

TUS

RDI NEWSLETTER
ACADEMIC YEAR 2022/2023



TUS RDI MANAGEMENT TEAM

OFFICE OF THE VICE PRESIDENT, RDI



Dr Liam Brown, VP Research, Development & Innovation

RESEARCH, RUN-EU & RUN-EU+



Dr Patrick Murray
Head of Research & Technology Transfer



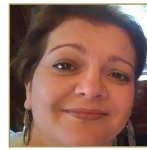
Lorna Walsh
Funded Research Manager



Dr Siobhan Moane
RUN-EU + Manager



Tania Marsh
Research Integration Manager



Dr Michelle Cooney
Research Grant Support

INNOVATION & ENTERPRISE



Gillian Barry
Head of Innovation & Enterprise



Michael Lonergan
Director of Innovation and Enterprise

GRADUATE STUDIES



Dr Lisa Moran
Dean of Graduate Studies

RESEARCH INSTITUTES



Dr Declan Devine
PRISM



Dr Margaret Brennan-Fournet
PRISM / CPS



Prof Neil Rowan
BRI



Dr Brian Lee
SRI



Dr John Cosgrove
Smart Manufacturing



Dr Frank Houghton
Social Sciences ConneXions



Dr Adam DeEyto
ACADEMY

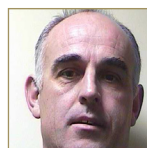


Padraic O'Reilly
SDRI/Development Unit

TECHNOLOGY GATEWAYS & CLUSTERS



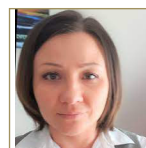
Dr Noel Gately
APT



Anthony Cunningham
Comand



Dr Emma Murphy
Shannon ABC



Dr Lena Madden
Shannon ABC



Dr Caitriona Mordan
ATIM



Dr Jamie Meehan
IDEAM

Welcome to the TUS RDI newsletter for Academic Year 2022/2023. The following pages showcase some of our innovative projects, events and initiatives across the entire continuum of Research, Development and Innovation and I hope that you enjoy them. I would like to thank all staff and students that have submitted items for this newsletter and if your item did not appear, it was purely down to space constraints so please do submit for the next newsletter. We have an accompanying newsletter that covers some of our RUN-EU and RUN-EU + initiatives. As you will be aware our recently launched strategic plan has set a series of ambitious targets for RDI over the next number of years and I have no doubt that our team is up for that challenge. I would like to sincerely thank the TUS RDI team for their outstanding work and contributions since we have commenced the exciting journey of our Technological University and finally I would like to take this opportunity to welcome Dr Lisa Moran as our newly appointed Dean of Graduate Studies.

Liam Brown



BioICEP (Bio-Innovation of a Circular Economy), is a €7M flagship EU-China Horizon 2020 project, which is now demonstrating radically new technologies for sustainable plastics recycling, including those that are not recycled/recyclable today. <https://www.bioicep.eu/>. Bringing together academic and industrial experts from nine countries, BioICEP spans Western to Eastern Europe and on to China. New sustainable technologies to unmake and then remake plastics in a range of green loops and cycles are under development. In essence, fossil fuel-based mixed plastic waste is taken in at one end, undergoes a series of novel treatments and then original polymers or new eco-polymers are remade at the other end. BioICEP provides routes to mixed plastics circularity at levels far in excess of those currently achievable and mitigates against pollution generation and fossil fuel extraction.

TUS LEADS GLOBAL EFFORT TO TACKLE PLASTIC POLLUTION AND DEVELOP NEXT GENERATION MATERIALS



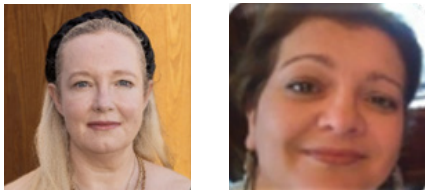
BioICEP researchers Dr Margaret Brennan Fournet, Dr Chaitra Venkatesh, Dr Cuneyt Erdinc, Dr Marija Mojicevic and Dr Olivia Adly of TUS Midlands. Dr Paudie Murray, Dr Catherine Collins, Dr Sushanta Saha and Akanksha Joshi all based at TUS MidWest and Project Coordinator

Global production and consumption of plastic have grown exponentially in recent decades. Since the 1950s, approximately 8.3 billion tonnes of plastic have been produced – 60% of which has ended up in landfills or the natural environment. Dr Paudie Murray, Dr Catherine Collins, Dr Sushanta Saha and Akanksha Joshi of Shannon Applied Biotechnology Centre are investigating the role that fungi and microalgae can play in degrading plastic as part of the Bio-Innovation of a Circular Economy for Plastics (BioICEP) project. On the other side, Midlands team is approaching plastic pollution problem by developing different pre-treatment technologies, stream led by Dr Olivia Adly, Dr Cuneyt Erdinc and Dr Chaitra Venkatesh, and production of biomaterials such as bacterial nanocellulose and polyhydroxyalcanoates (PHA) led by Dr Marija Mojicevic. This project is a pan-European-Chinese collaboration, consisting of 12 European and 3 Chinese partners, to tackle the burden of plastic waste in the environment. The grant worth €5 Million was awarded under the call H2020 topic CE-BIOTEC-05-2919 “Microorganism communities for plastics biodegradation” Research Innovation Action and started in January 2020 running for 4 years in total. The project is coordinated by Dr Margaret Brennan Fournet of TUS (Midlands).

In July 2022, TUS team (Midlands & MidWest) travelled to Athens, Greece to meet up with partners from the BioICEP consortium on first in person projects’ General Assembly. This was the first time that the consortium was able to meet since February 2020. The project is making good progress in the challenge of plastic waste. Novel methods of treating plastic using mechanical and green technologies have been applied to plastic polymers to make them more amenable to biological degradation. Bacteria and fungi which can degrade different plastic polymers have been identified. These will be used to create different consortia to tackle individual plastic waste and mixed plastic waste. The aim is to achieve sustainable degradation of at least 20% of mixed plastics and this is looking achievable midway through the project. In addition, this project looks to create a circular bioeconomy for plastics by taking breakdown products of plastic and converting them into useful biopolymers such as biosurfactants, polyhydroxybutyrate (PHB), and nanocellulose. This has been already achieved where the breakdown products of one plastic type are being converted by bacterial fermentation to produce PHB which has similar properties to polypropylene and can be used in the manufacture of spoons, pots, and plastic bags. Project progress is acknowledged through significant number of conference attendance and publications in peer reviewed journals with average Impact Factor of 5.1 in the last three years. More details can be found at the project website <https://www.bioicep.eu/index.php>. You can also sign up on the project website for free to the BioICEP newsletter for regular updates on the project. BioICEP is present on social media such as Twitter and Instagram where we post project updates, feel free to follow us!



BioICEP statistics for the conference attendance and paper published in the last three years. Scanning QR code you will be redirected to BioICEP Instagram page!



L to R - Dr Margaret Brennan Fournet – Assistant Director PRISM – CPS Manager – Coordinator Bioicep.eu , Michelle Cooney – Lead Sustainability Strategist PRISM and CPS

The TUS led EcoPlastiC project is a cross continental, EU funded project focused on break through circular plastics technologies. EcoPlastiC technologies are designed to facilitate the full decoupling of plastic consumption from the current extraction of finite resources and instead enable entry into permanent regenerative loops. EcoPlastiC is focused on validating novel, highly efficient systems for the depolymerisation of mixed recalcitrant plastics and regeneration as bioplastics. These eco-plastics are fully sustainable and can have equivalent properties to virgin petroleum plastics.

The highly motivated and adept EcoPlastiC team are dedicated to building compelling ecological-based innovation for a sustainable world. Dr Margaret Brennan Fournet, Assistant Director of the PRISM Polymer Institute and leader of the EcoPlastiC project, states that, "Delivering viable, ecological alternatives that won't negatively impact companies' bottom line or affect the consumer adversely is essential to building a circular economy. The EcoPlastiC team works closely with consumers, industry and policy makers on an international basis to foster and implement opportunities creating new prospects for industrial circularity. According to Michelle Cooney, Lead Strategist on Sustainability at PRISM, these new low carbon Eco plastics will decrease energy consumption, avoid the release of microplastics into the oceans and will help Ireland and the EU meet their sustainability targets.

TUS RESEARCH POSTGRADUATE STUDENT CIARA DAVIS WHO PARTICIPATED IN A RUN-EU MOBILITY TO HAMK

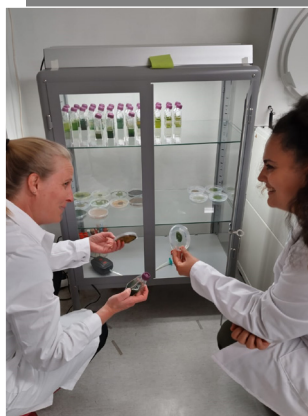
In August, TUS research postgraduate student Ciara Davis undertook a 4-week mobility to HAMK, Finland. Under the guidance of Dr Marika Tossavainen, Salla Leppakoski, and Vilhelmiina Harju, Ciara expanded her masters research project. In TUS, Ciara's project focuses on biofortification of plants using the CELLS growth chambers and hydroponic methods under her supervisors, Dr Peter Downey and Dr Siobhán Moane. HAMK's Leppa campus has large greenhouse space that allowed Ciara to undertake an experiment using soil growth.

Growing lettuce and spinach, Ciara monitored the plants daily and biofortified these plants with selenium. Following harvest, Ciara was trained on the instrumentation available at HAMK to study the chlorophyll levels and carbon, hydron, nitrogen and sulphur content of the plants, to see if the selenium had affected plants growth and uptake. Ciara is now back at TUS completing phenolic, flavonoid, and ICP-MS analysis of the plants. Outside of laboratory and scientific skills, Ciara also improved her communication, project management and organisation skills.

This collaboration was made possible by RUN-EU's mobility funding and has opened doors for future projects between Shannon ABC and HAMK's Bio Unit



TUS RESEARCHER DR HANDE ERMIS VISITS HAMK AS PART OF RUN-EU MOBILITY



Dr Hande Ermis visited HAMK University in Finland on a RUN-EU 4- week mobility award programme. This interdisciplinary 4-week mobility project was a seed funding to test the science behind the optimal parameters to produce the different carotenoids in selected algal culture which provided opportunities for knowledge transfer and new skillset development both

for TUS and HAMK. With this mobility programme, it's aim was to build long-term research collaboration and strengthen collaboration between Ireland and Finland in the field of algal biotechnology.

This research included both "hands-on training activities for developing scientific skills and transferable skills" and "inter-sectoral or interdisciplinary transfer of knowledge" mobility activity. The main objective of this study was to elucidate changes in carotenoid accumulation of selected culture in response to light and temperature stress. The optimal parameters were identified to produce the different carotenoids, and design of experiments (DOE) with a central composite face centered (CCF) layout being used. The carotenoids were analysed by HPLC with a newly developed method and results were modelled with response surface methodology.

CIRCULAR BIOBASED PILOT SCALE DEMONSTRATION AT THE NATIONAL BIOECONOMY CAMPUS



Dr Patrick Murray leads a team at TUS with Dr Catherine Collins and Dr Lena Madden that have been awarded just under €1 million by the Department of Agriculture, Food and the Marine to demonstrate an integrated one-stop-shop for bioeconomy innovation with a blueprint pilot at the National Bioeconomy Campus at Lisheen, Co. Tipperary (formerly a lead-zinc-silver mine) using two exemplar projects. In the project TUS will collaborate with Prof. Kevin O'Connor, University College Dublin and Dr Ramesh Padamati, Trinity College Dublin and a number of Industry stakeholders.

