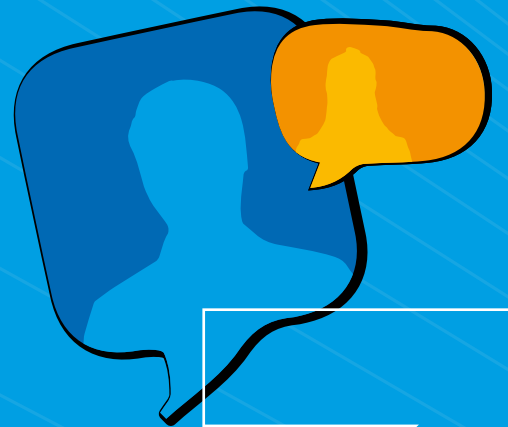




RGU RESEARCH MAGAZINE



2024:Issue

4

Welcome and introduction
Welcome by Professor Nick Fyfe

14

Features

- 14. Steam-based hydrogen production breakthrough
- 16. RGU research supports the expansion of treescapes in the UK
- 20. Funding boost for medical device innovation
- 22. Exploring cost of living pressures and infant food insecurity
- 26. Thought leadership: Professor Paul de Leeuw
- 28. PhD focus: Are we doing enough to eliminate microplastics from the environment?

6

- 6. Chancellor's Fellows background
- 8. Meet the Chancellor's Fellows
- 12. Research Culture Survey

Spotlight Feature

32

- 34. Young people's mental health should be a priority for society
- 36. How Artificial Intelligence is helping people manage back pain
- 37. Improving access to service charities for female veterans

Research Revealed

39

- 39. News, funding, events and more

Research in Focus

CONTENTS



This edition of RGU's Research Magazine exemplifies the significant progress we are making across the University in growing our research capacity and capability and in taking forward innovative, interdisciplinary and impactful research. Using the strategic investment awarded by the RGU Board, we have been able to appoint nine Chancellor's Fellows who are profiled in this edition. Each of them is a leader in their field, with exciting and ambitious plans to use their Fellowship to drive forward research aligned with our interdisciplinary themes. They are also highly collaborative, working with colleagues in RGU and beyond to help enhance our research profile and reputation.

This edition also reports on the findings from our second Research Culture survey. Strengthening our research culture lies at the heart of the University's research strategy and ensures a focus on those norms and behaviours which are fundamental to creating a positive and collegial environment in which research activity can flourish. The survey shows clear signs of progress and improvement since 2021 and while there is still much work to be done to address issues raised by staff, the action plans we have at both school and University level will help sustain the momentum we have now developed in this area.

universities in the UK. It will also increase our Research Excellence Grant which we can reinvest in people and infrastructure. Our planning for REF2029 is already well developed. We have Working Groups aligned with the three components of REF (People, Culture & Environment; Contribution to Knowledge & Understanding, and Engagement & Impact), a REF Operations Group meeting monthly, and a REF Steering Group meeting quarterly. Using data from the Annual Peer Review of Research exercise, we are also able to model our REF submission each year, helping identify areas for improvement.

Research is a team activity involving staff and students from across the University. I want to thank everyone for their contribution to making RGU a great place to do research and hope you enjoy reading about the exciting work we are doing here.

Professor Nick Fyfe

Vice Principal for Research and
Community Engagement

Research culture is to be an important focus of the next Research Excellence Framework (REF) exercise and so the work we are already doing in this area will enhance our submission. REF is of key importance to the University in terms of reputation and revenue and a strong performance will help us recruit and retain the best staff and students and improve our league table position relative to other

WELCOME

4

SPOTLIGHT FEATURE

RESEARCH COMMUNITY BOOSTED BY THE APPOINTMENT OF CHANCELLOR'S FELLOWS

RGU's significant recent investment into research has led to the recruitment of nine Chancellor's Fellows with their aim being to advance innovative research that responds to real-world challenges.



RESEARCH STRATEGY



Chancellor Dame Evelyn Glennie meets some of the new team of Fellows alongside Professor Nick Fyfe at the University's winter graduations

The Chancellor's Fellows are part of the University's ambitious research strategy and will be focussing on interdisciplinary research, based across RGU's academic schools. As leading experts in their chosen fields, Fellows will develop a programme of research and knowledge exchange activities, producing high quality research materials and applying for external funding to support their work.

Dame Evelyn Glennie CH, Robert Gordon University's Chancellor, said: "No University should become an ivory tower but instead be one of the most collaborative organisations out there. Few organisations have such a wide range of stakeholders - from government agencies and public bodies, to the charitable and corporate world.

"The initiative of the Chancellor's Fellows focuses on the importance of research and connections which are vital to the enrichment of all our lives. After all, it is not enough to create knowledge that exists only within the University, but to build on the mechanisms to transfer that knowledge out.

"All associated with a University are expected to contribute to the big challenges facing us; climate change, sustainability, global health. To do so successfully, we must all engage with proactive thinking, yet remain in close partnership with society. This is why the Chancellor's Fellowship initiative is so important."

READ MORE ABOUT THIS PROJECT





Dr Gael Morrow

Gael is based in the School of Pharmacy & Life Sciences with her research interest being in fibrinolysis (degradation of a blood clot) in both inherited and acquired bleeding disorders. Her Chancellor's Fellowship will focus on major bleeding following traumatic injury and will investigate the differences in clot strength and structure between different blood product replacement therapies. Prior to joining Robert Gordon University, Gael was a Research Fellow at the University of Oxford for six years after obtaining her PhD in Medicine & Therapeutics (Immunohaematology) at the University of Aberdeen in 2018.



Dr Laura Leuzzi

Laura is an art historian and curator at Gray's School of Art, developing a research project on digital art and activism. Author of articles and essays in books and exhibition catalogues, her research is particularly focused on early video art, European video art histories, feminism, activism and new media. Laura is co-editor of REWINDItalia. Early Video Art in Italy (John Libbey Publishing, 2015), EWVA European Women's Video Art in the 70s and 80s (John Libbey Publishing 2019), and Richard Demarco: The Italian Connection (2021). Laura is the co-coordinator of the Digital and Activism Network and the founding co-director of RE_EXHIBIT_REWIND Online Gallery started in 2023.



Dr Ann-Marie Foster

Ann-Marie from the School of Creative and Cultural Business is a public historian with research interests in digital access, crowdsourced collections, and histories of everyday life. Anne-Marie has published widely on people's interactions with memory building, archives, and the history of the family and has previously held lecturing and research posts at Queens University Belfast and Northumbria University. While at RGU, Anne-Marie will be finishing their second monograph on the topic of ephemera and cultural memory, while developing a new project which increases access to digital heritage collections.



