University of Strathclyde Glasgow

Images of Research

Safeguarding today, securing tomorrow

Welcome

I am delighted to welcome you to **Images of Research 2018: Safeguarding today, securing tomorrow.**

The images you see before you offer a small insight to the breadth of innovative research being carried out across the University's four faculties.

The categories this year align to our strategic themes - **Advanced Manufacturing and Materials; Energy; Health and Wellbeing; Innovation and Entrepreneurship; Measurement Science and Enabling Technologies; Ocean, Air and Space; Society and Policy** – and demonstrate the wide scope and significance of the University's research, which takes place on a local, national and international scale.

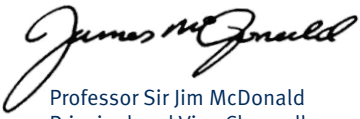
As a leading international technological and socially-progressive university, we pride ourselves on academic excellence with impact. The compelling images on display showcase our commitment to making the world better educated, prosperous, healthy, fair and secure.

This year's competition, "Safeguarding today, securing tomorrow" - and the resulting exhibition - highlight Strathclyde's endeavours to address today's global challenges and to enable society to adapt and advance.

The Images of Research exhibition is part of the Engage with Strathclyde Programme - a week-long celebration of the University's partnership with the public, private and third sectors. I hope you will join us for some of our other events so we can tell you more about the story behind the pictures.

We have also launched an online gallery of the images, before the exhibition goes on tour around other venues in Scotland. I hope these innovative and imaginative images illustrate the spectrum and quality of research taking place at the University of Strathclyde, and encourage you to engage further with us.

Best wishes,



Professor Sir Jim McDonald
Principal and Vice-Chancellor

Contents

Images of Research 2018

Images of Research is an annual competition for research students and staff which showcases Strathclyde's innovative work through compelling images. The images form an exhibition during Engage with Strathclyde 2018, a week-long programme celebrating and promoting the University's partnership with businesses, public and third sector organisations. The collection then embarks on a roadshow across venues in Scotland, and beyond, and forms an online gallery.

The 37 shortlisted entries – comprising an image and short story – illustrate the big societal issues being tackled by researchers across our four faculties – Engineering, Science, Humanities and Social Sciences, and the Strathclyde Business School.

The competition and exhibition is sponsored by Engage with Strathclyde and Strathclyde's Researcher Development Programme.

For more information and to view all of the competition entries in an online gallery please visit

www.imagesofresearch.strath.ac.uk/visit_exhibition.htm

Meet the Judges

Professor Tim Bedford

Professor Tim Bedford is Associate Principal of the University, leading the Research and Innovation portfolio in the University Executive Team, working in close collaboration with the Principal and Deputy Associate Principals Professors Lowit, Kerr and McArthur.

Key responsibilities within his Associate Principal role are: representing the R&I interests of the University in discussions with Government and other public bodies such as research and innovation funders; convening the University Research and Knowledge Exchange Committee and, with colleagues, developing University strategy in research and innovation; providing leadership to cross-faculty initiatives such as the Technology and Innovation Centre and the University Strategic Themes; engaging with external university research partners in business and government; leading the University involvement in the Association of European Technological Universities, CESAER.

Professor Bedford is currently a member of the Scottish Funding Council Research and Knowledge Exchange Committee. He is a Fellow of the Royal Society of Edinburgh and a member of its Business Innovation Forum. In 2016, he was on the advisory board of the Reid Review of Scottish Innovation.

Ronnie Cleland

Strathclyde alumnus, Ronnie Cleland, is a lay member of the University's governing body (Court) and holds the formal offices of Vice-Convener of Court and Deputy Convener (Staff). As such, Ronnie's contribution to the University's growth and success over a number of years has been significant. He also sits on several sub-committees including the Court Business Group, Staff Committee, Court Membership Group and Remuneration Committee. Until 2013, Ronnie was the Scottish Chair of Odgers Berndston which assists leading media, entertainment and publishing organisations in the recruitment of top executives. He has also previously been Chair of the Audit Scotland Board and various Scottish NHS organisations, a board member of the Beatson Cancer Charity and a member of the Judicial Panel of the Scottish Football Association.

Benjamin Aris

Benjamin grew up with a camera in his hand and has regarded himself as a photographer from a young age. After graduating from the University of the Highlands and Islands, in Inverness, with a degree in Media and Photography, he became a freelance photographer specialising in product and still life photography. He now works as a team leader and academy tutor at Jessops, where his courses range from level one photography to landscapes and wildlife.

HOW TO WATCH A DIGITAL STORY

Find an image with the HP Reveal® butterfly logo, then frame the tagged image in the app's viewfinder to unlock the Aura!

BRING THIS IMAGE TO LIFE

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Get the App

Download on the App Store

Google play

Get the App and search for our channel "imagesofresearch01" and follow us to view the auras.

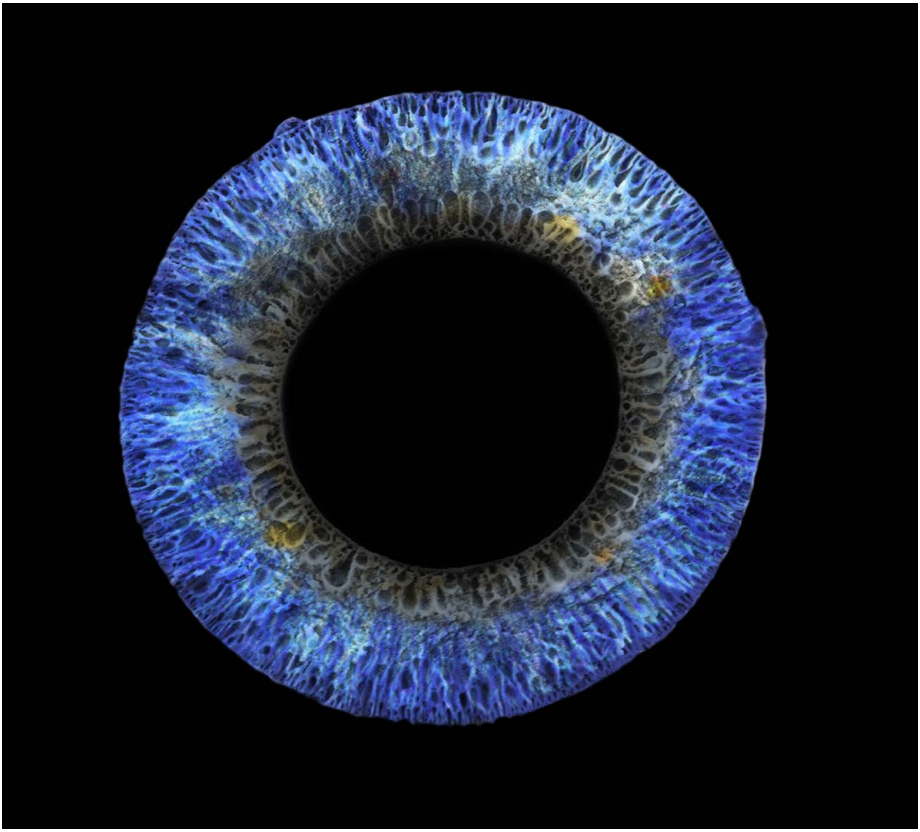
YouTube

If you don't wish to download the app, you can also view the videos on You Tube. Details can be found beneath each image that has an accompanying video.

