examine whether existing international law may apply to, and thus constrain, military activities in outer space. On the basis of my prior work, I was invited to join a global research initiative working on a Manual on International Law Applicable to Military Uses of Outer Space (MILAMOS). I took this photo last October, while visiting the Canadian Space Agency along with other MILAMOS experts. I like that it reflects both the fragility of space assets and the need for international collaboration to strengthen the rule of law in outer space.

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Tell Us Where You Are Going

Matthias Becher

Honeybees form large colonies with ten thousands of workers. As they collect nectar to make honey, they are important pollinators for crops and wildflowers. They are also famous for their waggle dance by which they can communicate the distance and direction of profitable food sources to recruit more nest mates to this location. Honeybees and other bees have been in decline for some time and one reason might be the use of neonicotinoid pesticides in agriculture. A research team from the University of Exeter, led by Prof Juliet Osborne, investigated in field experiments how neonicotinoids affected the dancing and recruitment behaviour of the bees. Here, Dr Pete Kennedy releases worker bees at their hive entrance. These bees were equipped with a coloured, numbered disc to be able to identify these individuals when they are visiting a food source and then return to the hive where their dances can be recorded.

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The Honeybee Ambulance

Matthias Becher

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Worker Blue Green 30

Matthias Becher

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Neonicotinoids affected the dancing and recruitment behaviour of the bees. Here, individually marked bees are gathering around the entrance of an observation hive, based within our lab rover. The red cross helps the bees to find the flight hole and enter the hive.

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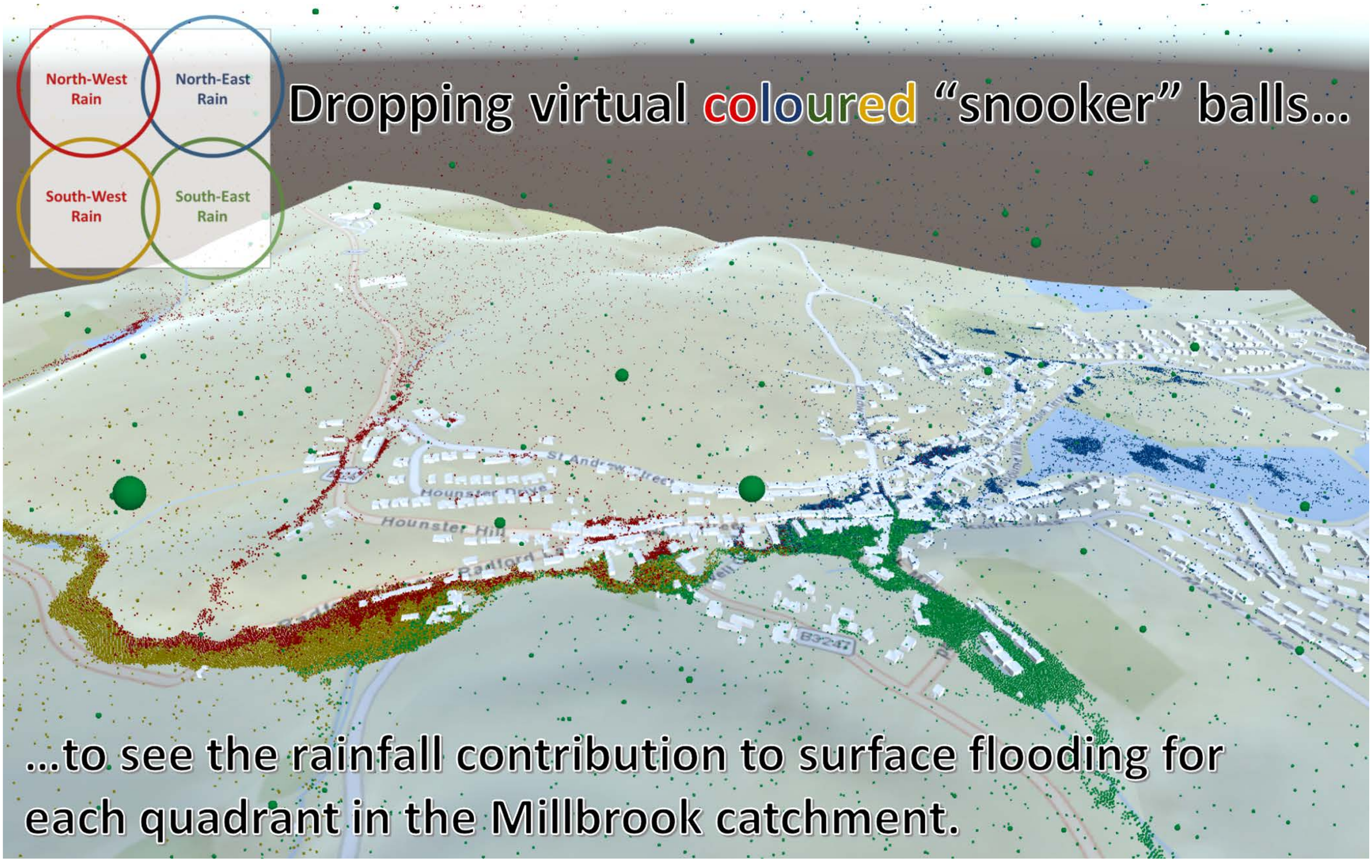
Dropping Virtual Coloured “Snooker Balls”

Mehdi Khoury



In the context of the Water-Food-Energy Nexus research program, we present an early prototype for a serious game that aims at helping residents to understand the causes of surface flooding in the village of Millbrook.