Ikechukwu Nkisi-Orji

Ikechukwu has a background in mathematics and computer science and is a core member of RGU's AI and Reasoning group in the School of Computing. Ike's research interests are in Intelligent information retrieval, semantic web technologies, natural language processing, case-based reasoning (CBR), and continual/lifelong learning. Ike's PhD focused on semantic information retrieval using domain ontologies in collaboration with the British Geological Survey. Some of his recent projects include error prediction in food listings, conversational digital health triaging, recruitment decision support, and explainable AI strategy recommender. Ike is the key architect of CloodCBR, a state-of-the-art CBR framework that simplifies the creation of research and industrial-scale CBR projects.



Dr Joanna S C Shim

Joanna is a physiotherapist, graduating with first class honours from Cardiff University, and holds a PhD in Epidemiology from the University of Southampton. She has held several research fellowships funded by organisations, including Cancer Research UK and Versus Arthritis (previously known as Arthritis Research UK). Joanna's research largely focuses on understanding current challenges in healthcare, such as health disparities and disease prevention, through the integration of medical and social sciences. She adopts a multidisciplinary approach to her work, collaborating with experts from various fields to develop holistic solutions for complex public health issues.



Vinoth Ramalingam

Vinoth is a solution-oriented and an interdisciplinary researcher working on sustainable energy technologies to support low-carbon future target. He earned his PhD in Physics from SRM Institute of Science and Technology, India, in 2017. Following this, he worked as a Postdoctoral Fellow at KAUST and Energy for Future (E4F) Fellow at the University of Strathclyde. He is excited to join RGU as a Chancellor's Fellow in the School of Engineering, where he will build an independent academic career and interdisciplinary research focused on next generation catalysts and solar-driven systems that can efficiently produce valuable fuels and chemicals from abundant sources.

MEET THE CHANCELLOR'S FELLOWS



FELLOWS FOCUS



Dr Wei Zhang

Wei's research interests include engineering design for sustainability, computational mechanics and digital twinning. Prior to joining the National Subsea Centre, he held several research posts at some of the UK's most prestigious universities, including Oxford, Bath and Queen's Belfast. He obtained his PhD in Mechanical Engineering, with a particular focus on understanding inverse problems under uncertainty for modelling and designing complex engineering systems. In his spare time, he enjoys music, reading, traveling and running. He is a marathon finisher and regularly takes part in full or half-marathon events around the globe.



Dr William Ball

William is a Social Epidemiologist based in the School of Nursing, Midwifery and Paramedic Practice. He is a Registered Nurse by background and his research sits across the border between population health and social science, using advanced quantitative methods informed by theory to better understand health inequalities. Will's main interest is in children and young people's mental health. His current research focuses on better understanding how health inequalities in this population are constructed and perpetuated, to develop effective policy aimed at reducing unfair and avoidable differences in health. Will is also a strong advocate for open and reproducible research approaches.



Dr Ruby Roberts

Ruby is an Industrial Psychologist in the Aberdeen Business School. She is also a Chartered Psychologist, as well as a member of the British Psychological Society. Dr Roberts' applied research centres around human factors and organisational culture, with a focus on high-hazard environments working closely with industry. Recent projects have examined the psychology of corporate technology adoption, and she continues to work with the Research Office to lead RGU's research culture surveys. Her fellowship aims to applying human factors research to the wind sector to support training standards, operator competence, and industry safety.



FELLOWS FOCUS





SPOTLIGHT FEATURE

RESEARCH CULTURE MATTERS:

Results of RGU's research culture survey 2023

By Ruby Roberts and Jane Williams

Our aspiration is for RGU to continue to provide a vibrant and supportive workplace for our staff and students. Our organisational culture is a fundamental component of achieving that environment, especially when it comes to research.

Everyone has a valuable contribution to make that can enable excellent research at RGU. Research culture encompasses the behaviours, values, expectations, attitudes and norms of our whole community. The results from our most recent research culture survey, which invited contributions from all RGU staff and post-graduate research students, was presented at an event on Tuesday 6 February.

Recognising the importance of research culture for the way that research is conducted and communicated, influencing researchers' career paths and mental wellbeing, we ran our first research culture survey in 2021.

As our research community is made up of people with various roles, all of whom make high quality research possible, we ran a second survey at the end of 2023 to capture the views of academic staff, post-graduate research students, professional support staff and leadership.

Running the survey every two years will allow us to understand the progress that we are making and, more importantly, to help us understand and identify where more work is needed. Results from the survey will be used to inform future policy, target resources more effectively, and develop new initiatives that build a positive research culture at RGU.

The key takeaway messages from the 2023 survey were:

- There has been a positive improvement since 2021;
- There is variation in the results at school level, with the data placing an emphasis on school actions; and
- There is work to be done on improving staff wellbeing.

For RGU staff who would like to see a summary of the 2023 survey please contact Jane Williams and Ruby Roberts at researchculture@rgu.ac.uk

FEATURE

School of Engineering

RGU RESEARCHERS MAKE STEAM-BASED HYDROGEN PRODUCTION BREAKTHROUGH

Researchers at RGU have designed a tubular cell that can withstand high temperatures which will help cut costs as well as moves toward greener forms of energy.

Led by RGU's School of Engineering in collaboration with University of Surrey, the team have developed a solution to aid the production of hydrogen by designing, fabricating, and testing electrodes used in solid oxide steam electrolysis (SOSE) for waste steam generated from nuclear power plants.

SOSE systems operate at between 600 °C to 900 °C temperature range and the associated cathode, electrolyte and anode layers were manufactured with thermal spray and dip coating techniques.

Advances in the design of the cell as well as the materials and arrangement were made in the laboratory during the project. All of this helped contribute to the performance of the system.

The research showed that the tubular electrolyser cell (pictured below) provides an improved performance, which means the design has a higher hydrogen production rate, compared to the existing cells.

More research is needed to develop improved manufacturing techniques to prevent cracking while the system is used at high

temperatures. Another move forward for the team and the project would be upscaling and life cycle assessment (LCA) before it becomes a commercial product.

Developing electrolyser cells with enhanced hydrogen production and their scalable manufacturing can play an important role in enabling not only eco-friendly development but also cost-effective, reliable, and sustainable opportunities.

The research was funded by the Engineering and Physical Sciences Research Council (METASIS, EP/W033178/1) with co-investigators Prof Qiong Cai and Dr Bahman Horri from the University of Surrey. Dr Victoria Kurushina (PDRF), Dr Ajith Kumar Soman (PDRF), and Vinooth Rajendran (RA) worked on various aspects of this project.

Professor Nadimul Faisal, METASIS lead investigator from the School of Engineering, said: "Developing electrolyser cells with enhanced hydrogen production and their scalable manufacturing can play an important role in enabling not only eco-friendly development but also cost-effective, reliable, and sustainable opportunities. This project has the potential to advance technology to produce green hydrogen and thus we will exploit the outcomes and commercialise the product."