Advanced Manufacturing and Materials

High-speed sand particles

Certain processes, like separating minerals from rock during mining, cause unavoidable erosion to equipment. Frequently scrapping damaged equipment is costly and environmentally harmful. By better understanding the erosion process, we can better protect against it. This research analyses the behaviour of sand particles as they impact a surface, using a laser and high speed camera to capture images and data that can make computational erosion models more accurate.



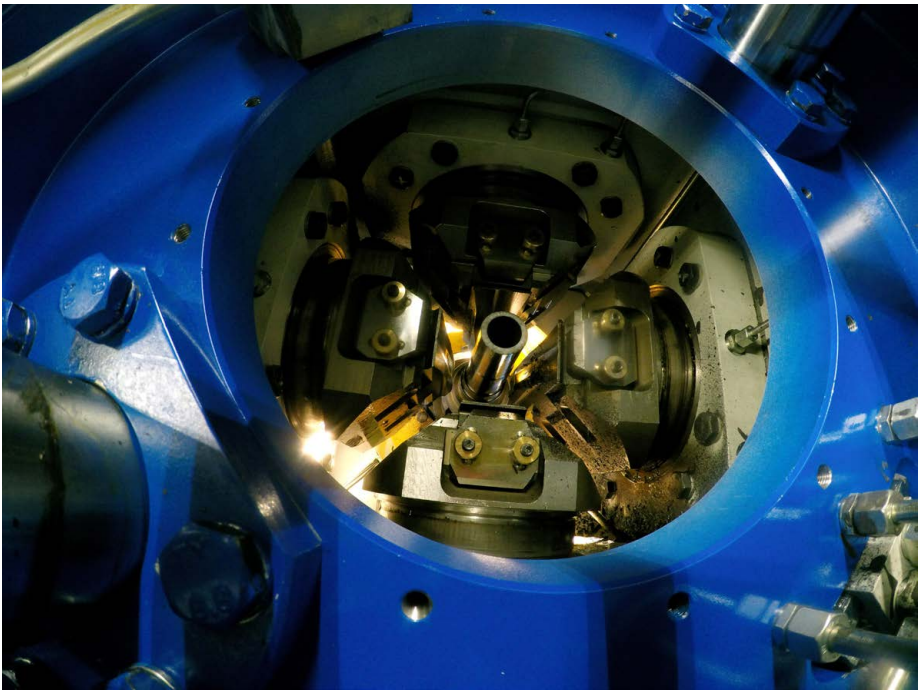
A vision of the future

Ozone gas has been used to clean water for centuries; however, this complex process can make water treatment expensive. My research has created a new material – a polymer membrane (pictured) – which aims to enhance ozone water treatment, making it more efficient and cost-effective, especially for countries with limited access to water. Resembling an eye, the membrane also represents my vision as a researcher: to make a difference.

YouTube **https://youtu.be/rizXjVh2Erc**

Innovation in craft-based textile manufacturing

In a 220-year old mill, a craftsman handles cashmere yarn on a weaving loom. By transforming the way such century-old businesses manufacture products, we contribute to preserving their heritage for centuries more. Our research develops models for incorporating data-driven technological changes to the manufacture of craft-based textiles and explores novel approaches for capturing, digitising and thus preserving century-old expert craft knowledge, used in the manufacture of cashmere-based textile products.



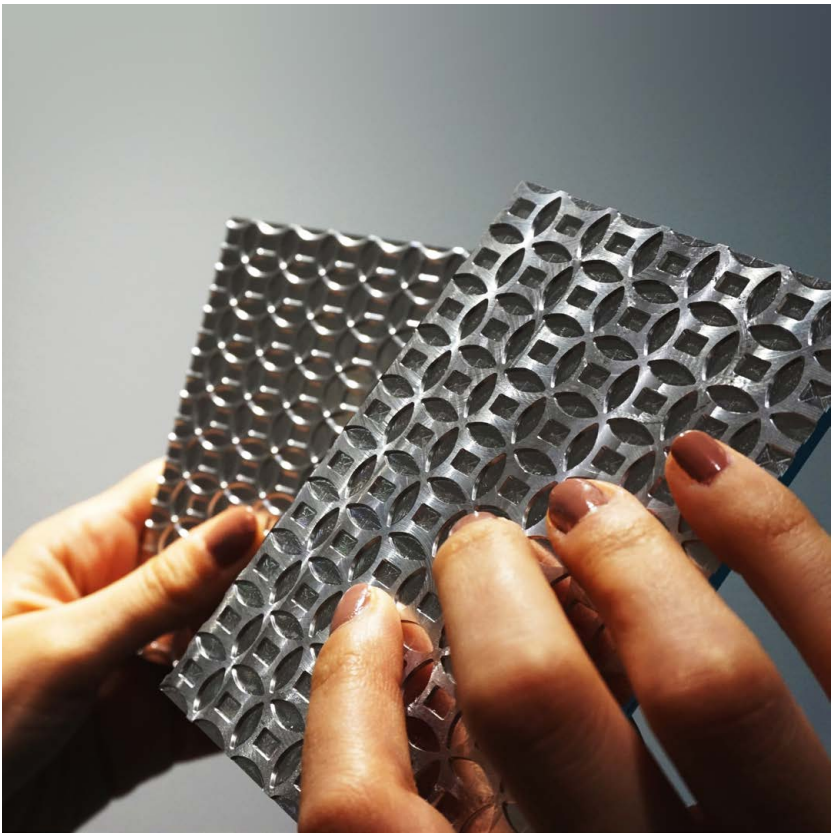
The belly of the beast

Developed specifically for the Advanced Forming Research Centre (University of Strathclyde), the radial forge will allow manufacturers to try new alloys and other materials in a range of applications. Featuring two pairs of hammers, it allows engineers to incrementally develop more complex shapes, improve materials, work at lower temperatures, and create parts that are nearer net shape.

‘Shrooms save soils!