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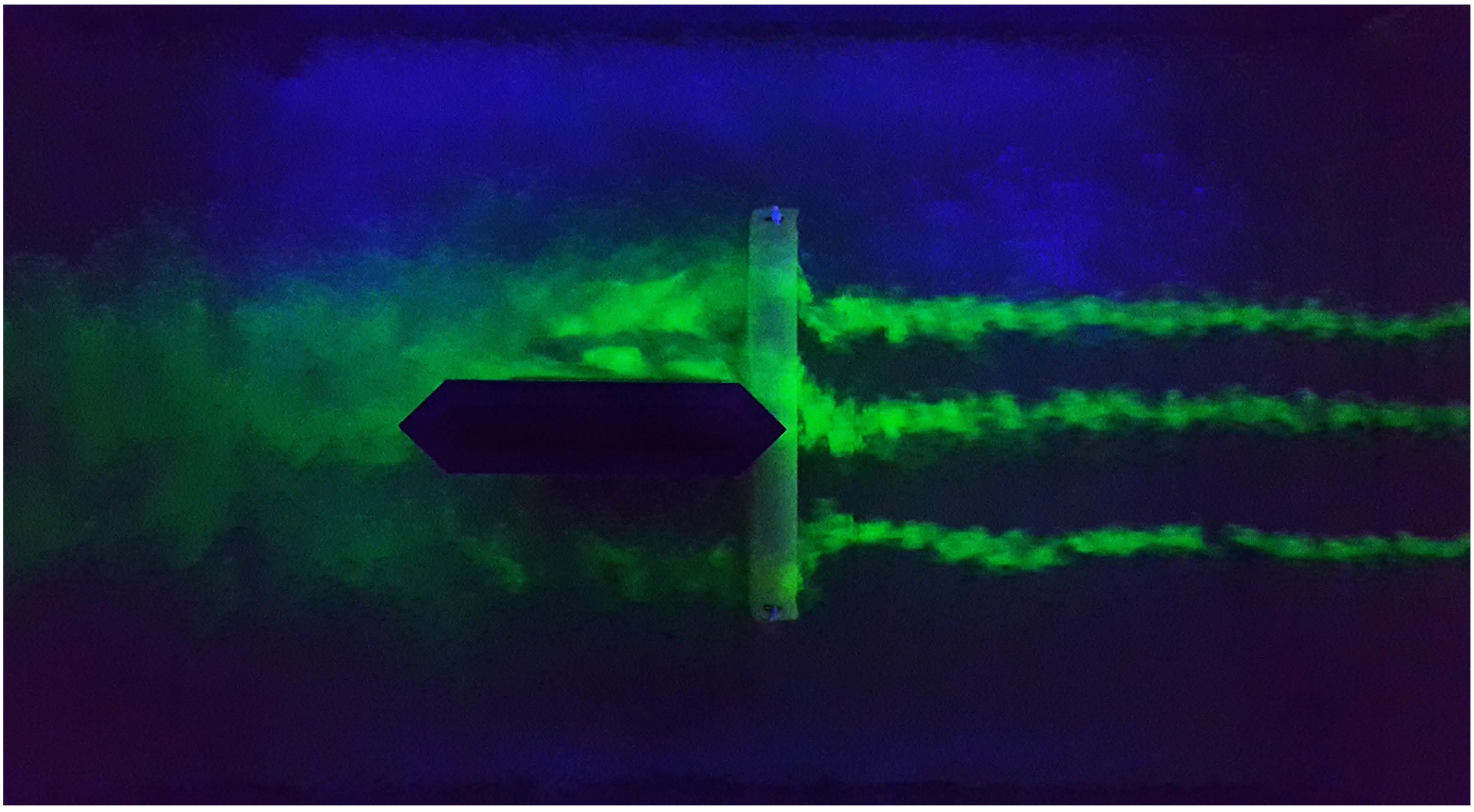
Plan View of a Flow Visualisation Experiment Around a Bridge Pier

Mohsen Ebrahimi



The photo shows plan view of water flow (right to left) visualisation around a bridge pier blocked by a log in a laboratory experiment. This is taken from the preliminary stage of an ongoing project, at Centre for Water Systems, investigating hydrodynamic effects of debris blockage at masonry bridges. Project findings are expected to inform bridge maintenance and enhance resilience of transport infrastructure in the UK.

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Encountering the Police

Natalie Ohana

The image represents one aspect of a postdoctoral British Academy research project, which examines how psychological trauma is processed and evaluated in legal proceedings and whether a gap can be identified between the human experience of trauma and its legal understanding.

It was created by A in a workshop I held in a women's refuge, in collaboration with the artist Sue Challis. Using visual art as mediums of expression, the workshop aimed to reveal the multi-layered perceptions held by women in times of trauma towards the legal system.

A seeked to express her encounter with the police by mapping her body. A called the police for protection from her partner's violence for herself and her two-year old son; she was seven months pregnant at the time. Body mapping allowed A to depict an intensity of pain and broken reality that language would be inadequate to express.

Large-scale imprint of the body, chalk pastels on card.

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Legal Alienation

Natalie Ohana

The image represents one aspect of a postdoctoral British Academy research project, which examines how psychological trauma is processed and evaluated in legal proceedings and whether a gap can be identified between the human experience of trauma and its legal understanding.

It was created by R, a woman who suffered domestic violence, in a workshop I held in a women's refuge, in collaboration with the artist Sue Challis. Using visual art as mediums of expression, the workshop aimed to reveal the multi-layered perceptions held by women in times of trauma towards the legal system.

The image was sketched by R to express her experience of being represented by a lawyer by sketching a mask representing him. R was represented by a lawyer in child-protection proceedings, submitted against her by the welfare services claiming that her children should be removed from her custody.