Professor Mamdud Hossain, from RGU's School of Engineering, said: "This EPSRC funded project gave us an opportunity for building something from scratch through fundamental research. We have shown our technology works and provide a better performance compared to the existing design. We are seeking further partners to take the technology near to market."

Dr Anil Prathuru, Lecturer at the School of Engineering added: "Solid oxide electrolyser technology is set to play a key role in UK's energy goals. Scalable manufacturing is a potential issue. This project gave us the opportunity to try some unique ideas towards enhancing the operational efficiency and demonstrate a highly scalable method of electrolyser manufacture."

This EPSRC funded project gave us an opportunity for building something from scratch through fundamental research.


[READ MORE ABOUT THIS PROJECT](#)

The research team from RGU's School of Engineering, L to R: Professor Nadimul Faisal; Dr Anil Prathuru; Vinooth Rajendran; Dr Victoria Kurushina; and Prof Mamdud Hossain.

FEATURE

Gray's School of Art

Researchers at Robert Gordon University are contributing to a new study to find out how we can expand the UK's trees, hedgerows, woodlands and forests in rural and urban settings.

Their aim is to find out more about the social and ecological implications of agroforestry - which is the growing of trees alongside crop and livestock farming on the same land - in rural areas and surrounding towns and cities in the UK.

Forests and other treescapes account for more than 13% of the UK's land surface and capture approximately 21 million tonnes of carbon dioxide a year, an important contribution to the UK's goal of reaching net zero carbon emissions by 2050.

In order to meet the UK's ambitious tree planting targets and simultaneously reduce agricultural greenhouse gas emissions, current agricultural land will need to be converted into alternative land-uses.

The UK Research and Innovation (UKRI) body has commissioned research to improve our understanding of treescapes in the UK, and their value to people and the planet, and has committed £14.5m funding to support the studies.

RGU is collaborating with partners at Newcastle University, Southampton University and Reading University, as part of the Future of UK Treescapes Programme, to find out about the attitudes of society to UK forests.

Researchers want to explore society's attitudes to UK forests, and to find out what they want in the future and whether we can adapt our trees and forests to tackle climate change. They will also assess the impact of agroforestry on ecosystems and how best to engage farmers and other stakeholders in the process.

The team from RGU want to make the current scientific research on AgroForestry more accessible to a diverse range of people and is collaborating with artists and the Museum of English & Rural Life (MERL) to create visual and multimedia materials to 'translate' or transform scientific data.



Artist Naomi McIntosh

RGU RESEARCH SUPPORTS THE EXPANSION OF TREESCAPES IN THE UK

"We are collaborating with artists to create artistic works that transform the scientific knowledge into more imaginative forms."

One artist is producing creative material to visualise ecological models around heat mapping and the impact of forests on animal welfare, whilst other participatory workshops are exploring sensory methods, and transforming plant's electrical signals to sounds.

Dr Jennifer Clarke, anthropologist, artist, and Associate Professor in Critical and Contextual Studies at Gray's School of Art is leading RGU's part of the study and is holding participatory workshops to engage the public.

She said: "Agroforestry, where trees are deliberately combined with agriculture on the same piece of land, is an important form of land use that can maintain food production whilst driving down carbon emissions.

"In order to fully understand society's attitudes to UK forests, we need to engage as wide a group of the public as possible, including farmers, landowners, and more marginalised groups in society including low-income groups, ethnic minorities and young people.

"We are collaborating with artists to create artistic works that transform the scientific knowledge into more imaginative forms. Art works and participatory practices are being developed to engage and foster discussion about treescapes in the UK at a series of workshops with different groups. The

information gathered will be used to enhance future decision-making by stakeholders, including farmers and land managers and to identify opportunities to increase agroforestry.

"Our experimental research and public engagement prioritise equality, diversity and inclusivity, which underpins Robert Gordon University's mission to lead innovative and interdisciplinary research that fosters economic and social regeneration and creates a more sustainable future for all."

A number of artists are involved in the project including interdisciplinary artist, Naomi McIntosh, who is based in the Cairngorms National Park in Scotland. Naomi previously produced a project called 'Lost Song' which visually captured the data of bird song. She will use similar techniques to create engaging content to generate discussion about the UK's treescapes.

Artists Simone Kenyon and Dr Jen Clarke are holding a series of sensory mapping and creative workshops with the Youth Panel at the MERL to engage young people in about the UK's treescapes.

More workshops are planned for 2024 and the culmination of the research will include public exhibitions showcased at The MERL in Reading in 2024 and The Sill in the Northumberland National Park in 2025; an associated book publication; and online archive to make agroforestry futures accessible for all. The research findings will be also presented at national and international conferences, bridging arts, humanities, and science.

READ MORE ABOUT THIS PROJECT



FEATURE

School of Engineering



MULTI-MILLION-POUND FUNDING BOOST FOR MEDICAL DEVICE INNOVATION IN SCOTLAND

The Medical Device Manufacturing Centre (MDMC) has been awarded £3.35m of additional funding from Scottish Enterprise to continue its work developing novel medical device innovation and improve the industry's sustainability.

The new funding was confirmed on Thursday 7 December by the Scottish Government's Cabinet Secretary for Wellbeing Economy, Fair Work and Energy, Neil Gray, who was given a tour of the facility.

The MDMC is a consortium of institutions comprising of Robert Gordon University (RGU), the University of Edinburgh, the University of Glasgow and Heriot-Watt University where it is headquartered. The University of Dundee has also been announced as a new partner.

The investment will help to address current challenges facing organisations like the NHS, exploring the inclusion and development of degradable or reusable polymers. Designed to have reduced environmental impact, use of these polymers could help to make medical device manufacturing more sustainable. More work will also be done on the real-time evaluation of the carbon footprint of manufacturing processes and the safer removal of greenhouse gases in the NHS.

Additionally, further support will be given to earlier-stage entrepreneurs in healthcare who are part of Scottish Enterprise's High Growth Spinout Programme, a significant and positive step towards closer integration of innovation in the health and care sectors.

RGU's role in the MDMC has been led by Professor Radhakrishna Prabhu from its School of Engineering. He said: "This funding is great news for the continual development of the MDMC and its support for early-stage development of Scottish innovations in medical device manufacturing area."

"Central to RGU's role has been to provide expertise in the areas of medical biosensors and instrumentation. This positive collaboration with MDMC and the institutional partners positively boosts the University's applied research and its faster translation, ideally leading to new spin-out companies which will help to stimulate and grow the sector."

Wellbeing Economy Secretary Neil Gray said: "This funding will not only drive innovation across the healthcare landscape, but help produce more sustainable medical devices as we continue our transition to net zero."

"Having previously supported the MDMC through the Scottish Government's Advancing Manufacturing Challenge Fund, it is fantastic to see these state-of-the-art facilities continuing to encourage collaborative working."