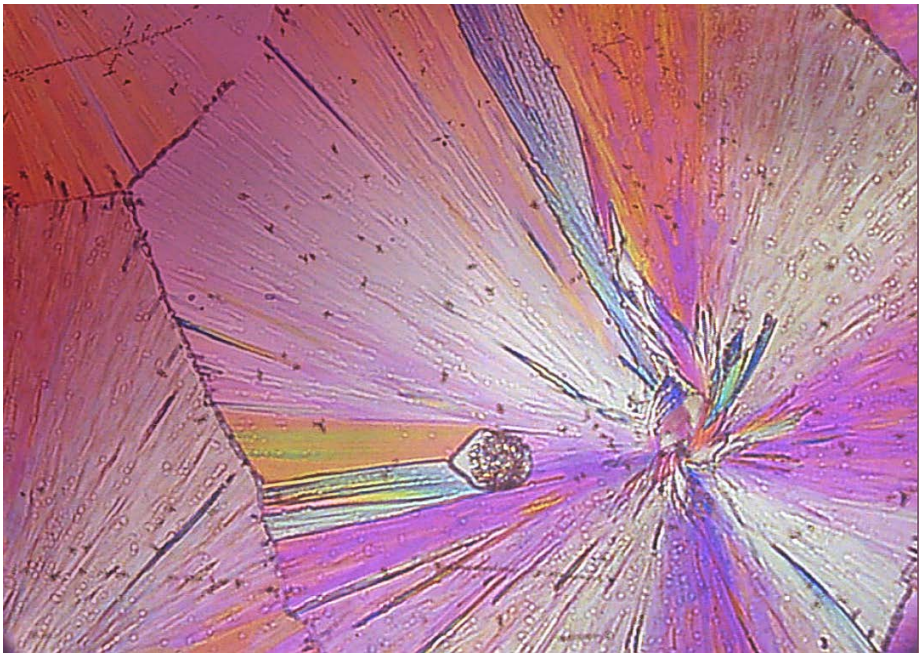
Soil erosion, landslides and floods impact millions globally, causing deaths, infrastructural damage and food shortage. Soil-binding chemical compounds used to mitigate these hazards further harm the environment. What if mushrooms could provide the solution? By engineering the network structure, ‘cementing ability’ and moisture-regulating function of the roots of this mushroom, we are improving its ability to bind soil particles together, and aiming to provide a low-cost, low-carbon alternative to chemical solutions.

YouTube **https://youtu.be/LuwpBxAOJak**



Embedding meaning

How objects look and feel – their aesthetic design – conveys meaning to human beings. At Strathclyde, we are exploring the emotional impact of design, experimenting with a range of surface texturing designs to create distinct emotive meaning. By exploring the use of modern manufacturing techniques, like computer-numeric-controlled (CNC) machining and 3D printing, future consumers may benefit from more bespoke products and new avenues of aesthetic experience.



Psychedelic recrystallisation of drugs

This image shows a stage in the recrystallisation of paracetamol as we attempt to devise the optimal operational window for a solvent-free manufacturing process to generate stable tablet-form medications. Strathclyde researchers are trying to understand how amorphous (non-organised state) pharmaceutical materials evolve and interact during the heating and cooling processes of manufacture. This will help to deliver medicines with enhanced performance, while reducing manufacturing costs and benefitting the environment.

Energy

Tailoring energy integration

Clean energy technologies are at the forefront of future energy provision but with constantly changing factors like weather, prices and policies, how can stakeholders determine the optimal technologies for a project with its own unique requirements? Our research is currently studying the integration of fuel cells with intermittent energy supply systems (wind, solar etc), with the ultimate goal of developing an algorithm to provide recommendations tailored to stakeholder's needs.

YouTube **https://youtu.be/aXYpcA_x7Tk**

Nature-inspired to withstand nature

Renewable technologies generate energy using natural forces but they can also draw inspiration from the natural world. Aeroelastic Tailoring Blades (ATBs) are wind turbine blades designed to reflect the movement of leaves, making them more flexible than conventional blades, and less prone to stress-damage. Strathclyde is developing a model and controller for these next-generation blades, which will increase the lifespan of wind turbines, and significantly reduce costs for the industry.

Looking deep inside the earth

This abandoned Scottish coalmine provides scientists with a unique opportunity to study rocks that normally occur deep below the surface. Here researchers, from the University of Strathclyde and the British Geological Survey, are looking at faulted and fractured limestone and coal beds, to improve and safeguard future energy technologies such as Carbon Capture and Storage, and Geothermal energy.

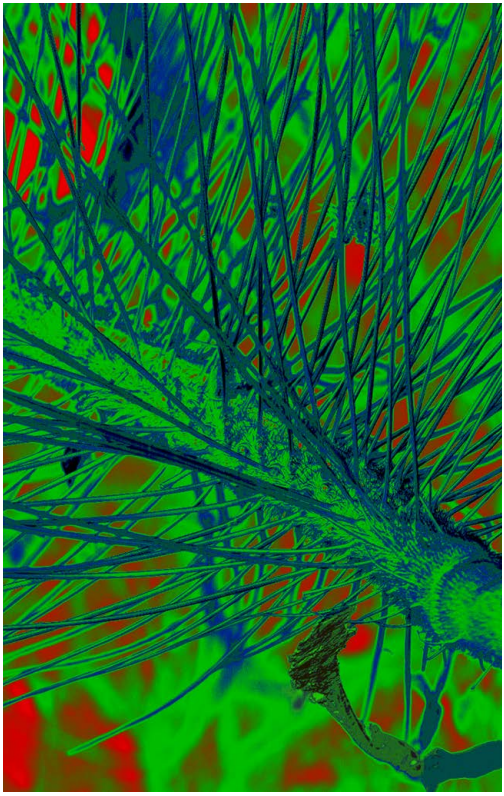
Infinite innovation through simulation

Wind turbine technology is advancing at a startling rate but with numerous variables to consider such as blade size, length and weight, how can researchers innovate so quickly? Computer simulation enables us to model and test thousands of ideas before selecting only the optimal designs for prototype building. This drastically reduces materials and logistics costs, and offers limitless opportunities to innovate.

Augmenting the way we work

Maintenance is key to sustaining optimum performance, but equipment in remote places, such as wind turbines, makes inspection and repair a challenging task. At Strathclyde, we are exploring opportunities for Augmented Reality technology to make maintenance workers' jobs faster and easier by projecting extra information over their view of the real world. Used in this way, even inexperienced workers could be guided step-by-step through complex maintenance tasks.

Health and Wellbeing



Mysteries of perception

You are looking at an image of a midge's antenna in false colour. The size of this tiny sample is less than 2mm, however scanning electron microscopy allows us to study its anatomy in detail. But why care about how a midge hears, beyond marvelling at the mysteries of perception? Understanding the biological principles of hearing in insects can lead to bio-inspired technological developments like miniaturisation of hearing aids.

Targeted treatments in combatting cancer

Gene therapy is a promising cancer treatment though limited by a lack of carriers able to specifically deliver genes to tumours. We have developed a new “seek-and-destroy” nanomedicine that can lead to sustained regression and disappearance of up to 90% of tumours in laboratory settings. This image represents cancer (the crab) being surrounded and attacked by the nanomedicine (grey vesicles) and the genes (in green) entering the cancer cells (blue).

