

2014

ResearchNews, Volume 7, 2014

Dublin Institute of Technology

Follow this and additional works at: <https://arrow.tudublin.ie/jouresiss>

Recommended Citation

Dublin Institute of Technology, "ResearchNews, Volume 7, 2014" (2014). *Issues*. 4.
<https://arrow.tudublin.ie/jouresiss/4>

This Other is brought to you for free and open access by the ResearchNews at ARROW@TU Dublin. It has been accepted for inclusion in Issues by an authorized administrator of ARROW@TU Dublin. For more information, please contact arrow.admin@tudublin.ie, aisling.coyne@tudublin.ie, vera.kilshaw@tudublin.ie.

Volume 7

ResearchNews



BIOTOXIN RESEARCH TO STRENGTHEN MONITORING

DIT ON THE MOVE

NEW FOOD RESEARCH AIMS TO SUPPORT IRISH COMPANIES

SMART PLANNING FOR HEALTHCARE SERVICE DELIVERY



Contents

- 01 **DIT on the move**
- 03 **Dedicated research facility at DIT Grangegorman campus**
- 04 **EHSI showcases at international conference**
European Radiation Research Conference hosted by DIT
- 05 **Planning for Healthcare Service Delivery**
- 06 **Conference news**
- 08 **Intergenerational learning project**
- 09 **Sunny Dublin hosts solar energy researchers**
- 10 **Biotoxin research to strengthen monitoring**
- 12 **Business, Society & Sustainability Research Centre**
- 13 **Two new DIT spin-outs**
- 14 **IEO researchers to commercialise**
- 15 **New device aims to improve ultrasound diagnosis**
- 16 **Launch of groundbreaking Encyclopaedia of Music**
- 17 **The Digital Commons Network Portal**
- 18 **Two Become One**
- 19 **Music at the Abbey Theatre**
Novel treatment to protect against surface corrosion
- 20 **Energy wizard helping Irish consumers reduce energy costs**
- 21 **Improving efficiency in the food industry**
Global research on contemporary housing
- 22 **Fiosraigh 2013 Winners**
- 24 **Making the most of solar photons**
- 25 **Children in Ireland deeply affected by cyberbullying**
- 26 **The future is bright for digital entrepreneurs**
- 28 **Remember toddler privacy online**
- 29 **Launch of Dublin Music Trade History**
- 30 **Video-sharing sites top the ranking of risky platforms**
- 32 **DIT food research supports innovation in Irish companies**
- 34 **New EU funding opportunities**
- 36 **Research evaluates inner-city schools computerization**
- 37 **New technology for learning languages**
- 38 **Mercer's Hospital Music Collection**
- 40 **New DIT research funded by SFI**
- 41 **Research shows lives saved by ban on smoking**
- 42 **Research and Innovation on show**
- 44 **Research Foundation launched at music symposium**
New project investigates cancer diagnostics
- 45 **Innovation award for novel paint company**
- 47 **DIT academic chairs expert advisory group**
- 48 **Industry-led research centres**
- 50 **New DIT Adjunct Professors**
- 54 **Enjoying a Fulbright experience**
- 56 **Getting ready for Horizon 2020**
- 58 **Novel packaging system to improve meat safety**
- 58 **Effective and reliable optical system**
- 60 **Research investigates alveolar bone support**
- 62 **New technologies developed by DIT researchers**
- 64 **First Irish-trained optometrists graduate in Mozambique**
- 66 **New control technology for infant formula**
- 67 **Launch of new sustainable design journal**
- 68 **Research round-up**

Editorial

Research in Dublin Institute of Technology is critical, both in itself and as the means by which our curriculum remains up-to-date. To underpin this work, next year we will open new dedicated research facilities on our city centre campus at Grangegorman. These new facilities will support research on all aspects of the effects of the environment on our health: directly and indirectly, immediate and long-term. These include air and water quality, energy use and the food we eat.

Researchers from Sciences & Health, Engineering and the Built Environment, and Social Sciences will be co-located in a unique multi-disciplinary environment.

A new business incubation centre will be located on the ground floor of the facility which will enable us continue our record of being the most successful converter of research into licences and spin-offs with the attendant job creation.

To date over 1,300 people work in companies developed from activities created in DIT. Our new incubation space will be at the heart of the new Grangegorman campus; symbolic of the importance we place on innovation in DIT.

This issue of our Research magazine is a snapshot of just some of our current research in DIT. If you wish to know more I invite you to contact the relevant researchers directly. They will be only too willing to share their work with you. Much of our work is collaborative with other Institutions and should you wish to collaborate with DIT, whether you are developing a product for industry or research laboratories elsewhere, please do not hesitate to contact us.

Professor Brian Norton
President DIT

Editor: Jean Cahill

Design: www.designetc.ie

Print management: Arrow Print Management Ltd

E: research@dit.ie

DIT on the move



Signalling a massive escalation in the Grangegorman campus project, An Taoiseach, Mr Enda Kenny TD, performed the official “turning of the sod” ceremony in Grangegorman on the 12th December 2013. Minister for Education and Skills, Ruairi Quinn TD, and local TDs Minister of State for European Affairs, Paschal Donohue TD, and Deputy Maureen O’Sullivan were also present along with representatives of DIT, the HSE and the local community.

The Taoiseach also met representatives of the construction companies currently working on the site as well as a large contingent of construction workers. The Grangegorman project will deliver a new unified campus for all of Dublin Institute of Technology. In July 2012 as part of the Government’s Jobs Stimulus Plan, Minister for Public Expenditure and Reform Mr Brendan Howlin TD announced that a Grangegorman PPP project, worth €200 million would go ahead as a flagship project. That project went out to tender on 31st October and the two quadrangles which are being built through this process will be occupied by 10,000 DIT students in September 2017.

Describing the project as transformative for Dublin's inner city in terms of higher education, health, community and enterprise, the Taoiseach said *"The Grangegorman Project is a key capital development in the Government's Jobs Stimulus Plan. The future of the Irish economy is in enterprise and innovation and the development of Grangegorman fits perfectly with that goal. In the development of the site alone, 300 construction jobs will be created which will provide a boost for some of those who were hit the hardest when the construction bubble burst."*

He continued *"In tandem with the Luas Cross City project this should be a really positive development for the north inner city in Dublin. The Government's top priority is getting people back to work and we will continue to pursue relentlessly every opportunity to create jobs and build economic recovery."*

Speaking at the event, President of Dublin Institute of Technology, Professor Brian Norton, said *"As can be seen from the activity on site today, we are well on track for the arrival of the first 1000 DIT students next September—students of Art and Design, Photography, and Social Sciences."*

This exciting new campus will play a key part in the education and development of a new generation of graduates who will become the leaders, professionals, technologists and entrepreneurs we need to drive Ireland's future competitiveness. After many years of planning, we are extremely grateful to the very many colleagues in the GDA, the Department of Education and Skills, the NDA—and in DIT—for their work in delivering this project."



Professor Brian Norton explains the plans.



Minister for Education Ruairi Quinn, TD confers with Taoiseach Enda Kenny TD.

Contracts, totalling approximately €50 million, are currently underway. These have been awarded to a number of companies, including Roadbridge, Rhatigans, O'Connor Sutton, Purcell, and Burkes. The project is being procured and delivered by the Grangegorman Development Agency (GDA). A Local Employment Charter has been put in place which aims to provide 20% of new jobs to local people.

The two quadrangles are due for completion at the same time as the Luas Cross City, which will provide a new sustainable public transport service for the city and for the students and staff coming to the new campus in Grangegorman.

In terms of other community facilities, the site infrastructure project which was launched in December will deliver parkland walks and a playground. A new primary school is to be developed shortly and a public library will eventually be co-located with the DIT library.

The €26 million contract, which has been awarded to Roadbridge Ltd by the Grangegorman Development Agency, sees over 200 construction workers on site, providing the underpinning services that will enable the build out of the new development.

In addition to launching the 'Site Infrastructure and Public Realm' contract, the Taoiseach also announced that a further 100 construction industry jobs will come on stream in Grangegorman, as three more contracts commence.

