

# ADAPT, SFI Research Centre for Digital Media Technology

ADAPT is a world-leading multi-institutional research centre and is Ireland's global centre of excellence for digital content. Awarded €50 million in funding, it combines the expertise of researchers at seven higher education institutions with that of industry partners to produce ground-breaking innovation in digital content that is revolutionising the way people interact with content, systems and each other.

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Engaging Content  
Engaging People



ADAPT's cutting-edge technologies enable businesses in all sectors to analyse, personalise and deliver content more effectively to drive engagement, reach and revenue.

## Research Areas

- Our AI powered analysis techniques allow more powerful tailored access to customer and community insights
- ADAPT is pushing the boundaries of human speech and gesture recognition to increase the accuracy of robotic interpretation
- We extend the effectiveness of all the MT system types across a wide range of languages and domains
- ADAPT research is transforming and delivering personalised content
- Our Machine Learning models enable the analysis of complex data such as financial data sets giving accurate results on large scale data sets
- ADAPT's technology facilitates the recognition of relationships between multi-dimensional data sets by providing new ways to interpret, interact with and gain insights from data

## Research programmes

Many of ADAPT's 200 researchers collaborate on research projects with industry partners. Current projects include:

- Next Generation Recommender Systems - A Collaborative, Contextual, and Content-Based Recommender
- AI Powered Video Discovery and Engagement - Leveraging knowledge graphs for semantic video summarisation
- AI Environment Mapping and Modelling - Discovery and geotagging of assets in street-level imagery
- Dialogue Machine Translation - Building real-time, task-oriented dialogue translation systems

## Facilities

- Content-aware multilingual search and discovery technologies
- State-of-the-art interactive information retrieval and meta-data semantics models
- World-leading language technology systems
- Personalisation and delivery applications for textual and multi-modal content
- Dedicated Design & Innovation Lab (dLab) aims to solve immediate business needs by leveraging the outputs of platform research to generate commercial impact for ADAPT partners

## Industry and commercialisation

By enabling deeper engagement for users, ADAPT enhances efficiencies and global reach for a range of industry partners in industries such as ICT, localisation, financial services, eCommerce, eHealth, media, entertainment and games, life sciences, digital culture and humanities, and eLearning/education.

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## Industry partners include:

- |                  |          |                       |            |                      |
|------------------|----------|-----------------------|------------|----------------------|
| > Accenture      | > eBay   | > Kantan MT Microsoft | > PayPal   | > VistaTec           |
| > Brite:Bill     | > Huawei | > Mazda               | > RTÉ      | > Welocalize         |
| > Deutsche Bank  | > IBM    | > Moravia             | > Ryanair  | > Wolters Kluwer     |
| > DID Electrical | > Intel  | > Novartis            | > Sajan    | > Xanadu Consultancy |
| > eir            | > Iconic | > OSi                 | > Symantec |                      |

## Education and Public Engagement:

The theme of ADAPT's Education and Public Engagement programme is Engaging in Our Digital World. The Education strand aims to foster skills necessary for citizens and students to engage effectively in our increasingly digital world and to drive future developments in this rapidly-changing field.

The Engagement strand engages the Irish public with experiences that incorporate discussion, dialogue and deliberation around societal implications of digital engagement.



## Key Contacts

### Prof Vincent P Wade

CEO

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*Vincent Wade holds the Professorial Chair of Computer Science in the School of Computer Science and Statistics, Trinity College Dublin, as well as a personal Chair in Artificial Intelligence. His research focuses on intelligent systems, AI and Personalisation. He was awarded Fellowship of Trinity College for his contribution to research and has published over three hundred and fifty scientific papers in peer reviewed international journals and conferences. In 2018 he was awarded Trinity's highest accolade the university can bestow for international research impact, the Provost Innovation Award. He also holds multiple patents and invention disclosures in the area of personalisation and digital content technologies.*

### Prof Andy Way

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# AMBER, SFI Research Centre for Advanced Materials and BioEngineering Research

AMBER is a dynamic, multidisciplinary partnership between world-leading material scientists, bioengineers and industry. We work collaboratively to address fundamental research questions and create solutions with impact for society in ICT, MedTech, energy and sustainable industrial technologies.

## Research Areas

AMBER is built upon an outstanding reputation in research supported by state of the art infrastructure at our Advanced Microscopy Laboratory and Additive Research Laboratory. Our highly ambitious multidisciplinary research programme brings scientists and bioengineers together to work collaboratively in key areas to generate impact for society.

From 2019 – 2025 AMBER will build on the centre's Pillars of Expertise, into 4 fundamental research themes and 5 targeted research areas with industry.

## Targeted Projects

ICT Technologies & Devices	Sustainable Materials & Technologies	Medical Devices
Sensors & Diagnostics	Industrial Materials & Manufacture	

## Fundamental Research Themes

Materials for ICT	Materials for Energy	Materials for Health	Engineered Functional Materials
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## Underpinning Pillars of Expertise

2D & Emerging Materials	Modelling & Theory	Synthesis & Fabrication
Characterisation	Bionengineering	

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Advancing Materials for Impact

## Facilities

- Advanced microscopy and nanofabrication lab
- Polymer development and characterisation lab
- Photonics lab
- Clean-room facilities
- Metrology/spectroscopy
- Additive manufacturing

## Industry and commercialisation

AMBER is focused on driving innovation through excellent science and a vibrant culture of industrial engagement and commercialisation. Together, we contribute a pipeline of highly skilled graduates to the Irish STEM sector, creating jobs and economic growth.

We have over 40 industry partners.

**Since 2013 AMBER has grown industry engagement from 18 companies to over 40**



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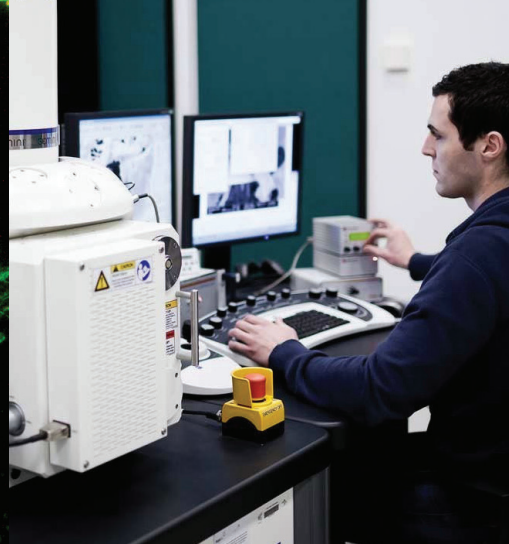
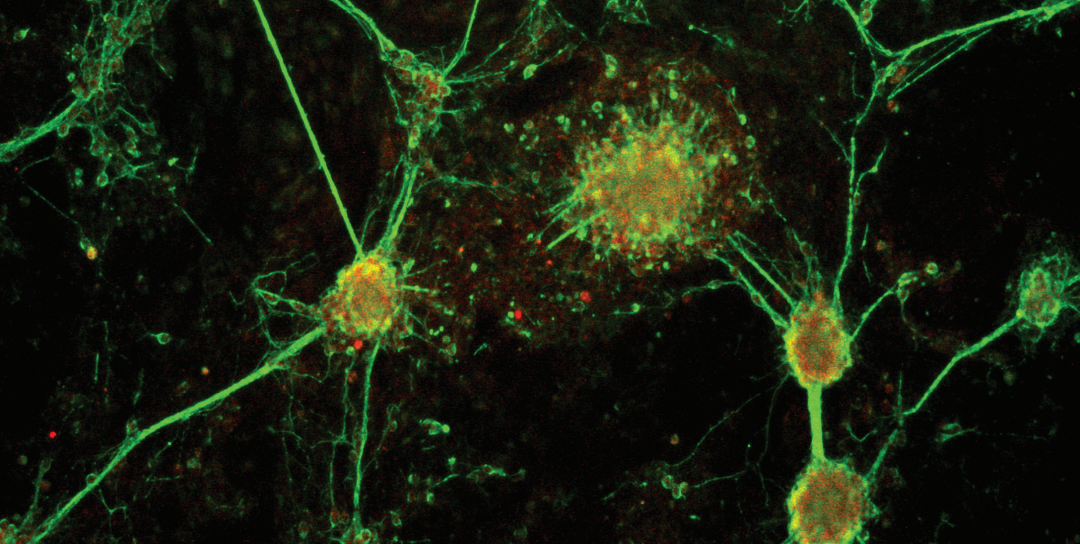


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## AMBER impact

The outputs of materials science and engineering research are all around us: from wearable health sensors, flexible phone screens and superfast computers, medical devices, drug delivery systems and regenerative medicine, sustainable packaging materials and better energy storage devices.

AMBER's Communication, Education and Public Engagement Programme aims to create dialogue between researchers and publics on materials science and bioengineering and its potential impacts.

From school-going children, young people and educators to policy makers, parents and community groups, our CEPE programme will engage in critical conversations around our work, inspire a new generation of scientists, (bio)engineers, designers and inventors, and ensure that access to the centres research is open to all.