"Innovation is a priority, and the National Innovation Strategy sets out plans to drive up our performance and compete with the best in the world over the next decade."

More than 150 SME medical device companies in Scotland have worked with the MDMC since it was launched in April 2020. Its key role is to provide free expert advice on manufacturing engineering, regulatory issues, and funding streams, coupled with technically supported access to state-of-the-art manufacturing facilities. Its engineers, scientists and clinicians have helped Scotland's SMEs to translate medical device concepts into commercial products.

"Innovation is a priority, and the National Innovation Strategy sets out plans to drive up our performance and compete with the best in the world over the next decade."

Professor Radhakrishna Prabhu

Companies supported by the MDMC include Intellipalp which is working to take its prostate cancer diagnostic device from concept to prototype and ConfiPlus, which has been supported to take its a stoma bag accompaniment that tackles leaks through the first steps towards NHS accreditation. It saves many clients up to eight months of development time and helps them to secure significant investment.

READ MORE ABOUT THIS PROJECT



FEATURE

School of Nursing, Midwifery and Paramedic Practice

RGU RESEARCH EXPLORES COST OF LIVING PRESSURES AND INFANT FOOD INSECURITY

A new research study to explore how cost of living pressures are affecting parent or carer and infant food insecurity across the UK was launched in November.

In the first study of its kind in the UK, researchers – led by RGU’s Professor of Public Health, [Flora Douglas](#) – will interview parents and carers, living in Scotland and England, who have had or are currently caring for babies 0-6 six months and under, during the period January 2022 till April 2024.

The study aims to find out how cost of living pressures are impacting household food budgets and infant feeding decisions. This life stage is when, according to UNICEF recommendations and guidelines, infants

should be exclusively breast fed. However, the cost-of-living crisis is making it even more difficult for parents to feed their babies the way they would like to.

Recent reports indicate that further deepening poverty levels in the UK, are making it even more difficult for many people to meet their basic needs such as food, warmth and shelter. Professor Flora Douglas said: “Much has been done to track household food insecurity experience in the UK in recent years, and to secure the Right to Food for children in Scotland and the UK through policy development, but there is a gap in our understanding as far as babies and their parents and carers, as feeders of babies, is concerned.



“In the midst the current cost of living crisis, there is an urgent need to understand what is happening in relation to food access for parents, carers and their very young infants who rely on either breastmilk or infant formula for life, at this crucial early life stage, in the UK. By comparison in a comparable high-income country, Canadian research, has found that low-income mothers are struggling to meet breast feeding recommendations due to poverty.

“The most recent First Steps Nutrition report also highlighted that the cost of infant formula has grown exponentially in the last 18 months which is deeply concerning from a public health perspective, given that many UK families will rely on infant formula to feed their babies during the first 6 months of life at some point. There is also evidence that some families are struggling to attain formula through non-commercial means.”

“We are aware of just how challenging it may be for many parents and caregivers to talk about their experiences of feeding their baby and that they may be worried about being exposed to judgment from others. We want to hopefully reassure potential participants that we are carrying out this research with the aim of developing an understanding about how difficult it is to raise and feed a baby during the cost-of-living crisis. We would also like to reassure those thinking about taking part that all discussions will be confidential.”

Kirsty McKechnie, representing [Child Poverty Action Group](#) said: “All children need the best start in life and it is vital that parents and carers have an adequate income to provide that. CPAG are happy to be supporting this important research from Robert Gordon University into the impact of the Cost of Living crisis on feeding babies in their first six months.”

Dr. Lesley Frank, Research Chair in Food, Health and Social Justice at [Acadia University](#) in Canada stresses the importance of the project at a time of growing and deepening food insecurity for families across high income nations.

She said: “It is incredibly important to hear directly from those feeling the pressures of the cost of living in the UK in order to build adequate local systems of support to ensure that families and their babies have access to the food they need.”

The outcomes of this research will be used to inform politicians, policy makers and key stakeholders at a local and national level, including the food industry, third sector organisations, and health and social care professionals, on how best to support food insecure parents and babies at this critical time.

Ultimately, the research will contribute to future decision making that aims to improve public health, particularly for those in disadvantaged communities who suffer the largest burden of ill health in the UK.

The study will run until September 2024 and will contribute to the [Diet and Health Inequalities \(DIO\) Food Study](#) as an extension of FIO Food research concerned with obesity and food insecurity.

This work is being undertaken by a university collaboration involving RGU, Leeds Beckett University, the University of Liverpool, University College London and led by Professor Alex Johnstone of the Rowett Institute of Nutrition and Health, University of Aberdeen.

This research is being funded through the Transforming the UK Food System for Healthy People and a Healthy Environment SPF Programme, delivered by UKRI, in partnership with the Global Food Security Programme, BBSRC, ESRC, MRC, NERC, Defra, DHSC, OHID, Innovate UK and FSA.

[READ MORE ABOUT THIS PROJECT](#)


Ultimately, the research will contribute to future decision making that aims to improve public health, particularly for those in disadvantaged communities who suffer the largest burden of ill health in the UK.

FEATURE

Energy Transition Institute

Thought leadership: Professor Paul de Leeuw

VOTING FOR A BETTER AND GREENER TOMORROW



Writing for *The Scotsman* in February, Professor Paul de Leeuw, Director of Robert Gordon University's Energy Transition Institute, emphasises the importance of 2024 as an election year for the ages.



Against a backdrop of global challenges, 2024 could be the year where the world's axis shifts. Around 70 countries, comprising half the world's population, will cast their vote in a range of polls, ranging from presidential, parliamentary and legislative to local elections. This will set a new record for the greatest number of people voting in elections in a single year.

The outcomes of these various democratic (and some not so democratic) votes could have profound global consequences and will inevitably shape both the near and long-term future for our planet. The 70 countries voting in 2024 include eight out of the ten most populous countries in the world - Bangladesh, Brazil, India, Indonesia, Mexico, Pakistan, Russia and the United States. It also includes six of the largest greenhouse gas

emitters in the world - the United States, India, Russia, Germany, Iran and Indonesia. These six countries alone represent around 60% of global GDP and close to 50% of the world's carbon emissions.

Given the challenges facing the countries when it comes to delivering on their net zero ambitions, there is growing concern that some may use the polls as a legitimate opportunity to deviate from them, as well as the commitments agreed at the recent COP28 meeting in the United Arab Emirates.

As the first generation to experience the impact of climate change and the last generation who can do something about it, we all have to play our part. But let's also be clear that real change will only come about by the largest emitters demonstrating true climate leadership.

The UK represents circa 1% of the world population and around 1% of the global emissions - it is not one of the top 10 emitters in the world. However, it does have a key role to play as a G20 country and its words and deeds do matter. Therefore, the actions the UK is taking

to change its energy system are important, and particularly of course in relation to the transitioning North Sea oil and gas sector.