These are being carried out by Irish contractors JJ Rhatigans & Company, Bourke Builders and Purcell Construction Ltd. Between now and 2017 it is estimated that a total of 3,500 construction jobs will be created on the Grangegorman project.

www.dit.ie/grangegorman

Dedicated research facility at DIT Grangegorman campus

PRTL Cycle 5 funding of €10.25m supports the development of a custom designed 2500m² research facility on the Grangegorman campus. It incorporates shared core laboratories, specialised laboratories, office space and seminar/meeting rooms to accommodate 136 research personnel including 90 PhD students, 40 researchers, administrative and technical staff.

It will create a critical mass of interdisciplinary and cross-sectoral research specialists, engaging in academic research with the knowledge and expertise of relevant professionals to generate collective responses to environmental health issues.



The specific areas of research include: water, food, energy and bio-monitoring. Underpinning the research are cross cutting themes including: Social and Educational Research, eHealth and assistive technologies, vision sciences and medical technologies.

The first new building on the Grangegorman campus will house phase—one a 4,600m² Research Hub. It will be optimally located near the undergraduate science and engineering buildings in the Central Quads to facilitate and promote the integration of research activities on campus.

This five story state-of-the-art building will provide accommodation for 2,600m² of research laboratories, offices and training facilities in addition to shared spaces to facilitate networking/ideas exchange and promote interdisciplinary research.

A 2,000m² commercialisation centre will provide researchers with on-site access to commercialisation expertise and incubation units that will be available for new start-up (spin-in/out) companies. The building has been designed for flexibility, to allow expansion of research activities in the future.

e: noreen.layden@dit.ie



L to R: Dr Noreen Layden, Dr Aoife McGowan, Dr John McGrory, and Dr Damon Berry pictured at the EHSI stand.

EHSI showcases at international conference

Dr Noreen Layden, Head of DIT's Environmental Health Sciences Institute (EHSI), researchers and members of the Grangeormon Campus Planning Group attended the World of Health IT Conference and Exhibition to promote DIT's health sciences research expertise and to spread the word about EHSI.

The exhibition was held in the Convention Centre, Dublin, as part of the Irish Presidency of the Council of the European Union. The event brought together industry partners and providers from across Europe as well as important government and regional decision makers.

e: noreen.layden@dit.ie

European Radiation Research Conference hosted by DIT

The Radiation and Environmental Science Centre hosted the 2013 European Radiation Research Society Annual meeting in Dublin Castle on behalf of the Irish Radiation Research Society. The conference was very successful with more than 300 delegates representing 26 countries from all over Europe but also across North and South America, the Middle East, Asia, Africa, and Oceania.

Four keynote lectures, three prestigious award lectures, 32 invited speakers, 49 proffered papers, 41 oral posters and 188 posters were delivered in 15 scientific sessions covering all of the major disciplines of radiation science, including physics, chemistry, biology, medicine, and radiation protection.

A 'Clinical Day' focussed on cancer treatment and prevention. It attracted professionals, such as medical physicists, radiation and clinical oncologists, radiographers and radiobiologists/cancer biologists working in the cancer field with an interest in radiation science.

e: fiona.lyng@dit.ie

Planning for Healthcare Service Delivery

Smart planning to provide excellence in healthcare services has come into sharp focus in recent years as health service providers seek to do more with less resources. Reduced budgets are limiting the range of options for health service planners and has seen them look to innovative smart solutions to plan effectively. The 3S Group (Smart Sustainable Solutions for complex business processes) is a College of Business research initiative to develop solutions for complex systems such as the healthcare and supply chain. It was formed in 2008 by Dr Amr Arisha, School of Marketing, as a multidisciplinary research group with a vision to become a leading international centre of excellence in promoting innovative solutions to problematic systems.

Hospital and medical facilities are among the most complex systems in the world. Numerous factors contribute to overall efficiency and work-flow, including: patient flow, staff utilisation, and resource management. The 3S Group has teamed up with hospital professionals in several projects involving the HSE and major Dublin hospitals to create smart tools for health care service planning using simulation modelling. These tools enable planners to understand the complexities and nuances of healthcare facilities and examine new strategies—all without the need for changing the settings of the current system. The virtual model has been developed in two initiatives: Emergency Department and Elderly Care Planning.

Emergency Departments

Due to the internal dynamics and complexity of Emergency Departments, longer waiting times, increased numbers of patients on trolley beds, and service failures are issues that face healthcare service planners in every hospital in Ireland. The Mater Hospital has teamed up with 3S Group to develop a smart planning tool to improve service and reduce patient waiting times. The smart planning tool developed in this collaboration has provided hospital management with a clearer picture of the bottlenecks in the system and the sources of variability. A process mapping exercise provided insights into patient flow and the activities required at every stage. Non value added activities were examined using Value Stream Mapping and a new balanced score card to monitor performance is now being developed. Integration of different techniques will support a comprehensive smart planning tool that will assist the decision makers in the Mater to adapt lean strategies while improving the service quality level.

Both staff and patients can benefit from the tool since it considers the resource utilisation and staff burn-out levels. Results to date have been used in the planning of the new Mater Hospital Emergency Department.

Elderly Care Planning

Population ageing is creating an immense pressure on hospitals to meet the growing demand for elderly healthcare services. In spite of a rapid increase in total healthcare expenditure in the 2000s, Ireland still has modest primary and community health services, with two-thirds of the population paying the full out-of-pocket cost of primary care, and a model of care that favours hospitals over community services. A shortage of community care beds contributes to delayed discharges from acute hospitals. As a result, new admissions into hospitals are restricted and hospitals carry avoidable costs. Research indicates that acute beds are among the most expensive resources of the entire healthcare system. Consequently, many elderly and dependent patients who have finished their hospital treatment are being forced to remain in hospital beds for over six months due to the unavailable alternatives.

The 3S group and HSE team has developed a smart System Dynamics model to map the dynamic flow of elderly patients in the Irish healthcare system. This tool helps decision makers to envisage the complexity in the system due to the infringing parameters. Stock and flow intervention policies were proposed and evaluated subject to projected future demographic changes. The model shows that a significant reduction of bed occupancy (up to 25%) can be achieved with considerable savings in related operating costs. Using a system dynamics approach enables policy makers to propose new strategies to overcome delayed discharge for elderly patients. Currently 3S Group is working on developing a nation-wide model to facilitate long-term planning for the non-acute service sector for the elderly.

The research group in collaboration with Irish hospitals and the HSE has developed innovative solutions to complex non-linear stochastic problems with a high level of uncertainty, variability and resource constraints. Smart planning tools (information-centred solutions) are the way forward into a leaner efficient Irish Healthcare system.

e: amr.arisha@dit.ie

Higher Education Policy Conference

The Higher Education Policy Research Unit's (HEPRU) conference "Measuring the Public Value of Arts and Humanities Research" was the closing event for a three-year research project focused on improving understanding about the value of research in the arts and humanities and how such value might be measured or demonstrated. The "HERAVALUE" project was conducted with partners in Norway and the Netherlands and was funded by 21 European research councils and the European Science Foundation.

Magnus Gulbrandsen (Nordic Institute for Studies in Innovation, Research and Education) and Paul Benneworth (Center for Higher Education Policy Studies at the University of Twente), Norwegian and Dutch country representatives respectively, attended and speakers were: Dominic Scott (University of Virginia and Cambridge), Jordi Molas-Gallart (Spanish Council for Scientific Research), Dave O'Brien (City University London), Ingeborg Meijer (Centre for Science and Technology Studies, University of Leiden), Eucharia Meehan (Irish Research Council and Higher Education Authority), and Laura Lugg (Arts and Humanities Research Council, United Kingdom).

e: ellen.hazelkorn@dit.ie

World Enterprise Conference

DIT will host the International Council for Small Business World Conference on Entrepreneurship—(ICSB 2014) in Dublin (11th to 14th June 2014). The conference will have many different elements to it which will include: a Marketplace, Online Platform, Case Writing Competition, Journal Special Edition, Silent Conference, Live Twitter and Networking Technology. The keynote speakers include senior politicians, globally successful entrepreneurs, and international experts from academia and support agencies in the area of entrepreneurship and sustainability.