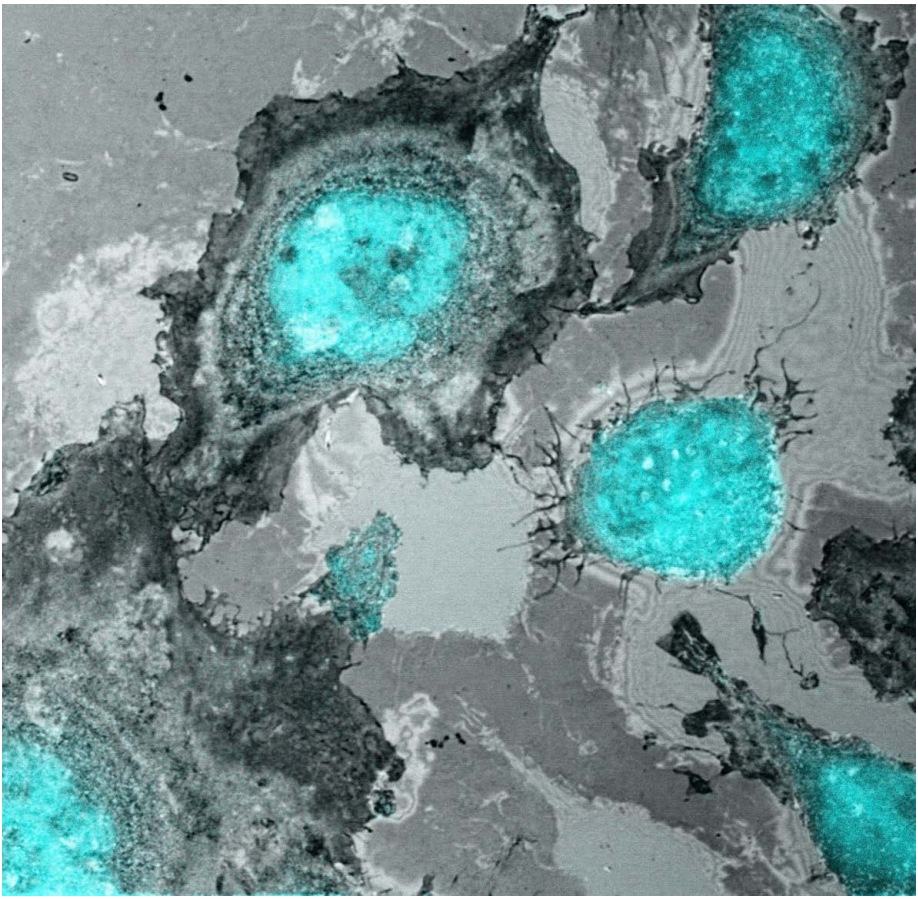
Silver-lining experiments

Cardiovascular disease (CVD) is the primary cause of death worldwide, affecting almost everyone in some way. Early detection of CVD could greatly impact the lives of sufferers, and metals such as silver (shown here) and gold could provide the answer. By functionalising these metals with biological molecules, they are able to target CVD biomarkers. We then use lasers to monitor their interaction with light, enabling a more efficient disease diagnosis.

Battling the bugs

This exotic collage of micro-organisms is just a sample of the bacteria that exist all around us. Many are harmless but others pose a serious health risk, and their extreme biodiversity can make these difficult to treat and eradicate. At Strathclyde, we are developing new disinfection and sterilisation technologies and antimicrobial drug delivery methods, in order to improve infection prevention and control methods in the global battle against antibiotic resistance.

YouTube **https://youtu.be/sBGSSfZEXds**



Light uncovers cancer cell biology

The Universities of Strathclyde and Edinburgh are currently investigating how transmitted, reflected and emitted light from cells can be used to answer questions in cancer biology. Specifically, we are trying to unravel the mechanism of the dysfunctioning Hippo signalling pathway in Malignant Mesothelioma - a cancer that is caused by asbestos exposure. Further understanding could contribute to developing a successful treatment strategy.

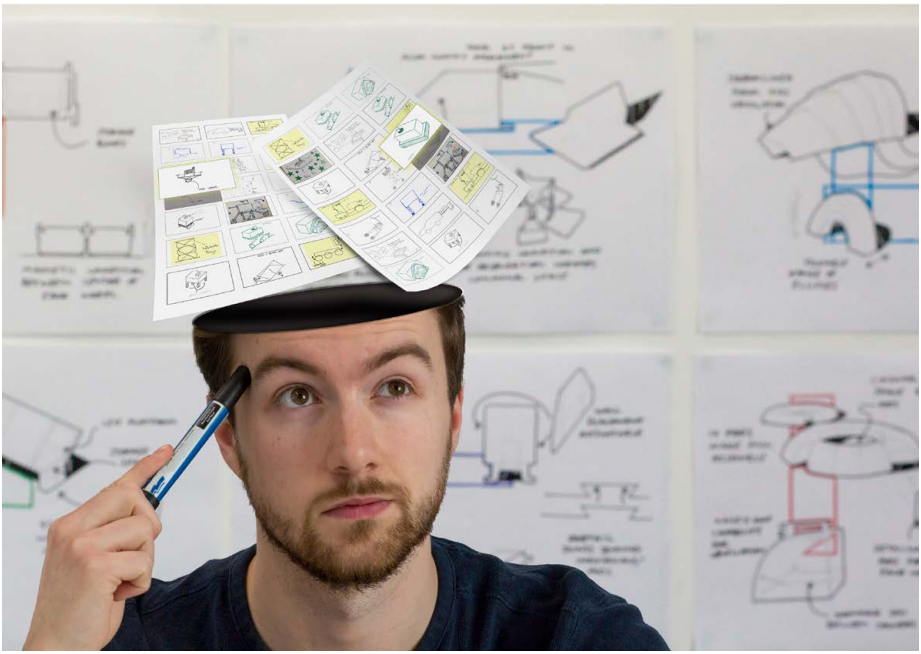
Strange medicines

A fine line separates a magic bullet from a dangerous drug. The line governs the consumption and control of pharmaceuticals and recreational drugs, and is determined by calculations in science, politics, and the medical marketplace. My research investigates the constantly evolving knowledge, myths and meanings of drugs over time, and aims to enhance existing research on intoxicants, promote research collaborations, and devise alternative policy strategies.

Innovation and Entrepreneurship

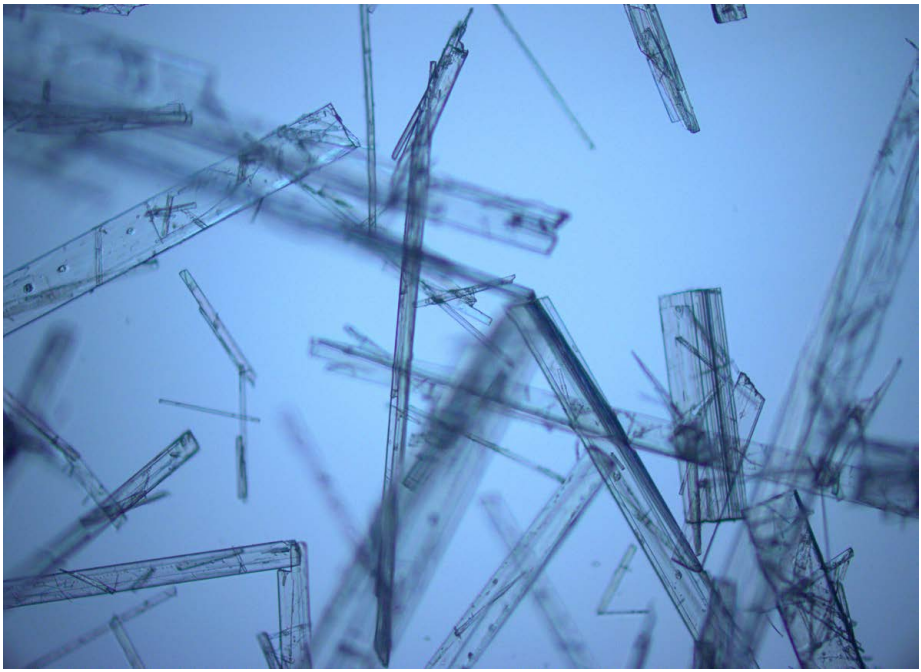
Giving voice to the voiceless

Stories are read and heard; they reflect experiences, and can reveal truths. My research gathers narratives of women working in informal settlements near Cairo, to understand how entrepreneurship is not only creating new products and services, but is facilitating a more empowered and liberated individual and collective existence for marginalised females, their families and the communities as a whole.