## Key Contacts

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# APC Microbiome Ireland SFI Research Centre

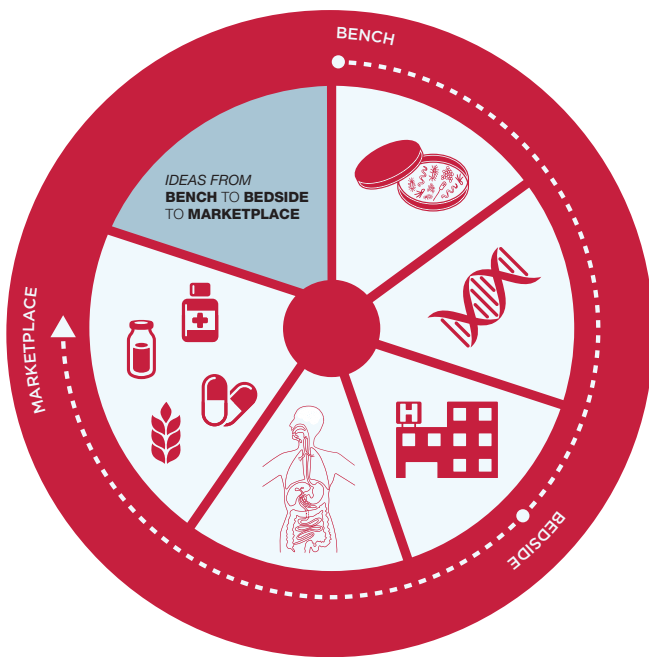
APC Microbiome Ireland SFI Research Centre explores the role that microbes (microbiome) play in health and disease. The microbiome is a target for the prevention and treatment of disease, it is also a source of functional food ingredients, new drugs and disease biomarkers.

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*Interfacing Food & Medicine*



One of the world's leading institutes in gut microbiome research, APC Microbiome Ireland is receiving €80 million in SFI, industry and other non-exchequer funding across 2019-2025. It hosts a diverse group of clinicians and scientists working in teams and sharing ideas and resources.

## Research Areas

- Discovery of molecules for therapeutics and functional foods
- Designing functional ingredients/foods across the lifespan
- Links between diet, microbes and mental health
- Signalling, host immune-inflammatory responses
- Phage as regulators of the microbiome in health and disease

## Research Programmes

APC Microbiome Ireland SFI Research Centre's 300+ researchers include global research leaders in food/pharma areas, such as gastroenterology, microbiology, immunology, neuroscience, nutrition, neonatology, gerontology, cardiovascular and metabolic health.

## Technology and Support platforms

- Culture collection
- Next generation sequencing
- BioIT
- Pre-clinical and germ-free
- Human studies
- Flow cytometry

## Industry and Commercialisation

The APC team has extensive experience collaborating with the food, pharmaceutical, biotechnology and diagnostic sectors and welcomes new industry partnerships.

APC Microbiome Ireland's industry partners can access technology platforms, extensive databases and biobanks, as well as the expertise of its investigators.



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**Mining the Microbiome  
for different life stages**

## Current industry partners include:

- |                        |                     |                           |               |
|------------------------|---------------------|---------------------------|---------------|
| › AbbVie               | › Crema SA          | › Janssen Pharmaceuticals | › Pepsico     |
| › Adare Pharma         | › Danone            | › Kerry Group             | › Pharmavite  |
| › Alkermes             | › DSM               | › Mead Johnson Nutrition  | › Tate & Lyle |
| › Alimentary Health    | › DuPont            | › Morinaga Milk Ltd       | › 4D Pharma   |
| › Artugen Therapeutics | › Friesland Campina | › Nutricia                |               |
|                        | › General Mills     |                           |               |



## Education and Public Engagement (EPE):

This is an integral part of APC Microbiome Ireland's strategy and is informed by research on public perception and understanding of microbiome science and by government policy. The goals of our EPE programme are to foster awareness and interest in microbiome science amongst the general public and to train APC researchers to effectively communicate their research to a wide variety of audiences.

APC Microbiome Ireland SFI Research Centre researchers engage with the community through three core programmes: Education, Early Intervention, and Engaged Research, with a focus on Citizen Science. Underpinned by evidence-based design and targeted communications, the APC's approach to EPE is focused and strategic. Programmes are planned, implemented and evaluated to maximise the societal impact of our research.

## Key Contacts

### Prof Paul Ross

APC Microbiome Ireland  
SFI Research Centre Director  
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*Professor Paul Ross' research focuses on novel antimicrobials, including bacteriocins and bacteriophage. He has published over 600 peer-reviewed papers in addition to 58 book chapters and 23 patents and supervised 61 completed PhD's and 23 MSc's. He has received many awards and was designated one of "The World's Most Influential Scientific Minds" by Thomson Reuters based on citations (2015) and a Highly Cited Researcher by Clarivate Analytics (2017, 2018). He has been an investigator on grants totalling over €130 million since 1994.*

### Dr Sally Cudmore

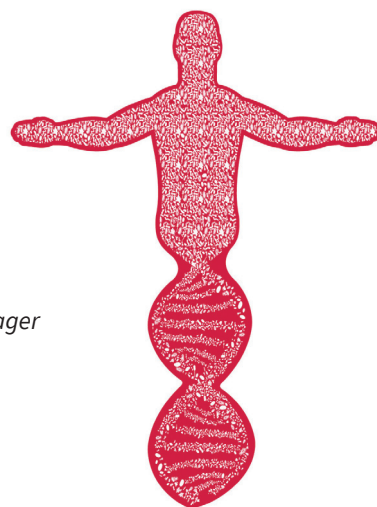
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## BiOrbic, Bioeconomy SFI Research Centre

BiOrbic, Bioeconomy SFI Research Centre harnesses the wealth of Ireland's natural resources on land and in the sea for the development of a sustainable circular Irish bioeconomy, enabling vibrant sustainable communities.



BiOrbic, Bioeconomy SFI Research Centre develops sustainable novel processes and products using biobased resources, creating clusters for new industry partnerships and delivering the expertise and trained workforce to translate new technologies into new sustainable products, processes, markets and industries.

### Research Areas

- › Bioeconomy
- › Agri-Food
- › Marine
- › Advanced Materials
- › Renewable biological resources
- › Biotechnology/Biologics
- › Resilient and Resource-Efficient Value Chains
- › Rural Renaissance

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### Research Programmes

BiOrbic, Bioeconomy SFI Research Centre will address 3 key interrelated research questions

1. Selective Separation
2. Conversion
3. Sustainability

### Facilities

- › HPLC coupled to size exclusion chromatography with refractive index detector
- › Q Exactive
- › Varian Saturn 2000 GC-MS (ion trap) with GC olfactometry
- › NMR Spectroscopy
- › Mass Spectroscopy
- › Electron Microscopy

### Industry and Commercialisation

BiOrbic, Bioeconomy SFI Research Centre collaborates closely with industry across the Agri-food and Marine sectors to convert residues and waste streams created during primary production processes to higher value products (including food/feed ingredients), creating new business opportunities and new value chains, enabling our partners to diversify and increase resource efficiency.

Through our partnerships we are stimulating rural regeneration, curtailing environmental damage, extracting healthy nutritional supplements, reducing import dependency, and developing human capital.



## Industry partners include:

- BHSL
- Commercial Mushrooms Producers
- Glanbia
- Nutramara
- Monaghan Mushrooms
- NVP Energy
- Nuritas
- Carbery

## Education and Public Engagement:

BiOrbic, Bioeconomy SFI Research Centre's public engagement programme focuses on enhancing the public understanding of bioeconomy and its impact on Irish society.

Research outputs from BiOrbic, Bioeconomy SFI Research Centre's Sustainability Platform informs and supports dissemination activities, including the development of the knowledge hub which integrates emerging knowledge from the centre for engagement with consumers, society, industry, investors, researchers, regulators and policy makers.



## Key Contacts

### Prof Kevin O'Connor

Director

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*Prof Kevin O'Connor, SFI Researcher of the Year 2019, is shaping the European Bioeconomy Strategy through his chairmanship of the Scientific Committee for the €3.7 billion PPP (Bio Based Industries). He has been at the forefront of national developments and was instrumental in securing EU Model Demonstrator Region (MDR) status for the Southeast, drawing together stakeholders from industry, academia and policy-makers from Tipperary County Council. He is a champion for the step-change a bioeconomy can deliver to the Irish economy and society. He is a PI on EU projects researching synthetic biology (P4SB) and biobased products (SYNPOL). Consequently, he is very strongly networked with leading industries, academic institutions and policy makers in the bioeconomy. He is the recipient of Nova UCD Innovation award 2016.*

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## CONFIRM, SFI Research Centre for Smart Manufacturing

Our mission is to transform industry to become leaders in Smart Manufacturing.

Smart Manufacturing is the process of fusing intelligence to the production process to improve manufacturing performance via automation and data analytics. CONFIRM has expertise across the full Industry 4.0 Smart Manufacturing ecosystem and works to identify business needs in partnership with industry and then selects the right research team to help to solve business challenges.



We have an extensive researcher network that spans 9 research partner institutes and 16 international collaborations this is coupled with 100+ industry partners and supported by €45 million in funding.

### Research Areas

CONFIRM has 8 key research areas that sit within our hub:

- › Data Analytics: AI, Predictive Modelling, Decision Analytics
- › Enterprise Modelling & Simulation
- › Networking Systems & IOT
- › Product & Process Modelling
- › Robotics & Control
- › Sensors
- › Software Systems
- › Material Processing

### Research programmes

- › **Hub 1** – Virtual Industrialisation, focusing on adaptive data analytics and optimisation for smart manufacturing; end-to-end supply chains and predictive modelling of manufacturing.
- › **Hub 2** – Cyber-Physical Manufacturing Systems, focusing on connected infrastructures, machines & software systems; data, information, knowledge integration, security and technology adoption; and semantic interoperability and data analytics for production.
- › **Hub 3** – Self-Aware Manufacturing Systems, focusing on advanced sensors, controls and robotics to add intelligence, efficiency and safety to machines and production systems.
- › **Hub 4** – Testbeds & Prototype Lines to provide versatile, adaptable facilities for collaborative assessment and validation of CONFIRM's technologies by all stakeholders.