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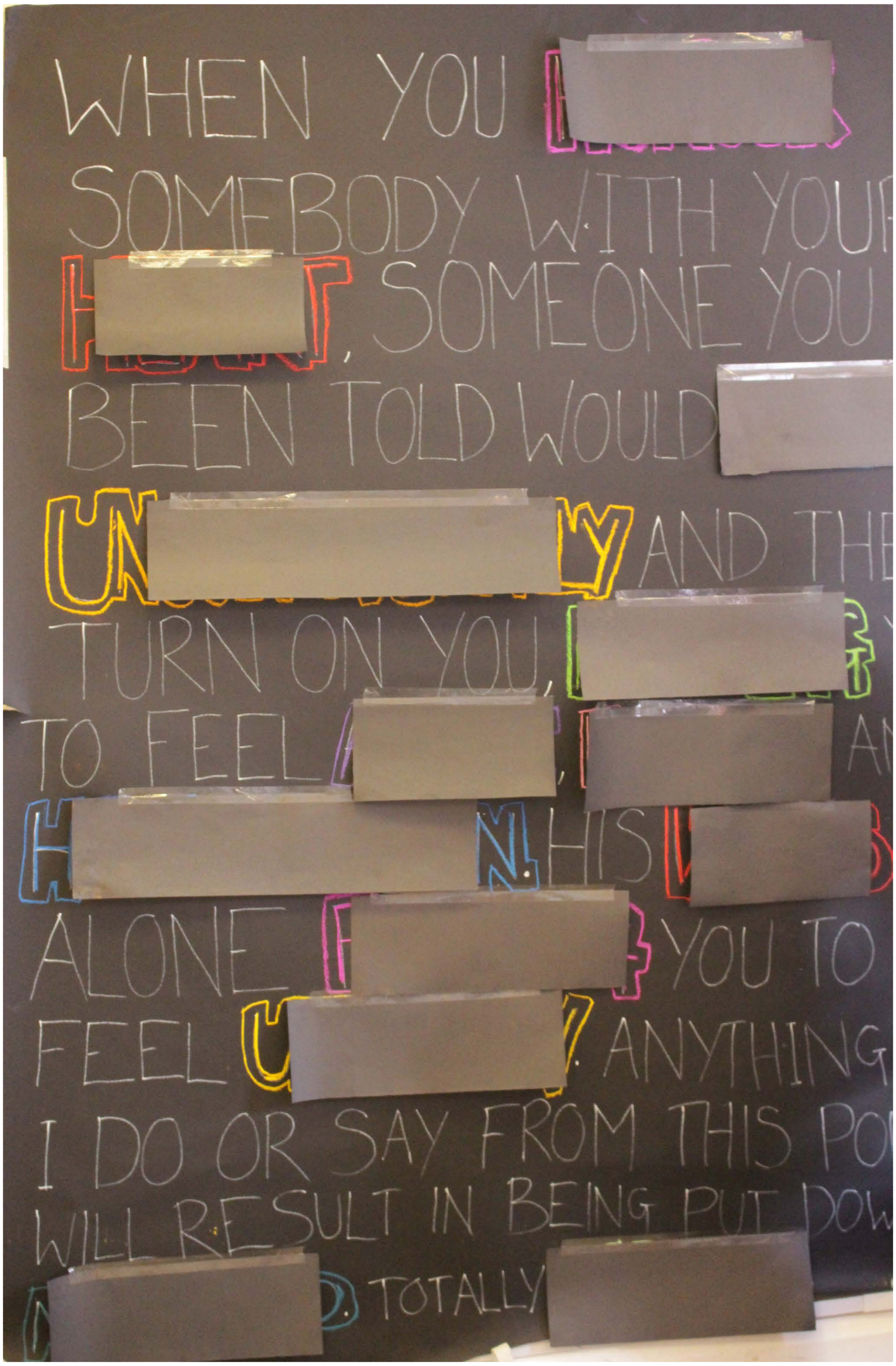
Legal Translation

Natalie Ohana



The image represents one aspect of a postdoctoral British Academy research project, which examines how psychological trauma is processed and evaluated in legal proceedings and whether a gap can be identified between the human experience of trauma and its legal understanding.

It was created by J, a woman who suffered domestic violence, in a workshop I held in a women's refuge, in collaboration with the artist Sue Challis. Using visual art as mediums of expression, the workshop aimed to reveal the multi-layered perceptions held by women in times of trauma towards the legal system.

J recreated the affidavit that was written on her behalf and submitted to court by her lawyer in proceedings concerning her partner's violence. It is cut and covered and represents J's feeling that in the process of translating her words to legal language, the affidavit no longer represented her experience of violence.

Large-scale imprint of a legal affidavit, collage, chalk pastels on card.