The theme of ICSB 2014 is Entrepreneurship and Sustainability which will address the current international movement towards sustainability, whether that is related to our environment, our cultures, our businesses or our economies.

e: thomas.cooney@dit.ie



Delegates at Enter 2014 enjoy the welcome party in the Guinness Storehouse

Major eTourism Conference

The largest eTourism Conference of its kind in the world took place in January in Dublin. DIT was the local organiser for this event which, in its 21st year was held in Ireland for the first time in the Chartered Accountants House on Pearse St. As part of the conference a dedicated Irish eTourism Day was held at the same venue. It brought together a cross-section of best practice on the use of ICT in the Irish Tourism industry. It engaged the Irish eTourism community through discussions about topics that are of particular interest to the Irish tourism and hospitality industry including eCommerce, smart technologies and eMarketing. The theme of the conference was "Managing the Customer experience in the Digital Age" with a specific focus on "Be Inspired".

e: patrick.horan@dit.ie

Surface Coating Conference

The Irish Adhesion, Surface Coating and Composites (IASCCO) Conference hosted by DIT CREST and organised by the Society of Chemical Industry's All Ireland and Materials Chemistry Groups was held in the Focas Institute in May. It brought together researchers from industry and academia to discuss their research in adhesion, surface science, surface coatings and composites under the theme of Challenges for 2020.

e: brendan.duffy@dit.ie



John O'Connor, Dean, College of Arts & Tourism

International Tourism Conference

The Travel and Tourism Research Association (TTRA) held their annual Europe conference 'New Directions: Travel and Tourism at the Crossroads' in Dublin in the Radisson Blu Hotel, Golden Lane in June 2013. Dr Kevin Griffin, School of Hospitality Management and Tourism, was Chair of the Scientific Committee and along with his colleagues in the College of Arts & Tourism organised this key event in the TTRA calendar. The conference explored emerging issues as the travel and tourism industry finds itself at a post-recession crossroads. The event brought together international scholars, researchers, policy makers and tourism professionals to explore new directions and identify new opportunities.

e: kevin.griffin@dit.ie



Delegates at the TTRA Conference

Intergenerational learning project



Dr Carmel Gallagher and Anne Fitzpatrick, Centre for Social and Education Research, are members of an 8-country consortium that was awarded European Commission funding under the Lifelong Learning Programme (GRUNDTVIG). The two-year project called 'Together Old and Young (TOY)', is built on the premise that constructive relationships between young children and older people can benefit both generations and communities as a whole.

The broad context for the project is Europe's changing demographics and social and family structures which is leading to fewer opportunities for older people to interact with young children. Older people are living longer but many are increasingly isolated from family members and young generations due to urbanisation, migration, family breakdown and increasing spread of extended networks of families across communities and continents. Children are growing up in smaller families with fewer siblings and have fewer opportunities to connect with other age groups.

Family sizes in general are getting smaller, the free market economy in Europe is expanding and the pursuit of a better quality of life has also weakened social ties. Generations are being separated into same age institutions and spaces.

Although grandparents may be involved in the care of children, overall, more children are attending Early Childhood Education and Care (ECEC) settings from an early age. Here, they are frequently organised in same-age groupings and are cared for by predominately young to middle-aged women.

Intergenerational programmes are potential vehicles for the purposeful and ongoing exchange of resources and learning among older and younger generations for individual and social well-being. The TOY project will investigate learning opportunities which bring together older people and young children to the mutual benefit of both generations.

The project meets the challenge of improving opportunities for active ageing and solidarity between generations by increasing the capacity and participation of older people (50/55–74 years) in informal learning opportunities with young children, in a variety of community spaces.

The consortium brings together the worlds of older care, active ageing and senior volunteering on the one hand, and early childhood education and partnership with families in a new innovative figuration on the other. The integration of intergenerational learning and community development will facilitate capacity building through the development of shared indoor and outdoor community spaces.

The overall aim of the project is to raise the level of awareness, skills and knowledge regarding intergenerational practice involving old and young among the educational and community organizations, local authorities, NGOs, and other partner organisations. The quality of intergenerational learning and practice will be improved. Furthermore an accessible body of knowledge and practical resources for those wishing to organize intergenerational activities will be available in 7 language versions. It is planned that results will be exploitable in other countries in addition to partner countries.

DIT is identifying examples of good practice (Positive Deviance) in Ireland and Western Europe and disseminating to research partners who are undertaking Positive Deviance Action research. Training and pilot action programmes will be developed to build capacity for practitioners such as training mentors to become intergenerational coaches.

The co-ordinators of the project are from the International Child Development Initiatives (ICDI), Leiden, the Netherlands, an NGO working to improve the care and education of children in Central and Eastern Europe. Collaborating partners are from Slovenia, Italy, Poland, Spain, and Portugal.

e: carmel.gallagher@dit.ie

Sunny Dublin hosts solar energy researchers



The Dublin meeting of EU COST Action TU1205 in the summer of 2013 brought together 50 experts from 15 countries across Europe. The COST Action is chaired by DIT Adjunct Professor, Dr Soteris Kalogirou from the Cyprus University of Technology, Limmasol.

While the delegates (pictured above) were working hard to develop strategic plans and milestones for the project with the focus on integrating Solar Thermal Systems into the architecture, fabric and construction of new and existing buildings, the temperatures in Dublin reached their highest for the year to date! Energy use in buildings represents 40% of the total primary energy used in the EU and therefore developing effective energy alternatives is imperative. Solar thermal systems (STS) will have a main role to play as they contribute directly to the heating and cooling of buildings and the provision of domestic hot water. STS are typically mounted on building roofs with no attempt to incorporate them into the building envelope, creating aesthetic challenges and space availability problems.

This Action aims to foster and accelerate long-term development in STS through critical review, experimentation, simulation and demonstration of viable systems for full incorporation and integration into the traditional building envelope. Viable solutions will also consider economic constraints, resulting in cost effective Building Integrated STS. Additionally, factors like structural integrity, weather impact protection, fire and noise protection will be considered.

e: david.kennedy@dit.ie

Biotoxin research to strengthen monitoring



Mussel farm

Researchers in the School of Chemical & Pharmaceutical Sciences have been undertaking collaborative research with the Marine Institute (MI) for more than 15 years. They have focused on veterinary drug residue analysis in farmed finfish; analysis of persistent organic pollutants in marine biota, sediment and seawater; and analysis and toxicological evaluation of shellfish biotoxins.

Dr Barry Foley, Assistant Head of School and his postgraduate student Jenny Geraghty are currently researching a class of biotoxins called azaspiracids (AZA) which were originally discovered in mussels from Killary Harbour following toxic episodes in 1995. Dr Foley has already completed two studies on azaspiracids with the Marine Institute (MI) and he is now collaborating with them on this major research project which aims to strengthen the national biotoxin monitoring programme. The €1.5m project led by the MI was funded under the National Development Plan (2007–2013). The project consortium includes partners from France, Germany, Norway, USA and Canada.

Background

Marine microalgae are the main food supply for bivalve molluscs and are a natural, renewable and environmentally friendly resource for the shellfish aquaculture industry. However, a few species of these microalgae produce compounds called azaspiracids that occasionally accumulate in bivalves and may be harmful to humans at elevated levels when consumed.



Algae can grow exponentially (algal bloom) when the environmental conditions (light, nutrients, temperature) are optimal, and can accumulate in shellfish to toxic levels over as little as a few days. Azaspiracids are regulated lipophilic marine phycotoxins that cause Azaspiracid Shellfish Poisoning (AZP). The acute symptoms of AZP are nausea, vomiting, diarrhea and stomach cramps with the onset of symptoms within hours of ingestion. Most shellfish producing countries have implemented programmes to monitor both the toxic algae and the shellfish potentially exposed to these algae and the aim of this research project (ASTOX2) is to strengthen the programme in Ireland by:

- elucidating the source organism of azaspiracids;
- clarifying relative and combined toxicities and mode of action of azaspiracid analogues and other lipophilic toxins;
- developing a sustainable supply of AZA-calibrants in support of international efforts to validate quantitative test methods and refine, reduce and replace animal testing.

Research programme

The availability of toxins when consumed can contribute to the overall toxic effect and may have implications for established regulatory limits. However, little is known about the pharmacokinetics of AZAs in mammalian tissue so the digestion process needs to be understood before designing pharmacokinetic studies. The DIT/MI team has therefore focused on the fate of AZA compounds during the digestive cycle. They are:

- elucidating the source organism of azaspiracids;
- clarifying relative and combined toxicities and mode of action of azaspiracid analogues and other lipophilic toxins;
- developing a sustainable supply of AZA-calibrants in support of international efforts to validate quantitative test methods and refine, reduce and replace animal testing.