### Facilities

CONFIRM's new headquarters, a bespoke 1619 m2 facility based in Park Point, Limerick, will open on February 2020. This facility will enable a community of practice where CONFIRM will host 70 researchers, 12 operational and management staff, resident and visiting investigators from CONFIRM's 9 national research partners, international collaborators, industry partners, as well as test-bed and prototype facilities.

Across our partner institutes, we have an array of cutting edge equipment:

- › Process & Product Development Labs – Tyndall National Institute
- › Process Technology Services – Tyndall National Institute
- › JAMIR Composite Joining Suite – University of Limerick
- › Universal Robotics UR Series Cobots – University of Limerick
- › MAXIEM 1530 Water-Jet Machining Centre – University of Limerick
- › Ultrasonic Welding Facility – University of Limerick
- › Injection Moulding Smart Manufacturing Cell – Athlone Institute of Technology

### Industry and commercialisation

CONFIRM gives industry partners a competitive advantage by ensuring the right research team is working to drive business readiness for Industry 4.0. CONFIRM has experience working with MNC and SMEs across diverse sectors, including, Computer, Electronic, Optical, Pharmaceuticals, Medical Devices, Chemical, Nutrition & Beverage, and Electrical equipment.

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## Industry partners include:

- › Johnson & Johnson
- › Analog Devices
- › AccuCode
- › SCRI-IS Technologies Ltd
- › Modular Automation
- › SL Controls
- › Robotics & Drivers
- › ATG Europe

## Education and Public Engagement

With manufacturing being the 2nd largest employer in Ireland, CONFIRM believes it has a responsibility to future proof the community so that it is best placed to adapt and thrive in Industry 4.0.

CONFIRM has developed an array of training and workshops to inform various cohorts including the general public, schools, industry, and stakeholders on smart manufacturing and Industry 4.0.

Examples include:

- › Smart manufacturing & Robotics for primary school
- › Career information for 3rd and 4th level pathways
- › Pint of science
- › National science week



## Key Contacts

### Prof Conor McCarthy

Director

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*As Professor of Engineering at the University of Limerick, Professor McCarthy also leads a research group, who are developing novel methods to join high performance composite materials to other lightweight materials, to result in structures with superior strength and stiffness properties, and with only a fraction of the weight compared to typical steel or aluminium structures. This work has attracted over €6 million in competitively won research funding from Europe, Irish research funding agencies and both national and international Industries. His research has led to over 150 high impact publications and a patent pending on a new smart glue that can be “unzipped” using only high frequency radio waves for applications in automotive assembly down to dental implants. Prof McCarthy is a SFI Principal Investigator, and leads major research programmes in Engineering Science.*

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# Connect, SFI Research Centre for Future Networks & Communications

**CONNECT is the Science Foundation Ireland Research Centre for Future Networks and Communications. Its mission is to research and develop innovative solutions for the communications challenges facing society today. The Internet of Things (IoT), 5G networks and new broadband architectures are the centre's main areas of focus.**



Photo © jamesteohart/Shutterstock

Communications networks are now part of our critical infrastructure, enabling a vast range of applications that we have all come to rely on. These networks must now evolve to enable services that one day will also become ubiquitous, from augmented reality to autonomous vehicles. At CONNECT, we design the next generation of networks that automatically respond to the services that run on them.

Over 250 CONNECT researchers across 10 Higher Education Institutes are supported by €50 million of funding from the Science Foundation Ireland Research Centres Programme, the European Regional Development Fund and industry partners.

## Research Areas

CONNECT researches future networks, Internet of Things, 5G and beyond from the following perspectives:

- Dependable Networks (supporting mission-critical applications, leveraging edge computing)
- Sustainable IoT (scalable solutions for integrated energy harvesting, storage, and power management, reusable platforms, security and resiliency)
- Link Performance (MGb/s wireless & wireline transmission, flexible mmWave, photonic networking and in-body biological communications)
- Data-driven Optimisation & Management (proactive network management, distributed ML, actionable metrics, explainable AI)
- Customised Networks (end-to-end across shared networks to support verticals, slice monitoring, trust)
- The New Operators (frameworks for collaboration, business models, regulation)

CONNECT researchers have vast expertise in test and experimentation in these areas.

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## Research programmes

CONNECT's 250 researchers tackle issues of particular interest to industry. Their work includes the development of:

- Energy-efficient networks, and ultra-low-power smart sensors, and storage
- Programmable network substrates for multi-stakeholder ecosystems
- Extreme-sharing systems for Cloud-RAN architectures
- Network-aware, high performance and mm-wave radio transceiver architectures for 5G
- Quality-of-experience management for sparse, bursty data networks

CONNECT is leading Enable, a new €14.5 million IoT research programme to connect communities to smart urban environments. It focuses on buildings, environment, mobility, and networks.

## Facilities

- Pervasive Nation – Ireland's Internet of Things testbed using a Low Power Wide Area Network (LPWAN). See [www.pervasivenation.ie](http://www.pervasivenation.ie)
- Ireland's largest public data centre at TSSG, based in Waterford Institute of Technology
- Indoor/outdoor wireless testbeds for cellular, Cloud-RAN and SDR
- RadioSpace - a national facility at Maynooth University for the development and testing of new radio technologies for the Internet of Things and 5G.

## Industry and Commercialisation

CONNECT works with a wide range of industry partners on targeted projects in the areas of Internet of Things, future cellular (5G and beyond), next-generation broadband, software-defined networks and cloud-based services. CONNECT's expert researchers are dedicated to delivering outstanding results at the pace and standard demanded by industry.

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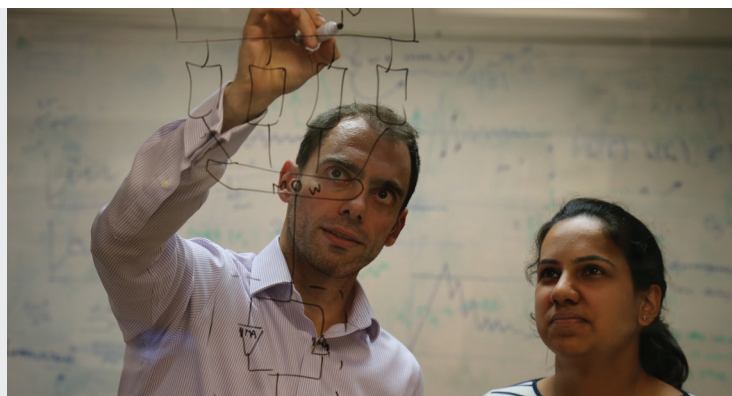


**Industry partners include:**

- |                       |                                   |                                  |                     |                          |
|-----------------------|-----------------------------------|----------------------------------|---------------------|--------------------------|
| > Accessgreen         | > Civic Integrated Solutions      | > Dun Laoghaire Rathdown Co. Co. | > MACOM             | > Synopsys               |
| > Adesto Technologies | > Cork City Council               | > Ericsson                       | > Nokia             | > Taoglas                |
| > Aeronet Global      | > Cork County Council             | > ESB                            | > Nonlinear Systems | > TrackNStop             |
| > Ampleon             | > Dell EMC                        | > Google                         | > Rambus            | > Tyco Ireland Ltd       |
| > Analog Devices      | > DenseAir                        | > Granahan McCourt               | > Real Wireless     | > UTRC                   |
| > Arris               | > Digital Canopy Technologies Ltd | > Huawei                         | > Rivada Networks   | > Westire Technology Ltd |
| > ARUP                | > DLRCCC                          | > IBM                            | > Routematch        | > Workz                  |
| > Benetel             | > Dublin City Council             | > Intel                          | > S3 Group          | > Xilinx                 |
| > BlueMetrix          |                                   | > Johnson Controls               | > Silent Sensors    | > Zeto                   |
| > CISCO               |                                   |                                  | > Softbank          |                          |

### Education and Public Engagement:

CONNECT has a strong commitment to education and public engagement. A key focus of this outreach is 'STEAM' - using the Arts and creative practices in the traditional formula of science, technology, engineering and mathematics. CONNECT also uses media (international, national, local and social) to engage with the public on features of the centre's research. CONNECT researchers also engage with the public at festivals and events such as the National Ploughing Championships and also with visits to schools.



## Key Contacts

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*Professor Luiz DaSilva is the Director of CONNECT and Professor of Telecommunications at Trinity College Dublin. His expertise is in wireless communications and networks. He has published widely in these domains and is a Fellow of the IEEE for his contributions to cognitive networking and resource management in wireless networks. He has a wide range of collaborations in Europe, the US, Latin America, and Asia.*

**Dr Tim Forde**

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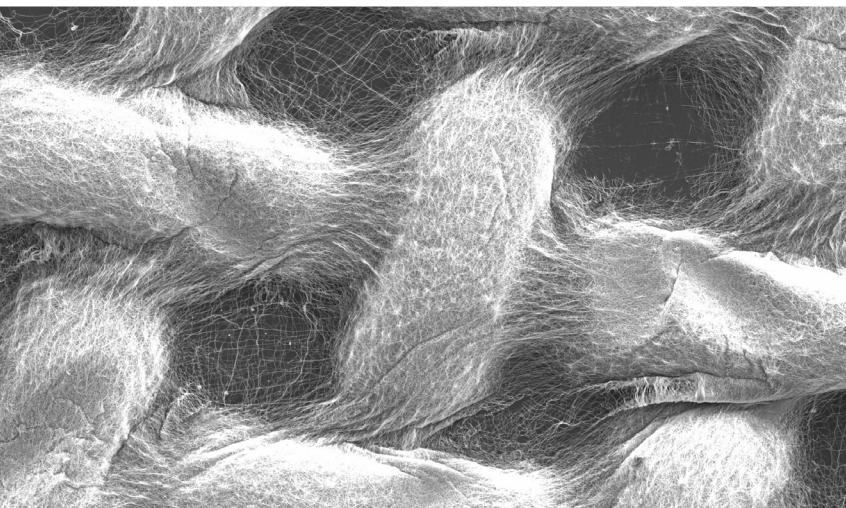
SFI Research Centre for Medical Devices

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# CÚRAM SFI Research Centre for Medical Devices

The centre aims to radically improve health outcomes for patients by developing 'smart' medical devices and implants. It develops these devices through collaborations with industry partners and hospital groups to enable their rapid translation to clinics.