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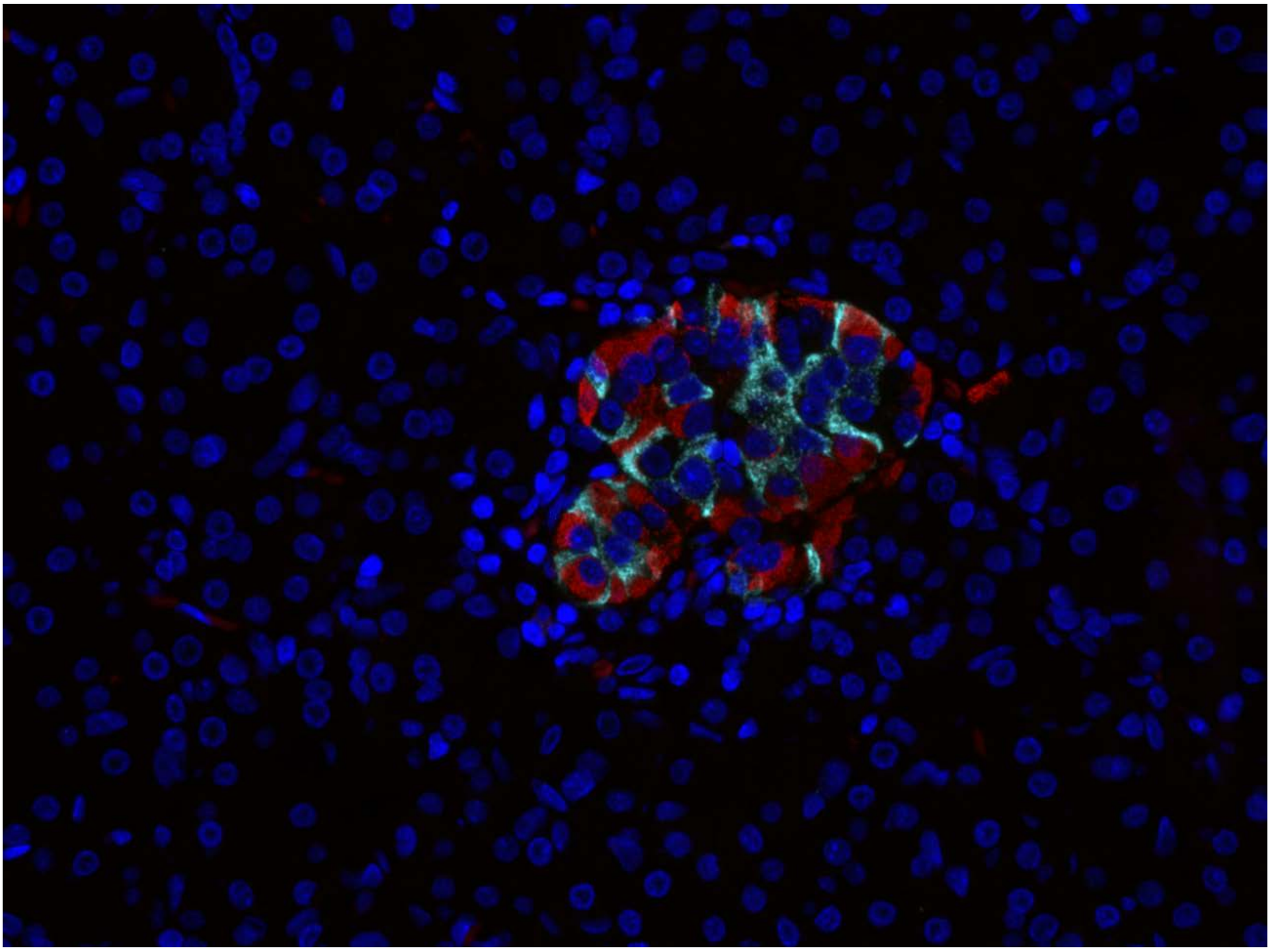
Dory the Islet

Pia Leete



We rely on the cellular collaboration to maintain balance within our bodies.

Alpha and beta cells work together to maintain our blood sugar levels and are clustered in tiny organs called islets, within our pancreas. In this image, one islet is visualised in a sea of pancreatic tissue (the deep blue nuclear stain) using combined immunofluorescence. The beta cells which produce the hormone insulin are coloured pale blue, whilst the alpha cells, producing glucagon are red.

These hormones are the key regulators of blood sugar levels, but in some islets of patients with Type 1 diabetes, the beta cells are completely destroyed, leaving blood sugars unregulated. No other cell in the mammalian body produces adequate insulin to counteract the loss of these cells, and we are dependent on them for survival. Investigating these, and other proteins may help us understand what factors collaborate to attack or protect these critical cells.

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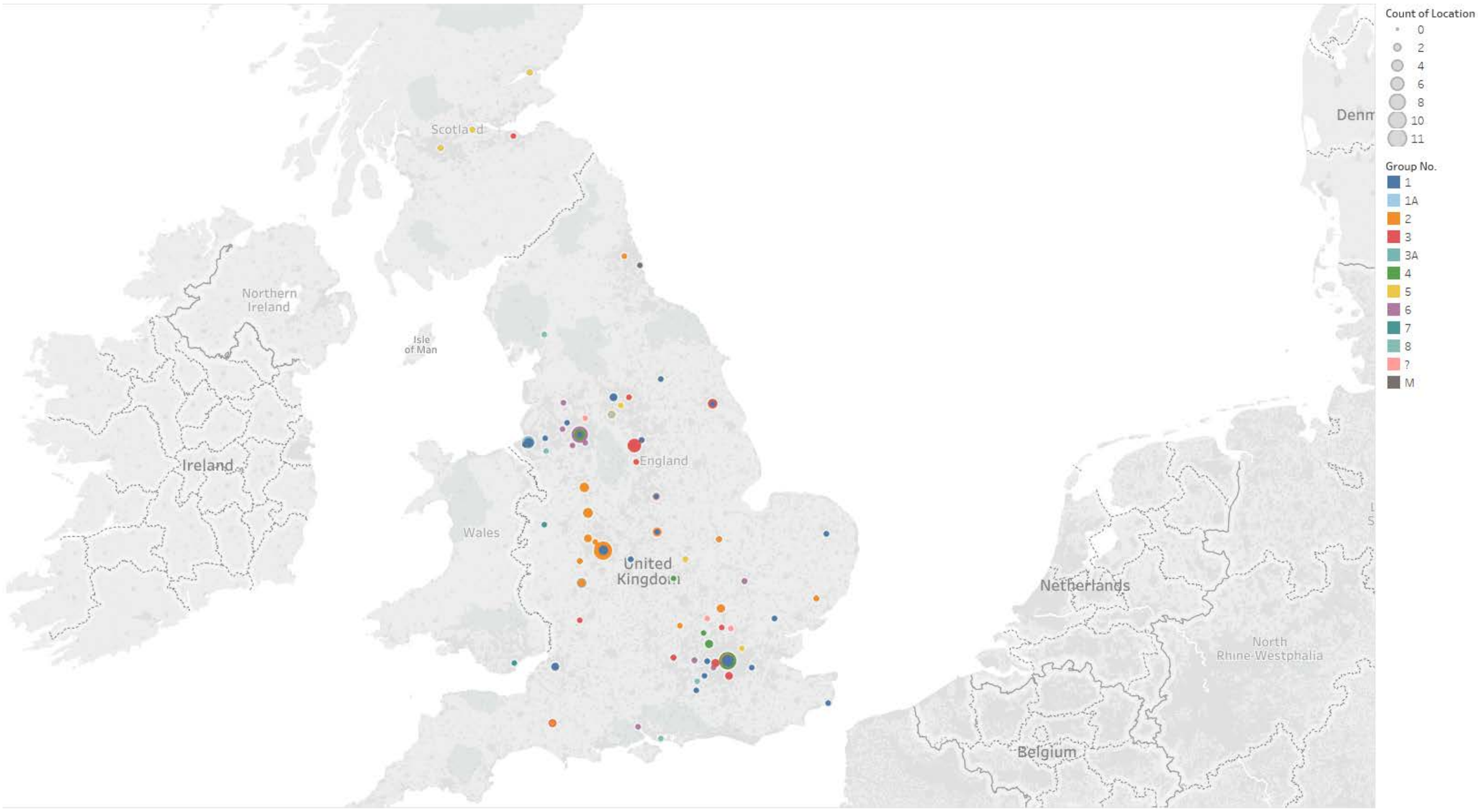
Management Research Groups