Bioeconomy is considered the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. The bioeconomy sector is one of Europe's most important sectors, with around 17.4 million people employed and an annual turnover of in excess of €2 trillion including agriculture, forestry, fisheries, food, paper & pulp production, as well as parts of chemical, biotechnological and energy industries. As it stands, we are currently facing environmental challenges including global warming coupled with a scarcity of resources. The Circular bioeconomy refers to the intersection of bioeconomy and resource reutilisation towards net zero-carbon processes. Ireland has abundant bioresources that present immense opportunities for the development of a vibrant circular bioeconomy on the island. Scale up and demonstration activities are seen by the European commission as critical to the advancement of bio-based products in society. This project will bring together relevant stakeholders to a scaled demonstration facility access point, providing state of the art high-quality biotransformation services aiming to unlock the innovation potential and uncover opportunities to build relationships and partnerships across the circular bioeconomy. The demonstration upscaling projects within this project will showcase how Ireland is responding to the national need for scaling bio-based processes and stimulate others to undertake scale up work.



TRANSMIXR TO 'IGNITE THE IMMERSIVE MEDIA SECTOR BY ENABLING NEW NARRATIVE VISIONS'

A €9 million project aiming to transform the news media and arts sectors through the creation of social extended reality experiences is to get underway at the Technological University of the Shannon (TUS) in Athlone this October.

TRANSMIXR, which is funded by Horizon Europe and led by TUS, brings together researchers, design partners and media companies from 19 countries

with the goal of creating human-centric tools for remote content production and consumption.

With the maturity of extended reality (XR) and artificial intelligence (AI) technologies, a unique window of opportunity for the European creative and cultural sector (CCS) exists to reimagine digital co-creation, interaction and engagement possibilities.

The TRANSMIXR platform aims to provide (i) a distributed XR creation environment that supports remote collaboration practices, and (ii) an XR media experience environment for the delivery and consumption of evocative and immersive media experiences.

Project coordinator Dr Niall Murray, who is based in TUS's Athlone campus and is an investigator in the SFI Adapt Centre, says TRANSMIXR will "ignite the immersive media sector by enabling new narrative visions".

"TRANSMIXR is a very exciting project that will create a suite of user centric technologies to support the creation, consumption and understanding of new media experiences in distributed, collaborative and immersive ways. Underpinned by the convergence of AI and XR, the design of these new systems will be informed by and be evaluated with real end users," Dr Murray explained.

He continued, "A key strength of the TRANSMIXR consortium is its interdisciplinary nature, bringing complementary technical, methodological and domain expertise together to create impactful solutions for the creative and culture sectors."

Ground-breaking AI techniques for the understanding and processing of complex media content will enable the reuse of heterogeneous assets across immersive content delivery platforms.

Using the Living Labs methodology, TRANSMIXR will develop and evaluate four pilots that bring the vision of future media experiences to life in four important CCS domains: news media, broadcasting, performing arts, and cultural heritage.

Explaining further, Dr Conor Keighrey, an immersive technology researcher at TUS's Athlone campus, said, "In addition to our role as coordinator, TUS will further develop our research on extended reality (XR) for the TRANSMIXR distributed creation environments as well as working on the creation of human centric AI for XR audience understanding".

The TRANSMIXR project, which is expected to run for three years, held its kick-off meeting on October 25 and 26 in Athlone, Ireland.

COMAND A MEMBER OF THE ENTERPRISE IRELAND TECHNOLOGY GATEWAY TECHNOLOGY GATEWAY PROGRAM BASED AT TUS MIDLANDS CONTINUES TO DELIVER INNOVATION PARTNERSHIP'S.

IDASO based at National Science Park, Mullingar, Co Westmeath, specialises in providing traffic, transport and mobility data for use in Strategic Planning, Traffic Impact Assessments, Property Management and Retail Assessments, along with optimisation of existing transport management systems.

IDASO Data Collection provides a range of traffic data collection services from turning counts to origin destination surveys. Through leveraging technologies such as artificial intelligence and cloud based software solutions we have been able to collect data in an efficient manner and present it in user friendly formats in "Analyser" our data visualisation and analysis software

In order to be able to undertake ANPR related tenders, IDASO required a solution that would allow analysis of video footage and extraction of ANPR records which could then be further analysed with reports produced for end users. Often enough ANPR surveys require precise camera positioning at various locations which requires a lot of survey planning before a job can be undertaken. To alleviate these problems and reduce the amount of time spent on processing ANPR surveys, IDASO required a cloud based solution which allows survey planning, ANPR analysis which leverages computer vision and further report generation.

COMAND has developed a number of solutions for IDASO leveraging the Innovation Partnership Funding in the past 3 years. In February 2023 it has committed to a new Innovation Partnership that with partner with TUS to deliver a computer vision based machine learning solution for traffic monitoring. The product researched & developed a proprietary tool which leverages computer vision to analyse ANPR data and produce valuable reports about access patterns, journey times, path analysis etc. for the client.

A Content management system was developed to manage video files and reports in a structured way with the ability to share this data with third-party vendors and a Survey planning tool has been developed utilising Google Maps which allows IDASO to plan ahead surveys of large complexities involving hundreds of sites and sensors by precisely positioning them on the map and assigning related information which is then used during the installation process.

The Company has commented that "The solution provided by TUS allowed IDASO to expand their range of provided service, speed up reports delivery and secure large, long-term contracts".

Irish & worldwide Shipping Ports are now introducing autonomous unmanned vehicles to replace manned trucks and stacking vehicles. Autonomous unmanned vehicles will require reliable high quality data links in order to successfully collect containers and move them to and from a stacking area. The associated devices and applications require guaranteed coverage of high-speeds and low latency connections to operate in real time. Any other port systems (e.g. quayside cranes) that are controlled via video or VR will require high data throughput. A private 5G network could meet these technical requirements.

"Within the context of ongoing 5G standardisation, is it technically feasible to create a mediation framework enabled by machine learning and AI technologies to optimise the configuration of a 5G network to meet the quality of service (QoS) requirements and define the key performance indicators (KPIs) of the devices and vehicles that will be deployed in a smart container port?"

The 5G network will have its own KPIs governing throughput, latency and other parameters to meet the required QoS. However, the containers themselves are opaque to 24 GHz 5G signals and may also impair 3.5 GHz signals. The container stacks represent walls of obstacles that can vary in height (up to 8 containers, each 2.44m high) and width throughout the day. Furthermore, autonomous vehicles moving into the same coverage zone may create conflicts of priority in bandwidth allocation. Any 5G network operating in this environment would require some form of dynamic service orchestration in order to maintain connectivity and guaranteed performance levels with all fixed and moving sources and sinks of data. The data collected and transmitted will be used to control all vehicles, streamline container throughput and optimise overall port operations.



Rialtas na hÉireann
Government of Ireland



Có-mhaoinithe ag an
Aontas Eorpach
Co-funded by the
European Union



Tionól Reigiúnach an Deiscirt
Southern Regional Assembly

ENTERPRISE
IRELAND
where innovation means business



Pictured (L to R) is Dr Enda Fallon, Principal Investigator, TUS; Prof. Vincent Cunnane, TUS President; Paul Madden, CEO, Zinkworks; and Aileen Cramer, Zinkworks. Photo: Ashley Cahill.

TUS AND ZINKWORKS LAUNCH €2M TELECOMMUNICATIONS RESEARCH GROUP TO MAKE DRIVERLESS, INTELLIGENT SHIPPING PORTS A REALITY

The group will develop cutting-edge autonomous port management capabilities using 5G, AI and cloud, improving eco-efficiency and safety.

As the race for self-driving cars heats up, a team of researchers at the Technological University of the Shannon (TUS) and Athlone-based ICT start-up Zinkworks are turning their attention to how shipping ports can adopt the technology to improve global supply chains, eco-efficiency and safety.

To do this, they have formed a new €2 million cognitive – or ‘thinking’ – technologies management research group aiming to develop a prototype for managing the full port eco-system autonomously – from the cranes to the vehicles that transport shipping containers.

According to Dr Enda Fallon, principal investigator on the project and head of the Department of Computer and Software Engineering at TUS, outputs from the project will have the capability to “smooth the issues with global supply chains”.

“Using 5G intelligent telecommunications management systems, we will be able to alleviate congestion in a port, taking into account things like when did the last ship come in, where did the containers go, how they are stacked and stored and how does that impact the network coverage,” he explained.

“Because you’ve got so many autonomous vehicles and so much networking involved, it is critical to be able to understand that environment and predict what the network coverage is going to be to ensure the autonomous vehicles stay connected and continue to operate as intended.”

“To put things in perspective, he continued, “Imagine if, due to a crane having issues with the network, a shipping container weighing 100 tons ends up dangling 40 feet in the air in windy conditions because of poor coverage. That’s a serious safety hazard.”

The new TUS-Zinkworks research collaboration, which received initial funding from the IDA and Enterprise Ireland through the Innovation Partnership Programme, will encompass 15 research staff and PhD students.

TUS President Prof. Vincent Cunnane said the project “illustrates how close collaboration can create deep knowledge for the fast-moving technology sector”.

“Proximity to TUS was a vital factor in Zinkwork’s establishment in Athlone in 2018, and we are delighted to formalise our ongoing partnership and offer our significant expertise and research capabilities in developing this highly sophisticated cognitive

telecommunications management prototype,” he said.

Prof. Cunnane also pointed to the importance of deep, strategic technical knowledge development and transfer, explaining that TUS’s transition to technological university has been “vital” in building the physical and knowledge capability to support start-up companies, such as Zinkworks, as they continue to expand their workforce.

TUS supports regionally based ICT companies through its Software Research Institute (SRI), which it established in 2006 to facilitate applied research collaborations with industrial partners.

Zinkworks, which services clients in the telecommunications and financial services sectors, has expanded significantly since its establishment and now has more than 200 employees across three locations, Athlone, Letterkenny and Hyderabad in India.

The highly successful ICT start-up aims to launch its first telecommunications product through this research project with TUS, which is expected to take 18 months to bring to fruition.

“As 5G private networks are rolled out in complex dynamic environments like ports and manufacturing facilities with advanced automation, understanding the impact of the changing environment on the critical network characteristics and quality of service is essential,” Zinkworks CEO Paul Madden explained.

“The collaboration with TUS will provide this knowledge and through machine learning, modelling will define how best to optimise coverage required for complex industry use cases.”

The partnership is also expected to benefit current and future TUS students by providing the project’s investigators with insight into the skills that students will require in the medium to long term.

“Such a problem-based innovative project creates opportunities for both undergraduate and postgraduate students, giving them day-one, industry-ready skills. This talent pipeline is vital to support the regional ICT sector,” Dr Fallon said.

“As we look ahead to an autonomous future, the nature of jobs is changing. There will be huge employment opportunities but many of the current engineering jobs will be automated, with more high calibre jobs and specific, advanced skill sets required to manage these autonomous systems.”

Dean of Faculty of Engineering and Informatics at TUS Dr Sean Lyons also welcomed the collaboration, saying, “We have a demonstrated track record of engagement with industry, and this collaboration serves to further illustrate what can be achieved through our close links with local companies.”