CÚRAM SFI Research Centre positions Ireland as the driver in developing medical device technologies that will provide affordable transformative solutions for chronic diseases. The centre strengthens Ireland's standing as a major global hub for medical device research and development.

CÚRAM's research programme focuses on innovative design, assessment and manufacture of medical devices and is driven by specialist researchers, clinicians and industry partners, ultimately translating research into clinical settings.

## Research Areas

- Biomaterials
- Drug Delivery
- Tissue Engineering
- Regenerative Medicine
- Device Design
- Glycoscience

## Research Programmes

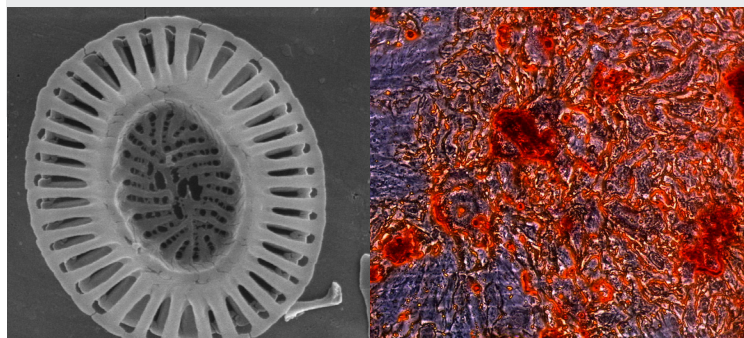
Backed by €49.6 million in SFI and industry funding, CÚRAM's 650+ researchers are designing and manufacturing implants to respond to the body's environment and delivering therapeutic agents exactly where they are needed. CÚRAM's outputs will particularly benefit patients with chronic ailments such as heart disease, wound healing, diabetes and musculoskeletal diseases.

## Facilities

- Biomaterials manufacturing and processing from nanoscale to macroscale level
- Extensive biomaterials and biological characterisation
- Physicochemical drug analysis
- Device design and testing
- National Biophotonics Imaging Platform (NBIP) including pre-clinical imaging
- Centre for Cell Manufacturing (CCMI)
- Preclinical disease models
- GMP manufacturing
- Clinical research and trial infrastructure
- Additive/subtractive manufacturing testbed for electrically, optically and thermally activated biomaterials

## Industry and commercialisation

CÚRAM includes more than 32 industry partners, including Irish companies and multinationals. CÚRAM also supports product development and the creation of spin-out companies.



HOST INSTITUTION



NUI Galway  
OÉ Gaillimh

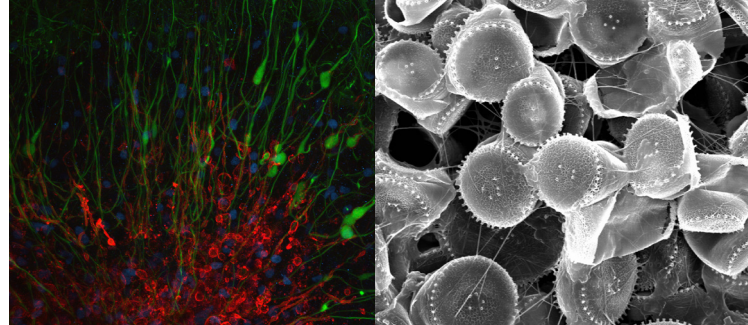
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## Industry Partners Include:

- > Aerogen
- > Arch Therapeutics
- > Acuitive
- > Boston Scientific
- > Cook Medical
- > Medtronic
- > Mylan Inc
- > Neuravi
- > Stryker



## Education and Public Engagement:

Researchers at CÚRAM engage with the community through three core residency programmes, for artists filmmakers and teachers.

- > The Artists in Residence programme supports interaction between the artistic, scientific and industry communities to develop outputs that can educate and inspire the public about the creativity and innovation involved in Irish R&D in the medical devices field.
- > The Filmmakers in Residence programme 'Science on Screen', aims to increase the level of scientific research incorporated into TV and film and develop a Science on Screen Festival.
- > The annual Teachers in Residence Programme runs from October to March and aims to develop a MedTech educational module designed for teachers by teachers, linking with both the primary and secondary school curricula.
- > Participation at national events allows CÚRAM researchers to engage with a wide national audience. Events include BT Young Scientist Exhibition, Famelab, TeenTech, Brain Awareness Week, The Galway International Arts Festival, The Ploughing Championships and the Galway Science and Technology Festival.

## Key Contacts

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Centre Director

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*Abhay Pandit, PhD, Professor of Biomaterials at the National University of Ireland, Galway, is Scientific Director of the Centre for Research in Medical Devices (CÚRAM). Through CÚRAM he develops affordable, innovative and transformative device-based solutions to treat global chronic diseases. During his career in the medical device sector he secured regulatory clearance for a hydrophilic wound dressing, and secured IDE approval for a family of collagen vascular sealants for FDA submissions. In 2013, he was awarded the Academic/Emerging Medical Technology Company of the Year-Silver Award, he was the first Irish academic to be elected a Fellow of the Tissue Engineering and Regenerative International Society and was also inducted as an International Fellow in Biomaterials Science and Engineering by the International Union of Societies for Biomaterials Science and Engineering.*

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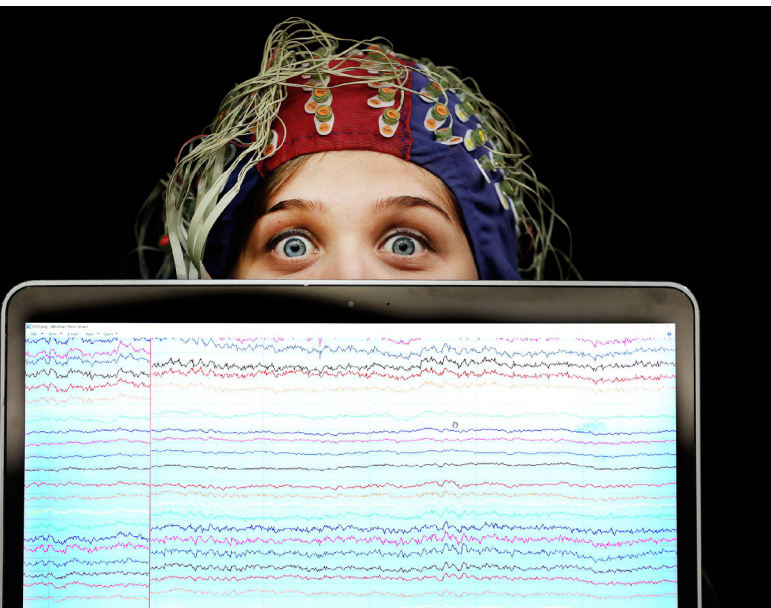
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# FutureNeuro, the SFI Research Centre for Chronic and Rare Neurological Diseases

The FutureNeuro Vision is to enable people with neurological diseases to live independently. We aim to realise this vision by providing Faster Diagnosis, Personalised Treatments and Patient-Centred Care.



## Research Areas

- › Connected Health
- › Diagnostics/Biomarkers
- › Electronic Patient Records
- › Epigenetics
- › Human Genetics
- › Neurology
- › Neuroscience and Behaviour
- › Pharmacogenomics
- › Precision Medicine
- › Sensors and Monitoring
- › Therapeutics

## Research programmes

FutureNeuro uniquely combines three thematic areas of Diagnostics, Therapeutics and E-Health, mapped closely to targeted projects with our industry partners to leverage and create exceptionally strong synergy between basic, clinical and applied (industry-focused) research capacity. We have established expertise in epilepsies, Motor Neurone Disease, Multiple Sclerosis, Parkinson's and Alzheimer's.

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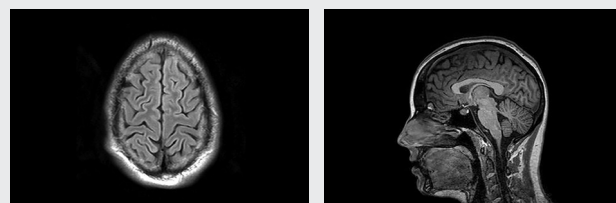
## Facilities

- › Genomics, bioinformatics and computational biology
  - Next-generation sequencing platforms
  - Proteomics core
  - Bioinformatics and systems biology core
- › Preclinical disease phenotyping
  - iPSC lines, in vitro modelling and gene editing
  - Molecular, cellular and brain imaging
  - Electrophysiology
  - Pre-clinical in vivo phenotyping
- › Sensor Development
  - Companion diagnostics
  - High-speed electrochemistry
  - Super resolution fluorescence microscopy
- › eHealth enabled patient support
  - National electronic patient records system and patient portal infrastructure
  - Integration of genomic and phenotypic information
  - Integration of wearables
- › Clinical research
  - Clinical infrastructure for trials
  - Biobanking and biosample collection
  - Large patient datasets of structural MRI

## Industry and commercialisation

FutureNeuro connects national and multinational industry with key academics and clinicians based in our leading hospitals to provide diagnostic, therapeutic and E-Health solutions.