While the UK has already reduced its greenhouse gas emissions by almost 50% since 1990, there is significantly more to be done. Given the magnitude of change required, far more transparency and honesty are needed about the likely cost implications, lifestyle changes, economic impacts and job prospects as part of the net zero journey.

So, with a UK election looming, how important is the wider sustainability and net zero agenda to the UK electorate? YouGov polling conducted in July 2023 shows that over 70% of people surveyed either strongly or somewhat supported the UK's commitment to cutting carbon emissions to net zero by 2050, with similar percentages across the various age groups and regions across the country. The remaining 30% either somewhat opposed it (8%), strongly opposed it (8%) or didn't know (close to 13%). Other polls conducted over recent years show a similar picture.

As it is often easier for the electorate to be supportive of something that happens in the far future, separate polling by Opinium highlighted that, although most people across the UK want government action and are positive about net zero policies, support starts to waver when people feel it might cost them money and/or negatively impact their lives.

Of course, polls are designed to capture a representative sample of public opinion at a snapshot in time and as such can never reflect the full picture. However, they do show the opportunity for the political parties to benefit at the ballot box if they manage to capture the mood of the nation in terms of focusing on the net zero agenda. Having said that, most of the electorate will see through unsubstantiated enthusiasm and so the political parties need to also propose credible, costed plans with bold actions that can deliver in an accelerated time window.

This is where the net zero agenda is a real challenge for the political establishment and why the climate emergency debate has become so polarised. Striking the difficult balance between affordability, sustainability, do-ability, fairness, jobs and supplying secure, low carbon energy to the UK will require carefully managed and coordinated transition plans. To successfully deliver these transition plans, the UK will need to (re)establish its credibility as a world class offshore energy investment basin, underpinned by a stable fiscal and regulatory regime, and with a supply chain and workforce to match.

The recent Robert Gordon University's Energy Transition Institute report - [Powering up the Workforce](#) - highlights that delivering the UK and Scotland's energy ambitions will see the UK's offshore energy workforce numbers increase from around 150,000 today to close to 225,000 by 2030. However, the report reinforces that if the ambitions are missed, it is unlikely that the UK will meet its net zero targets and that the number of industry jobs could fall to as low as 130,000.

We are currently behind the curve in terms of driving investment and setting up the infrastructure and business models that will be key to the UK hitting all its crucial net zero targets, while generating new businesses and jobs.

As such, it has never been more important for the future of our planet to exercise our collective voting power to demonstrate and cement the UK's and the world's commitment to deliver net zero by 2050 (2045 in Scotland) or earlier. This is why every single vote in 2024 counts towards the need to help deliver a better, greener planet for tomorrow's world.


[READ MORE ABOUT THIS PROJECT](#)


FEATURE

School of Nursing, Midwifery and Paramedic Practice

ARE WE DOING ENOUGH TO ELIMINATE MICROPLASTICS FROM THE ENVIRONMENT?

Katie McKenzie on her PhD which is examining one of the North East's most talked about roads...

“Microplastics (MPs) are everywhere and their environmental risks have been well publicised in recent years, with many individuals and industries striving to reduce plastic pollution. When we consider MPs, it is easy to consider some of the more well documented sources, i.e. the breakdown of larger plastic articles, however the problem is much more widespread.

One source that many people don't even consider is from our road networks in the form of tyre and road wear particles (TRWPs). Despite much interest in reducing the environmental impact of our roads, the focus has heavily been on reducing exhaust emissions with little acknowledgement to date on the contribution to MPs.

The composition of a tyre can vary between type and manufacturer. They are around 40-50% natural and synthetic rubbers with other additives (fillers, softeners, vulcanization agents and other chemical additives) added to obtain the desired properties of the product. Over its lifetime a tyre will lose approximately 10-30% of its tread rubber. Friction between tyre treads and the roads surface cause small particles to form, some of these deposit on the roads surface where they become combined with other materials such as brake dusts, road markings and surface materials forming TRWPs.

When it rains these particles can be washed from the road into our drainage systems. As well as the particles themselves being considered contaminants they may also provide further environmental worries. During production of plastic products, and indeed tyres, a variety of chemicals are added, some of which are known to show toxicity in the environment.



MPs are however impossible to completely remove from the environment. As they continue to breakdown into smaller particles the possibility of at least some of these chemicals to leach into the environment over time is high.

The Aberdeen Western Periphery Route (AWPR) is a road many of us in the area are now familiar with. As its name suggests, the road bypasses the city of Aberdeen, stretching from Stonehaven to Blackdog, with the aim of reducing traffic congestion passing through Aberdeen. Despite mention of a new bypass for Aberdeen since the 1950's, it was into the new millennium before plans were approved. Construction began in 2015, with the final section opening fully in 2019, and along the length of the road you will see some ponds - sustainable drainage systems (SUDS).

When it rains, water is drained from the roads into these systems, carrying with it particles and other pollutants from the road surface. There are different designs and configurations of SUDS that

can be constructed depending on the location and road type. One widely used in the area is a retention pond which are designed to hold the water for a period of time before released into the environment. They aim to remove pollutants during this time as different processes occur.

Studies worldwide have recently considered roads to be a major contributor of MPs into the environment. But how much do our roads contribute and how well do our current drainage systems deal with the problem?

As a current PhD student within the School of Pharmacy and Life Sciences, I'm working on this research project alongside Balfour Beatty who were involved in the construction and now maintenance of the route, to address these questions. The primary study area will be the AWPR, with methods been applicable to other roads in the future.

Under the supervision of Dr Bruce Petrie and Professor Linda Lawton, the project aims to develop methods to determine the amount of TRWPs, MPs and plastic additive chemicals in SUDS.

My passion has always been sport and exercise which has led me to a lot of outdoor activities and walks over the years. Born and bred in Scotland, I spent some of my teenage years living in the Sultanate of Oman. Both countries have natural beauty that are difficult to beat. In my weekends spent camping or hiking in both locations I was able to gain a real understanding of the beauty of our environment. Unfortunately, within this beauty it was also evident of the negative impact we as humans were having.

This is one reason I pursued environmental research. Sport and science/math were my passions at school and a last-minute switch from plans to pursue a career in sport to one in science has definitely proven to be a good one. As an undergraduate student studying Forensic and Analytical Science at RGU, I quickly realised that my passion was in research. A degree that has also proved very useful with the amount of time spent looking down a microscope to count plastic particles this year!

Carrying out my own work and having no two days the same was much more appealing to me than a more repetitive job. Being an inquisitive person asking questions is something that I am familiar with and the thought that I could answer some of these whilst doing something I enjoyed meant that applying to do a PhD was a no brainer when the opportunity presented itself.

So far, the project has focussed on creating methods to collect samples and produce data, with these methods now being applied to samples collected from SUDS ponds serving the AWPR. Creating the sampling device has been one of the more difficult and enjoyable parts of the projects so far. Designing something which uses little to no plastic is much more difficult than it sounds.