BUDDIE-PACK €7M FOOD PACKAGING PROJECT INVOLVING TUS RESEARCHERS TO HELP EU MEET SUSTAINABILITY TARGETS

A €7 million EU project involving researchers at the Technological University of the Shannon (TUS) aims to tackle single use plastic waste by analysing consumer psychology around reuse and creating new food packaging solutions. TUS is one of 19 members of BUDDIE-PACK, a multinational consortium consisting of packaging manufacturers, consumers, and logistics, cleaning and recycling experts from six European countries.

The project, which is expected to take three and a half years to complete, will see researchers look to behavioural psychology and the drivers of reuse to help them figure out how to promote consumer acceptance of reusable food packing.

In tandem, the BUDDIE-PACK team will also devise new food packaging cleaning solutions to prevent any possible contamination of packaging, while preserving its durability and enabling it to be used for up to 300 times.

Dr Declan Devine, director of TUS's PRISM research institute, believes outputs from BUDDIE-PACK could drastically reduce the volume of single use plastic waste in landfills.

"Food packaging plays an essential role in reducing food waste, enabling long food shelf life and preventing tampering," Dr Devine explained, "However, it is clear that our relationship with single use plastic must change due to its negative effect on the environment."

He continued, "Due to the importance of the meat industry to the Irish economy, this research has the potential to remove millions of tonnes of single use packaging from the environment."

In addition to dramatically cutting down the production of single-use plastic packaging, Buddie-pack is also expected to significantly reduce water and energy consumption and avoid the release of micro plastics into the oceans.

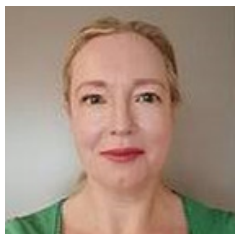
According to Dr Romina Pezzoli, applied packaging platform lead at APT, an Enterprise Ireland technology gateway based at TUS's Athlone campus, the project will help Ireland and the EU meet their sustainability targets:

"To tackle the plastic waste crisis, we need to approach the challenge from the design of new packaging systems; the development of reusable food packaging technologies is a key strategy," Dr Pezzoli explained.

"We will work together with Irish and European industry partners, research centres and consumer behavioural psychologists to progress the state of the art and to find a solution that involves all stakeholders."

BUDDIE-PACK is funded by Horizon Europe and coordinated by the Industrial Technical Centre for Plastics and Composites (IPC) in France.

HORIZON MENTORING PROGRAM



Dr Margaret Brennan Fournet is the Assistant Director at the PRISM research institute at TUS and is manager of the Centre for Polymer Sustainability (CPS). My primary aim is creating low carbon plastics for the circular economy of the future. Leading a number of EU and national transformative projects, Margaret's talented cross sectorial team at the CPS are dedicated to fast-tracking sustainable technologies and equipping companies to achieve circularity for their products and processes. Dr Brennan Fournet has lectured extensively both nationally and internationally. Dr Brennan Fournet received a B.Sc. in Experimental Physics at University College Dublin in 1997, and a Ph.D. from the School of Physics Trinity College Dublin in 2002. Today Margaret is dedication to delivering solutions at the forefront of emerging and disruptive sustainable polymer and plastics technologies which

preserve natural resources and reduce polluting emissions, while creating jobs and building market opportunities. The Horizon mentoring programme is an excellent opportunity to empower the next generation of visionary researchers to succeed in realising their innovations to shape our future and I am privileged to contribute to this mission.



RUN-EU GROUP EXPLORATORY MISSION: BUILT ENVIRONMENT

The Faculty of Engineering and the Built Environment at TUS hosted a RUN-EU Group Exploratory Mission in the domain of the Built Environment. The GEM took place at the TUS Moylish Campus, Limerick on 20 & 21 September 2022.

The aim of the RUN-EU Group Exploratory Mission gathering was to explore possibilities for education and research cooperation in the relevant fields, such as collaborative research activities, the development of double and joint degree programmes, short advanced programmes (SAPS) and student and staff mobility. The success of any GEM is the sharing of ideas, experiences and professional and educational aspirations.



The PerPETual Technology team (TUS, UCC, Novelplaste and Avoncourt) at the project launch in Oct 2021

PERPETUAL INDEFINITE RECYCLING FOR PET PLASTIC TECHNOLOGIES

PerPETual as the name suggests, is dedicated to the everyday polymer, PET, used in drinks bottles, food packaging and textiles. The €2.9M PerPETual project, funded by Enterprise Ireland's Disruptive technologies Innovation Fund, can circularise polyester plastics continuously and positively impact the low carbon and sustainability targets in Ireland's Climate Action Plan. Coordinated by Dr Fournet the science developed in BioICEP has led to the creation of PerPETual innovation. Partnering up with Irish companies, Novelplast and Avoncourt and University College Cork, PerPETual technologies enable continuous recycling for all grades of PET, spanning pristine bottle grades to low grade PET-based pots tubs and trays. Indefinite PET monomer generation and repolymerisation as "new" virgin PET, equivalent to fossil fuel extracted PET, is delivered in this new industrially scalable process.

BRI (BIOSCIENCE RESEARCH INSTITUTE)



UNCERTAINTIES CAUSED BY CLIMATE CHANGE WILL IMPACT UPON FOOD SECURITY AND CAUSE SCARCITY, EXPERTS WARN IN A NEW SPECIAL ISSUE EDITION OF A LEADING SCIENTIFIC JOURNAL.

TUS has brought together some of the world's foremost experts on eco-innovation and climate change to address key challenges facing humanity, among them food security, in a new special issue of a leading scientific journal.

The expert papers, which delve into topics like bee decline and disease-mitigation for improved pollination, sustainable food production and climate change, and bioplastics, are published in Current Opinion in Environmental Science and Health.

Guest editors Prof. Neil J. Rowan, director of the Bioscience Research Institute at TUS, and Dr Robert Pogue, an adjunct professor at Universidade Católica de Brasília and a visiting research fellow at TUS, sought the opinions of top scientists globally with a view to accelerating the transition to a greener future.

"This is the first time world-leading experts, representative of all continents, have been brought together to address these pressing challenges in this manner. The emerging opportunities identified are key to unlocking complex environmental issues for the betterment of society," Prof. Rowan said, emphasising the significance of the special issue edition.

He continued, "I am overwhelmed with the amount of interest expressed in this special issue from both contributors and readers as it continues to trend internationally. The topics discussed are extremely important and align with many needs emerging from COP26, along with potential sustainable and disruptive approaches to satisfy many of the United Nations Sustainable Development Goals."

TUS President Prof. Vincent Cunnane called the wealth of expert opinions shared in the new special issue edition timely and said its "rich repository of knowledge" would act as a catalyst for positive change.

"This work highlights and complements community and regional opportunities that are met by key strategic TUS initiatives, such as Empower Eco, and internationally through our RUN-EU network and by allied European-funded projects. The underpinning tenets of this special issue reflect the sustaining and disruptive potential of TUS, along with our partners, as we continue to make significant strides on the global stage."

Vice President of Research, Development, and Innovation at TUS Dr Liam Brown added, "This is a remarkable achievement given the nature and importance of topics addressed in this prestigious scientific journal and the potential impact for society globally. From a top-down perspective, it also reflects the strong international networks and influence our TUS researchers bring to the fore in addressing complex societal challenges."

TUS researchers Michelle McKeon Bennett, Dr Emma Murphy, Seamus Hoyne, and Dr Darren Barry are among those who contributed to the 'Disruptive Green Deal Innovations' special issue edition of Current Opinion in Environmental Science and Health, available now.

RESEARCHER AWARDED EMPOWER ECO FELLOWSHIP AT TUS TO DEVELOP PEATLAND INNOVATION



Dr Emer O'Neill from Castlepollard, Co. Westmeath has been appointed as Research Fellow at the Bioscience Research Institute (BRI), Technological Institute of the Shannon to develop peatland innovation and to support communities transitioning to low carbon economies. Dr O'Neill is the first recipient of the prestigious "Empower Eco"

Fellowship at TUS dedicated to advancing green technologies that have economic and societal breakthrough benefits.

Professor Neil Rowan, Director of the BRI, remarked "Dr O'Neill is a remarkable researcher having progressed through the full ladder system where she obtained her level 5 Certificate from Cavan Institute that acted as a catalyst to ignite a passion for healing our environment. Emer went on to achieve her impressive First Class Honours Degree in Toxicology and thereafter, her PhD in peatlands-related innovation at TUS. Dr O'Neill has published extensively on the development of freshwater aquaculture and green-technologies in the novel peatlands setting that encompasses assessing the impact of variance in weather events and climate change on this sustainable food production system". Emer's research also constitutes the first studies to use naturally occurring microalgae as indicators of climate variance in food systems. Dr O'Neill contributes as subject-matter expert to several related European projects including Interreg Atlantic Area NEPTUNUS, MSCA RISE ICHTHYS, and RUN-EU(+). Emer has also contributed to outreach programmes by way of regional school visits to openly share her experiences and the benefits of education, particularly STEM.

Dr Don Faller, Dean of Science and Health stated, "I am very pleased for Emer where this Empower Eco Fellowship will advance her stellar researcher career and unlock her capabilities for the benefit of the region with a global orientation. I am mindful Emer has published 7 journal papers in the prestigious Science of the Total Environment, which attest to her calibre and potential".

Dr Liam Brown, Vice President, Research, Innovation and Development (TUS), noted that "Dr O'Neill's exemplary academic, professional and personal achievements attest to her pursuit of excellence that is commensurate with the resilience of our new Technological University of the Shannon to support, enable and nurture our learners across the educational spectrum in order to meet ambitions and needs. Empower Eco is an important enabling platform for TUS that will expedite green innovation, training and services with regional stakeholders and communities along with acting as important conduit to foster national and European research in the bioeconomy, sustainability and adjacent bridging areas, such as digital transformation. Emer's research will also enable community transition to low carbon economies under a fair and just transition".

NEW DOCTORATE GRADUATE DR BRIAN MCEVOY CELEBRATES MOST DOWNLOADED PAPER IN LEADING JOURNAL OF APPLIED MICROBIOLOGY

Dr Brian McEvoy is the first doctorate graduate in the discipline of Terminal Device Sterilization at TUS, which is also a first for Europe, and potentially worldwide.

Congratulations to Dr McEvoy who received a prestigious certificate for "the most downloaded paper" achievement from the Journal of Applied Microbiology.

The paper entitled "Terminal sterilization of medical devices using vaporized hydrogen peroxide: a review of current methods and emerging opportunities" has been cited 97 times by his peers.

This paper also informed the safe-reuse of personal and protective equipment (PPE) under Emergency Use Authorization (EUA) during COVID-19 pandemic.

Dr McEvoy is Senior Director Global Technologies at STERIS Advanced Sterilization Technologies (AST). Dr McEvoy was supervised by Professor Neil Rowan (BRI Director) and Dr Mark Lynch (HUB Officer) in the Faculty of Science and Health, TUS..