FutureNeuro's target projects with industry partners will bring diagnostic supports to market, a pipeline of new drugs, and connected health solutions that enable patients to monitor and report their health better than ever before.



HOST INSTITUTION



PARTNER INSTITUTIONS



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Coláiste na Tríonóide, Baile Átha Cliath  
The University of Dublin



NUI Galway  
OÉ Gaillimh



UCC  
University College Cork, Ireland  
Coláiste na hOllscoile Corcaigh



Waterford Institute of Technology

## Education and Public Engagement:

“A society that is informed about the impact of neurological disease and supports research to address the challenge” is the vision of the FutureNeuro Education and Public Engagement Programme. Working with policy makers, civil society organisations, research and education communities and industry, FutureNeuro’s ambitious programme highlights that neurological disorders are a challenge that impacts everyone; research is vital to address these challenges; and that we need more people supporting research to make this happen.



## Key Contacts

### Prof David Henshall

Director

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*Prof David Henshall is Professor of Molecular Physiology & Neuroscience and has been working at the Royal College of Surgeons in Ireland since 2004. His main interests lie in the causes and treatment of the neurological disorder epilepsy. Some of his major research projects are looking at the patho-mechanisms underlying epilepsy development following brain injury, neonatal seizures, developing new medications for epilepsy and exploring the role of epigenetics and non-coding RNA in this disease.*

*He is the co-ordinator of EPI-Cluster, a pan-european research and advocacy network, which was recently funded by European Brain Research Area (EBRA) He is also the chair of the International League Against Epilepsy (ILAE) Genetics/Epigenetics Taskforce. Prof Henshall has authored over 175 papers and 9 book chapters.*

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# iCRAG SFI Research Centre for Applied Geosciences

iCRAG, the SFI Research Centre for Applied Geosciences, is Ireland's national geoscience research centre supported by Science Foundation Ireland, the European Regional Development Fund, Geological Survey Ireland and industry partners.

Our mission is to transform Irish geoscience by driving research and discovery, delivering economic and societal benefit, and advancing public understanding.

iCRAG's multidisciplinary research transcends industry and academic boundaries to address key research challenges in the fields of energy security, raw materials supply, groundwater protection, safeguarding the geomarine environment and protection from the Earth's hazards.



The centre has €26 million in funding supporting 150 researchers.

## Research Areas

- Raw materials – mineral/aggregate geoscience
- Marine – marine geoscience
- Groundwater – hydrogeology/hydrology
- Energy Security – petroleum geoscience
- Geohazards - protection from Earth's hazards
- Geochemistry, geophysics, 3D geological modelling, public perception and understanding of geosciences

**iCRAG**  
IRISH CENTRE FOR RESEARCH  
IN APPLIED GEOSCIENCES

## Research Programmes

Forming an integrated team of internationally leading researchers and both large and small-scale industry partners, iCRAG conducts research which will help in the discovery and harnessing of Ireland's natural resources, such as its world-class Zn-Pb mineral deposits, untapped hydrocarbon resources in challenging NE Atlantic deep water environments, and important and environmentally sensitive seabed and groundwater resources.

## Facilities

- A comprehensive suite of analytical and modelling resources
- Platform facilities in geophysics, geochemistry and 3D modelling

## Industry and Commercialisation

The technology developed by iCRAG takes the form of soft-knowledge, data, methods, protocols, policy documents and software. This technology helps companies discover and develop natural resources for their mutual benefit, and the benefit of Ireland. As an SFI Research Centre, iCRAG encompasses the broad community of Irish geoscience researchers and engages with industry partners from diverse geoscience-related sectors, including hydrocarbons, marine, minerals and groundwater.

HOST INSTITUTION



PARTNER INSTITUTIONS



## Industry and State Policy partners include:

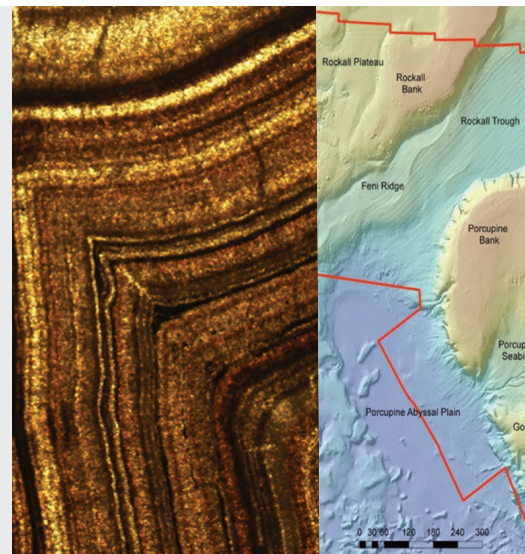
- APEX Geoservices
- Arup (Ireland)
- AWN Consulting
- Boliden
- BP Exploration Operating Company Ltd
- BRG
- Cairn Energy Plc
- Chevron North Sea Limited
- Compass Informatics
- Designer Group
- ENI Ireland BV
- Equinor
- Europa Oil and Gas (Holdings) Plc
- ExxonMobil E&P Ireland (Offshore) Ltd
- Fehily Timoney & Company
- FLI Group
- GDG
- Geoscience Ireland
- Geoserv
- Group Eleven Mining & Exploration Ltd
- Geological Survey of Ireland
- Homebond
- IE Consulting
- IGSL
- International Lithium Corp.
- Intersocial Consulting
- Irish Drilling
- JB Barry & Partners
- Lagan Asphalt Group
- LTMS
- Lundin Mining
- Meehan Drilling
- Mincon Group PLC
- Murphy Surveys
- Nicholas O'Dwyer
- Pavement Management Services
- Petroleum Affairs Division
- PIPCo RSG
- PW Mining
- PW Nigeria
- QME
- Repsol Exploración SA
- Roadstone
- Rubicon Heritage
- Shell E&P Ireland Ltd
- SLR
- Sosina Exploration Ltd
- SRK Consulting
- SSE Renewables
- Teck Ireland
- Techworks Marine
- Tobin Consulting
- Transport Infrastructure Ireland
- Trevali Mining Corp.
- Tullow Oil Plc
- Verde Environmental Group
- Woodside Energy (Ireland) Pty Ltd

## Education and Public Engagement:

Modern societies and economies are underpinned by applied geosciences. The provision of secure sources of energy, clean water and raw materials, all of which are crucial for economic and societal functioning, are directly reliant on applied geosciences. iCrag is dedicated to developing the next generation of geologists, engineers and scientists through our education and public engagement programme. The programme works alongside the public perception and understanding of geoscience research platform in iCrag, with each informing the other.

The objectives of iCrag's education and public engagement programme are:

- Empower the Irish publics to make informed decisions about the Earth's resources and changing climate.
- Enhance public understanding of Earth's resources and earth system change.
- Engage the publics such that our research is influenced by, and shared with, the publics for mutual learning.



## Key Contacts

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*Murray W. Hitzman is Director of iCrag and a Science Foundation Ireland Research Professor. Murray has B.A. degrees in geology and anthropology from Dartmouth College (1976), an M.S. in geology from University of Washington (1978), and a Ph.D. in geology from Stanford University (1983). He was awarded the SEG Silver Medal in 1999, the Daniel C. Jackling Award by Society of Mining, Metallurgy, and Exploration and the Des Pretorius Award by the Geological Society of South Africa in 2015, and the Haddon Forrester King Medal by the Australian Academy of Sciences in 2016.*

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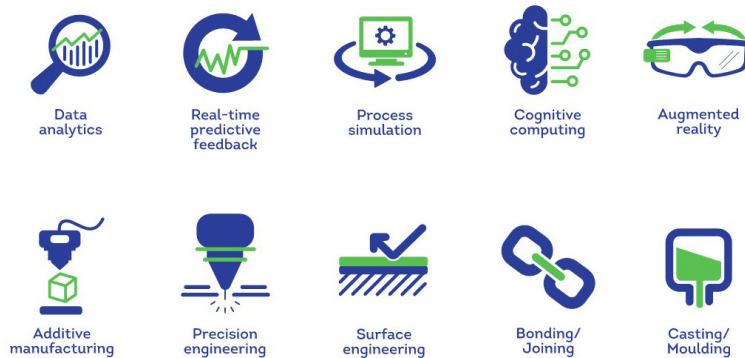
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# I-Form, the SFI Research Centre for Advanced Manufacturing

I-Form, the SFI Research Centre for Advanced Manufacturing, is delivering the next level of understanding and control for complex manufacturing processes. Our mission is to shape the future of manufacturing through high-impact research into the application of digital technologies to materials processing. I-Form brings together a nationwide pool of expertise in materials science, engineering, data analytics and cognitive computing. I-Form is applying exciting developments in digital technologies to materials processing, to improve understanding, modelling and control, thus increasing the competitiveness of Irish manufacturing on the world stage.



Funded by Science Foundation Ireland, I-Form works with industry to advance the low-cost, low-risk design of new products and the manufacture of high-value components exhibiting enhanced material performance, while reducing processing times and achieving improved process reliability. I-Form is actively engaged across a range of different materials processing technologies, with a particular focus on Additive Manufacturing (3D printing).