The bioaccessibility of AZAs in cooked (10 minutes @ 90°C) and uncooked blue mussels (*Mytilus edulis*) was investigated to determine whether passage through the mammalian gastrointestinal tract (GIT) could affect AZA availability for subsequent absorption.

Digestive simulation was designed to mimic conditions in the GIT using synthetic saliva, gastric and pancreatic juices. Samples of homogenised blue mussel tissue were subjected to various pH conditions for durations normally encountered in the gastrointestinal tract, and samples were agitated at 37°C.

At incremental time intervals the reaction was stopped and Liquid Chromatography Tandem Mass spectrometry (LC-MS/MS) was used to analyse the undigested tissue and digestive fluids for the three regulated toxins: AZA1, AZA2 and AZA3.

Early results indicate that cooking has a significant effect on the release of AZAs from the tissue during digestive simulation. The concentration of AZAs in uncooked mussel tissue reduced significantly (AZA1, 64%) but the majority of AZA toxins remained in the cooked mussel tissue and would therefore be less available for absorption.

Feed trial

An AZA-contaminated pig feed was developed for an *in vivo* study on pigs. The hepatopancreas of highly AZP contaminated mussels were freeze dried, a solvent extracted and a semi-pure isolate containing AZA1, AZA2 and AZA3 toxins obtained using double partition and column chromatography.



Feed pellets for trial

The isolate was analyzed for its toxin content and then incorporated into a commercial pig feed. First the feed pellets were homogenized in a blender and sieved, and then water and toxin isolate were added to the resulting powder, before it was reformed and dried.

The feed was then analyzed to determine the final concentration and to ensure homogeneity of toxins throughout the pellets. Four pigs including a control were included in the feeding trial carried out by partners in the Norwegian School of

Veterinary Science. The pigs consumed the complete dose of AZA contaminated feed and blood samples were collected throughout a 24 hour period. At the end of the trial the researchers completed a pathological examination of the tissues. Multiple tissue types, stomach content, urine and faeces were also collected for LC-MS/MS testing by the DIT/MI team.

Dose rates were based on an initial trial and LD₅₀ derived from mouse studies. The dose rate was at a level exceeding that ever observed in naturally contaminated shellfish and at levels that would result in clinical signs in humans (diarrhoea and vomiting). The clinical sign in the pig were not as expected with only slight drowsiness towards the end of the trial. The clinical signs suggest that the pig model is more closely related to the mouse than the human model. Pathological examination of the tissue showed only minor damage to the intestines.

The tissues were tested for the regulated toxins AZA 1, 2, and 3 along with the AZA metabolites AZA 4 to 12, 17 and 19. Analysis of the tissues showed that AZA toxins were able to cross the intestinal barrier and enter the blood and were widely distributed throughout the pig tissues. In addition to the regulated AZAs the other AZA analogues tested were also detected in varying concentrations in different tissues demonstrating that AZAs are also undergoing transformation within the mammalian system. The levels detected in the tissue, stomach content, urine and faeces were significantly lower than the concentration of the feed, suggesting that phase 2 metabolism is also playing a significant role.

The opportunity to carry out this study on a mammalian system other than mice has yielded significant information in relation to the pharmacokinetics (absorption, distribution, excretion and metabolism) of azaspiracid. This information is invaluable to the European Food Safety Authority when carrying out risk assessment as part of the evaluation of regulatory limits for azaspiracids.

The research includes contributions from Conor Duffy, Dr Daniel O'Driscoll, Jane Kilcoyne and Joe Silke, Marine Institute, Co. Galway and Dr John Aasen, Norwegian School of Veterinary Science. This project (Grant-Aid Agreement No. PBA/AF/08/001) is carried out under the Sea Change strategy with the support of the Marine Institute and the Marine Research Sub-programme of the National Development Plan 2007–2013, co-financed under the European Regional Development Fund.

For more information: e: barry.foley@dit.ie

Business, Society & Sustainability Research Centre goes from strength to strength

Since its foundation a little over three years ago the Business, Society and Sustainability Research Centre (BSSRC) team based in the College of Business has:

- organised research seminars
- published widely
- recruited postgraduate researchers from both home and abroad
- benefitted from postdoctoral researchers in its 3S group
- celebrated a number of collected volumes published by its members
- co-ordinated the work of diverse groups researching in related areas
- hosted national conferences
- seen its members travel the globe to carry out and present world class research work.

Three members of the BSSRC research team were also awarded research fellowships by the College of Business following a very competitive process in 2013.

Dr James Hanly's (School of Accounting and Finance) fellowship will allow him to expand his work in the area of risk management, volatility modelling and hedging. Dr Paul F Donnelly's work takes a processual and historically informed approach to developing new organizational theories. Dr Brendan K O'Rourke received a College of Business Research Fellowship to continue his work in examining the constructions of the economy, particularly in terms of enterprise and strategy discourses.

This investment by the College coupled with the contributions to research being made by all its research team means that the Business, Society and Sustainability Research Centre will continue to celebrate, harness and facilitate learning that contributes to national and international progress on the important issues facing business and society.

Postgraduate students

Over a dozen postgraduate researchers are associated with the Centre largely due to the number of successful funding applications being made by its members. Jennifer Manning, for example, joined the centre as a winner of a 2012 DIT Fiosraigh Scholarship.

Her work, under the supervision of Dr Paul Donnelly, looks at fair trade co-operatives run by indigenous women in Guatemala and so aids in the development of socially and economically excluded indigenous communities. Jennifer is conducting fieldwork in Guatemala.

Based in Ireland, Martin Duffy works as a management consultant across Europe. He is pursuing a part-time PhD at the centre. As an engaged scholar Martin is looking at how the discourse of meetings, when viewed as a system constitutes the organization of a small to medium sized enterprise. His work, with Dr Brendan K O'Rourke, is published in the Journal of Business Communications. Martin has also published in the latest issue of Defence Forces Review.



Jennifer Manning

These two research students are researching the intersections between business and society in very different ways, from different backgrounds and with different perspectives but each is concerned with adding to our knowledge of how these intersections operate.

Contributing learning to policy debate and development

With its interest in policy studies the Business Society and Sustainability Research Centre was well-represented at the 2013 Political Studies Association of Ireland conference.

Roger Sherlock, Ewan MacDonald and Dr John Hogan presented their findings on the brand equity of Irish political parties. This research was based on Ewan's work for his final dissertation for his BSc Marketing degree. Siobhan Graham's research work for her 2012 BSc in Business & Management formed the basis of her and Dr John Hogan's presentation on the use of social media in Seán Gallagher's presidential campaign.

Sharon Feeney presented her work with Dr Paul Donnelly and Dr John Hogan on undergraduate students' understanding of Irish politics as revealed in freehand drawings.

Albert Veksler, a BSSRC postgraduate student supervised by Dr John Hogan, School of Marketing, also presented two papers at the Australian Political Studies Association annual conference, which was held in Murdoch University in Perth, Western Australia. The papers were:

- Diluted Regulations—A Need to Review the Theoretical Classification of the Different Lobbying Regulatory Environments.
- Opaque Transparency: an analysis of the Israeli lobbying regulatory regime 2008.

Albert's first paper has been published in the peer reviewed Journal of Public Affairs.

(<http://onlinelibrary.wiley.com/doi/10.1002/pa.1495/abstract>)

Special Interest Group in International Business

The Business Society and Sustainability Research Centre and the College of Business, hosted the first workshop of the Irish Academy of Management Special Interest Group in International Business. Organised by Dr Pamela Sharkey Scott, College of Business and Dr Esther Tippmann, Quinn Business School, UCD, this paper development workshop promoted the refinement of journal articles by drawing on the collective expertise of the participants in a friendly and collaborative environment. DIT researchers and PhD students were joined by colleagues from NUI Galway, University of Limerick, UCD and NUI Maynooth. For more information or if you would like to join the International Business Research Special Interest Group:

e: pamela.sharkeyscott@dit.ie

If you are interested in postgraduate research opportunities visit the BSSRC website (www.dit.ie/bssrc.ie) or contact Dr Brendan K O'Rourke, e: brendan.orourke@dit.ie



Albert Veksler at the Australian PSA Conference in Perth

Two Become One

The Consumption and Leisure Studies Research Centre (CLS) and the Business, Society and Sustainability Research Centre have recently merged. The Consumption and Leisure Studies Research Centre was founded by Dr Paddy Dolan and Dr Olivia Freeman in January 2008 and has been very active since its establishment, hosting over 5 seminars per year and creating networks and alliances within Ireland and internationally.