Photo from L to R : Dr Mark Lynch, Dr Brian McEvoy, and Professor Neil J Rowan (TUS)

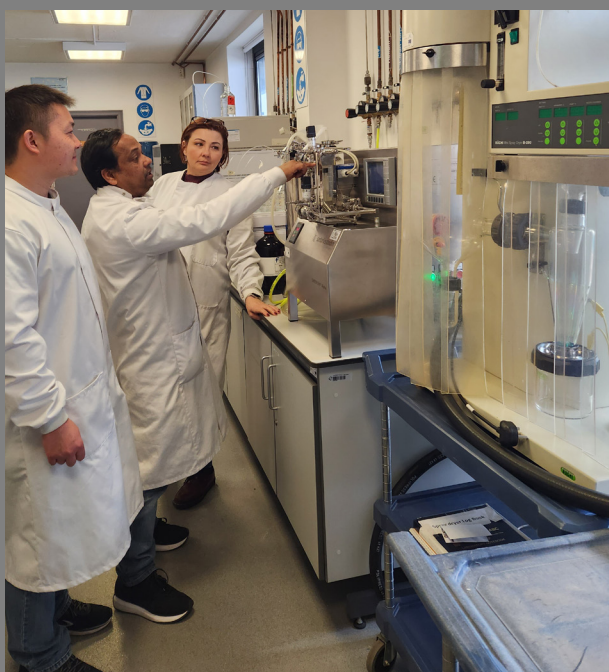
IDEAM UPDATE

The last few years have been challenging providing many obstacles and opportunities for growth for many businesses. With Brexit, the COVID-19 Pandemic, the rise in inflation and the unfortunate war in Europe impacting our everyday lives and our economy. However, despite this turbulence, the Irish economy is resilient, and our SMEs are the bedrock of our communities. To provide some context, manufacturing in Ireland is strong with approximately 29% of manufacturing jobs in high technology sectors with the support of world-class leading industry clusters to advance national and international manufacturing operations. Moreover, there are over 260,000 people employed in the Irish manufacturing ecosystem, thus reporting over 12% of total employment figures in the country.

2022 was a year of travel, both nationally and internationally, which brought the IDEAM team closer to industry, onto manufacturing floors and across the world to build strong relationships and explore new opportunities for our companies in Ireland. It was also a year full of new connections and strategic partnerships that will provide new avenues for growth and strengthen the resilience of our ecosystem. We are profoundly impressed by the continuous engagement, dedication and enthusiasm of our members to work together, explore new opportunities and drive positive change in their respective industries as well as in their communities around them. It is a great source of pride and purpose for us at IDEAM as we continue to build and grow our diverse ecosystem that encourages trust, collaboration, innovation and growth.

As such, we will continue to support our members through our four strategic pillars: (1) Talent & Skills, (2) Research & Development, (3) Internationalisation & Funding and (4) Business & Community Development to become and remain leaders in the digital engineering and advanced manufacturing space. We welcome your input to transform our strategic offerings to help your growth moving forward. Looking ahead, we are excited to continue our trajectory and further grow the cluster as well as follow the suggestions and feedback that we have received from our members to best support and shape the future direction of our cluster ecosystem.

A huge thanks to all of you! Dr Jamie Meehan



TUS NOW PART OF MEAT TECHNOLOGY IRELAND

TUS now part of Meat Technology Ireland TUS now part of Meat Technology Ireland In 2022, TUS became a formal member of Meat Technology Ireland (MTI), through Shannon ABC. MTI is a Technology Centre, funded by Enterprise Ireland, to support a research and innovation for meat and by-products processing industries. The work in TUS, led by Dr Lena Madden, is focussed on developing an industrial process and quality control protocols for valorisation of meat by-products into high-value commodities. The project is in collaboration with the Shannon ABC team in Munster Technological University and supports the Circular Economy Theme in MTI. Postdoctoral Research fellows - Dr Sushanta Saha and Dr Yin Zhu are delivering the project in TUS in collaboration with key Irish meat processing companies. Shannon ABC's involvement with MTI is based on well-established track record working with industry in the development of commercial processes, and QC protocols as well as their significant expertise in biochemistry, analytical chemistry and modern extraction methodologies.

SHANNON ABC RUNS ALL OVER EUROPE

TUS is a founding member of the European Universities Initiative Erasmus+ funded Regional University Network- European University (RUN-EU) alliance which brings together seven like-minded, regionally focused Higher Education Institutions (HEIs): Politécnico de Leiria, Portugal; Häme University of Applied Sciences, Finland; Politécnico do Cávado e do Ave, Portugal; NHL Stenden University of Applied Sciences, Netherlands; Széchenyi István University, Hungary; Vorarlberg University of Applied Sciences, Austria. As part of the RUN-EU WP5 Discovery program four Shannon ABC researchers have been successful in the RUN-EU Discovery research mobility call.

Dr Hande Ermis (Postdoctoral Scientist) visited HAMK University in Finland in May 2022 where she worked with Dr Ulla Moilanen and Dr Marika Tossavaine. This interdisciplinary 4-week mobility project was a seed funding to test the science behind the optimal parameters to produce the different carotenoids in selected culture. The carotenoids were analysed by HPLC with a newly developed method and results were modelled with response surface methodology. The work they carried out will be published and orally presented in future organizations. This visit served to strengthen collaboration between Ireland and Finland in the field of algal biotechnology and lay the groundwork to build a long-term research collaboration between TUS and HAMK.

Jessica Walshe (Postgraduate student and Research Assistant) visited MARE (Marine and Environmental Sciences Centre) at the Polytechnic Institute of Leiria in Portugal in June, 2022. She worked with an experienced team of researchers, under the supervision of toxicology expert Dr Sara Novais. Jessica learnt how to use cell culture techniques to investigate whether a synergistic link exists between certain terpenes and enhanced cannabinoid activity. Jessica also assisted researchers at MARE in the use of chromatography-based systems, such as HPLC, MSMS and GCMS. The mobility programme provided Jessica with a highly beneficial opportunity to research abroad for the first time, allowing her to integrate into a new team of researchers, expand her research network and build further links and communications between RUN EU universities.

Postgraduate student, Ciara Davis visited HAMK University in Finland, studying under Dr Marika Tossavainen and Dr Salla Leppakoski working on biofortification of plants. Ciara grew the plants in soil and applied the nutrients via foliar application.



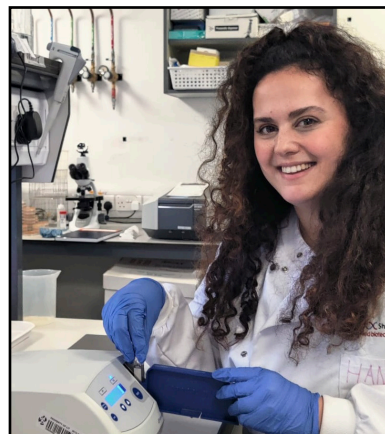
HAMK have a fantastic agriculture centre which taught Ciara other ways of growth as in TUS Ciara's research mainly focuses on hydroponic growth. Following Ciara's placement, plants that

were grown were analysed for metabolite and nutritional profile in TUS. Postgraduate student and Research Assistant Katie Shiels visited Peniche (Portugal) in November, 2022 as part of the RUN-Eu Short Advanced Programme (SAP) "Who are we: Mapping the Identity of the RUN-Eu-er". This SAP aimed to develop students' intercultural skills to enable them to operate within several cultures at the same time. By promoting multiculturalism and multilingualism among the alliance regions, supported by student mobility, innovative pedagogies and blended learning activities, the programme also aims to contribute to societal needs and lifelong learning. The TUS RUN-EU International RDI Mobility Programme is still open and provides a great opportunity to gain experience, transfer knowledge and connect with international researchers.

IRISH RESEARCH COUNCIL SUCCESS FOR DR HANDE ERMIS

In September 2022, Dr Hande Ermis was successful in her application for an Irish Research Council Postdoctoral Fellowship. This prestigious award will fund Dr Ermis for her project entitled "Genetic Engineering of Microalgae To Overcome Microplastic Pollution in Wastewater (GEM)". The cultivation and use of microalgae in a range of applied settings is a key skillset of Shannon ABC in TUS, and Dr Ermis, who was previously employed as a Business Development Scientist in Shannon ABC, will use her background in environmental and engineering applications of microalgae to research the potential for microplastic removal by microalgae with this ground-breaking application. The central research question of this project is whether the selected culture can have the potential to be used for complex bioremediation approaches in wastewater treatment with the aim of breaking down nano- and micro-plastic PET particles at moderate temperatures as well as removal of organic pollutants from the wastewater.

Polyester-based plastic, such as polyethylene terephthalate (PET), is a combination of two simple monomers joined by ester bonds – making its degradation by either enzymatic and/or biological means to be highly challenging. PET has become an increasingly large portion of plastic pollution - responsible for up to 18% of global plastics. To counteract this, various resolutions to PET consumption in regard to treatment or recycling have been investigated and experimented. A vast amount of PET waste is still incinerated, causing an immense amount of CO₂ emissions, plastic discarded in landfills, or found in the environment as micro-particles. Plastic pollution can enter into surface waters through a variety of factors such as multiple pathways, including storm water runoff, wind advection and atmospheric fallout, alongside treated wastewater discharges. However, the main sources of microplastics in an aquatic environment have been determined as municipal wastewater treatment plants (WWTPs). In this project, Dr Ermis aim to solve the global issue of PET contamination through the establishment of a biological mode for polyethylene degradation that will be robust and easily applicable to real life scenarios.



Dr Hande Ermis, TUS Moylish

SDRI (SUSTAINABLE DEVELOPMENT RESEARCH INSTITUTE) / DEVELOPMENT UNIT

HORIZON EUROPE FUNDED PROJECT HP4ALL COMING TO AN END!

Horizon Europe Funded project HP4ALL coming to an end!

The €1 million grant funded project will be coming to an end in February 2023. HP4All work alongside leading experts across Europe to enable skills development within the Heat Pump sector and to ensure that the energy efficiency gains afforded by heat pumps are realised.

HP4All worked with both the supply side (manufacturers, SMEs, installers etc) and demand side (building owners, public sector etc.) of the heat pump sector with the aim to enhance, develop and promote the skills required for high quality, optimised Heat Pump (HP) installations within residential/non-residential buildings bringing Europe.

HP4All developed the HP4All package, a set of different tools and resources to be used by the different stakeholders. The package includes a HP Skills & Competency Framework to facilitate Mutual Recognition of HP Skills, Policy recommendations for local authorities, regional authorities, member states and the European Commission. From an end user perspective, a HP Knowledge Hub and HP benchmarking tool was created to promote the use of heat pumps. The HP4ALL project also helped Local Authorities and housing authorities with procurement guidance to increase the demand for HP skills and knowledge. HP4All validated this package through 3 regional pilots in:

1. Andalusia Spain,
2. Ireland and,
3. Upper Austria.

TUS Development Unit (DU) were the project coordinator and the Irish pilot leader. The Irish pilot focused on providing the most up to date information on heat pumps, NZEB and retrofit to county councils, their housing and planning departments, their contractors, and their tenants. To date, TUS DU coordinated the training of over 120 County Council staff. TUS DU also worked closely with the Heat Pump Association of Ireland (HPA) to provide webinars and training events to over 400 people that include heat pump installers, heating system designers and homeowners alike. From a preliminary impact analysis of the project, the project is set to surpass its grant agreement energy targets of 2 GWh/year of primary energy resulting in a carbon emissions reduction of 628 tonnes of CO₂ per year.

The Final conference for the project will be taking place in Seville and online on February 8th for anyone interested in attending the conference please see on the HP4ALL website for more information:

<https://hp4all.eu>



The Development Unit has been involved in social farming for many years, leading a number of Erasmus + funded projects on the topic. Social farming is defined by Di Iacovo and O'Connor, 2009 as 'short or long-term activities that use agricultural resources such as animals and plants to promote and generate social services in rural areas'. Examples of these services include rehabilitation, therapy, sheltered employment, life-long education and other activities that contribute to social inclusion.'