## Research Areas

- Process digitalisation, for optimisation and control
- Process simulation, for shorter development times
- Data analytics, enabling real-time process feedback
- Augmented reality, for enhanced operator decision-making
- Cognitive computing/artificial intelligence/machine learning
- Additive manufacturing (3D printing)
- Surface engineering
- Precision engineering
- Cyber physical systems
- Bonding/Joining
- Casting/Moulding

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# I-Form

Advanced Manufacturing  
Research Centre

## Industry Partnerships

I-Form has strong collaborative industry engagement in sectors including medical devices, aerospace, automobile and microelectronic components.

Examples of projects I-Form is working on:

- Combining large volumes of existing process data with the examination of new materials and process conditions, in order to create a predictive model for manufacturing a new component. This is aimed at reducing the development time and trial-and-error cycles by more than 50 percent.
- Adding new types of sensors to processes to collect data – this is used to generate new process control algorithms that can adjust the process in real-time to ensure quality. This will significantly reduce the volume and regularity of quality inspection on the finished part.
- Enhancing or replacing an existing manufacturing process with a digitally based equivalent to increase flexibility, reduce cost and maintain competitiveness.

Through collaborative research projects, we can:

- Develop process simulation tools to significantly reduce product development time
- Apply novel data analytics algorithms to your manufacturing process datasets to improve real-time process control
- Develop new process monitoring tools to improve process understanding
- Apply cognitive computing and augmented reality techniques to improve process decision making and control
- Increase understanding and modelling capabilities for product failure modes and mechanisms and develop product improvements
- Explore the application of Additive Manufacturing to an existing or new product for performance, cost, flexibility or individualization purposes

HOST INSTITUTION



PARTNER INSTITUTIONS



Trinity College Dublin  
Coláiste na Tríonóide, Baile Átha Cliath  
The University of Dublin



Waterford Institute of Technology





## Education and Public Engagement:

As a publicly funded research centre, I-Form recognises the importance of engaging with the public about our research and the motivations behind it. Public engagement also offers an opportunity for researchers to improve their communication skills and to ensure there's an ongoing connection to the bigger societal picture. From a theoretical perspective, the ethos of public engagement for I-Form is underpinned by a move towards more participatory models, with the ultimate aim of progressing towards engaged research.

I-Form has developed three long-term goals for its public engagement activities; these tie in with the centre's vision and mission, and all our education and public engagement activities aim to align with one or more of these goals:

- Help address the skills shortage in advanced manufacturing
- Increase the diversity of the advanced manufacturing community
- Grow awareness of the revolution in manufacturing (including the decline of low-skilled jobs; increase in high-skills demand)

I-Form's education and public engagement remit is delivered through two main 'pillars':

- "Advanced manufacturing in education"
- "Diversity & community"

Our programmes include second-level teacher training in 3D printing, Transition Year student innovation challenges, primary school workshops, women in 3D printing meetups, youth group activities, and activities at festivals and other events.

I-Form will develop a range of different academic courses targeted at both undergraduate and graduate students. Online training programmes will target those currently working in manufacturing. These courses will address materials processing, AM and data-driven digital manufacturing, with shared modules enabling multi-site education.



## Key Contacts

### Prof Denis Dowling

Director

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*Prof. Denis Dowling obtained his degree and PhD through DIT and UCD respectively. He worked for over 20 years in Enterprise Ireland in technologically-important materials research. There he played a key role in the development of research activities within Irish companies. Denis took up an academic position in UCD Engineering in 2008. He has had an outstanding record of scholarship including over 165 peer reviewed journal papers and 13 book chapters. He has a demonstrated record in translating research from academia to industry. For example, he has been very active with the SME sector, as evidenced by his 8 patent awards and 6 technology licences. Denis was the recipient of UCD's prestigious Innovation Award (2012) and the Institute of Materials Finishing Gold Medal Award (2013). In the case of the latter he was only the 15th recipient of this, the Institute's highest award, in its 88-year history.*

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# Insight SFI Research Centre for Data Analytics

Insight is one of the largest data analytics centres in Europe. It undertakes high-impact research, seeks to derive value from Big Data and provides innovative technology solutions for industry and society by enabling more informed decision-making.

# Insight

SFI RESEARCH CENTRE FOR DATA ANALYTICS



**Insight is driven by €150 million in funding, supporting 450 researchers across areas such as Sensing and Actuation, Scaling, Model Building, Multi Modal Analysis, Network Data and Decision Making.**

## Research Areas

- Personal Sensing
- Machine Learning and Statistics
- Optimisation and Decision Analysis
- Media Analytics
- Natural Language Processing
- Linked Data/Semantic Web
- Recommender Systems

## Industry and commercialisation

Insight SFI Research Centre offers data analytics solutions for a broad range of industry and other partners in the areas of Health and Human Performance, Enterprises and Services, Smart Communities and Internet of Things, Sustainability and Operations.

Insight's expertise includes the whole data value chain, from the integration of multiple heterogeneous data sources to discovering patterns and trends in data and making sense of them.

## Themes

Insight integrates and demonstrates its research across three themes:

- Augmented Human
- Smart Enterprise
- Sustainable Societies

## Education and Public Engagement:

Education and Public Engagement (EPE) is a strategic priority for Insight, underpinned by a commitment to inform and enthuse the public, and students in particular, about data science and its value to society using demonstrations, internships, school outreach and lab visits.

Insight is developing and rolling out a programme for third-level undergraduate students to de-mystify research, demonstrate the wide range of career options for researchers and encourage the choice of research as a career.

In collaboration with Science Foundation Ireland, Insight EPE is involved in many local and national events including Thesis in 3, digital maker-clubs such as Coderdojo, 091Labs and Hacker-space. Insight also organises, in conjunction with the Central Statistics Office, Apps4Gaps, the first all-Ireland mobile app competition.

### HOST INSTITUTION



### PARTNER INSTITUTIONS



## Industry partners include:

- › Abtran
- › Fidelity Investments
- › Irish Times
- › Shimmer
- › Acquis BI
- › Fujitsu
- › Keepak
- › UTRC
- › Boston Scientific
- › GAA
- › NitroSell
- › Curtiss-Wright
- › Guiyang
- › Orreco
- › Eagle Alpha
- › InsulCheck
- › SAP

## Facilities

- › Software lab space
- › Environmental lab space



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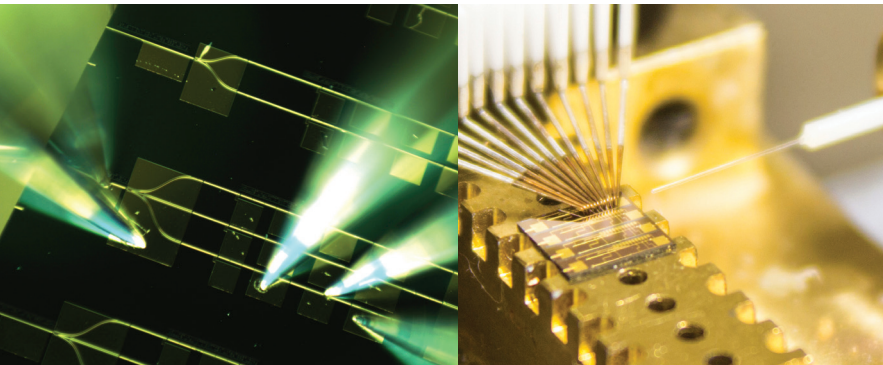


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# IPIC SFI Research Centre

IPIC is Ireland's centre of excellence for research, innovation and PhD training in photonics – the science and application of light – which today represents a 0.5 Trillion\$ global industry.



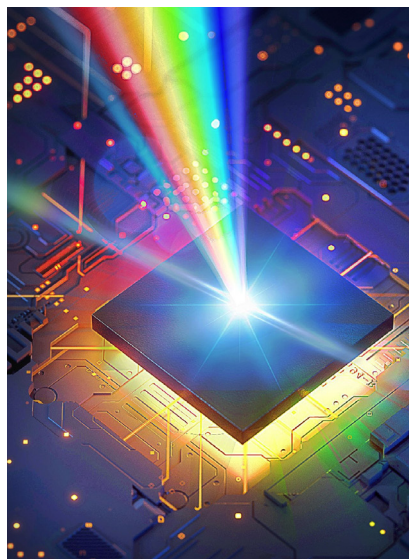
**IPIC's integrated research team has competencies in the theory of novel light-emitting materials through to the design of devices and systems. We accelerate transfer from laboratory to market by using our advanced fabrication and packaging capabilities to develop concepts and deliver low-volume manufacturing of prototypes.**

## Research Areas

Our research focuses on the development of novel photonic integration technologies and their applications in information and biomedical systems. Activities span from photonics theory and materials research, through to device and system fabrication, enabled through our in-house laboratories and semiconductor fabrication and packaging facilities at Tyndall National Institute.

## Facilities

- Modelling and design
- Materials growth
- Device fabrication
- Packaging
- Device characterisation
- Systems testing



## Research programmes

Our core Platform Research Programme represents an investment of over €20 million, and is focused on four inter-disciplinary, world leading Research Themes:

- Monolithic and Heterogeneous Integration - 'Printed photonics on anything'
- Packaging and Hybrid Integration - 'Breaking the packaging cost barrier'
- Optical Communications - 'Coherent everywhere: migration of coherent communications to the network edge'
- BioMedical - 'World's smallest integrated imaging system for guided surgery'

Here we combine the expertise and knowledge from our 17 research groups, with the scale and resources to deliver ground-breaking technology for a wide range of applications, including AR/VR displays, data centres, environmental sensing, medical devices and portable diagnostic systems.