Rachel Pistol



This map shows the membership of Management Research Groups between 1927 and 1937 as discovered so far, and shows that the movement attracted businesses from all around the UK. First established by Benjamin Seebohm Rowntree in 1926, the aim of the Management Research Groups was to give employers a forum for exchanging ideas and solving business problems. This was the birth of the modern management movement, and it was hoped that by fostering greater collaboration between businesses, more efficient management could be created. The significance of these groups lies in the fact they encouraged knowledge transfer between different business sectors and emphasised the importance of communities of practice. In essence, this project is 'looking back to see ahead' in order to inform modern business and management practices.

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Who is Being Guarded?

Rachel Pistol

This photograph shows one of the recreated guard towers at Manzanar internment camp in California. During the Second World War, 120,000 Japanese and Japanese Americans were arrested and detained across the West Coast of the USA. It is usual during war to intern enemy aliens, but the fact that children born in the United States were denied their constitutional rights because of their ethnicity shows how such powers can be abused.
The former internment sites are barren and formidable places and so isolated it would have been impossible for the internees to escape, yet those of Japanese ancestry were still forced to live behind barbed wire, their every move watched by armed guards. My research focuses on how Second World War internment is remembered and understood, and this is particularly relevant today given current calls for mass arrests, deportations and general anti-immigrant rhetoric in America.

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A Blast from the Past

Richard Tennant

An image of lake sediment samples in crucibles, that have undergone loss on ignition (LOI) analysis. These samples were taken from a lake sediment core that ages 12,000 years. LOI analysis involves burning the sample to temperatures as high as 925°C in a blast furnace to determine the organic, calcium carbonate and silicate composition of the sediment. The range of colours that can be seen are characteristic of the iron concentration within the sample. Although this batch of samples only represents a few centimetres of the core, there is a striking difference in the iron concentration over this short period of time. This data represents the lakes activity over time and is used to reconstruct past climates.

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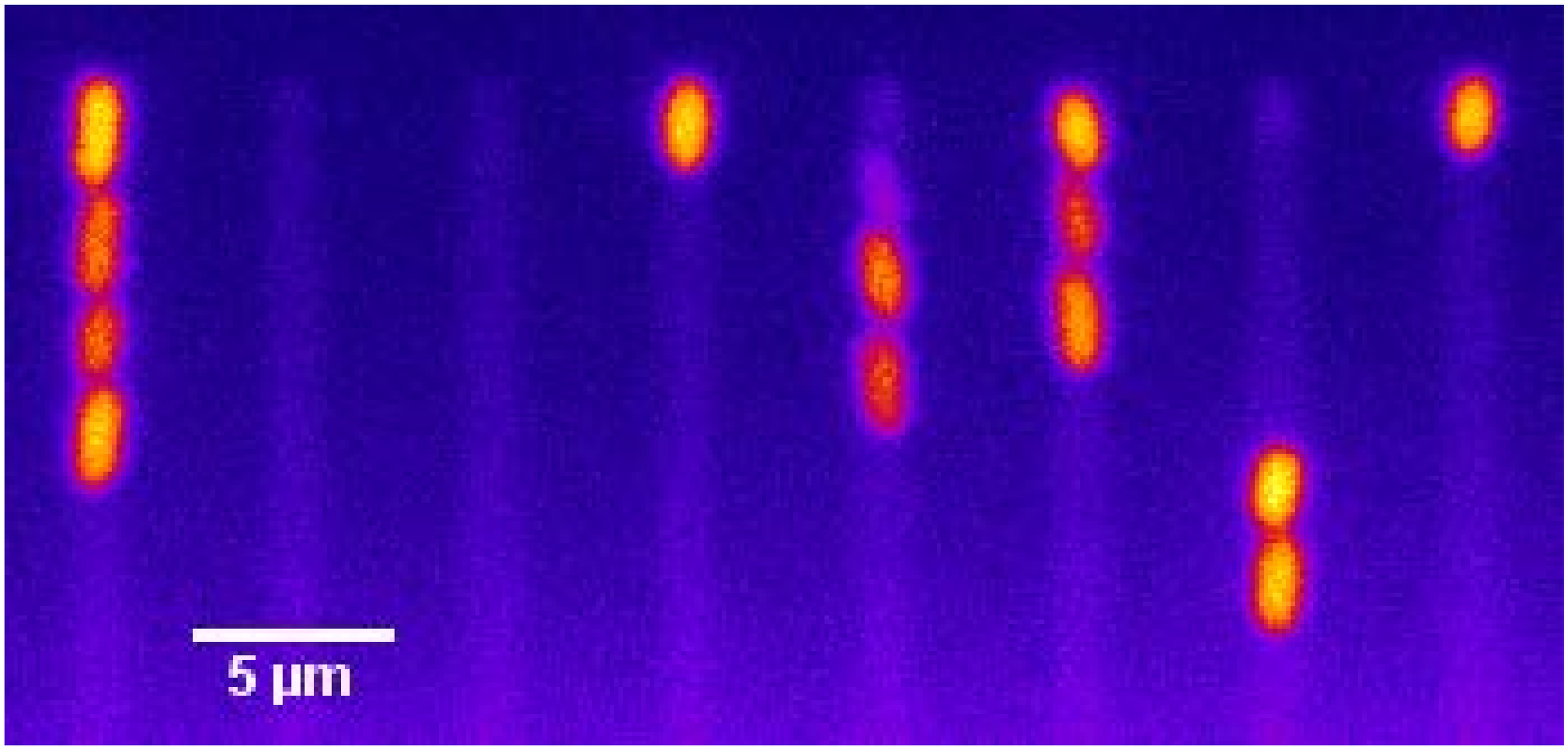
The Mother Machine