Our latest social farming project is focused on the needs of the elderly. Working with seven other partners from Ireland, Portugal, Slovenia, Germany and Belgium we have just completed national reports and case studies which examine some of the solutions that social farming can contribute to the many challenges faced by Europe's ageing population. We are now working on a short online training course that will give stakeholders a greater understanding of how social farming works in this context. We are also creating a short video documentary which will highlight some of the inspiring case studies we have come across in our research.

You can read our reports and case studies on our website farmelder.eu and keep up to date on the project by following us on twitter at twitter.com/farmelder_eu



FarmElder partners try some hydrotherapy in Bad Wörishofen - home of the renowned naturopath Sebastian Kneipp"



IN-PLAN: INTEGRATED CLIMATE, ENERGY AND SPATIAL PLANS

Technological University of the Shannon (TUS) has begun participating in a new EU funded project looking at developing and implementing energy plans in local and regional authorities. The kick-off meeting was held recently in Zagreb, Croatia and was attended by development unit senior project officer Dr Darren Barry. The project will run until March 2026.

The overarching objective of IN-PLAN (Integrated Energy, Climate and Spatial planning) is to develop, test and roll out the IN-PLAN practice – a long-lasting support structure enabling local and regional authorities to effectively implement their sustainable energy, climate, and spatial plans. They aim to do so by:

- Integrating energy and climate planning with spatial planning (and other types of planning tools, such as mobility, infrastructure, etc.);
- Ensuring commitment at all political levels (through vertical integration); and
- Matching the included measures with specific dedicated local and regional budget lines.

On top of delivering this innovative and effective approach, IN-PLAN intends to empower local and regional governments and their agencies through a two-step capacity-building programme. From the start, the IN-PLAN consortium will engage 15 local and regional governments – the Lighthouses – in order to co-create, implement and refine the IN-PLAN practice, its operational guidelines and the capacity-building programme. 30 more local and regional governments – the Pilots – will also benefit, in part, from the IN-PLAN practice.

Once developed, the two-step capacity building will start. Phase one will aim at training the trainers: empowering energy, climate and/or development agencies from across Europe to become IN-PLAN Multipliers. Phase two will aim at passing on the knowledge to local and regional governments, the Replicators. They will be tutored either by the five national project partners or by the trained multipliers.

IN-PLAN's ultimate goal is to empower local and regional authorities in developing and implementing integrated energy, climate, and spatial planning in their territories.

Follow #LifeINPLAN on every channel!



A PROJECT TO RAISE AWARENESS OVER THE RISK OF WATER SHORTAGE AND TO GUARANTEE AN EFFICIENT USE OF THIS RESOURCE AMONG AGRICULTURAL YOUTH

The EUWAY project (Efficient Use of Water among Agricultural Youth), funded by the Erasmus+ Programme, aims at building knowledge, skills, attitudes, and values related to sustainable water management practices on farms. Climate change has a fundamental impact on the availability of water resource, as well as for the quality of water used in many parts of Europe. Agricultural production is the first sector for the use of water, therefore having a major responsibility in the management of this precious resource. What is really missing at EU level are solutions to prevent water shortage and guarantee an efficient use of water in agriculture. The purpose of this project is then to raise awareness among young European farmers over the risks of water shortage and bad quality of water used in their farms.

Even if water scarcity seems a matter far from the Irish agricultural reality, what is not is water quality. Using the words of Jim Woulfe, the former Chief Executive of Dairygold, at the Fianna Fail Agricultural Policy Conference, on Saturday 3rd December 2022, "Water quality has deteriorated, and we have to reverse that very quickly". The Water Quality in 2016-2021 report released by EPA in 2022 confirms this statement. The report shows an increase in pollution trends, with a concentration of nutrients too high in many water resources. These nutrients, such as nitrogen and phosphorus, impacts the health of rivers and basins, especially in south of the country. This is mainly caused by intensive farming, synthetic fertilizer and animal waste. This is just an example why projects like the EUWAY one are fundamental nowadays, helping farmers to tackle different problematics related to the water management for their agricultural production.

Partners from Belgium, Germany, Italy, Spain and Slovenia, together with TUS, are committed to provide young farmers (under the age of 40 years old) with training to gain knowledge on water optimization and quality, through the development of open-access and free educational material on the project website and on the web-app. It is indeed through the exchange of good practices and entrepreneurial experience that it's possible to guarantee a speed-up and enrichment of the necessary developments in the sector at the European level. The project outputs are a summary guide about the use of water in Europe, a case-study report with the best practices on water management selected in the partner countries, and a training platform for young farmers. TUS, with a total budget of 80,000 euros, is responsible for the creation of the Summary Guide and the web-app with training material.

Project website: <https://euway-erasmus.eu>

Twitter account: EuwayProject

Contact person: Daniel Monteleone, ELO, elo@elo.org



Minister of State Niall Collins with Dr Liam Brown, VP RDI, TUS; Dr Briga Hynes, University of Limerick; Padraic O'Reilly, Development Manager, TUS; Dr Marie Taylor, SocialB Coordinator, Development Unit, TUS; SocialB Consortium including Ballyhoura Development, University of Ljubljana, Development Agency Kozjansko, Slovenia, University of Patras and Olympic Training, Greece.

TUS has successfully coordinated a 3 year Erasmus+ Knowledge Alliance programme which commenced in January 2019 and was completed on December 2022. The SocialB project was on the topic of Social Enterprise especially in the areas of growth and management. The consortium included partners from Greece, Slovenia and Portugal as well as the Irish partners of Ballyhoura and TUS.

SocialB identified the skills gaps and training needs in current educational/training programs and created an interactive map of nearly 100 education and training courses related to social enterprise (HEI and VET institutions) currently available across Europe. This map is available at <https://socialb-erasmus.eu/interactive-map/>.

To address these needs SocialB developed 24 Learning Units in 6 modules at EQF level 5 and 6. The curriculum also includes a Work Based Learning element. Each partner country piloted a full module and 2 other Learning Units between April and June 2022 through various delivery methods including face-to-face training, synchronous and asynchronous e-learning, self-directed learning and work-based learning. This was achieved through the development of an E-Learning platform which TUS developed for the project. Various supplementary material was developed for social enterprises, students, educational institutes and social enterprise/business supporting agencies including Trainers handbook, Trainees handbook, Programme Descriptors, Innovative Teaching Techniques Handbook, Training and Assessment Methodology handbook, The Training material, Exploitation Toolkits for HEIs, VETs, Social Enterprise practitioners and for students. All these resources are available on <https://socialb-erasmus.eu/>.

SocialB held a very successful blended Social Enterprise Symposium in Croom Community Enterprise Centre. The opening address was given by Dr Liam Brown, Vice President RDI, TUS and by Minister of State at the Department of Further and Higher Education, Niall Collins. Guest speaker was Dr Briga Hynes, Senior Lecturer in Entrepreneurship at University of Limerick Kemmy Business School and also a member of the SocialB Project Advisory Group along with Ciaran Lynch Thurles Chamber Enterprise Centre who also attended online and Dr Felicity Kendall, Professor of Management Practice, SETU. Other speakers included our European partners who travelled to Croom for the Conference. There were also guest speakers from local social enterprises as well as information stands in the room on local social enterprises, support agencies, TUS and RUN EU Network. The closing address was given by John Ryan, Social Enterprise Unit, Department of Rural & Community Development who had previously spoken at the University of Ljubljana's SocialB Social Enterprise Summer School in June 2022.

For more information on the SocialB project please visit the website <https://socialb-erasmus.eu/> where you can access the reports, resources and enrol on the E-Learning platform and contact marie.taylor@tus.ie in the Development Unit for more information.



THE COMENT 'FOSTERING INNOVATION IN COMMUNITY LED ENTERPRISE DEVELOPMENT' PROJECT,

funded through the ERASMUS+ programme, aims at developing a blended learning educational programme and associated teaching/learning resources for higher education institutions; accrediting agencies; and social entrepreneurs / innovators on the innovative topic of community enterprise development. Project partners include: TUS, Communities Creating Jobs (Ireland; Accreditation Council for Entrepreneurial and Engaged Universities (Germany); Archivio della Memoria Italy); Burgas Free University (Bulgaria); Close to You Foundation (Romania); and FH Vorarlberg (Austria).

TUS, along with project partners, are in the process of developing a special purpose award programme – Certificate in Community Enterprise Development (15 ECTS). This special purpose award will commence in September 2023.

The ComEnt project wishes to equip stakeholders with the necessary knowledge, skillsets and competencies to develop and enhance the development of community owned and community-led enterprises, which would be innovative approach to fostering social inclusion amongst marginalized groups and disadvantaged areas across Europe.

To date, the ComEnt project has held a kick-off meeting in Thurles, Co. Tipperary (May 2022); a second project meeting in Burgas, Bulgaria (October 2022); and a Teaching, Learning and Training workshop in Rome, Italy (December 2022).

Contact person: Dr Shane O'Sullivan (shane.osullivan@tus.ie)



AgriNext (Agricultural and rural excellence Incubator and Platform for the Exchange of competencies) is a new project for the DU. It is funded by the ERASMUS Partnership for Excellence - Centres of Vocational Excellence.

The general aim is to create a learning environment that responds to the skill demand on the job market in the field of Multifunctional Agriculture. A new guidance service model (GSM) will be developed, which will gather all the training and learning opportunities (formal, non-formal, projects, apprenticeships etc. on the EQF levels from 3-6, designed for C-VET or I-VET learners) in the field of Multifunctional agriculture (MA). This GSM will be developed, and pilot tested within first 13 months of the project. Training will also be developed for guidance service providers, that will enable them to use and apply this model with learners and to also prepare guidelines for students. The aim of this GSM is to offer solutions for learners in the MA field, according to their needs, abilities and the needs of the job market.

AgriNext also aims to raise awareness of opportunities in rural areas, especially related to multifunctional agriculture and raise awareness of importance of lifelong learning, upskilling, and reskilling, if necessary, to create resilient society of capable active citizens, that are able to respond to the needs of our rapidly changing world. An online platform will also be developed to share ideas, technologies, resources, products.

An AgriNext Business Incubator will be established for the interaction of target groups as a Learning lab and Application centre to build strong, long-lasting business-VET partnerships. For more information on AgriNext contact Anthony or Marie in the DU office.

Greenhive is another new DU project that will be launching in April 2023 and will be coordinated by TUS. It is funded by KA220-VET - Cooperation partnerships in vocational education and training.

It aims to increase VET providers' capacity to prepare learners for the green transition and will provide VET with the tools to build local multi-stakeholder hubs to activate co-creation processes for sustainable development. It will provide a long-term cooperation platform to connect hubs and facilitate the transfer of knowledge and know-how across sectors and countries, contributing to adapting VET to the labour market needs. It will also implement direct actions to improve VET providers' sustainability competence and develop educational resources, built on the exchange of experience and knowledge with transnational, cross-sectoral and multi-disciplinary team; boost the internationalisation of the partners' activities, as members and managers of the Green Hive's transnational community, enabling them to establish synergies with min. 18 VET institutions where the localised hubs will be established, and min. 54 stakeholders (e.g., representatives of civil society organisations, companies, Adult, School and HE institutions) that will be involved in the Hive during the project, and potentially more after the project. For more information on Greenhive contact Marie at marie.taylor@tus.ie.



THE REBOUND ‘FOSTERING RESILIENCE IN RURAL COMMUNITIES’ PROJECT,

which is supported by the EU through ERASMUS+, has adopted an action-research approach to promoting rural community resilience. Partners from Ireland (TUS and O’Keeffe Social Research CLG), Portugal (ADRMAG), Slovenia (University of Ljubjana and Razvojna Agencija Kozjansko) and the European AEIDL Association are pooling their expertise and engaging a diverse range of stakeholders in examining rural community resilience. They are compiling an evidence-base that will guide the development of a Level 7 VET training and capacity -building special purpose award programme (Certificate in Rural Resilience – 15 ECTS).