Demystifying design ideation

Every product design is a combination of a designer's experience, product knowledge and new ideas, but we know little about how this all comes together in the mind. If we can understand how designers combine ideas, we can make them more creative and create innovative design support tools. At Strathclyde, through integration of psychology and design research, we're unlocking the secrets of both the mind, and the act of design.



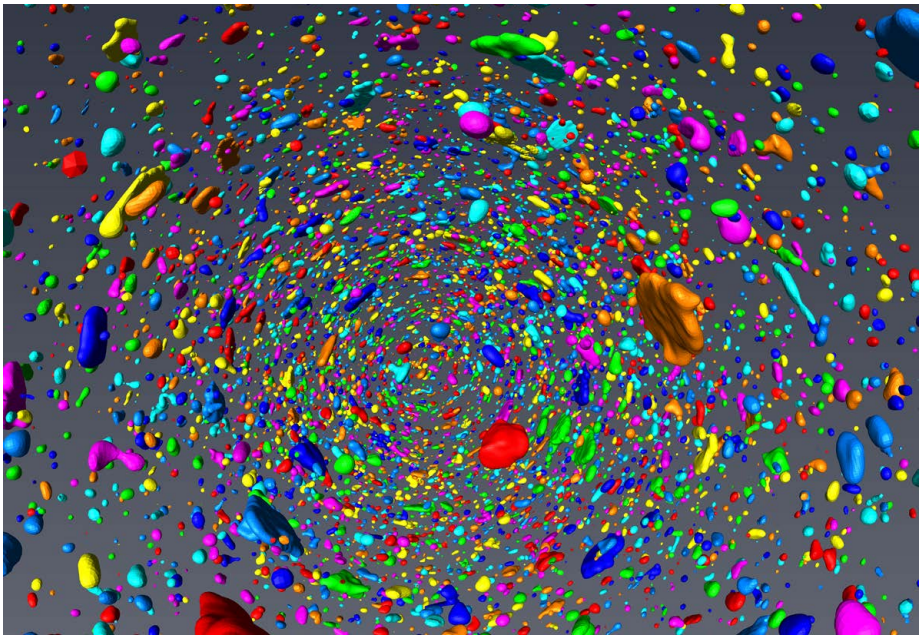
Best of both worlds

The crystal structure of chemical compounds in medicines is key to how well the body absorbs them and therefore how effective they are. At Strathclyde, we are studying the formation of co-crystals (pictured) – combining different compounds into a single crystal structure – with the aim of making medicines more effective. This could result in tablets with enhanced absorption and therefore greater therapeutic effect, as well as reducing manufacturing costs.

Measurement Science and Enabling Technologies

Detecting ground anomalies

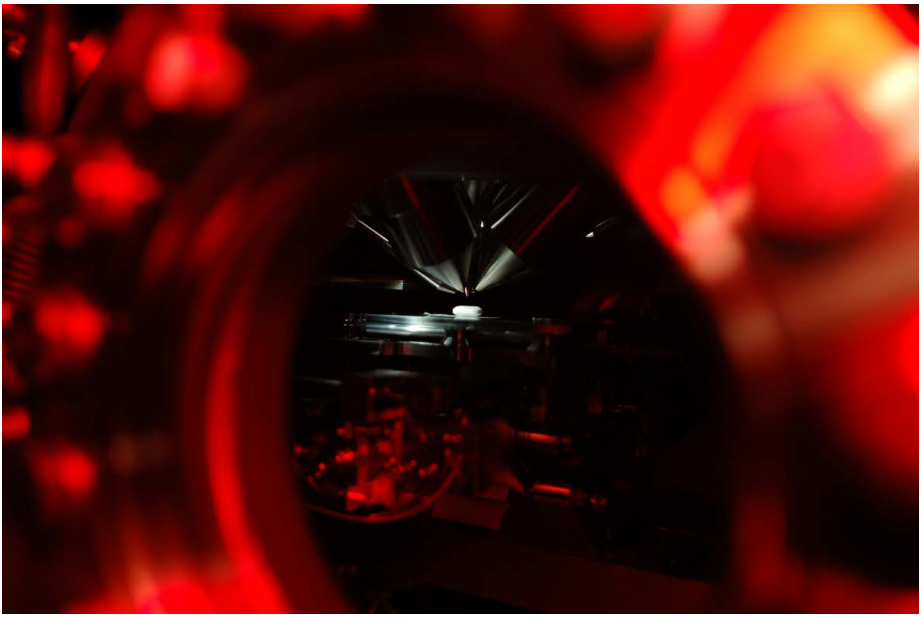
Coastal masonry structures like seawalls are vital in protecting our vulnerable shorelines, but how can we best protect the structures themselves? Development planning and practice recognises the risks that arise when coastal structures are damaged, and efforts are constantly being made to improve methods of detecting problems. Strathclyde is working to improve non-invasive techniques such as Ground Penetrating Radar (GPR), which can identify hidden damage without further compromising the structure.



Engineering greenwares for sustainability

This colourful image – created by X-Ray Computed Tomography – shows the particle alignment within a piece of crockery. Strathclyde's researchers are studying earth materials (soils, especially clays) with the aim of developing solutions to multiple problems; from improving the strength of earthenware products (reducing energy, resource and time wastage) to preventing natural disasters such as landslides.

YouTube **https://youtu.be/assKk5k-OCg**



To the heart of tablets

This picture shows a tablet – a common pain-reliever – sitting inside a vacuum chamber during analysis of its molecular composition by Mass Spectrometry Imaging (MSI). At Strathclyde, we are advancing methods to analyse the composition and properties of pharmaceutical products with the aim of improving their production and performance. Optimised medicines can create tangible benefits for patients, such as minimising side-effects and reducing the cost of production.

YouTube **https://youtu.be/D34pStFn_E0**

Keeping equipment cosy

Research involves many unique challenges, and often calls for creative solutions, as this image demonstrates! Keeping subjects in focus during long imaging sessions is essential in microscopy, however something as simple as fluctuating temperatures in a laboratory can cause out of focus drift, by making the microscope support structure expand and contract. Our solution? Wrapping the entire structure in thermal blankets during an overnight imaging period.