Initial data supports claims that roads could be major contributors to MPs in the environment, and MPs could be contributing to chemical pollution.

Further sampling will continue to assess levels as well as address the question of whether or not these systems are suitable to remove or retain these pollutants before release into the wider environment. Working closely with Balfour Beatty, this will also allow for comment on the current designs and maintenance procedures and aid in improving the environmental sustainability of our road networks while providing vital knowledge for policy updates and infrastructure improvements if necessary.

It has been a quick first year with many challenges along the way - but all of the positives definitely make up for it. I look forward to seeing what the next few years have in store for the project.



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RESEARCH REVEALED

Research Revealed is continuing to bring our research to life through engaging and informative videos, articles, and multimedia content. Join us on a journey of discovery as we explore the world-changing research at RGU, where our academics and researchers make a real difference in the world through their cutting-edge work.

You can visit all of our Research Revealed videos on the [RGU website](#) as well as on [RGView](#). Do you want to get involved by sharing your research through video content? Please tell us at RGUCommunications@rgu.ac.uk



RESEARCH REVEALED

School of Nursing, Midwifery and Paramedic Practice

YOUNG PEOPLE'S MENTAL HEALTH SHOULD BE A PRIORITY FOR SOCIETY

Writing in the Press & Journal, new Chancellor's Fellow, Dr William Ball, highlights how society has the power to change the circumstances of children, as increasing numbers of young people present with more complex mental health needs than ever before. He also featured in RGU's latest Research Revealed video.

Mental health services across NHS Grampian have been facing increasing demand for many years, as they respond to what is being called a 'mental health crisis' among young people. What's new is that clinicians are now reporting that children are presenting with more complex mental health needs than ever before, which is putting even more pressure on an increasingly resource-limited NHS.

Alongside figures from mental health support services, survey-based research has shown that increasing numbers of young people are experiencing symptoms of mental health disorders. Most of the young people from these surveys with symptoms, never seek or receive professional help, highlighting that adolescence is a critical period for intervention as mental health experiences during this period often determine lifelong mental health trajectories. While any child can develop mental health issues, it's important to highlight that not every young person has the same risk of mental health disorder. Our mental well-being is heavily influenced by the social, cultural, and economic circumstances in which we grow up and live.

In NHS Grampian, recent research shows that rates of mental health prescribing and referrals to specialist psychiatric services for children living in the most deprived areas are twice as high as for children in the least deprived areas. Trends also show an acceleration in the increase in mental health disorders since COVID-19, particularly among teenage girls.

Awareness campaigns such as [Children's Mental Health Week 2024](#) and January's [National Mental Wellness Month](#), have tried to reduce the stigma associated with recognising mental health challenges and accessing professional support, but increased willingness to seek help doesn't explain the rise in mental health problems amongst young people.

Considering the past decade of cuts to spending on public services, a global pandemic and the current cost of living crisis, young people are growing up in conditions which increase the risk of mental health disorders. We need to take this challenge seriously, not only for children today but also for their future.

Mental health and wellbeing are often discussed in the media through an individualised lens, with advice to people in distress being to talk, take up exercise or practice mindfulness. Whilst some people can find benefit in these approaches, the true causes of their distress are often not located within themselves. Traumatic experiences during childhood will understandably manifest as mental health challenges.

We need to focus more attention on the society-wide factors that negatively impact young people's mental health in the first place. It's like swimming upstream against a raging river – improving your stroke might help keep your head above water, but you'll struggle less once the flow is reduced. A systematic lack of access to resources and opportunities for certain groups in society can't be counteracted by individualised advice. Collective problems require collective solutions.

Inequalities in health are not a fact of life and political institutions hold the power to reduce young people's exposure to the harms of poverty, poor quality housing and underfunded schools.

Funding is one answer. It would be incredibly helpful to spend more on services which can help young people experiencing acute distress or intervene earlier to avoid a crisis. At the same

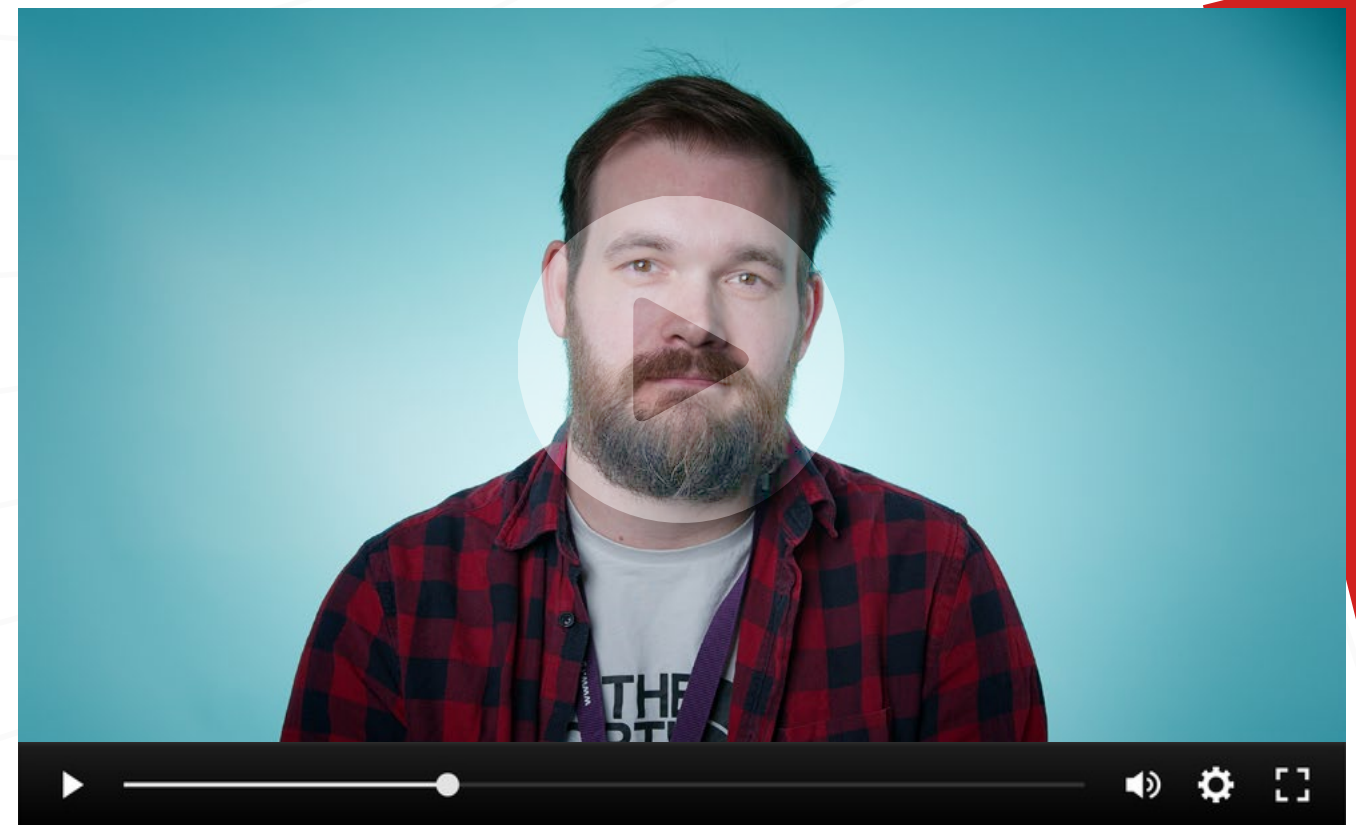
time, we need to ensure that fewer children get to the point of ever needing these services. [The Scottish Government's Wellbeing and Sustainable Development Bill](#), which has a public consultation process open now, has the potential to play a role. The bill proposes a new set of priorities for Scotland, alongside ways to measure our progress towards them.