Rosie Bamford



This microscopy image shows single bacteria trapped in a microfluidic device, so-called the Mother Machine, which allows us to study communities of microbial cells at the single cell level. We design and test bespoke microfluidic devices in order to understand the interaction between microbial cells and their environment. We can accurately control the microenvironment and delivery of specific molecules to the cells. In this representative image, a fluorescent glucose analog is delivered to the bacteria and the varying levels of fluorescence demonstrate the differences in sugar uptake between single cell bacteria. This level of detail would not be observed using standard molecular biology assays. In this particular experiment, we are investigating if there is a link between environment and drug efficacy.

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Organised Chaos

Sarah Bailey

The days leading up to the submission of one's thesis are a harrowing time, a part of PhD culture that every researcher has experienced. This image shows my desk, three days before submission, when I was double and triple checking the numbers in a series of table included in Chapter 4 of my thesis. I used a black and white effect for this photo to reflect my bleak state of mind at the time. My research found that thrombocytosis (raised platelet count) is a clinically significant marker of cancer, and I hope that my work will benefit society as a whole in enabling general practitioners to diagnose cancer earlier.

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Contestable Crimes?

Dr Sarah Cooper and Dr Owen Thomas

The law upholds the distinction between motive and intent, and has always been concerned with the latter; the Victorian pauper who stole a loaf of bread to feed his hungry family, for example, was nevertheless sentenced to hard labour. In the 21st century, however, this principle appears at threat when contextual factors appear to regularly enter into trials on sexual offences. This project consequently asks if a damaging societal culture contributes to the high levels of unsuccessful cases brought before a jury, and detracts from the important message that 'rape is rape'. Engaging sixth formers aged 16-18, a 'safe zone' is created for discussion of the current black letter of the law and its ability to provide appropriate justice for such victims. The answer to this dilemma is not an easy one for the students and requires a complex debate concerning the historical purpose of the courtroom.

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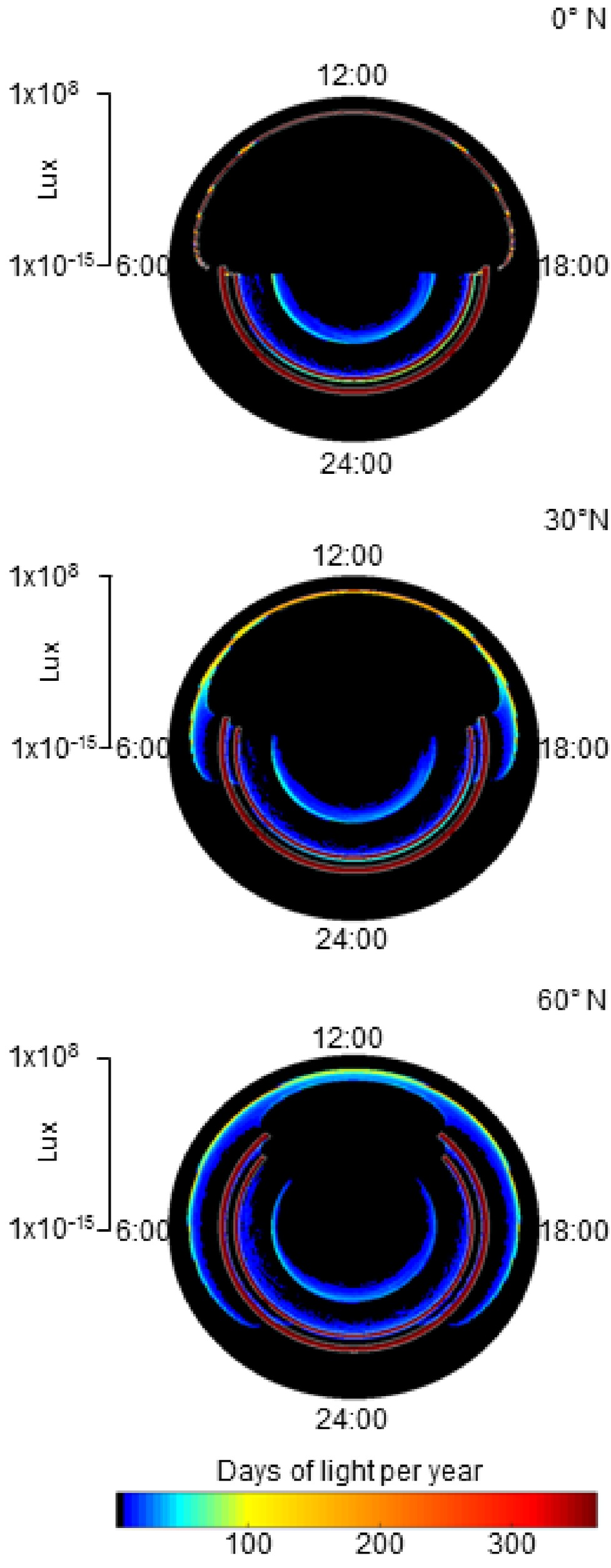
Light Figure with Pollution