In case of emergency – innovate!

Field research often requires a bit of creative thinking. To measure natural CO_2 leakage from rocks on this riverbed in Victoria (Australia), we niftily adapted our equipment to obtain the best results. Our research is developing methodologies to measure CO_2 leakage, enabling precise monitoring of carbon capture and storage (an important technology to tackle climate change), which can provide reassurance for regulators and communities, and help to shape international policy.

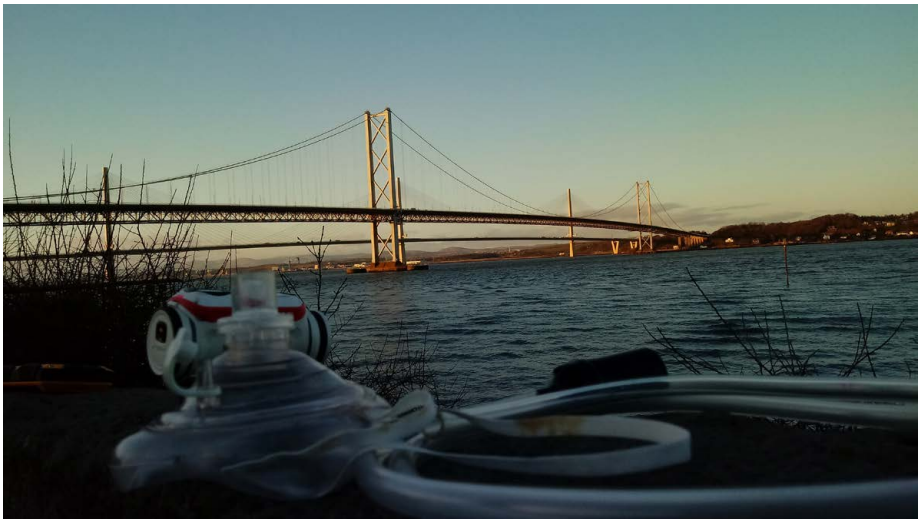
Ocean, Air and Space

O porpoise, where art thou?

Harbour porpoises are small-toothed whales found exclusively in the northern hemisphere, and a resident species in the Firth of Clyde. They are shy and very difficult to observe at sea; however, we can 'see' them in a different way. My research is focused on improving the algorithms to detect these highly vocal mammals and classify the characteristic ultrasonic clicks that they produce to study their ecology and natural behaviour.

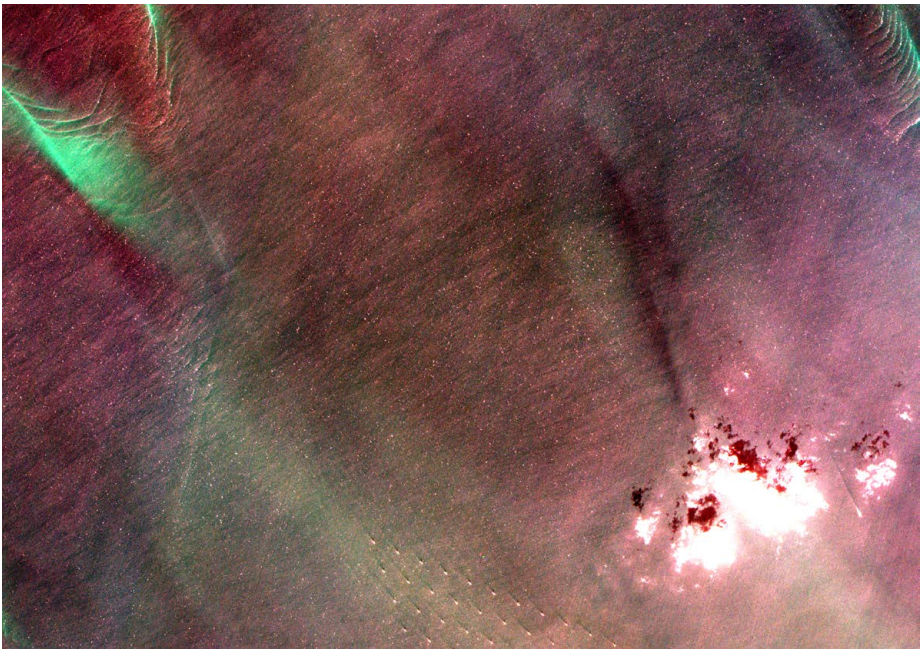
Humans' thirst for water

One of the biggest issues facing our generation is the availability of fresh drinking water. Removing salts and minerals through desalination could be the answer but it is expensive and energy hungry at large scale. At Strathclyde, we are investigating the potential of capacitive deionisation – desalination using electrolysis – as this could greatly reduce the cost, bringing us a step closer to a viable solution.



Tackling the air quality crises

Scotland is facing an ongoing air quality crisis. Fumes from cars and lorries are a major source of air pollution across Europe. Our research uses personal sampling equipment to monitor traffic related air quality impacts on human health. We experiment with these new and exciting monitoring techniques at several sites across Scotland including the world famous Forth Road Bridge.



Answers from above

Wind turbines operate in remote, weather-challenging areas making turbine data collection and maintenance difficult, dangerous and costly for operators. At Strathclyde, we are investigating the use of high-resolution optical imaging from satellites to provide accurate, up-to-date turbine data and valuable insight not possible at ground (or sea) level. Perfect for remote and weather-extreme areas such as this cluster of offshore wind turbines in the North Sea.

Society and Policy

Building blocks of social innovation

Will our future built environments enable citizens to get a level up - facilitating inclusive growth and social mobility - or is it game over for creative citizen participation in planning our cities? Our research engaged a diverse group of stakeholders around the regeneration of Christchurch, New Zealand, following the earthquake in 2011. It asks, can social innovation impact more democratic decision-making in planning the cities of the future?

