



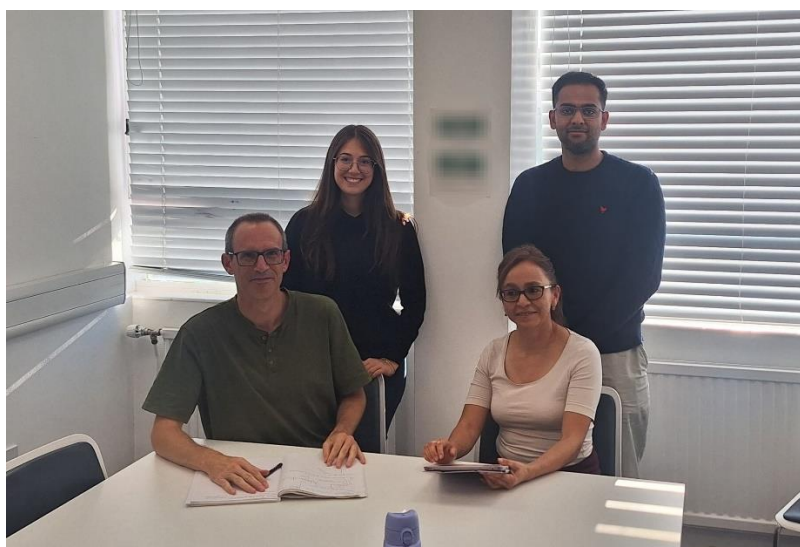
Sent on behalf of Professor Perumal Nithiarasu, Associate Dean for Research, Innovation and Impact

Dear Colleagues,

Please read below about some of the Faculty's most recent success stories. We would particularly like to see more from our Professional Services staff for the next email!

Staff News

Selected as an Impactful Publication of the Year



A recent study on dark energy in theories of quantum gravity, led by Ivonne Zavala in collaboration with Giulia Borghetto, Ameet Malhotra, and Gianmassimo Tasinato from the Theoretical Cosmology and Gravitational Waves group in the Department of Physics, has been selected by IOP Publishing as one of its most impactful UK publications of 2024.

The paper, "*Cosmological constraints on curved quintessence*" (JCAP 09 (2024) 073), explores models of dark energy that can emerge from quantum gravity frameworks and examines their compatibility with the latest cosmological observations. The team's results place some of the most stringent constraints to date on how fundamental theories of high-energy physics can shape the accelerating expansion of our Universe.

This recognition highlights the growing influence of the group's work at the intersection of cosmology and fundamental theory. The featured papers were chosen for their significant impact within a short time since publication and will be promoted internationally among the scientific community.

The full IOP collection celebrating impactful UK research can be viewed here:
<https://publishingsupport.iopscience.iop.org/questions/celebrating-jisc-uk-research/>

Swansea University will host the 2026 Annual Meeting of the UK Academic Alliance for Pavement and Highway Engineering (UK-AAPHE)



Founded in 2024 at the University of Nottingham, the alliance is a collaborative network of university academics and researchers from over 15 institutions across the UK working in pavement and highway engineering. The vision of this alliance is to become a leading platform for research, education, and innovation in all aspects related to highway and pavement design, construction, and maintenance. Hosting the event will be [Dr Jose Norambuena-Contreras](#), Swansea University Senior Lecturer in Civil Engineering and a recognised expert in self-healing asphalt research.

[Professor Ben Evans](#), Head of the School of Aerospace, Civil, Electrical and Mechanical Engineering, said that this event will be a fantastic opportunity to bring the highway engineering research community to our Bay Campus and showcase the excellent work that is going within Civil Engineering at Swansea University and provide an networking opportunity for our student and staff research community working in this area.

ENCYRCLE Project Launches at Swansea University's Computational Foundry



The ENCYRCLE project officially launched on 1st October at Swansea University's Computational Foundry. The event was opened by Principal Investigator [Professor Siraj Shaikh](#), alongside industry partner Peter Davies from Thales, who introduced the project to an audience comprising of academic colleagues and key industrial stakeholders including Siemens EDA, HORIBA MIRA, and Acanumis. The event also welcomed members of the Welsh Government's Innovation Team, who expressed strong support for the project's regional focus for skills development and prosperity.

Co-Investigators [Professor Markus Roggenbach](#) and [Dr Trang Doan](#) provided insights into the industrial challenges the project aims to address throughout its duration, highlighting its potential impact across multiple sectors.