The bill provides a chance to reconsider how we want to structure our society and is an opportunity to embed some of our shared values in the way Government works. What does a successful Scotland look like? Do we want to put economic metrics such as GDP above everything else, or is the health and well-being of our citizens the top priority?

I'm encouraged by proposed commitments in the bill to 'tackle poverty by sharing opportunities, wealth, and power more equally' and ensure 'children grow up loved, safe and respected so that they realise their full potential'.

It's easy to feel overwhelmed, dejected, and powerless when confronted with a trend of rising mental health disorders among young people. However, the current situation is avoidable and collectively we have the power to change the circumstances of children and young people for the better.

READ MORE ABOUT THIS PROJECT



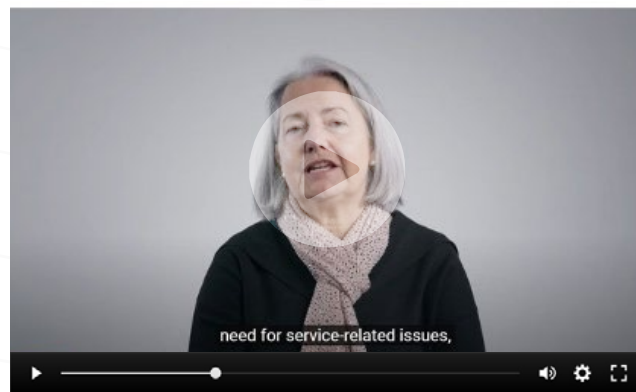
RESEARCH REVEALED

Aberdeen Business School

IMPROVING ACCESS TO SERVICE CHARITIES FOR FEMALE VETERANS

Vital research from Robert Gordon University (RGU) has helped lead to the creation of a new £200,000 government fund which will support female veterans who have suffered sexual trauma while serving in the military.

It comes after three independent reports commissioned by the Cabinet Office's Office for Veterans' Affairs (OVA) investigated how both the government and charities can improve access to care for female veterans. The fund will support the rollout of dedicated training and guidance for frontline staff to support women veteran survivors of sexual trauma across healthcare services, military, and civilian charities.



Led by Professor Zoe Morrison at Aberdeen Business School, RGU specifically investigated the barriers and opportunities for female veterans in accessing service charities by engaging with a number of stakeholders, including female veterans themselves and support services across the country.

Here, Zoe talks about her research for Research Revealed, the University's video series exploring the breadth of research across its academic schools.

READ MORE ABOUT THIS PROJECT



School of Health Sciences and School of Computing

HOW ARTIFICIAL INTELLIGENCE IS HELPING PEOPLE MANAGE BACK PAIN

The World Health Organisation estimates that low back pain causes discomfort for millions of people across Europe and adds a significant cost to the continent's various economies.

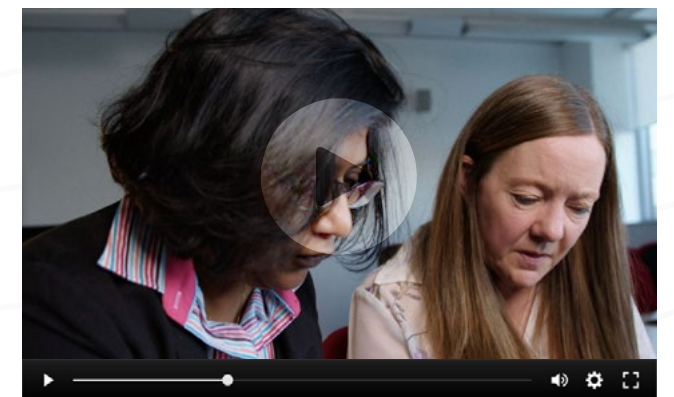
Now, researchers from RGU have made a crucial contribution to a solution which incorporates expertise from the disciplines of both health and computing.

RGU is one of the partners in the selfBACK consortium, an international group of academics and industry experts aiming to transform the self-management of low back pain through digital technology – pertinently through a new app.

Professor Kay Cooper, Associate Dean for Research in the School of Health Sciences, and Professor Nirmalie Wiratunga, Associate Dean for Research in the School of Computing, helped develop the activity recognition algorithms and the development of theory-backed digital intervention approaches.

Being physically active, doing specific exercises, and being educated on self-management are three vital components to successfully managing back pain – all three of which are integrated within [selfBACK](#).

Kay said: "This was a very interdisciplinary project because it brought across all the different project partners, it brought together people from a health and exercise background, along with people from a computing science background and also people from industry for the app to be developed into an actual product."



READ MORE ABOUT THIS PROJECT



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RESEARCH IN FOCUS

NEWS

School of Engineering

Machine learning PhD success for Mohaned

A PhD researcher who conducted a study on how machine learning can be used to select artificial lift methods that provide tangible solutions to industry challenges has passed RGU's Doctor of Philosophy viva.

Mohaned Mahdi completed his PhD in 2024 following three years of rigorous study. His thesis was titled 'An Integrated Approach to Select Artificial Lift (AL) Method Using Machine Learning'. The study uses innovative machine learning techniques to revolutionise the process by analysing data from 100 wells

in a Sudanese oilfield that is experiencing excessive production loss due to suboptimal AL selection.

He said: "Both my supervision team and the graduate school had an excellent support framework in place, and they were both capable of providing student-centered support. As a result, I was able to narrow my research to a topic of excellent personal interest to me, allowing me to pursue a research career in a field I enjoy."

 [READ MORE](#)

School of Pharmacy and Life Sciences

SULSA admittance for PALS pair

Congratulations to Dr Gael Morrow, Chancellor's Fellow, and Mr Nuruddin Mahadik, PGR, for being accepted onto the Scottish Universities Life Sciences Alliance (SULSA) Forging Futures Programme. This scheme, which is a partnership between SULSA, Interface, SkillFluence and MyFuture Plan, provides training and opportunities for ECR researchers to liaise with Academia and Industry, before 'graduating' as Ambassadors for Industry Engagement. Gael and Nuriddin join several colleagues in PALS who collaborate with and support SULSA.