In June 2022, the Rebound project partners had their first in-person meeting. This took place in the Iveragh Peninsula, South Kerry (Ireland). Partners were hosted by Forbairt na Dromada — a community-based organisation that operates on social economy principles in the heart of the South Kerry Gaeltacht. The meeting enabled partners to progress project-specific tasks and to meet communities and practitioners in this peripheral, yet proud and dynamic rural area. The meetings noted the significance of cultural and landscape factors in promoting community resilience.

In November 2022, the Rebound Partners convened their second in-person meeting. This took place in Ballyorgan, Co. Limerick (situated in the Ballyhoura Hills). Ballyhoura Development, which has been in operation for over 30 years, is the main driver of territorial development in this locality, and the partners met with representatives of the organisation and with local civil society organisations. The area has strengths and achievements in bottom-up development, social enterprise / community business, heritage and rural tourism, and stakeholders shared their experiences in respect of promoting rural community resilience.

Project Contact Person: Dr Shane O’Sullivan (shane.osullivan@tus.ie)

DESC (Developing Empowered Sustainable Communities: Green Lifestyle, Cultural Heritage & Economy)

is funded under the Erasmus+ programme KA2 - KA220-ADU - Cooperation partnerships in adult education. Cultural and natural heritage is directly influenced by the contemporary global climate changes. As a result, DESC is aiming at exploring how cultural heritage is affected by the climate threats and creating knowledge and raising awareness around this. The main goal of this project is to connect European cultural heritage, Climate Change and impact on the Economy.

In addition, DESC promotes people’s right to access services they need to re-engage in training thus preventing social exclusion. In this respect, the project makes a direct contribution to the 1st pillar of the “European Pillar of Social Rights in 20 principles”. DESC aims to empower adults to develop sustainable communities possessing the knowledge, abilities, values and attitudes needed to live in, develop and support a sustainable and resource-efficient society.

Outputs that are underway include:

- (1) Handbook and practical toolkit on Green Lifestyle, Cultural Heritage and Economy
- (2) E-platform
- (3) Trainer Guide

DESC will be piloting the learning material during the summer (2023) with at least 30 adult education trainers and at least 240 adults involved in training sessions across the European partner countries of Italy, Lithuania, Turkey, Ireland, Greece and Spain.

The project started on 28th of February 2022 and will end on 27 of November 2023.

For more information check out DESC Project Website: www.descproject.eu and DESC Project Facebook: <https://www.facebook.com/profile.php?id=100083026485285> or contact marie.taylor@tus.ie.



Developing Empowered Sustainable Communities
Green LifeStyle | Cultural Heritage | Economy



Funded by
the European Union



TUS INSTITUTIONAL RESEARCH REPOSITORY – RESEARCH@THEA

The Library hosts and manages the TUS Institutional Research Repository called Research@THEA which is an open-access repository established in 2017 to disseminate research outputs from THEA institutions. It was launched as a service for capturing, storing, preserving and showcasing the research output of all the Institutes of Technology in Ireland, whilst also providing a platform for their researchers/academic staff and students to publish and promote their work.

The Research@THEA repository is a free gateway to academic and qualitative research that can be accessed electronically at <http://research.thea.ie/>. Here, you can search the entire collections/research output of the partaking Institutes of Technology/Technological Universities in a single search or alternatively you can opt to search the research from a single Institute/Technological University using the individual site.

All TUS staff, researchers, academics and students can avail of this service and the library will provide the support for the process. For information on the repository, how to have your work included and how to connect to the library see the links and emails below.

LibGuide on TUS Research Repository <https://ait.libguides.com/repository> Email: repository@ait.ie or repository@ait.ie



SCHOLARLY COMMUNICATIONS LIBRARIAN – MAEVE HYNES

The Library is delighted to welcome Maeve Hynes into the role of Scholarly Communications Librarian. Maeve has a wealth of library experience from the University of Sydney and most recently has been supporting the RUN-EU Project. As Scholarly Communications Librarian Maeve is available to all TUS staff, academics, researchers and students to provide expertise on a range of areas including academic profiles like ORCID/Scopus, communicating and disseminating research, publishing strategies, bibliometrics and more. To connect with Maeve, email maeve.hynes@ait.ie. See the following guides for further information: <https://ait.libguides.com/academicsandresearchers>
<https://lit.libguides.com/researchmetrics>



RESEARCH INTEGRATION PROJECT MANAGER – TANIA MARSH

Research is delighted to welcome Tania Marsh to our team as the TUS Research Integration Project Manager responsible for implementing a Research Information Management System (PURE) which will be a researcher-centric system for TUS research. Tania comes to this role with over twenty years' experience in a range of library roles, most recently Scholarly Communications Librarian for TUS. She has lead library engagement with research and researchers, developed training, research guides and provided individual, research group and faculty supports in academic publishing, open access, bibliometrics, alternative metrics, research impact and scholarly identity. Tania is co-chair of the Open Science Ambassador

INNOVATION & ENTERPRISE

TUS has one of the most extensive enterprise centre programmes of any higher education Institute in the country. TUS has, and continues to operate and support five enterprise, acceleration, and incubation centres across two regions sitting across three economic regions, the Midlands, Midwest and Southeast. TUS provides entrepreneur and innovation development programmes, leadership development workshops, mentoring, office hours and startup clinics as well as supporting our entrepreneurs with access to an active global network. This network includes investors, mentors, supply chain connections, research organisations, other startup ecosystem leaders, entrepreneurs and many more key individuals and organisations to support entrepreneurs start and grow a global business. TUS has also a strong Entrepreneur in Residence Programme across our centres who give their valuable time and experience to the team and centre clients. TUS has recognised the need to take an active lead in enterprise development and has been recognised nationally for its efforts in supporting startups.

UPCOMING EVENTS INSPIRING WOMEN ENTREPRENEURS

TUS are delighted to host a panel of speakers from the new 'Inspiring Women Entrepreneurs' team led by the renowned Paula Fitzsimons and supported by Enterprise Ireland and KMPG.

Join us to learn about this new flagship programme whose aim is to support women foster innovation and entrepreneurship capacity, grow their network, expand their knowledge of, and gain access to, a wide range of supports.

This interactive panel discussion will feature inspiring women entrepreneurs, Anne Cusack, Barbara Ann Murphy and Vanessa Creaven, who have achieved significant milestones in their respective industries and offers you the opportunity to ask questions, network and gain inspiration. Furthermore, Paula Fitzsimons, who also leads the award winning Going for Growth and ACORNS programmes, will share insights from her experience and there will be an opportunity to register your interest in applying for this new national programme.

You will also learn about supports and opportunities here in TUS and across RUN-EU as well as the wider innovation & entrepreneurship community.

Date: Friday 5th May 2023

Time: 12 noon - 2 pm

Where: Millennium Theatre, TUS Moylish Limerick

Registration via www.hartnettcentre.ie



DR ANNE CUSACK
Co-Founder of Critical Healthcare



DR BARBARA ANN MURPHY
Founder of Equilume Ltd



DR VANESSA CREAVERN
Co-Founder of Spotlight Oral Care

TUS are delighted to host the team from the new 'Inspiring Women Entrepreneurs' Programme led by the renowned Paula Fitzsimons. Join us to learn about this new flagship programme whose aim is to support women foster innovation and entrepreneurship capacity, grow their network, expand their knowledge of supports and further support them should they then embark on an entrepreneurial journey.

Inspiring Women Entrepreneurs Programme and this event is proudly supported by:



NEW FRONTIERS The National Programme for Developing Entrepreneurs

About

New Frontiers consists of practical and interactive workshops, personalised one-to-one mentoring, financial support and co-working space in a peer-to-peer environment. Funded by Enterprise Ireland and run across Ireland. TUS teams lead it in both the Midlands Mid-East and the Midwest. It is a game-changer for anyone serious about developing their business idea into a successful startup.

Latest on New Frontiers

New Frontiers Phase 1 'Test the idea' programme. Phase 1 will commence in Limerick on 19th April, in Athlone on 6th June and in Maynooth on 7th June, running over one-two evenings for five-six weeks. On Phase 1, participants are put through a rigorous programme as they build a toolkit to test their startup idea. Facilitated by a highly experienced entrepreneurial and innovation team together with guest entrepreneurs, the programme emphasises problem solving and developing innovative solutions with market opportunity. Keep an eye on our websites (below) for further Phase 1 calls that may be happening in late 2023.

The Phase 1 programme is the ideal way to prepare for and succeed on the 6-month Phase 2 programme 'Develop the Business' which is scheduled to commence in Limerick in September 2023 and in Athlone-Maynooth in October 2023 offering wrap around supports of practical workshops led by experienced entrepreneurs and experts, funding of €15,000 to aid participants in developing their innovative business idea as well as mentoring and access to a peer-to-peer network.

Phase 3 follows for a select few ready to launch or scale. New Frontiers has a total package worth more than €30,000 and offers participant entrepreneurs an opportunity to ensure success and boost their time to market.

If you are interested in applying for Phase 1 or Phase 2, please visit the websites below.

Read more at www.hartnettcentre.ie for the Midwest programme and <https://www.ait.ie/research-and-innovation/new-frontiers> for the Midlands Mid-East programme.

LUNCH & LEARN
3rd May 2023
FREE Virtual Event



Crafting the perfect blog

Where & When
3rd May 2023
12:15PM-13:45PM

Book Online:
www.hartnettcentre.ie

This would suit SME's, Sole Traders & Start-ups who are trying to be a jack of all trades and do their own social media, marketing & press releases until the get big enough to hire someone to do it.

Speaker: Deanna O'Connor

Limerick Chamber
Skillnet

HARTNETT
ENTERPRISE ACCELERATION CENTRE
WWW.HARTNETTCENTRE.IE

From crafting informative blog posts that will draw potential customers to your site, to writing a press release that will catch an editor's eye, or even mastering social media and going viral, quality content is a great tool for promoting your business. In this informative webinar, experienced editor and freelance media professional Deanna O'Connor will help you discover the mediums that work best for your business, showing you examples of best practice from businesses big and small that are really doing it right, and inspiring you to get started on planning your very own content calendar. If you're a small business owner, doing it all yourself, you'll go away with the tools and skills you need to make the most of opportunities to create and push out great content that your audience will love, and media will take notice of.