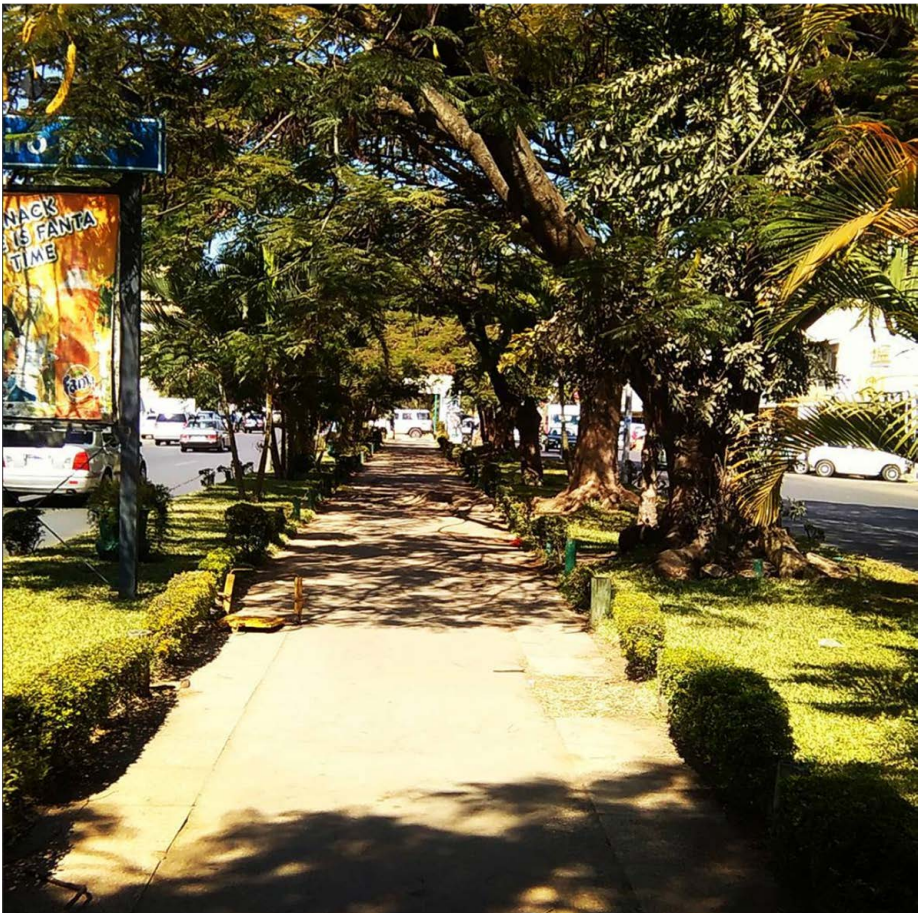
How to reward farmers' knowledge?

A plant reveals information leading to major discoveries for global food security. But it wouldn't be in a lab if it weren't for the knowledge of generations of farmers elsewhere in the world. At Strathclyde, we are asking, can the law help to share benefits from global R&D chains back to farmers fairly? Can it reconcile different economic interests and mindsets into genuine partnerships between more and less powerful actors?

Animals and us

Compassion for animals is innately human; but cruelty and greed can be too. Today we are trading more animals and animal products internationally than ever before. However, the animal welfare standards imposed by law differ vastly between countries. This research explores how precedents in trade and environmental law could support the emergence of a new field of global animal law. This development could enhance animal welfare and facilitate ethical consumerism.

YouTube **https://youtu.be/uToeCGbLa8E**



Urban qualities in African cities

This is a main route through Lusaka city centre. It illustrates that the physical qualities of an environment can affect how that space feels. Here the greenery masks the busy city life, creating a peaceful path. This research aims to investigate how the physical attributes of a city affect the quality of life of residents. This knowledge can be used by planners to determine areas for improvement in their cities.

Environmental governance in ‘global Britain’

The term ‘New World Order’ is widely associated with global governance; its origins lying in the formation of the League of Nations following the devastation of WWI. This scene in Edinburgh, shortly after the EU referendum, depicts the growing disillusionment surrounding cosmopolitan ideals. Strathclyde’s research on post-Brexit environmental governance is helping to realise the Scottish Government’s vision for continuing collaboration with the EU and other international actors on environmental matters.

Social landscapes post Brexit

Just one of the benefits of Scotland being an EU member state is financial assistance that has supported projects for 'smart, sustainable and inclusive' development in an effort to create social, environmental, and territorial unity across the country. The Strathclyde Centre for Environmental Law & Governance is investigating the opportunities and implications of Brexit, exploring avenues for continued support of citizens in realising their social, economic and environmental rights.

Water and technology for development

Over fifty per cent of community water supply points in Malawi have functionality issues, according to data recorded through a University of Strathclyde research programme. We are using this data to ensure future installations can be improved to support the development and wellbeing of people in developing countries, such as Malawi.

Researcher Development Programme (RDP)

The University of Strathclyde's Researcher Development Programme (RDP) is delivered by Faculties, Professional Services and external bodies to offer research students and early career academics a range of opportunities to continue their personal, professional and career management skills development.

Aligned to the national agenda supported by Research Councils UK (RCUK) and Vitae, courses, resources and events aim to help researchers enhance their transferable skills and competencies, and widen their scope for future employability both inside and outside academia.

Please visit **www.strath.ac.uk/rdp** to find out more.

Engage with Strathclyde, 30th April – 4th May 2018

The University of Strathclyde's flagship events programme, Engage with Strathclyde, is transforming the way the University reaches out to public, private and third sector organisations. This week-long series of events typically attracts around 2,000 delegates from over 600 organisations, and this year will host around 60 different events showcasing the latest research from all Faculties of the University. The Images of Research exhibition takes place in the Technology and Innovation Centre, the central hub for events during the week. This is an excellent opportunity for delegates to see another interpretation of some of the research that takes place at the University.

http://www.strath.ac.uk/workwithus/engage/

Entry Information

Advanced Manufacturing and Materials index

Psychedelic recrystallization of drugs
Submitter: Ecaterina Bordos
Department: Strathclyde Institute of Pharmacy and Biomedical Sciences
Funder: Engineering and Physical Sciences Research Council (EPSRC) Doctoral Training Partnership Research Excellence Award

A vision of the future
Submitter: Alexandra Costa
Department: Chemical and Process Engineering
Funder: University of Strathclyde John Anderson Research Award Funding

High-speed sand particles
Submitter: Alasdair MacKenzie
Department: Mechanical and Aerospace Engineering
Funder: Weir Advanced Research Centre

The belly of the beast
Submitter: Mark O'Hare
Department: Advanced Forming Research Centre
Funder: UK High Value Manufacturing Catapult

Innovation in craft-based textile manufacturing
Submitter: Chimaeze Onyeiwu
Department: Design, Manufacture and Engineering Management
Collaborators: Dr. Abigail Hird, Johnstons of Elgin (Image Owner)
Funder: Innovate UK / James Johnston and Co of Elgin Ltd Knowledge Transfer Project

'Shrooms save soils
Submitter: Emmanuel Salifu
Department: Civil and Environmental Engineering
Collaborators: Dr. Grainne El Mountassir (Supervisor), Prof. Alessandro Tarantino (Co-ordinator), Dr. James Minto (Photography)
Funder: Marie Skłodowska-Curie Innovative Training Networks (ITN-ETN) project TERRE 'Training Engineers and Researchers to Rethink geotechnical Engineering for a low carbon future' (H2020-MSCA-ITN-2015-675762). / Engineering and Physical Sciences Research Council (EPSRC) Engineering Fungal Networks for Ground Improvement (Engineering FUNGI); Project reference EP/N035526/1.

Embedding meaning
Submitter: Lewis Urquhart
Department: Design, Manufacture and Engineering Management
Collaborators: Nikoletta Trivyza - hand model
Funder: Engineering and Physical Sciences Research Council (EPSRC) CDT Advanced Manufacturing / Engineering faculty funding

Energy index

Tailoring energy integration
Submitter: Maria Damaskou
Department: Design, Manufacture and Engineering Management
Collaborators: Doosan Babcock
Funder: EU INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB), with match funding provided by the Department for the Economy and Department of Jobs, Enterprise and Innovation in Ireland.