## Industry and Commercialisation

We work closely with over 30 industry partners to develop their next generation products, across Ireland's high growth technology sectors such as ICT and MedTech, supporting their attraction to and growth in Ireland. In addition we commercialise our disruptive technologies through start-up companies and co-ordinate the Photonics Ireland National Technology Platform.

HOST INSTITUTION



PARTNER INSTITUTIONS



## Industry partners include:

- › Analog Devices
- › British Telecom
- › Compact Imaging Ltd
- › Eblana
- › FazTech
- › Firecomms
- › Hooke Bio
- › Integer
- › Intel
- › mBryonics
- › OEWaves
- › Pilot Photonics
- › Radisens Diagnostics
- › Rockley Photonics
- › Seagate
- › Synergia Medical
- › Stryker
- › X-Celeprint



## Education and Public Engagement:

IPIC, in collaboration with SFI, is involved in many local and national events and initiatives, including Smart Futures and the BT Young Scientist Exhibition. IPIC is dedicated to training highly skilled physicists and engineers and to support the next generation of scientists by showcasing the breadth and depth of career opportunities in STEM to students at all levels. Programmes include:

- › The “Secret Spectrum!” interactive workshop for primary schools.
- › Photonics Explorer Kits which provide innovative experiments in the physics of light and optics for secondary school students.
- › Summer Bursary Programme which provides a 10-week fully immersive internship for physics and engineering undergraduate students.

## Key Contacts

### Prof Paul Townsend

Centre Director

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*Paul Townsend is Professor of Photonic Systems Research in the Department of Physics at University College Cork and Head of Photonics at Tyndall National Institute. He is widely-known for his pioneering work on quantum key distribution in optical networks, and for world-leading demonstrations of high-capacity broadband access networks. His work has led to more than 200 peer-reviewed publications, including 40 invited contributions and 30 registered patents in 16 different families. He is a Fellow of the Institute of Physics and a member of the Photonics 21 Board of Stakeholders.*

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# Lero, The SFI Research Centre for Software

A World  
Leading SFI  
Research  
Centre



Lero brings together leading software teams from universities and institutes of technology in a co-ordinated centre of research excellence with a strong industry focus.



As the world's second largest software exporter, Ireland is recognized internationally as a leading location for companies in the software sector. Fifteen out of the top 20 global technology firms have strategic operations in Ireland. Lero is a key pillar in that sector. Since it was founded in 2005, Lero has become one of the best-known, and most highly regarded, software research centres in the world.

## Research programmes

### What We Build

#### Systems

- › Connected systems
- › Next generation architecture

### How We Build

#### Methods

- › Processes
- › Tools and platforms

### For The World We Want

#### Context

- › Values
- › Governance

## Research Areas

Lero has expertise across multiple disciplines from deep theoretical computer science and formal methods through to participatory design, human-computer interaction, ethics and values. Lero works collaboratively with industry partners to identify and solve specific problems.

Lero's research programme comprises systems (what we build), methods (how we build) and context (for the world we want) in six key application domains:

- › Connected autonomous vehicles
- › Health, wellbeing & human Performance
- › Smart communities/cities
- › GovTech
- › FinTech
- › AgriTech & food

## Industry and commercialisation

Lero works with a wide range of industry sectors, stage agencies, educational bodies and international collaborators to deliver on its twin goals of research excellence and social and economic relevance.



HOST INSTITUTION



PARTNER INSTITUTIONS





## Industry partners include:

- › ACI Worldwide
- › Allstate Insurance
- › Analog Devices
- › ARM
- › Bon Secour Hospital Group
- › Dell
- › Dairymaster
- › European Space Agency
- › Fidelity Investments
- › Horizon Globex
- › Hertz
- › IBM
- › Information Mosaic
- › Intel
- › Jaguar Land Rover
- › KOSTAL Automotive Electrical Systems
- › Logitech
- › Liebherr Container Cranes
- › Microsoft
- › McHale Farm Machinery
- › Portable Medical Technology
- › S3 Group
- › Salaso Healthcare
- › Stryker Medical
- › Software Quality Systems
- › STATSports
- › Toyota
- › Tullow Oil
- › United Technologies Research Centre
- › Valeo Vision Systems

## Education and Public Engagement:

Lero, in collaboration with Science Foundation Ireland, is involved in many local and national events including Smart Futures, Coder Dojo, EU Code Week, Pint of Science, the Scratch Competition, and Techweek. Lero has significant involvement in introducing computer programming into the primary and post-primary school curriculum.

Lero promotes awareness in technology through initiatives such as:

- › Scratch Programming in primary schools
- › The Junior Cycle Short Course in Coding
- › Summer Computing Camps

Lero is also involved in computer science at Leaving Certificate and has conducted research for the National Council for Curriculum and Assessment around the provision of computer science in upper second level education internationally. Lero develops and researches Professional Development (PD) for teachers in computer science, in collaboration with Professional Development Service for Teachers (PDST) and Junior Cycle for Teachers (JCT).



## Key Contacts

### Professor Brian Fitzgerald

Centre Director

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*Professor Brian Fitzgerald has been a Science Foundation Ireland Principal Investigator (PI) since 2002. He was one of the pioneers of research into Open Source software and is widely recognized as a global leader in the study of software development processes and methods. He was one of the founding PIs in Lero where he has been a researcher since its inception, apart from a period from 2008-2011, when he served as Vice-President for Research at the University of Limerick. Currently, Director of Lero, he previously held the role of Chief Scientist. He also holds an endowed professorship, the Frederick A. Krehbiel Chair in Innovation and Business Technology, at the University of Limerick. He was recently elected as President of the Association for Information Systems, the global body for information systems worldwide.*

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# MaREI, SFI Research Centre for Energy, Climate and Marine

MaREI is the SFI Research Centre for Energy, Climate and Marine research and innovation, coordinated by the Environmental Research Institute (ERI) at University College Cork. The centre comprises over 200 researchers working with over 50 industry partners, focusing on defined global challenges such as the Energy Transition, Climate Action and the Blue Economy. MaREI delivers excellent research with societal impact by supporting business, informing policy and empowering society, resulting in the development of a dynamic research ecosystem that is responsive to the needs of all our stakeholders. As a driver of collaboration, our researchers engage with stakeholders across more than 36 countries, and have a proven track record of academic excellence.



## Research Areas

- › MRE technologies
- › Materials and structures
- › Observation and operations
- › Coastal and marine systems
- › Bioenergy
- › Energy policy and modelling
- › Energy management

## Research Programmes

MaREI undertakes research related to the energy transition, climate action, and blue economy and uses this research to empower business, shift policy and support society. MaREI helps small energy and marine companies to develop new technologies and provides strategic guidance to large energy companies, thereby harnessing the economic opportunities of the low carbon energy transition. MaREI research increasingly underpins energy and climate policies of the Irish Government and the European Union. Through engaged research and dialogue with communities, MaREI also supports the human and societal dimensions of climate action and marine conservation.

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## Facilities

MaREI also offers unique world-class infrastructure and testing facilities that allow the systematic identification and reduction of development risks through a structured 'Technology Readiness Level' (TRL) development cycle. These include:

- › The Lir National Ocean Test Facility (Lir-NOTF)
- › Limerick Docks tidal tow-testing facility
- › NUIG Structural Research Laboratory
- › Coastal Observing Radar System
- › Mace Head Atmospheric Research Station

## Industry and Commercialisation

In addition to fundamental scientific research, MaREI undertakes targeted collaborative research activities with a wide range of companies, including over 50 industry partners. In so doing, they seek to maintain the forward momentum of the energy, climate, and marine sectors through the development of technologies, tools and processes that will accelerate them towards commercialisation.

## Education and Public Engagement:

MaREI's public engagement programme focuses on the development of a better understanding of the relevance and impact of their research on society, in collaboration with Science Foundation Ireland. Their researchers engage with schools, community groups and the general public through a programme of outreach initiatives aimed at different audiences and by participating in events like Science Week, SeaFest, Cork Harbour Festival and FameLab.

MaREI researchers have considerable experience in stakeholder engagement, working with NGOs, industry, government bodies, local authorities, policy makers and community groups through their research projects, and are focused on communicating science to enable informed decision making.

HOST INSTITUTION



PARTNER INSTITUTIONS



## Industry partners include:

- Aer Lingus
- Analog Devices International
- ARUP Ireland Trust
- Automsoft International
- B9 Power
- Brí Toinne
- Bureau Veritas
- CAPACITÉS
- Commissioners of Irish Lights
- DePuy Synthes
- DP Energy Ireland
- ÉireComposites
- Enerco Energy
- Ervia
- ESB
- ESRI Ireland
- Gas Networks Ireland
- GKinetic Energy
- GRSI Energy
- Henkel Ireland
- IDS Monitoring
- Irish Aviation Authority
- Johns Manville
- KOSMOS Energy Ireland
- MAFIC Black Basalt
- Marine Harvest Ireland
- MYMIC
- National Space Centre
- NTR Foundation
- Open Ocean Energy
- OpenHydro
- Pure Marine Gen
- Qualitas Instruments
- Resilience Energy
- Resolve Marine
- RPS
- RSK Ireland
- Shannon Foynes Port Company
- Shell E&P Ireland
- SkySails
- SonarSIM
- Technology From Ideas
- Techworks Marine
- Teledyne Blueview
- Teledyne RESONeson
- WECCA

## Key Contacts

### Professor Jerry Murphy

MaREI Centre Director  
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Prof Jerry D Murphy is the Director of MaREI, the SFI Research Centre for Energy, Climate and Marine. MaREI has c. 200 researchers across 12 partner Institutions, 50 industry partners and has accumulated research funding of €60 million since inception in 2013. In 2017 Prof Murphy was awarded the Chair in Civil Engineering, only the 12th person to hold this post in 170 years. Prof Murphy represents Ireland at the International Energy Agency (IEA) Bioenergy since 2007. He was elected by his international peers to lead the Biogas Task from 2016 till 2018 and for a second term from 2019 to 2021. In this role he authored/edited 11 IEA Bioenergy reports, 14 case stories and chaired 6 International Symposia. He has published c. 144 peer review journal papers in high-impact journals. Professor Murphy's expertise in gaseous and algal biofuels is world leading. His h-Index (49) places him amongst the highest cited academics worldwide in the fields of biogas and anaerobic digestion. He is also ranked amongst the most cited researchers worldwide in Civil Engineering.