Sophie Nedelec

Estimated daily light levels over one year at 0°, 30° and 60° latitude (time of day on rotational axis, log lux level on radial axis, number of days/year in colour). Warmers colours show more days of the year a particular lux level is reached at that time of day. Light levels vary more with increasing latitude (distance north or south from the equator). Two bands at 0.2-0.5 and 20-40 lux reveal that skyglow and streetlighting likely mask most lunar light patterns, and interfere with determining the start of dawn and end of dusk. These images reveal that artificial light could impact the use of natural light cues about time of day and seasonal shifts in day length, and animals and plants at higher latitudes could be more vulnerable to light pollution. This new way of visualising light cycles could help scientists, policy-makers, conservationists and the public to protect threatened wildlife.



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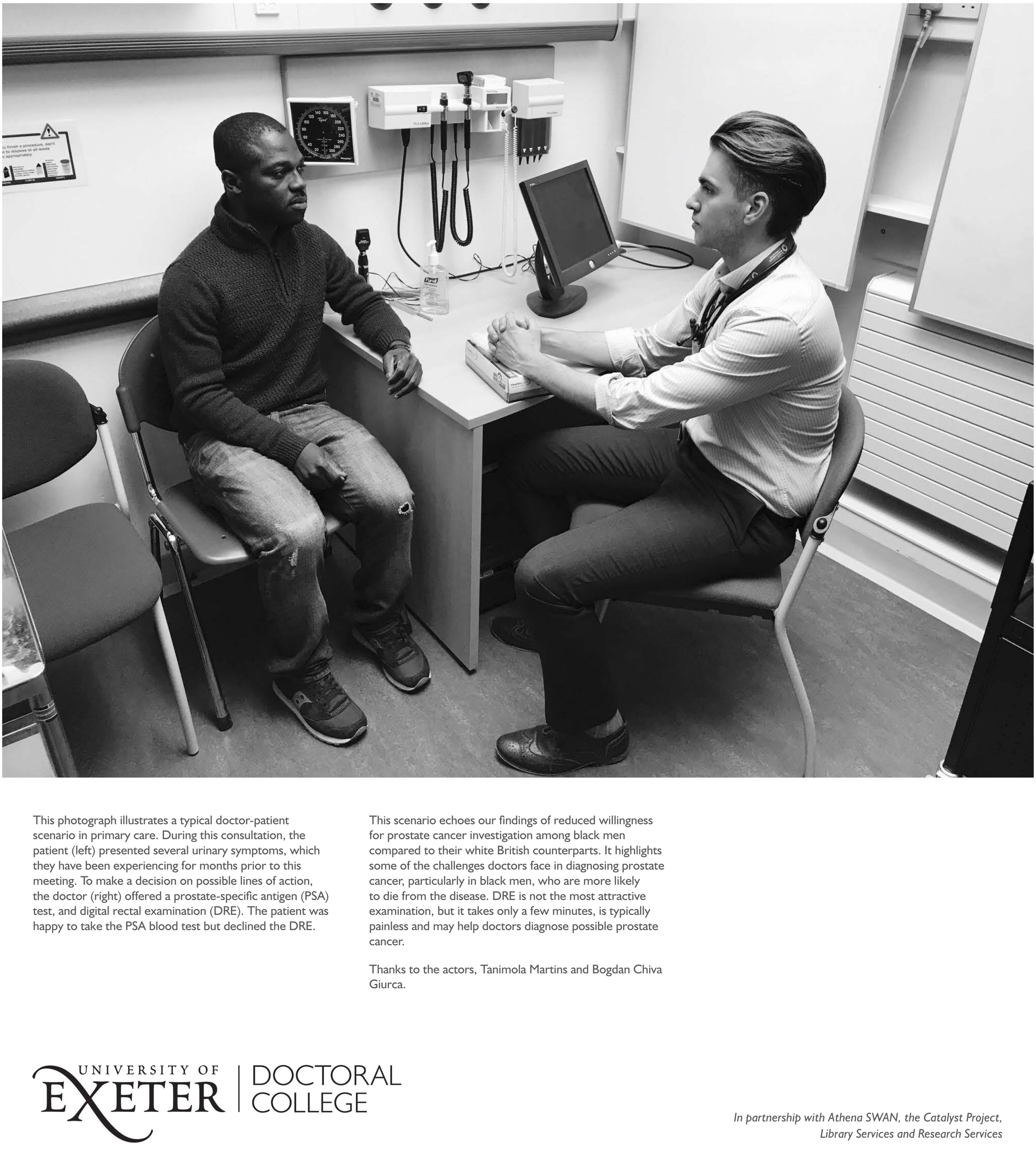
Ethnic Inequality in Diagnosis of Symptomatic Prostate Cancer

Tanimola Martins



This photograph illustrates a typical doctor-patient scenario in primary care. During this consultation, the patient (left) presented several urinary symptoms, which they have been experiencing for months prior to this meeting. To make a decision on possible lines of action, the doctor (right) offered a prostate-specific antigen (PSA) test, and digital rectal examination (DRE). The patient was happy to take the PSA blood test but declined the DRE.