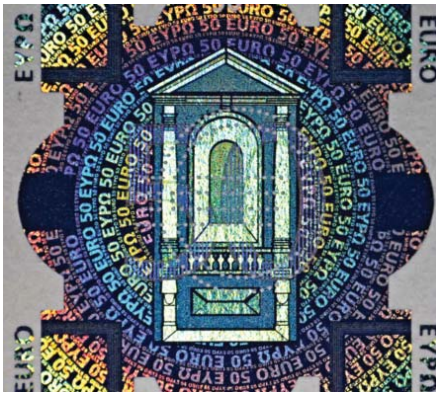
Both Olivia and Paddy will serve on the new merged centre's executive. Many journal articles were first presented at CLS seminars and their subsequent publication benefitted from the critique and encouragements received there. It will continue to carry out this work and its merger with its younger sibling the Business, Society and Sustainability Research Centre is intended to facilitate the inclusiveness and networking of all those involved.

For convenience, the Business, Society and Sustainability name and website will be used as the main contact point while the Consumption and Leisure Studies name and site will be used to facilitate the activities of centre that are more focussed on consumption and leisure. Business, Society and Sustainability Research will continue the work of its constituents to foster other research foci in a 'bottom-up' manner as evidenced in its work with other groups networked with the centre such as: the Public Policy Studies Unit, the International Business Research Special Interest Group, the Discourse Analysis Group, and the 3S Group.

e: brendan.orourke@dit.ie

IEO researchers to commercialise

Enterprise Ireland has awarded funding to the Centre for Industrial and Engineering Optics (IEO), School of Physics, to commercialise a new technology developed by its researchers.



The project named CODA (Covert Optical Devices for Authentication of commercial products) is led by Dr Izabela Naydenova. She aims to find a route to commercialisation for a plastic transparent photopolymer layer containing a diffractive optical device. The device is expected to have an application as an additional layer of security in anti-counterfeit labels for the authentication of commercial products.

There is a gap in the market for covert machine readable security features in the form of a completely transparent plastic layer that can be incorporated in packaging or in a label. The simplest example is an optical device which provides information about one or more of the following: batch number, product line, origin, and intended geographical market. The covert security feature is read by a hand-held device or read automatically on the production line to verify that the feature is present, that the product is genuine and that the product is at or destined for the correct geographical region.

The CODA project team also includes Dr Suzanne Martin and Professor Vincent Toal and two new researchers are being recruited to the project. The research outputs of CODA will further enhance IEO's reputation as a leader in the provision of anti-counterfeit technologies. The Centre has already spun out Optrace Ltd, a new DIT company which manufactures holographic labels.

e: izabela.naydenova@dit.ie

Prize for best cryptography paper for DIT team

Over the past 24 years, the ISSC (Irish Signals and Systems Conference) has established itself as the premier conference in Ireland addressing all aspects of signals and systems. The conference normally focuses on digital signal processing, control and communications, and encompasses algorithm and system modelling, design and implementation.

In 2013 a new topic was included and a team of DIT researchers won best paper for their contribution to that topic—systems and information security. This topic covered: secure coding, cloud infrastructures, mobile security, cryptography, watermarking, steganography and digital evidence/forensics.

The paper "Cryptography using Evolutionary Computing" was written by Professor Jonathan Blackledge, and students Paul Tobin, Serge Bezobrazov and Fransisco Zamora, and delivered by Paul Tobin. The group are all conducting research in DIT's School of Electrical and Electronic Engineering.

The paper was the first to consider the application of evolutionary computing to generate unique ciphers using natural noise sources obtained from data including atmospheric noise generated by radio emissions due to lightning, radioactive decay, and electronic noise.

The purpose of this is to 'force' the system to output a result (a non-linear function) that is an approximation to the input noise. This output is then treated as an iterated function which is subjected to a range of tests to check for potential cryptographic strength. This approach provides the potential for generating an unlimited number of unique cipher that can be used on a 1-to-1 basis. Typical applications include the encryption of data before it is uploaded to the Cloud by a user that is provided with a personalised encryption algorithm rather than just a personal key using a 'known algorithm' that may be subject to a 'known algorithm attack' and/or is 'open' to the very authorities who are promoting its use.

On the basis of this research, a new company focusing on the role of Personalised Encryption—encryptmydoc.com—has been established through Hothouse.

e: jonathan.blackledge@dit.ie

New device aims to improve ultrasound diagnosis



Dr Jacinta Browne and Dr Andrew Fagan demonstrating their project to Minister Séan Sherlock TD.

Enterprise Ireland (EI) has awarded a Commercialisation grant to Dr Jacinta Browne, (DIT School of Physics), to develop a physical simulation medical device which could be used to train junior doctors to conduct ultrasound breast scanning. The funding was awarded to Dr Browne and her long-time collaborator, Dr Andrew Fagan, (Centre for Advanced Medical Imaging, St James's Hospital) and follows on from the successful completion of an EI-funded feasibility study which demonstrated a significant training need for such a device.

Ultrasound imaging is a powerful tool that is used routinely in hospitals to diagnose a range of pathologies throughout the body, from cancers to cysts to calcifications. However, it can take a while to master the technique due partly to the complex physics underpinning it which makes it difficult to interpret the image features, but also because of the complexity of the scanner itself. There are many imaging options and modes of operation that can be used and these all affect image quality and the rapid pace of development of this technology only serves to accentuate the problem. Doctors typically train “on-the-job” which is not optimal for their training needs or for patient care.

To address this problem, Dr Browne’s team has developed a physical simulation device which mimics the complexity of breast tissue. When it is scanned it produces images which bear a remarkable resemblance to real images from patient breast tissue. The researchers have also mimicked a range of pathologies (tumours, cysts and calcifications) of varying sizes and appearances, and located them randomly in the device, mimicking their occurrence in real patients.

The trainees must try to find these pathology targets and then characterise their properties accurately—e.g. diagnose whether the tumour is benign or malignant. A pilot study conducted with a number of trainee doctors produced a significant improvement in their scanning ability.

The project will develop the technology further, identify new materials to mimic different tissue properties, and explore potential commercial opportunities. Two new staff members (one postdoctoral and one research assistant) will be recruited into the team to conduct the work under the supervision of Dr Browne and her collaborators in St James’s hospital.

e: jacinta.browne@dit.ie

President of Ireland launches groundbreaking Encyclopaedia of Music in Ireland



L to R President of DIT, Professor Brian Norton, Professor Barra Boydell, President of Ireland Michael D Higgins, Professor Harry White, Dr Kerry Houston at the launch.

DIT has played a key role in the production of a new publication launched in October 2013 by the President of Ireland, Michael D Higgins. The groundbreaking publication—The Encyclopaedia of Music in Ireland (or EMIR as it is known for short)—is the most comprehensive publication on music ever to have been undertaken in Ireland. It includes more than 2,000 articles reflecting Ireland’s musical culture in all its depth and variety, past and present.

The General Editors are Professor Barra Boydell (Department of Music, NUI Maynooth until his retirement in 2010) and Professor Harry White (Professor of Music, UCD). The Executive Editor is Dr Mark Fitzgerald, DIT Conservatory of Music and Drama. There are several subject specialists from across a number of Irish educational institutes including Dr Maria McHale and Dr Kerry Houston, both from the DIT Conservatory of Music and Drama.

The project received support from Atlantic Philanthropies, the Irish Research Council, NUI Maynooth and DIT Conservatory of Music and Drama.

The President was introduced by Professor Gerard Gillen, Professor Emeritus of Music at NUI Maynooth and a renowned organist. As an aside, President Higgins informed the audience that Professor Gillen had actually played the organ at his wedding to his wife Sabina.