The ENCYRCLE project is a 2 million research initiative with the Wales-based National Data Exploitation Centre (NDEC), part of global technology leader Thales, to strengthen the cyber resilience of interconnected systems, including those in transport.

Backed by £1 million in funding from the EPSRC Prosperity Partnership part of UK Research and Innovation, the three-year project—Engineering for Cyber Resilience: Through-Life Modelling and Analysis (ENCYRCLE)—will focus on strengthening cybersecurity in transport, manufacturing, and energy infrastructure.

Find out more about ENCYRCLE here: [ENCYRCLE](#)

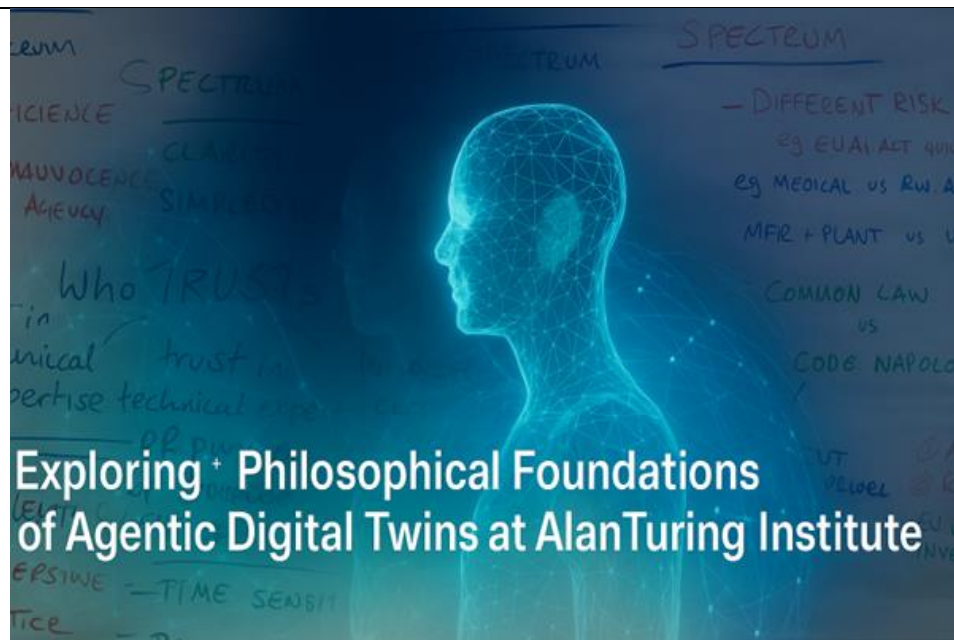
John Webster Award 2025



[Professor Tariq Butt](#) receives national recognition for pioneering fungal research
Congratulations to Professor Tariq Butt (Biosciences / Natural Products BioHUB) on being awarded the John Webster Award 2025 by the British Mycological Society.

The award celebrates his groundbreaking research on entomopathogenic fungi and their use in sustainable pest management — work that has shaped biological control strategies worldwide. Professor Butt will deliver an invited lecture at the Society's Annual Scientific Meeting in July 2026

Exploring Philosophical Foundations of Agentic Digital Twins at Alan Turing Institute



Exploring Philosophical Foundations of Agentic Digital Twins at Alan Turing Institute

[Dr Rajesh Ransing](#), a mechanical engineer at the [Zienkiewicz Institute for Modelling, Data and AI](#), leads 7Epsilon-FMEA-GPT, a custom AI agent for risk assessment, FMEA and root-cause analysis across industrial domains. He recently attended DTNet+'s "Philosophical Foundations of Agentic Digital Twins" at the Alan Turing Institute, London.

The event explored agency and responsibility in AI-enabled systems and their implications for dependable, explainable digital twins. Working with PhD student Philip Pe, the next phase of 7Epsilon-FMEA-GPT will examine how AI can support regulatory compliance and decision assurance in safety-critical, data-driven workflows.

Panel discussions gave Dr Ransing an opportunity to link agentic digital twins with the transition from Industry 4.0 to 5.0, emphasising the need for robust governance to ensure ethics and accountability. The World Café session highlighted shared responsibility across a spectrum of decision agency; participants endorsed an iterative define–observe–reflect–redeploy cycle for responsible human–AI collaboration.