Register via www.hartnettcentre.ie



THE STUDENT INC PROGRAMME

TURN YOUR BUSINESS IDEA INTO A REALITY THIS SUMMER

STUDENT SUPPORTS

- €4,000 Seed Funding (stipend)
- Training & Mentoring Supports
- Grow Your Network
- Pitch to Potential Investors
- Office Space
- Peer to Peer Environment

Student Inc.
SUPPORTING STUDENT ENTREPRENEURS

MTU TUS MIC
ATU UCC

FIND OUT MORE OR APPLY AT STUDENTINC.IE

STUDENT INC – SUMMER ACCELERATOR PROGRAMME

Student Inc. is a HEA-funded programme run by six University partners, including TUS. The summer programme supports students as they develop key entrepreneurial and innovation skills. Students are facilitated as they validate and develop their business ideas and are supported as they start their business. Student Inc consists of workshops and mentor clinics and provides students with seed funding of €4,000 and access to a network of entrepreneurs, trainers, mentors, and investors and space in one of the TUS campus incubators (MIRC, HEAC, TCEC and Questum).

www.studentinc.ie



TUS MIC
HEA HIGHER EDUCATION AUTHORITY
PROMOTING AN INCLUSIVE SOCIETY

EMPOWER
Innovation, Creativity,
Entrepreneurship & Active
Citizenship

Summer Camp
TY & 5th Year Students

8th - 10th June hosted at Limerick campuses
20th - 23rd June hosted at Tipperary campuses

EMPOWER

The EMPOWER Summer Programme delivered by TUS & Mary Immaculate College (MIC), delivered to second level students from the Limerick, Clare and Tipperary region, is designed with the aim of inspiring and fostering a culture of collaboration, creativity, innovation, adaptive leadership, active citizenship, enterprise and overall lifelong learning among young people with a diverse range of life-experiences and from different socioeconomic backgrounds. The 'Empower' Programme allows participants to experience, practice and reflect on a wide variety of innovative and creative inquiry-based, student-centred, teaching and learning pedagogies, focusing on scientific thinking, entrepreneurial thinking, generating new ideas and translating ideas into actions.

UPDATE ON OUR CENTRES

Our mission is to create a unique business incubation and acceleration environments that stimulates innovation and entrepreneurship. Our centres facilitate the transition from education, research and employment to start-up business success.

QUESTUM

Questum is a TUS enterprise acceleration and research centre based on a strategic site in Clonmel and was developed in partnership with Tipperary County Council. Questum supports innovative startups and scaleups with growth potential to succeed in its modern flexible workspace together with a community of support from TUS, the support agencies such as Enterprise Ireland and the Local Enterprise Office, the Questum Entrepreneur in Residence, Tom Brennan, and advisory board Pat McGrath (Chairperson), Tom Brennan and Anthony Fitzgerald together with Gillian Barry Head of Innovation & Enterprise at TUS.

LATEST CLIENT NEWS

The last two years was an important time for all Questum clients as they worked through the challenges of reduced demand, supply chain issues and rising costs.

Questum clients A&C Chemicals and Onebox Vision were both acquired during this time following continued standout success during this period.

A&C Chemicals was acquired by Aceto in April 2021 and completing the takeover later that year in October by acquiring A&C Bio Buffer. A&C were a key supplier to Pfizer in the development and production of their COVID vaccine.

One Box Vision were acquired in May 2021 by Maxcess, who now own the proprietary visual inspection technologies developed by OBV founder and Clonmel native Conor O'Neil. Continuing the success story for clients at Questum were JED Pharma, Shorla Oncology, Skanstec amongst other clients such as Theradep.

JED Pharma are a pharmaceutical sales and marketing, professional services and advisory firm supporting local and global clients in the Irish and European market. This year alone they have received a licence for a patented postoperative pain-management IV, which is a unique opioid-free combination painkiller (paracetamol and ibuprofen) Combogesic, and three new Marketing Authorisations; two licences for Mucolytic agents and one licence for an IV anti-infective agent. These are the first issues of a pipeline of products, with a further 11 products undergoing regulatory assessment.

In March 2022 Shorla Oncology rebrand from Shorla Pharma with the rebranding better reflecting their mission of re-thinking, re-imaging and improving on existing proven oncology treatments. This was followed by the appointment of Denis Purcell as Chair of the Board of Directors. Denis is the original Founder of Aisling Capital LLC, a leading life sciences investment firm based in New York City with \$1.8 billion in committed capital and a track record of investing and returning capital since 2000. In September Orlaith Ryan, CTO, spoke at the Scale Ireland Annual Autumn Conference

on the challenges in developing three pharma products in Ireland, creating a HQ in Questum in Clonmel, Co Tipperary and a new base in Boston, with scaling entering a critical phase over the coming years given the developmental stage of her products. Having raised €10m over the last few years, Orlaith would like to see fewer administration burdens around raising cash, which would then allow her to strengthen her focus on the business and its technological development.

Finance Minister Paschal Donoghue gave the keynote speech at the conference.



In November Shorla CEO Sharon Cunningham participated in a panel discussion in Boston entitled 'Cancer Research Across Borders – Ireland's Reach', discussing the vision for an overarching framework for cancer research across the island of Ireland and collaborative links with the United States.

Skanstec a company specialising in infrastructure projects in the energy and telecoms sectors, are headquartered in Questum and similarly had a strong year in their company development as they expanded their footprint into Europe. Highlights include the opening of a new regional office in Lisburn by the Minister of State, who is responsible for Trade Promotion, Digital and Company Regulation at the end of April 2022, as part of a two day trade mission by the Minister, who was in Portugal to mark the 80th anniversary of Ireland's diplomatic presence in Portugal, where he reflected on the importance of Skanstec's role in creating stronger economic ties within Portugal and wider Eurozone markets.

In October Skanstec were awarded the much sought after CPD Accredited Employer Standard by Engineers Ireland in recognition of their continuing professional development (CPD) strategy. Declan Wynne, Managing Director at Skanstec said this is a positive reflection of their standards driven business with an organisational culture focused on people who strive for excellence.

At the end of November, Tánaiste Leo Varadkar leading an

Enterprise Ireland and IDA trade mission to Denmark to boost business collaboration between Irish and Danish businesses announcement the opening of a new regional office in Denmark by Skanstec, further strengthening their footprint in Northern Europe, having secured two new contracts in Sweden. This office compliments their newly opened regional one in Lisbon.

Another Questum resident Dónal Ó Céilleachair of Anú Pictures continued his success with his latest international win with his production "Continuing Traditions". "Continuing Traditions" (Indian Classical Music meets Irish Traditional Music) has won a second Best International Non-Fiction Feature Film award in India at the Samskara International Film Festival in Uttarakhand in

Northern India. This award comes after winning Best International Documentary at the Vindhya International Film Festival in North Eastern India earlier in February.

View more info. on the film and a trailer on: <https://www.anupictures.com/project/continuingtraditions/>

Questum is a thriving enterprise acceleration centre with a growing peer-to-peer community. For innovative companies who have the potential to be high growth and are in need of space or support please go to <https://www.questum.ie/>



TCEC

Thurles Chamber Enterprise Centre is an enterprise centre on campus at TUS Thurles. The centre is wholly operated by TUS's Enterprise & Innovation Team who work with the TCEC Board of Directors to ensure the centre offers the business community affordable space for its startup entrepreneurs and small businesses. The team support entrepreneurs and innovators so their ideas can flourish, and relationships evolve supporting a culture of creativity, innovation, and professionalism.

Centre Upgrade

2021 and 2022 saw a number of major updates to TCEC through two government initiatives: The Enterprise Centre COVID Fund and the Connected Hubs Grant. These funding mechanisms allowed TCEC to overhaul a significant part of its offering in various communal spaces i.e.:

The Boardroom has new table and chairs, state-of-the-art video-conferencing unit paired with a large screen monitor, and air filtration unit.

The Training Suite has new demountable tables matched with cushioned chairs, state-of-the-art video-conferencing unit paired with a large screen monitor, digital A1 flipchart and air filtration unit.

Privacy Booths have been installed on the ground and 1st floors to allow resident-clients and visitors to take/make calls (phone/video) without disturbing colleagues or others in the building, or having to step outside.

A new Firewall was installed in the on-site Comms Room, which enhances the digital security of the local network and helps protect resident-clients and building users from cyber-attacks.

With the building in use 24/7, the CCTV system has been replaced, and is now monitored outside working hours, with a contract in place for the next four years.

A number of resident-clients and the visitors have electric vehicles, so the demand for onsite charging has been steadily rising. I am glad to say TCEC now has a dual 22KW EV charge point, which is operated via an app and pay-as-you-go.

Finally, to help residents and visitors, new directional and internal signage has been installed.

LATEST CLIENT NEWS

TCEC WELCOMES ELECTRIC IRELAND SUPERHOMES

Electric Ireland Superhomes is a joint venture between Tipperary Energy Agency's Superhomes and Electric Ireland established in 2021 with the aim of dramatically upscaling the Superhomes home retrofit One Stop Shop model and became a significant resident-client in TCEC in September 2021. They have grown from strength to strength and increased their staffing levels where they now employ approx. 40 people hoping to grow to approx. 50 by end 2023. www.TCEC.ie

MIDLANDS INNOVATION AND RESEARCH CENTRE

The Midlands Innovation and Research Centre at TUS - working in partnership with Enterprise Ireland - provides incubation and business support for innovative start-ups, delivers the New Frontiers entrepreneur development programme in collaboration with Maynooth University, and makes available the resources and expertise of TUS to support client companies and enterprise in the region.

Whether you are a prospective entrepreneur, a start-up, an existing company committed to ongoing innovation or a student, researcher or academic interested in commercialising your research or developing your business idea, the MIRC is open to you.



MIRC EXPANSION

With €3m funding support from Enterprise Ireland, and project managed by TUS's Estates team, a 950m² expansion of the MIRC was progressed with Kelbuild during 2022 and 2023. The extension provides ten new incubation units ranging from 29m² to 48m², a boardroom, a meeting room and circulation halls. The extension is due for completion/handover in July 2023.

The expanded MIRC is a key element in TUS's institutional strategy – working in partnership with Enterprise Ireland - to significantly increase the number of high-growth knowledge-intensive export-focused businesses in the Midlands.

LATEST CLIENT NEWS

GREYSCOUT DEMOCRATIZES IP PROTECTION



MIRC-based GreyScout, a cloud software business which monitors online channels for intellectual property infringements, raised €1m in pre-seed funding (including Enterprise Ireland HPSU funding) in 2022 and is currently close to closing its seed round. GreyScout was a participant start-up on TUS-MU New Frontiers 2018. GreyScout's technology and expertise allows businesses to protect their brand and customers from counterfeit and grey market activity in the online world. "Our

aim is to give companies control of their brand online because counterfeiting, piracy and grey market activity is a big and growing problem that will have an increasingly detrimental impact on the online economy in the years ahead," says GreyScout founder John Killian.

ZARASYL - REVOLUTIONARY TECHNOLOGY FOR ANIMAL SKINCARE



A participant start-up on TUS-MU New Frontiers 2018 and an Enterprise Ireland HPSU in 2022, Zarasyl is an innovative animal skincare company that has brought cutting-edge human science to veterinarians and equestrians worldwide. The silicate technology behind the company's steroid and antibiotic-free products was initially developed for use in human science, but founder Adrienne Magnier quickly realized the benefits for animal health as well. Following the success of the equine product, Zarasyl has recently released a new Companion

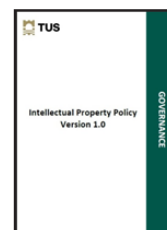
Animal Solution for skin and wound care.

KNOWLEDGE TRANSFER AND COMMERCIALISATION OFFICE

A key objective of TUS's research commercialisation and enterprise development activities is to turn ideas into innovation and innovation into new knowledge-based businesses, helping to drive economic growth within our regions and across Ireland. A key institutional priority of TUS is to maximise the impact, value and return of our research activities by identifying, developing and protecting new technologies and commercialising them through licencing and establishing new HPSU spin-out companies.

The KTC Office leads work to support knowledge transfer and to identify and commercialise IP arising from research at TUS. The Office also reviews and drafts documents in relation to industry collaboration agreements, contracts, heads of agreement, IP ownership arrangements, NDAs etc.

In November 2022, TUS's Governing Body approved TUS's Intellectual Property Policy and Conflict of Interest Policy. A review of TUS's IP Policy by IP Pragmatics concluded that it "is comprehensive, is compliant with the requirements of the National IP Protocol, 2019, and is in line with international good practice."