“The Encyclopaedia of Music in Ireland is both a celebration of the artistic empathy for which we, as a nation, are renowned and an affirmation of the great wealth of musical talent that has always existed in this country,” said President Higgins.

“It is a great coming together of knowledge and musical scholarship that will allow us to reach a true understanding of the musical journey of a nation—of its continual evaluation and progression, its constant re-working and re-shaping and its reflection of the society with which it engages.”

President Higgins said that our pride in our rich cultural heritage has tended to focus on our great literary tradition and that where debate does focus on our musical journey, it tends to begin with the traditional music which is identified so strongly with our culture and tradition and to travel straight to the success of some Irish musical landmarks of recent decades.

He said that these, *“are rightly regarded as having etched a new found confidence in ourselves as Europeans producing musical and cultural experiences. These volumes show how much has often been missed in the contemporary discourse.”* He called the book, *“a valuable map that allows us to retrace our country’s musical passage, and to fully explore the people, the places, the performances, the genres, the societies, the ensembles and the many other factors which have left their footprint on the landscape of Ireland’s musical voyage.”*

President Higgins also paid tribute to the collaboration between several Irish third level institutions in creating the book and said this was a real measure of educational endeavours, at a time when there was much debate about the value of university rankings.

Speaking on behalf of himself and Professor Barra Boydell, Professor Harry White paid tribute to the many people who had been involved in putting together the two volume book over several years. The initial idea for the book came 25 years ago but much of the work took place over the past 10 years. Amongst the recognitions, Professor Harry White thanked DIT, who, as well as providing contributions through staff members, laterally had a role in hosting the project. The Encyclopaedia of Music in Ireland is published by UCD Press and is available from the publisher and all good book shops.

e: mark.fitzgerald@dit.ie

The Digital Commons Network Portal

Early in 2013, Digital Commons, the company that supplies Arrow software to DIT, developed the Digital Commons Network (DCN) Portal. The DCN portal has taken the content from over 310 repositories throughout the world and arranged it by discipline or subject which the designers have designated as ‘Commons.’ All DIT papers uploaded to Arrow@dit are available through the DCN portal. DIT and RCSI are the only Irish Institutions with this facility.

On the Arrow home page: <http://arrow.dit.ie/> there is a link to the portal represented by a ‘Wheel’ or ‘Sunburst’ graphic best viewed using Firefox or Chrome. Each coloured “spoke” represents a discipline, for example engineering or life sciences, and the lighter shaded areas represent fields within that discipline. When you click on an area of the wheel you are quickly brought to a section where you can link directly to relevant full text documents.

Currently, the content is restricted to peer-reviewed journal articles and conference papers but there are no dead ends—each link brings you to a full text document and there is no embargoed content. The DCN Portal disseminates the intellectual output of a number of universities and is a wonderful example of how institutions can work together both to increase the visibility of their own research and to provide the user with a powerful search engine. This portal has the potential to become the largest and most authoritative database of scholarly work which is freely available.

Within each discipline or Commons you can select individual institutions or authors, find the most popular papers in that discipline and see how many items are in each subject. You can also see the most popular institutions for downloads and the most popular authors within each Commons. DIT and its staff and students are often highlighted in these categories. You can use the search box to find what you want but the wheel is a wonderful interactive tool for browsing, akin to looking down a row of shelves in the library to see if there is anything interesting to read and to keep an eye on what is new.

The DCN portal supports the Institute’s mission to showcase both the Institute and its authors internationally. Each time a paper is uploaded to **arrow@dit** it becomes part of this Commons Network and is disseminated globally. The Arrow slogan of “target the world with the right arrow” has never been truer!

e: yvonne.desmond@dit.ie

Two new DIT spin-outs supported by the NDRC

The Smart Grid Hub Innovation Programme is a collaborative initiative by EirGrid Group and NDRC (National Digital Research Centre) to promote the development of innovative Smart Grid solutions. It focuses on entrepreneurial initiatives by companies, academics and entrepreneurs in Ireland and Northern Ireland.



Bryan Maybury

One of these initiatives is Predalgo (Predictive Algorithms) a spin-out company based on research conducted in DIT by SFI Stokes Professor Dr Jonathan Blackledge. The company made a successful application for support to NDRC and was accepted on to its VentureLab Programme. This is a tailored science and technology investment

programme which supports new ventures and provides access to up to €100k. The company is Ireland's first independent venture focusing on trading energy and energy related commodities. It already owns licences for technologies that have been deployed commercially in the Foreign Exchange domain. These will now be brought to the trading rooms of energy companies and energy trading companies in Ireland and internationally. By encouraging an entrepreneurial approach to controlling the efficiency in which energy commodities are traded and used, Ireland is set to become a major competitor in the emerging energy industries.

The approach is based on a three-fold strategy using the Fractal Market Hypothesis to identify long term market trends; Artificial Neural Networks to predict intermediate market behaviour; and Evolutionary Computing for short term prediction. It is already delivering a successful trading strategy for gas and oil using the MateTrader4 platform and Predalgo has signed a Memorandum of Understanding with Bord Gáis. Although the initial focus of the company is to enhance the cost effectiveness of energy distribution in Ireland, Predalgo will expand into the distribution and control of electricity throughout the country contributing to the future development of the smart grid infrastructure. The CEO of Predalgo is entrepreneur Bryan Maybury who brings his extensive knowledge of the financial and ICT industries to the company including senior executive roles in Roamware Inc., Macalla Software and CSK Software. He also lectures on the MBA programme at Trinity College Dublin.

e: jonathan.blackledge@dit.ie



L–R; Dr Suzanne Martin and Amanda Creane

Optrace Ltd was also accepted on to the NDRC VentureLab programme. It is underpinned by research conducted by DIT's Centre for Industrial Engineering Optics (IEO). The Centre which was established almost fifteen years ago is based in DIT's Focas Research Institute and DIT Kevin St where it has well-equipped optical research laboratories. It specialises in holographic and interferometric techniques and has developed novel technologies with applications in product authentication, sensing, vibration measurement and optical device fabrication.

Optrace Ltd produces holographic labels that can enhance security and branding on all types of packaging or labelling. Each label is as "unique as a fingerprint" and Optrace Ltd is the only producer able to manufacture these using a patented process and secret know how. They are very difficult to copy, and have the potential to reduce losses due to counterfeiting and increase consumer confidence in a brand.

Revenue loss due to counterfeiting is a major concern to industry and costs the pharmaceutical industry alone in excess of \$200bn each year. Legislation also requires manufacturers to provide stronger protection against counterfeit versions of their products entering the supply chain.

The CEO of the company is Stephen McDonnell who is supported by IEO team members are Dr Suzanne Martin, Dr Izabela Naydenova, Professor Vincent Toal and Amanda Creane.

e: suzanne.martin@dit.ie

Novel treatment to protect against surface corrosion

DIT researchers have developed an advanced surface treatment for protection against corrosion and combined wear and corrosion (tribocorrosion) degradation. It is applied using a conformal deposition process as either an infused system into porous wear-resistant coatings (anti-tribocorrosion degradation) or as a surface passivating pre-treatment for paint (anti-corrosion degradation). It can serve to protect critical industrial installations, such as components dealing with slurries and corrosive fluids.



Initial laboratory work demonstrated significantly improved corrosion and wear performance on treated (uncoated and coated) inexpensive cast aluminium alloys. This was remarkable as these alloys typically display extremely poor corrosion/wear characteristics. Although a vast number of surface treatments are available, only a limited number properly address the effects of environments which experience both wear and corrosion degradation. Current sealant technologies are either ineffective or, based on industry responses, expensive.

The technology is based on the application of a hybrid organic/inorganic treatment onto an exposed surface—either as a stand alone treatment or as a sealant. The treatment is applied using an electrochemical deposition technique, allowing for the development of conformal coatings, irrespective of design complexity. Layer thicknesses are low—10 to 100nm—but resistance in corrosive marine environments indicate corrosion rates comparable to technologies currently employed by the aerospace and automotive industries. By applying the hybrid treatment as a sealant on to a porous wear-resistant coating, concerns regarding the effect of mechanical damage are reduced dramatically. In addition surface roughness levels are similar to electropolished finishes.

e: anthony.betts@dit.ie

Music at the Abbey Theatre



From the earliest years of the theatre up to the 1960s, music formed an integral part of the programming at the Abbey and while the importance of the Abbey Theatre in Ireland's cultural history is without doubt, this side of the theatre's history is virtually unknown. Dr Maria McHale and research assistants based at the Research Foundation for Music in Ireland (RFMI) completed an IRC-funded project to uncover this hidden musical history and to create a website and database of the music performed at the Abbey from the early years of its existence until 1965 at which point the Abbey orchestra was disbanded.