Nature-inspired to withstand nature
Submitter: Rohaida Hussain
Department: Electronic and Electrical Engineering
Funder: MARA / Engineering and Physical Sciences Research Council (EPSRC)

Infinite innovation through simulation
Submitter: Rohaida Hussain
Department: Electronic and Electrical Engineering
Funder: MARA / Engineering and Physical Sciences Research Council (EPSRC)

Looking deep inside the earth
Submitter: Yannick Kremer
Department: Civil and Environmental Engineering
Collaborators: Prof. Zoe Shipton, Silvia Sosio de Rosa, Sarah Arkley
Funder: Natural Environmental Research Council (NERC)

Augmenting the way we work
Submitter: Eleanor Smith
Department: Design, Manufacture and Engineering Management
Funder: EU INTERREG VA Programme, managed by the Special EU Programmes Body (SEUPB), with match funding provided by the Department for the Economy and Department of Jobs, Enterprise and Innovation in Ireland.

Health and Wellbeing index

Battling the bugs
Submitter: Laura Dougall & Justine Fraser
Department: Electronic and Electrical Engineering
Collaborators: Dr. Michelle Maclean, Student Supervisor
Funder: Engineering and Physical Sciences Research Council (EPSRC) Doctoral Training Partnership / University of Strathclyde

Targeted treatments in combatting cancer
Submitter: Christine Dufes
Department: Strathclyde Institute for Pharmacy and Biomedical Sciences
Funder: Worldwide Cancer Research

Silver-lining experiments
Submitter: Jennifer Gracie
Department: Chemistry
Collaborators: Kirsty Milligan, Craig Ward
Funder: Engineering and Physical Sciences Research Council (EPSRC) / University of Strathclyde Doctoral Training Partnership

Light uncovers cancer cell biology
Submitter: Lisa Kölln
Department: Physics
Collaborators: Prof. Gail McConnell (supervisor) and Dr. Carsten Gram Hansen (supervisor)
Funder: University of Strathclyde / Optima CDT

Strange medicines
Submitter: Lucas Richert
Department: History
Collaborators: Morgan Scott

Mysteries of perception
Submitter: Brian Saltin
Department: Electronic and Electrical Engineering
Collaborators: Christopher MacKerron (cell provision)
Funder: University of Strathclyde Research Excellence Award

Innovation and Entrepreneurship index

Giving voice to the voiceless
Submitter: Christine Habib
Department: Hunter Centre for Entrepreneurship
Funder: University of Strathclyde John Anderson Research Award

Demystifying design ideation
Submitter: Christopher McTeague
Department: Design, Manufacture and Engineering Management
Collaborators: Euan Macer, Law (background sketches)
Funder: Engineering and Physical Sciences Research Council (EPSRC) / University of Strathclyde Research Studentship (CM grant number EP/M506643/1); and the EPSRC (AHBD, MG, LH, grant number EP/M012123/1).

Best of both worlds
Submitter: Olayinka Olalere
Department: Continuous Manufacturing and Crystallisation
Funder: Engineering and Physical Sciences Research Council (EPSRC) / Continuous Manufacturing and Advanced Crystallisation Future Manufacturing Research Hub

Measurement Science and Enabling Technologies index

Engineering greenwares for sustainability
Submitter: Christopher Ibeh
Department: Civil and Environmental Engineering
Collaborators: Matteo Pedrotti, Prof. Rebecca Lunn and Prof. Alessandro Tarantino
Funder: University of Strathclyde John Anderson Research Award

To the heart of tablets
Submitter: Eleonora Paladino
Department: Strathclyde Institute for Pharmacy and Biomedical Sciences
Funder: National Physical Laboratory (NPL) Scottish Hub (University of Strathclyde) / Wolfson Foundation: ToF-SIMS instrument.

In case of emergency – innovate!
Submitter: Jen Roberts
Department: Civil and Environmental Engineering
Collaborators: Dr. Linda Stalker, Dr. Matt Myers and Cameron White (CSIRO)
Funder: UK Carbon Capture and Storage Research Centre (UKCCSRC), supported by the National Geosequestration Laboratory and CSIRO

Detecting ground anomalies
Submitter: Cedric Sachet
Department: Civil and Environmental Engineering
Collaborators: Dr. Phillippe Sentenac
Funder: University of Strathclyde Research Excellence Award / ICE: Institution of Civil Engineers

Keeping equipment cosy
Submitter: Jac Schniete
Department: Strathclyde Institute for Pharmacy and Biomedical Sciences
Collaborators: Lee McCann (imaging technician who did the wrapping)
Funder: University of Strathclyde ISP studentship and the Hong Kong University of Science and Technology

Ocean, Air and Space index

O porpoise, where art thou?
Submitter: Melania Cosentino
Department: Electronic and Electrical Engineering
Collaborators: David Nairn, Clyde Porpoise CIC (vessel owner)
Funder: Engineering and Physical Sciences Research Council (EPSRC). Data collection carried out and funded by the Clyde Porpoise CIC (clydeporpoise.org)

Tackling the air quality crises
Submitter: Samuel Grainger
Department: Civil and Environmental Engineering
Funder: University of Strathclyde Engineering the Future Scholarship / The Weir Group PLC

Answers from above
Submitter: Steve Owens
Department: Mechanical and Aerospace Engineering
Collaborators: Alasdair Macleod, Offshore Renewable Energy Catapult
Funder: Engineering and Physical Sciences Research Council (EPSRC) Impact Acceleration Account (IAA)

Humans' thirst for water
Submitter: Richard Pollock
Department: Electronic and Electrical Engineering
Collaborators: Abigail Cumming
Funder: University of Strathclyde

Society and Policy index

Water and technology for development
Submitter: Amando Borge
Department: Civil and Environmental Engineering
Collaborators: Janice Norrie, Finlay Paterson, Prof. Bob Kalin
Funder: Scottish Government

Building blocks of social innovation
Submitter: Donagh Horgan
Department: Architecture
Funder: University of Strathclyde SCDT associated studentship / BRE Trust

Urban qualities in African Cities
Submitter: Laura MacLean
Department: Architecture
Funder: University of Strathclyde Research Excellence Award

How to reward farmers' knowledge?
Submitter: Elisa Morgera
Department: Strathclyde Centre for Environmental Law and Governance, Strathclyde Law School
Collaborators: Margherita Brunori, BENELEX visiting scholar
Funder: European Research Council (ERC) under the European Union's Seventh Framework Programme (FP7/2007-2013) (grant agreement No 335592) "BENELEX: "Benefit-sharing for an equitable transition to the green economy - the role of law"

Environmental governance in 'global Britain'
Submitter: Maria Ntona
Department: Law
Funder: University of Strathclyde Student Excellence Award

Animals and us
Submitter: Iyan Offor
Department: Law
Funder: University of Strathclyde John Anderson Research Award in partnership with Eurogroup for Animals

Social landscapes post Brexit
Submitter: Mika Schroder
Department: Law
Funder: Arts and Humanities Research Council

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