This scenario echoes our findings of reduced willingness for prostate cancer investigation among black men compared to their white British counterparts. It highlights some of the challenges doctors face in diagnosing prostate cancer, particularly in black men, who are more likely to die from the disease. DRE is not the most attractive examination, but it takes only a few minutes, is typically painless and may help doctors diagnose possible prostate cancer.

Thanks to the actors, Tanimola Martins and Bogdan Chiva Giurca.

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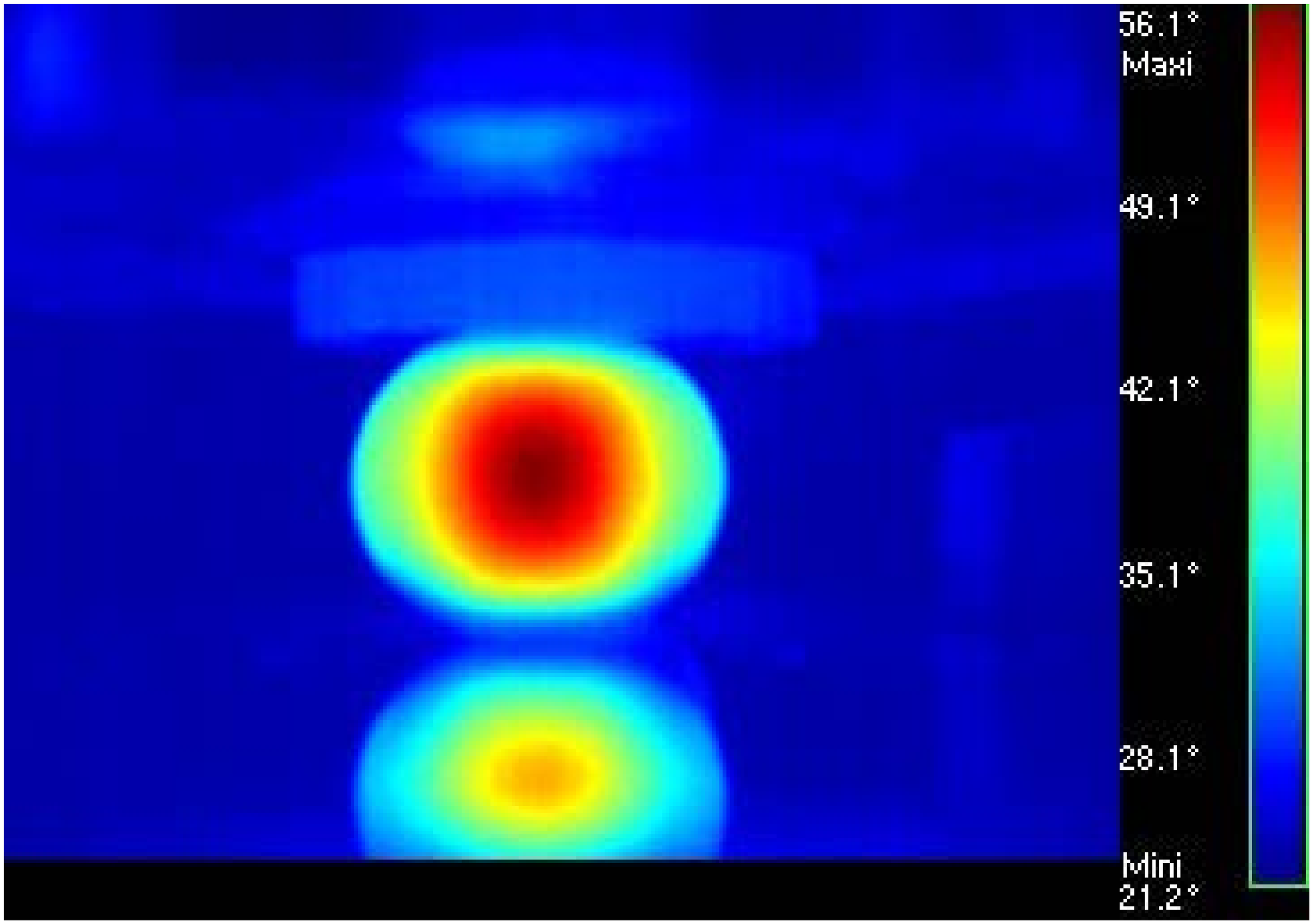
Heating up Under Pressure

Tessa Gordelier



This thermal image shows the temperature increase observed inside a section of polymer cord when subject to repeated compression cycles. This work was conducted to inform the development of the Exeter Tether, a patented mooring tether designed to mitigate peak mooring loads in floating marine renewable energy devices. The polymer under test is EPDM (ethylene propylene diene monomer), and forms a key part of the *Exeter Tether* core architecture. The long term behaviour of this material under exposure to the marine environment and compression cycles was unknown and this work was used to establish the operational durability of the *Exeter Tether*.

The image was taken using a Flir Thermovision A20 thermal camera whilst conducting test work at IFREMER Materials in a Marine Environment Laboratory. The work was funded by the MARINET FP7 programme.

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A Design for Life: Finding Solutions with People with Osteoporosis

Vicki Goodwin

People with osteoporosis (fragile bones) experience many challenges in daily life. They have pain and difficulty doing everyday activities such as getting dressed and moving around.

We are working together with a group of people with osteoporosis to design solutions to some of these problems they have. The image shows people with osteoporosis, a researcher and a physiotherapist discussing back supports and what features of a new support would be important to them. We can then use these ideas to create prototypes for further evaluation with the group members. This ‘co-creation’ is the perfect way to ensure that we design, develop and test aids and equipment that meet the needs of those who would be using them.

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