In the early days, music was provided by a solo violinist, but by 1906 a small orchestra had been formed which was under the direction of the composer John F. Larchet from 1908: a position he held for 26 years. Other key figures in Irish musical life followed suit including, Frederick May, Eamon Ó Gallchobhair and Seán Ó Riada. Almost every night at the Abbey saw a programme comprising overtures, individual symphonic movements, selections from operas and arrangements of Irish traditional airs.

The information contained in this fully searchable database has been extracted from original programmes which are housed at the Abbey Theatre Archive. In quantifying and disseminating the broad range of music performed over this 60 year period an unknown aspect of the theatre's history is now available, thereby changing perceptions of the Abbey from a venue solely devoted to drama, to a venue that also enjoyed a vibrant musical life.

e: maria.mchale@dit.ie

www.abbeytheatremusic.ie



Energy wizard helping Irish consumers reduce energy costs

Dublin Energy Lab (DEL) researchers and Electric Ireland have worked together on a number of research projects in the areas of domestic energy demand modelling, behavioural analysis and smart metering analysis. One of these projects which formed part of Daire Reilly's PhD led to the development of a residential energy efficiency modelling tool called the 'EnergyWizard' which you can find on the Electric Ireland website— www.esbenergywizard.ie

This project aimed to deliver a building simulation tool that allows residential consumers to 'self-assess' future dwelling energy performance accurately. The resulting web application can be used by residential energy consumers in Ireland to calculate the impact that various energy efficiency retrofit measures will have on existing energy bills. Users are prompted to input their building characteristics, the number of occupants and annual billing details, in a 30 question online survey.

The retrofit remedial measures considered in the tool are:

- External wall insulation
- Internal wall insulation
- Cavity wall insulation
- Attic insulation
- Window upgrade
- High efficiency boiler
- Heating controls
- Lagging jacket for un-insulated hot water tanks
- Energy efficient lighting

The Energy Wizard applies logic operators to determine which of the remedial measures are applicable on a case by case basis and it uses a simplified building energy simulation engine to model current performance of the dwelling and post retrofit performance for each of the applicable retrofit measures.

The output of the process is a report that is emailed to the customer. It gives a rating for the dwelling studied and returns the capital and installation costs and applicable government grants and predicts annual financial savings and CO₂ abatement for each of the retrofit measures.

Daire Reilly is a graduate student in the School of Civil Engineering and a recent recipient of the 2014 DIT Travel Scholarship in Renewable Energy. Daire will use the award to travel to Nepal to work with the charity Renewable World. He is funded by the Irish Research Council's Enterprise Partnership Scheme in collaboration with ESB Electric Ireland and IHER Energy Services. The project supervisors are Professor Aidan Duffy (Centre Manager, DEL), Professor Michael Conlon (Assistant Head, School of Electronic Engineering) and David Willis (Business Energy Services Projects, Electric Ireland).

e: aidan.duffy@dit.ie

Global research on contemporary housing



DIT has been selected to participate on a three-year international housing research programme worth a total of €750,000. Called the OIKONet Consortium and funded by the Lifelong Learning Programme of the European Union, the goal of the three year project is to create a space of collaboration to study contemporary housing from a multidisciplinary and global perspective.

Noel Brady and Jim Roche (DIT Project Co-ordinator) from the Dublin School of Architecture (DSA) and Dr Lorcan Sirr from the School of Surveying and Construction Management are representing DIT in the project. OIKONet will provide a structure to foster the exchange among research groups and higher education institutions, to interlink research activities and from DIT's perspective, the project will enable DIT students and staff that are involved in housing projects to share their work and engage in pedagogical discourse with international colleagues.

The OIKONET consortium comprises 30 partners from 26 European countries and 4 partners outside Europe. Educational and research institutions from the following cities are involved in the network: Barcelona, Valencia, Bratislava, Cottbus, Lugano, Goteborg, Rotterdam, Vilnius, Skopje, Oradea, Ljubljana, Aalborg, Riga, Nicosia, Preston, Grenoble, Oslo, Kocali, Sofia, Bologna, Lisbon, Belgrade, Bialystock, Budapest, Istanbul, Volgograd, Santiago, San Juan and Nairobi.

Each year there will be series of events in which DIT staff and students will participate: one major conference, one weeklong site-specific workshop including an exhibition and several sub-network seminars. An interactive digital platform will also be created to facilitate access to learning resources. The OIKONet reader, a detailed publication, will conclude the three-year programme.

Improving efficiency in the food industry

Dr Nissreen Abu-Ghannam, (Food & Health Research Centre) is collaborating with Teagasc's Ashtown Food Research Centre and UCD to develop novel non-thermal and bio-processing technologies to maximize the extraction of high value ingredients from agri-industrial byproducts for pharmaceutical and nutraceutical applications.

"Plant food processors generate a significant amount of waste that could be turned into a valuable resource if treated correctly, but to date industry friendly, low energy sustainable techniques for recovery of these components are not available" says Dr Nissreen Abu-Ghannam.

Her project aims to develop efficient and low cost processing technologies to generate high yield bioactive ingredients that are approved by EFSA (European Food Safety Authority) for their positive impact on health. Toxicity aspects of the co-extracted matrices will be evaluated in conjunction with DIT's Focas Institute.

This collaborative project was awarded €781,483 by the Department of Agriculture, Food and Fisheries under its FIRM funding programme allowing Nissreen to recruit a new postdoctoral researcher to her research team.

e: nissreen.abughannam@dit.ie

Fiosraigh 2013 Winners

Dublin Institute of Technology (DIT) manages the Fiosraigh Scholarship Programme. The Irish word Fiosraigh, which means to explore or inquire, underlines the purpose of this scholarship programme which is to promote the exploration and application of knowledge. The Fiosraigh Scholarships are awarded on a competitive basis and the winners of the 2013 awards are:

Research Excellence Award—the most prestigious research award made by DIT recognising excellence in research by individual researchers.



Dr Brian MacNamee, (pictured above) School of Computing, *AlFraD—Active Learning for fraud detection*.

Enterprise Scheme—an initiative for DIT researchers who partner with external, non HE organisations.

Dr Malabika Basu, with Esave Corporation, School of Electrical & Electronic Engineering, *Storage Integrated Unified Power Quality Conditioner (S-UPQC)*.

Dean of Graduate Research School Awards—recognising the outstanding achievement by individual students at undergraduate level and open to talented students who wish to pursue a PhD on a full time basis.

Ensar Mulahmetovic, supervised by Dr Grainne Hargaden, School of Chemical and Pharmaceutical Sciences, *Novel Magnetic Reservoirs*.

Jenny Hauser, supervised by Mr Michael Foley and Dr Brian O'Neill, Head of Research, College of Arts & Tourism, *Talking Back: Social Media's role in Democratising News Media*.

Heba Abdelaziz Mohamed, supervised by Dr Amr Arisha, School of Marketing, *Smart Planning for Healthcare Facilities*.

Arun Kumar Malik, supervised by Dr Yuliya Semenova, School of Electrical & Electronic Engineering, *Whispering Gallery Mode Resonators for Biosensing*.

Ravshan Khaydarov, supervised by Dr Joseph Coughlan, School of Accounting & Finance, *Financial Mechanisms for Innovation Support for Industry: A comparison between the Republic of Uzbekistan and the Republic of Ireland*.

Garret Rochford, supervised by Dr Orla Howe, School of Biological Sciences, *Copper metalo Nucleuses in Cancer Chemotherapy*.

Jennifer Dann, supervised by Dr Pamela Sharkey Scott, School of Management, *Too Good to Miss—Building Opportunity Selection Capacity to Grow International Business*.

Padraig Shanahan, supervised by Dr Catherine Barry-Ryan, School of Food Science & Environmental Health, *Novel Inhibitors of the Shaker Potassium Channels as Potential Therapeutics*.