School of Nursing, Midwifery and Paramedic Practice Postgraduate Research Symposium

An all-day event has been organised on Thursday 23 May to celebrate and disseminate the research carried out by postgraduate students and staff at SNMPP. The symposium is free to attend for students and staff and will particularly interest those in health and social care subjects. online discussion forum.

 [READ MORE](#)

The Law School

Mr Bates v The Post Office and its lessons for the Law of Contract

David Christie, Associate Dean for ADSE, has written about his research in The Law School Blog in relation to the ongoing Post Office scandal which has been prevalent across the UK news.


[▶ READ MORE](#)


School of Health Sciences

Double awards joy for RGU researcher

An academic from RGU who works closely with the Parkinson's community to research the condition is celebrating a double win at a national awards ceremony. Dr Julie Jones, Associate Dean, won the 'People's Choice' award, which was selected by people with Parkinson's at the 2023 Parkinson's Excellence Network Awards.

Dr Jones was also part of the winning team for the 'Community Support' award, presented to the Exercise Hub. She said: "This is a fantastic honour and what makes it so special is that the Parkinson's community, who I know well through my work, have had their vital say in myself picking up the People's Choice award. A huge thank you to the Parkinsons community, it is fantastic to work with such an inspirational, and motivated group of people all united in a common cause."

[▶ READ MORE](#)

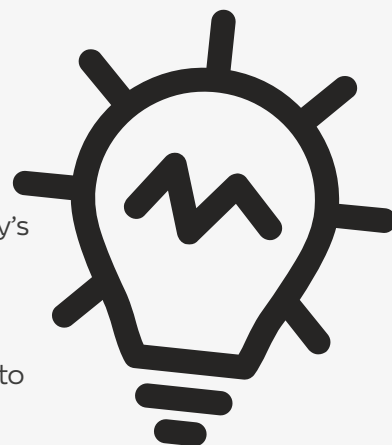
Gray's School of Art

Exhibition celebrates rising star awarded Freelands Studio Fellowship

A city centre exhibition showcasing the first Freelands Studio Fellowship at Gray's School of Art took place in December at the Look Again Project Space.

Gray's School of Art is one of six leading art and design institutions in the UK to host the esteemed Freelands Studio Fellowship which aims to broaden access to art education and the visual arts across the UK.

Esther Thorniley-Walker is the first artist to have received the prestigious Freelands Studio Fellowship at Gray's School of Art. The Fellowships run for a year and are awarded annually to talented early career artists who are then invited to spend a year in one of the collaborating art schools to develop their practice.

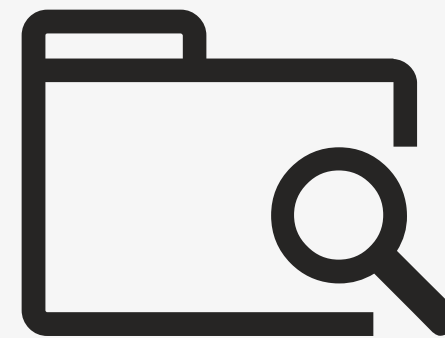

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National Subsea Centre

National Subsea Centre launch new net zero research pathway

Working with the University of Strathclyde and the Net Zero Technology Centre, the National Subsea Centre (NSC) at RGU has established the Centre for Doctoral Training (CDT) in Net Zero Technologies.

The CDT is designed for those who wish to undertake research to aid in the global transition to net zero whilst continuing a career in industry and forms part of a five-year Memorandum of Agreement (MOA) between UoS and RGU.

[▶ READ MORE](#)


Professor Sarah Pedersen's Royal appointment

Professor Sarah Pedersen, Dean of The Graduate School, joined Her Majesty Queen Camilla in January as she officially opened a Safe Space for domestic abuse victims at Aberdeen Art Gallery. Sarah had the opportunity to discuss her important research into violence against women in rural communities.

[▶ READ MORE](#)

Research team land award for work into domestic abuse

A team of RGU academics have won an award for the impact of their research investigating the policing of gender-based violence in rural and island Scotland during the Covid-19 crisis.

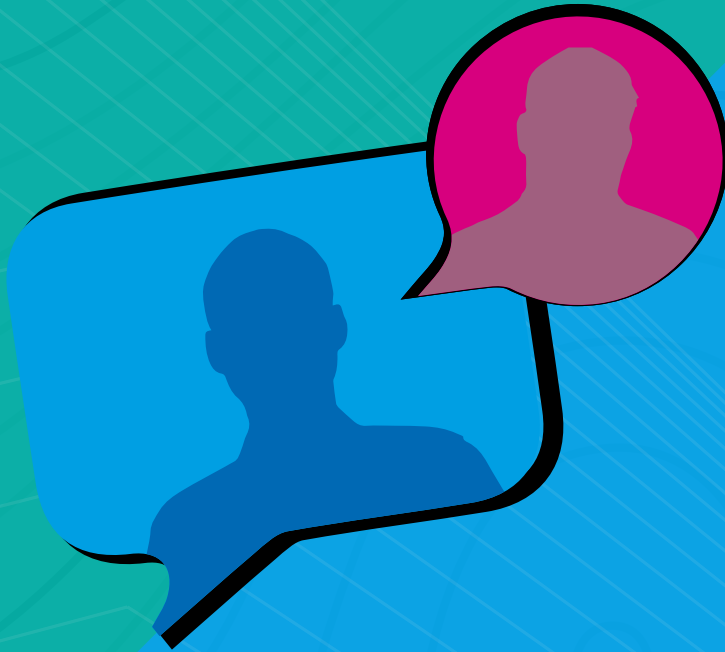
Professor Sarah Pedersen, Dr Natascha Mueller-Hirth, and Leia Miller won the Scottish Institute for Policing Research (SIPR) Impact Award for their study into the way the pandemic affected partnerships between police and third sector gender-based violence service providers in remote parts of the country. The research was also recently commended in Scottish Parliament.

[▶ READ MORE](#)

School of Creative and Cultural Business Research experts submit evidence

Professors Sarah Pedersen and Simon Burnett have submitted evidence to the House of Lords Communications and Digital Select Committee inquiry on the future of news: impartiality, trust and technology. The submission focused on women's use of third spaces such as Mumsnet to discuss news and politics with evidence relating to prior research which they conducted on the discussion of news sources by members of the UK online discussion forum.

Please inform the RGU Communications team of your research and help the production of our future RGU Research Magazine editions. Talk to us: RGUCommunications@rgu.ac.uk



If you have any submissions or inquiries, you can contact the RGU Communications Team using the email provided below:

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