### Prof. Brian Ó Gallachóir

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Prof. Ó Gallachóir is the Director of MaREI, the SFI Research Centre for Energy, Climate and Marine. He is also Professor of Energy Engineering in UCC, and Director of the B.E. (Energy) and M.Eng. Sc. in Sustainable Energy. His research focuses on energy modelling to inform energy and climate change mitigation policy. Brian is an elected Chair of the Executive Committee of IEA's Technology Collaboration Programme on energy systems modelling (IEA-ETSAP). Brian has published extensively (over 100 journal papers, over 4,700 citations and h-index of 36) and has directly informed energy and climate action policy decisions. He is lead PI in Climate Lab, an initiative of UCC's ERI, and is a member of the national Gas Innovation Group. Brian has a B.Sc. from TCD and a PhD from UCC.

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# SSPC, SFI Research Centre for Pharmaceuticals

The SSPC is now recognised internationally as a hub of process innovation and advanced manufacturing for the Pharmaceutical and (bio) Pharmaceutical Sector. The SFI Research Centre has demonstrated capabilities in the design and implementation of flow chemistry, asymmetric synthesis, fundamental and applied aspects of pharmaceutical crystallization, amorphous materials, continuous processing, novel pharmaceutical solid forms and emerging pharmaceutical technologies.

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SSPC has created a consortium of international industry and academic partners that is recognised as the most inclusive and collaborative pharmaceutical/academic partnership in the world. The centre facilitates a unique link between scientists and engineers, within academia and industry in Ireland and globally, to address crucial research questions, that face the global pharmaceutical industry.

SSPC produces PhD graduates and post-doctoral researchers with specific disciplinary expertise, coupled with a broad understanding of cognate disciplines across pharmaceutical science and manufacturing. Building on our industry placement programme, the transition rate of SSPC researchers to industry currently stands at 70% in a global context, the highest of any research centre in Ireland.

## Research Areas

The research carried out by SSPC crosses the pharmaceutical production chain from molecule to medicine, with the objective of gaining a better understanding of mechanisms, controlling processes, and predicting outcomes for the efficient and environmentally sustainable production of safe medicines. Extending into the manufacturing and modelling space, adding expertise in advanced screening, predictive modelling and drug hybrid conjugates.

These are categorised under five themes: Molecules, Materials, Medicines, Manufacturing and Modelling implemented by leading academic experts.

## Research programmes

SSPC offers some of the biggest pharmaceutical companies in the world a unique research proposition that is helping them redefine the way in which important treatments are manufactured. SSPC has already created a leading consortium that exemplifies the most inclusive industry and academic partnerships in the world.

The Research Programme can support your business with innovative research that aims to:

- Reduce Time to Market in Drug Development
- Advance Manufacturing Process and Technologies
- Improve Efficacy of Drug Products
- Address the Needs of New, More Complex Active Ingredients



HOST INSTITUTION



PARTNER INSTITUTIONS



## Membership and flexible business model

The centre welcomes targeted projects with both members and non-members offering two options, 100% industry funded proprietary projects or co-funded projects.

Fully funded projects provide organisations with the opportunity to initiate strategically important and commercially impactful research projects while retaining all the intellectual property (IP). Co-funded projects offer organisations the opportunity to receive 50% project funding by SSPC.

## Industry partners include:

- |              |                  |
|--------------|------------------|
| > Abbvie     | > ClaroChem      |
| > Sanofi     | > Scale-Up       |
| > Janssen    | > Pfizer         |
| > Eli Lilly  | > APC            |
| > MSD        | > SK Biotech     |
| > BioMarin   | > Mettler Toledo |
| > InnoPharma | > Canty          |
| > Alkermes   | > Magrotech      |

## Education and Public Engagement (EPE):

The SSPC EPE programme is broad and varied, targeting pupils, teachers, parents, grandparents and the wider public. The centre places particular focus on working with female pupils, those from a disadvantaged socio-economic background, and those living in geographical areas with little access to Science, Technology, Engineering and Mathematics research and activities. Some highlights of our programme are our Teacher Continuous Professional Development Programme, our Transition Year Work Experience Programme, the SSPC Structured PhD and our Innovation in Medicines Project.



## Key Contacts

### Professor Michael Zaworotko

Scientific Director

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*Professor Zaworotko is a Bernal Chair of Crystal Engineering at the University of Limerick. He is among the world's top 20 research chemists and secured the first award under the relaunched Science Foundation Ireland (SFI) Research Professor programme. His research interests focus on designing crystal structures that can be used in the pharmaceutical and energy industries.*

### Professor Gavin Walker

Scientific Director

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*Professor Gavin Walker is Bernal Chair of Pharmaceutical Powder Engineering and a principal investigator in the SFI Investigators Programme at UL and the SSPC Spokes Project, MOMEnTUM. His expertise is in pharmaceutical process engineering and modelling of particulate systems.*

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## SSPC, the SFI Research Centre for Pharmaceuticals

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# VistaMilk

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## SFI Research Centre for Digitalising Dairy Production and Processing

VistaMilk, the SFI Research Centre for precision-based dairy production and processing, will lead the Agri-Food technology sector through innovation and enhanced sustainability across the entire dairy supply chain.

While focused on pasture-based dairy production, the advances developed in the centre will be equally applicable to confinement dairy production and processing systems as well as acting as a catalyst for global growth in the Agri-Tech sector. This will be achieved by greatly improving the soil to gut supply chain connectivity, thereby improving resource efficiency, better meeting consumers' expectations and improving profitability and resilience.



### Research programmes

VistaMilk will develop novel, and advance existing, electronic monitoring and actuation technologies to transform the Irish dairy and Agri-Tech sectors into global leaders. It will specifically address pasture-based dairy production, improved processability and the generation of novel, higher value-added products.

In addition to the creation of new sensing and actuation paradigms, particular focus will be given to developing state-of-the-art analytical techniques applied to large scale, sensor data-sets delivered by advanced network and communication technologies.

### Facilities

- **Teagasc** - state-of-the-art research laboratories, including the largest DNA sequencing facility in Ireland and >1500 experimental dairy cows
- **Tyndall** - fully serviced wet chemistry laboratory featuring highly sophisticated nanofabrication technology
- **Insight** - specialised software for data analytics and for processing streamed data
- **TSSG** - infrastructure for testing and measuring networking protocols

### Industry and commercialisation

Through a strategy of highly-interconnected, innovative and ambitious scientific ventures and disciplines, VistaMilk will develop and deploy the scientific solutions and value-creating decision support tools, informed by sophisticated data analytical approaches, to empower the dairy industry in advancing efficiencies across all components of the food chain, and, in doing so, develop a vibrant and dynamic Agri-Tech indigenous industry.

HOST INSTITUTION



PARTNER INSTITUTIONS





## Industry partners include:

- › Alltech
- › Alt
- › Analog Devices
- › Anuland
- › Carbery
- › Cork County Council
- › Dairygold
- › Dairymaster
- › Devenish Nutrition
- › DLF Seeds
- › Dovea Genetics
- › Germinal Ireland
- › Glanbia
- › Goldcrop
- › Grasstec
- › Grazebot
- › Howard Foundation
- › Industrial Organica
- › Irish Holstein Friesian Association
- › Kerry Group
- › Lakeland Dairies
- › Mootral
- › Munster Bovine
- › Nestle
- › Nutribio
- › Ornua
- › Progressive Genetics
- › Reprodac
- › Terra Nutritech
- › United Technologies Research Centre
- › Volac
- › Weatherbys
- › Yara
- › Zoetis

## Education and Public Engagement:

The mission statement of the VistaMilk outreach program will be to “promote an understanding and appreciation of the role of information and communication technology and other sciences in the sustainable delivery of consistently high quality, safe dairy products through engagement with stakeholders and the general public”. The strategy of engagement will help the general public to judge the importance and relevance of science in achieving the goal of more sustainable and safe food production systems. Awareness will also be raised around the importance of dairy food in diet.

## Key Contacts

### Prof Donagh Berry

Director

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*Professor Donagh Berry works as a senior principal investigator in statistical genetics at Teagasc, Moorepark, Ireland since completing his PhD in animal genetics in 2003. He is responsible for the development of the national dairy cow breeding objectives which includes the prioritisation of the relative importance of different animal characteristics in the national breeding goals, generation of statistical and genomic models to generate accurate individual animal estimates of genetic merit for all traits, and the development of optimal breeding schemes to ensure long-term genetic gain.*

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