Reflecting on the day, Dr Ransing noted that the event aligned ongoing research on AI-based risk assessment with emerging governance perspectives and created valuable industry–academia connections for the disciplined design of human-aligned, dependable AI.

A digital twin can be understood as a virtual construct dynamically updated from its physical counterpart, equipped with predictive capabilities to inform decisions. This bidirectional link between physical and virtual systems is central to next-generation intelligent infrastructure—and to the aims of 7Epsilon-FMEA-GPT.

Swansea volcanologist joins global deep-sea mission to uncover earthquake secrets

A Swansea University volcanologist is set to explore one of Earth's most mysterious underwater landscapes as part of a groundbreaking international expedition off the coast of Japan.

The mission will investigate “petit-spot volcanism”—a little-known phenomenon that may influence earthquake behaviour—by drilling into the Japan Trench near the epicentre of the 2011 Tohoku Earthquake.

[Dr Katie Preece](#), Senior Lecturer in Volcanology, will join scientists from around the world on the [International Ocean Drilling Programme \(IODP³\) Expedition 502](#).

The team will retrieve a 225-metre core of rock and sediment from close to the subduction zone to better understand how these volcanic features affect seafloor sediment and tectonic activity.

Dr Preece will serve as a sedimentologist aboard the state-of-the-art research vessel [Chikyu](#), where she will help describe and interpret the core samples as they are retrieved.

Beyond this new role, Dr Preece’s research focuses on reconstructing eruption histories and understanding how volcanic systems evolve. Combining fieldwork with laboratory techniques, including petrology, geochemistry and geochronology, she investigates how magma behaves before and during eruptions.

Her previous fieldwork has taken her to volcanoes in Indonesia, Ascension Island and Armenia, but this will be her first time participating in an IODP expedition.

Following the voyage, Dr Preece will lead post-expedition research analysing the textures and chemical composition of the recovered rocks. Her work will help scientists understand how petit-spot activity alters the subducting tectonic plate and contributes to Earth’s deep geochemical cycles.

Expedition 502 is a collaboration between 17 countries. Like many IODP missions, it presents significant technical and scientific challenges, with drilling operations taking place in some of Earth’s most extreme environments.

Originally advertised by the Swansea University Press Office, further information found here - [Swansea volcanologist joins global deep-sea mission to uncover earthquake secrets - Swansea University](#)

Student News

International MSc student named co-inventor on Swansea CO₂ heat-pump patent application



International Mechanical Engineering MSc student Brian Sagini has joined Dr Rajesh Ransing as a co-inventor on a Swansea University patent application for an advanced CO₂ heat-pump design.

The work targets higher-temperature, high-efficiency heat pumps for industrial decarbonisation. The team's approach integrates an ejector operating in the superheated region with system-level efficiency measures, aiming to accelerate progress toward pilot-scale demonstration.

Patent application:

GB Patent Application No: GB2515031.9

Title: Transcritical CO₂ Heat Pump

Date filed: September 2025

Dr Ransing said, "Brian's contribution exemplifies how our students help create real-world intellectual property while advancing clean-heat technologies." Brian added, *"It's exciting to apply the core concepts I learnt in my MSc project to an innovation with clear industrial impact. The breadth of Swansea's Mechanical Engineering modules encourages open thinking, and this gave me the confidence to contribute creatively to solving a real-world challenge."*

Dr Ransing, who also leads the [Enterprise, Partnerships and Innovation \(EPI\) group at the Zienkiewicz Institute](#), notes that *"early discussions, even when ideas are still at the conceptual stage, are very important."*

For any innovation, colleagues and partners can engage with the EPI group or contact Swansea's IP and Commercialisation team, headed by Rhys Bowley, at innovations@swansea.ac.uk.

REF2029 Canvas Hub

A reminder that a new Canvas hub has been published. Developed by the REF Officers team, this is a central repository for the REF2029 documentation, guidance, resources and news.

The joining link is <https://canvas.swansea.ac.uk/enroll/BDY36G>. Please enable notifications as this site will be updated with guidance, news, consultations etc as they are received.

Keep in Touch!

If you are aware of any recent achievements to share, either for yourself or for any members of your team, we would love to hear about them! We're interested in stories from academic and professional services communities. Please email any news to **FSE Research** (fse-research@swansea.ac.uk). **Deadline for submissions: 20th of each month.**

If you would like to promote a research event on the FSE Events webpage, please contact fse-research@swansea.ac.uk

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