HARTNETT ENTERPRISE ACCELERATION CENTRE

The Hartnett Enterprise Acceleration Centre is part of a broader plan and greater vision to develop Innovation & Enterprise across Ireland and beyond. Our client companies have a significant international sales focus with exports across Europe, China, India, the USA and more. The Hartnett Enterprise Acceleration Centre, named after our patron John Hartnett, is a business acceleration centre serving Ireland's Mid-West region located on the main Moylish campus. Our mission is to deliver a unique business environment that stimulates innovation, research commercialisation, internationalisation, and entrepreneurship. The centre is home to the national entrepreneur development programme, New Frontiers. New Frontiers is the national entrepreneurial development programme for ambitious early-stage entrepreneurs with innovative business ideas which have the potential to scale and provide employment. It provides the skills, support, and confidence needed to make the leap to starting a successful business.

LATEST CLIENT NEWS

Trigr raise €750k in Investment

Since graduating from New Frontiers, Gavin Duffy and his company Trigr has been going from strength to strength in their mission to solve financial planning issues within the media industry. Gavin has been further tapping into the startup ecosystem by participating in the NDRC pre-accelerator, securing first customers and partnerships, winning awards and accolades, and is raising investment of €750,000 to enable the company to meet their ambition of solidifying product-market fit and scaling to the UK and US markets.

AgriGuardian win prestigious Limerick Chamber Regional Business Award

2021 New Frontiers alumni James Power and his company AgriGuardian were among the top winners at the Limerick Chamber Regional Business Awards, the largest awards event in the region in any calendar year. Winning Best Emerging category Agriguardian are recognised for their traction in the market as an impactful compelling business. AgriGuardians design and develop wearable tech for vulnerable members of the farming community such as children and the elderly, aiming to increase safety on our farms. Nationally Spark Crowdfunding Investment named Agriguardian in their top 100 companies to watch and 3 Ireland also backed and showcased Agriguardian in a recent national ad campaign.



RECENT AWARDS & EVENTS

NEW FRONTIER BUSINESS AWARDS 2023

Entrepreneurs helping manufacturers to increase production, upcycling food loss and providing instant access to static and live data for sport were the award-winning innovations at today's Technological University of the Shannon (TUS) New Frontiers Awards 2023. Recognising some of the most talented start-ups in the Midwest region, the TUS New Frontiers programme is delivered at the Hartnett Enterprise Acceleration Centre in collaboration with Nexus UL. Now in its 11th year, the New Frontiers programme is funded by Enterprise Ireland and is designed to accelerate the development of early stage high potential start-ups with strong employment, growth, and international potential while contributing to job creation and economic activity.

Limerick-based company, DataMinfo, founded by Paul Byrnes was named "Start-Up of the Year 2023". The company unifies operational data, enabling manufacturers to proactively increase their productivity. The local entrepreneur was one of eight new business leaders from the 2023 TUS New Frontiers programme which offers a support package worth €30,000 for each participant.

The Best Innovation Award was won by Maravil Food Ltd, founded by Joe Guiney from Limerick. Maravil Food Ltd process manufacturing food loss into novel ingredients for food manufacturers, producing a sustainable ingredient for further food manufacturing. The recipient of the "One to Watch" award went to Clare's David Kennedy of NICHE Sports Data, a company that uses data analytical tools to enable teams to access static & live data to enhance their performance. Find out more about these and all our startup clients on our centre websites.

ONE-ZERO: SPORTS TECH EVENT

TUS supported the inaugural One Zero Limerick event on the 31st of March at The Engine Collaboration Centre. The Limerick event was the final day in a series of events in Ireland as part of the One-Zero Conference which took place also at the Aviva Stadium, Dublin. One Zero brought a host of sports stars to the city as well as holding a pitch competition. Speakers included Lonie Paxton, a former NFL Superbowl winner, Thomas Ryan, VP Basketball Strategy for the NBA, retired NBA player Maurice Evans and Tracy Deforge, CEO, The Players' Impact and more. They delivered world-class insights on the accelerators in SportsTech and the opportunities for investors. The international panel were joined by local experts including Grainne Barry, STATS Perform. Trevor Keane of One Zero said, "One Zero Limerick is designed to show the best in sports technology, and to show what the opportunity is for Ireland, and Limerick on an international stage for startups in the sport system.". TUS startups took part in the pitch competition which saw some of the most innovative sports tech startups in Ireland as well as internationally compete. The winning pitch went to Paul Flaherty Founder and CEO of What's the Scor, a TUS New Frontiers alumni company.



Paul Flaherty, Founder and CEO What's the Scor wins Startup Pitch Competition.
Trev Keane, Director One Zero

GASP!

TUS were sponsors of the inaugural GASP! Creative Industries Conference held on the 30th and 31st of March in the heart of Limerick City at 1314. The conference investigated the business of digital storytelling and how that affects the creative industry nationally and internationally. TUS Dr John Cosgrove who spoke at the event shared details of a new project called FactorXChange and how scaling businesses can benefit from the creative industries expertise. Moreover GASP! adding a touch of theatre and the surreal to professional networking, Salon du Chat invited students to take a seat with a creative industry professional, have a coffee and choose conversations from a menu of stimulating topics. Students sat at tables in groups of 3 to 5 and had the opportunity to chat in an informal and comfortable setting with senior professionals who had extensive experience and knowledge of the creative industries. The Salon du Chat menu was the ideal conversation starter for sparking discussions with the creative professionals about their experiences in the industry, their recommendations for graduates, job opportunities, the work environment and more.

Salon du Chat featured industry professionals from across the creative disciplines and was open to students studying creative and digital-focused courses such as design, media, UX, animation, web development, film production, and broadcasting. GASP! Salon du Chat was supported by CreativeFutures Academy and TUS FactoryXChange.



Speakers – Dr John Cosgrove (TUS), Jeannette Naughton (Prospero),
Celine Dee (RichardsDee), Niamh O'Shaughnessy (Design Skillnet) Credit: Piquant





Dr Liam Brown, Gillian Barry, Bobby Healy, Peter Hunt and Dick Meaney at Startup Grind Limerick

STARTUP GRIND 2023

Startup Grind Limerick began its 2023 season with Founder and CEO of Manna Drone Delivery (Manna Aero). A full house at the new Engine Collaboration Centre helped make this a very special evening as Bobby shared insights into trailblazing the drone sector. Startup Grind is sponsored by Action Point Technology Group together with TUS whose Head of Innovation & Enterprise, Gillian Barry is also Co-Director.

STARTUP SPOTLIGHT:



QUESTUM BASED SHORLA ONCOLOGY SECURES FDA APPROVAL FOR LEUKAEMIA DRUG

Shorla Oncology founders Orlaith Ryan and Sharon Cunningham based in TUS Questum, Clonmel. The company has just been granted FDA approval for one of its drugs.

Shorla Oncology develops pharmaceutical therapies to help cancer patients, and has recently secured FDA approval to bring a speciality drug designed to treat T-cell leukaemia, to market in the United States.

The US Food and Drug Administration (FDA) has approved the use of the company's oncology drug Nelarabine Injection for the treatment of leukaemia and lymphoblastic lymphoma.

Founded in 2018 by Sharon Cunningham and Orlaith Ryan, Shorla Oncology is a Clonmel, Tipperary, TUS Questum, and Cambridge, Massachusetts-based pharmaceutical company with an advanced pipeline of innovative oncology drugs for women's, orphan and paediatric cancers.

"The news of US FDA approval of our oncology drug is a hugely significant milestone for us at Shorla Oncology. This is a critical treatment for patients, and in particular children, living with T-cell Leukaemia and it is a privilege to bring our product to market to serve these patients in line with our vision," Cunningham shared.

"We are proud to be an Irish-founded company operating in a strengthening biotech ecosystem in Ireland and we are committed to developing and commercialising solutions for unmet needs in oncology," she added.

T-cell leukaemia is an aggressive blood and bone marrow cancer which progresses quickly. While most leukaemia target older people, T-cell leukaemia is most common among children, with this particular treatment often in shortage.

Shorla's founders met when they worked together at EirGen Pharma, the Waterford company founded by Patsy Carney and Tom Brennan, who is the Entrepreneur in residence in Questum, which was acquired by US drugs firm Opko for \$135 million in 2015. The company has won multiple awards since, including the overall award at the Ireland's Best Young Entrepreneur competition in 2019.

Shorla raised \$8.3 million in investment in 2020 to help it complete trials and seek approval to launch its pharmaceutical therapies. The Series A investment round was led by Dublin-based venture capital firm Seroba Life Sciences, with Enterprise Ireland among the other participants.

"This significant milestone underscores our commitment to developing niche products that address key unmet needs and we look forward to bringing further treatments to market in the future as our pipeline of oncology treatments continues to advance," added Ryan, Shorla's chief technology officer.



TIPPERARY CHAMBER TIPPERARY COUNTY BUSINESS AWARDS 2023

TUS were delighted to support Tipperary County Business Awards again in 2022 as Innovation & Education Partners. Ryan's Cleaning, Waste and Recycling, the Thurles based family run company was awarded Business of the Year 2022. The President's Award went to actor, writer and comedian Pat Shortt. The full list of the 2022 Tipperary County Business Awards winners are available on the Chamber website.



LIMERICK CHAMBER REGIONAL BUSINESS AWARDS

Stryker, a multi-national firm, which produces hip and knee system implants, bone-cement and surgical blades for orthopaedic procedures, was named as the top company at The Limerick Chamber Regional Business Awards of which TUS is its main sponsor and partner since 2011.

A mainstay of the local economy, Stryker employs 950 people in the Raheen business park, a number expected to grow in the coming year. Amongst the categories, two startup companies shortlisted for best emerging category were alumni from the Hartnett Enterprise Acceleration Centre New Frontiers programme. The overall winner Agri Guardian taking home the prize.

The annual Chamber awards dinner was attended by over 470 of the region's top business leaders and government officials.

It also saw one of Limerick's most famous sons, JP McManus receive a lifetime achievement award to a standing ovation in the packed room. The full list of the 2022 Limerick Chamber Regional Business Awards winners are available on the Chamber website.

REGULAR EVENTS

Lunch & Learn

The 2022/2023 Lunch & Learn Series which is run in partnership with Limerick Chambers Skillnet is now underway, with four sessions in the series having already taken place – In January we hosted Lorraine Lynch who discussed “Smashing your goals”, in February we hosted with the topic: “Leadership - Enhancing the performance of your team” with Áine Barry of IBT and in March we discussed “How to sell in a non salesly way” with Patrick O’Sullivan and finally in April we had Liam Lynch of L2 Cyber Security dive into the work of cyber security with the topic “Don’t let a cyber incident stop your startup”.

The sessions give attendees an opportunity to step away from work for a short time to learn some essential skills whilst also having the opportunity to meet like-minded individuals.

We have embraced the world of hybrid events. While the majority of our events will be held online via Zoom we have taken the opportunity to hold in person events in December 2022 and March 2023.

RESEARCH WITH IMPACT

TUS delivers impactful applied research, development and innovation by growing the research community, engaging in next-generation thinking and addressing societal, economic, cultural and environmental challenges regionally, nationally and globally.

As an innovation-hub, we nurture ideas and enable the bright minds of our research ecosystem to flourish. Our partnerships enable us to share our knowledge with the world, widen research impact and embed a research culture. Our strategy focuses on extending our reach and driving more impactful research, development and innovation.