Research Student Internship Awards—to encourage mobility between DIT and enterprise or DIT and another Higher Education Institution.

Ines Ramos, supervised by Professor Fiona Lyng, School of Physics, internship to be hosted by *Sheffield Hallam University*.

Pat Daly, supervised by Dr Mary Lennon, Conservatory of Music & Drama, internship to be hosted by *Berklee College of Music, Boston*.

Head of Graduate Research School Awards—for best speakers and best poster presentation at the annual postgraduate symposium.

Michael Brogan, supervised by Dr Catherine Deegan, Institute of Technology Blanchardstown, *Semantic model generation for photo-realistic driving simulators* awarded Best Oral Presentation of the 4th Annual Postgraduate Research Symposium.

Kate Sheehy, supervised by Dr Gordon Chambers, School of Physics, *The ability of Metallic Nanoparticles to Induce a Toxic Response in the Human GI Tract* also awarded Best Oral Presentation of the 4th Annual Postgraduate Research Symposium.

Ronan Oliver, supervised by Professor Aidan Duffy, School of Civil Engineering, *Analysis of Small and Medium Enterprises' Heat Consumption in Ireland— Implications for a Competitive, Low-Carbon Economy*, awarded Best Poster of the 4th Annual Postgraduate Research Symposium.

Self-Funded Students Scheme—to help full-time self-funded students to complete their degree.

Hoda Akbari, supervised by Dr Suzanne Martin and Dr Izabela Naydenova, School of Physics, *Holographic Optical Elements for Applications in Solar Collectors*.

Government of Ireland—DIT Fiosraigh International Scholarships—awarded to high calibre higher education students from China and India to study on a PhD programme at DIT for a period of one year.

Zhe Kang, from Beijing University of Posts and Telecommunications, supervised by Professor Gerald Farrell, School of Electrical & Electronic Engineering.

Vivek Tomar, from Indian Institute of Technology—Delhi, supervised by Professor Brian Norton, School of Electrical & Electronic Engineering collaboration.

For more information on these scholarships:
gerolmina.dinardo@dit.ie



Above (L–R): Dominic Mullan, IADT, Jack McDonnell, IT Tallaght, Tom Flanagan, DIT Hothouse, Assumpta Harvey, IT Blanchardstown and Bertie Kelly, NCI.

DRIC consortium exceeds targets

The Dublin Region Innovation Consortium (DRIC) has beaten its targets for commercialisation of research developed within DIT, IT Tallaght, IT Blanchardstown, IADT and National College of Ireland in 2013. The consortium was established to maximise the impact of research in the member institutions and last year completed a total of 18 licenses of new technologies and launched 6 start-up companies. This record represents excellent value per million of research funding invested by the state, with four times more commercial licences and four times the number of spin-out companies compared to higher education institutions generally in Ireland and internationally. The results achieved by DRIC surpassed 2013 commercialisation targets set by Enterprise Ireland by a considerable margin, including:

Commercial Licenses:

- Target: 12
- Achieved: 18 new technologies licensed to 15 Irish companies

Spin-Out Campus Companies:

- Target: 3
- Achieved: 6, including launch of first ever spin-outs from research at both IT Blanchardstown and IADT as well as four new spin-out companies from DIT.

Inventions:

- Target: 35
- Achieved: 78 new research inventions were discovered

DIT Hothouse and its DRIC partners are determined to once again exceed their target objectives in 2014.

Making the most of solar photons

The solar spectrum received at the Earth surface covers a wide range of wavelength from 290 nm to 3790 nm. In an ideal situation, the absorption spectrum of photovoltaic (PV) materials should perfectly match the entire solar spectrum in order to convert the maximum photons from solar radiation to electricity. However the absorption band of the best PV materials can be found between 400 and 1200 nm depending on the case.

The main objective of EPHOCELL—an FP7 project completed in 2013—was to develop an easy-to-implement wavelength modulator device for maximizing spectral matching between the sun and different PV technologies (a-Si, InGaP, DSSC or polymer solar cells, among others). The devices will combine both down-shifting and up-conversion processes for improving the

efficiency of the PV panels. Downshifting process converts high energy UV photons into visible ones and up-conversion process converts low energy NIR photons into visible ones. DIT was a partner in the project led by LEITAT Technological Center. Other members of the consortium were: Max Planck Institute for Polymer Research (DE), Sofia University (BU), Institute of Chemistry and Technology of Polymers (IT), Polytechnic University of Catalonia (ES), Cidete Ingenieros (ES), Daren Labs (IS), MPBata (ES).

The team made significant progress over the three years:

- High efficiency up-conversion systems in different spectral ranges
- NIR-to-Vis up-conversion demonstrated
- High efficiency down-shifting systems for appropriate optical coupling with up-conversion
- Novel polymeric matrices for photoactive molecules (including

- quasi-solid gels)
- Stability evaluation under accelerated ageing studies
- Ray trace and thermal modelling tools for guiding device development
- Opaque and semitransparent solar cells for optical coupling.

DIT headed up activities on modelling of suitable device configuration, construction of functional devices and the validation of the technology. The EPHOCELL technology proposes notable innovations in materials and sustainable energy as well as industrial solution of a medium/long term nature. By combining state-of-the-art PV cells with the technology, the efficiency of some technologies like organic solar cells can clearly become more competitive with respect to present alternatives.

e: john.doran@dit.ie

Unforgettable trip for research student



Postgraduate student Brendan Towey's MPhil is focused on the upgrading of construction methods of timber frame structures to improve air tightness.

While conducting his research in DIT's School of Surveying and Construction Management, Brendan was selected to attend a research summer school held at the Hong Kong Polytechnic University (PolyU). At the time of his application he had also just won a poster presentation at the Associated Schools of Construction (ASC) international conference held in Birmingham, UK which contributed to his success. He received a travel bursary and free accommodation at the University.

The summer school showcased the areas of research being pursued by PolyU faculty members and research students. A total of thirty eight undergraduate and postgraduate students from around the world attended. The week long collection of seminars included some very interesting talks on building energy management. They were primarily concerned with reducing the energy consumption of

buildings in Hong Kong and mainland China. *"In the summer, high levels of external humidity and heat in Hong Kong add extra strain on building air-conditioning systems"*, said Brendan, *"Although this is the opposite to weather conditions in Ireland, energy reduction is a key focus. This is the same in Ireland although the research is focused on heating systems"*. As part of the summer school, students were taken on a tour of the 9.5 hectare PolyU campus and its extensive research facilities.

"The facilities ranged from an artificial solar replication ceiling (for solar panel research) to a large, purpose built earthquake testing rig which is used for both academic and industry research". Brendan had an unforgettable week attending the summer school as the emphasis placed on research and development was both encouraging and motivational.

Children in Ireland deeply affected by cyberbullying

The national Action Plan on Bullying, spearheaded by Ruairi Quinn TD, Minister for Education and Skills, has over the course of 2013 created new awareness on the risks of cyberbullying, particularly in primary and secondary schools. A media campaign for the programme drew on findings from a new DIT report which reveals that cyberbullying is having a significant emotional impact on Irish young people.

While bullying predates the internet, the phenomenon of cyberbullying—the circulation of hurtful or nasty messages online or via mobile technologies—has attracted widespread public concern and is perceived as one of the most damaging risks that young people can encounter during the course of their internet use.

Dr Brian O’Neill and Dr Thuy Dinh (Centre for Social and Educational Research, DIT) are behind the EU Kids Online report on cyberbullying. Their research shows that over half of young people in Ireland who said they were bullied in this way were seriously upset by the online harassment. It also finds that children in Ireland are 7 times more likely to be deeply affected than their European counterparts.

Funded by the European Commission Safer Internet Programme (2009–11), the EU Kids Online network surveyed 9–16 year olds using in-home, face-to-face interviews with a random stratified sample of 1000 children in 25 countries across Europe. Full technical details are available at: www.eukidsonline.net

Bullying was one of four types of online risk asked about in the survey. Young people aged 9 to 16 years were asked if they had themselves experienced bullying or had bullied others; what impact this had on them; and what actions they took in attempting to deal with the problem. Parents were also asked if they were aware their child had been bullied. The research showed that 68% of parents did not know their children had been cyberbullied and 29% of parents whose children had been bullied were not aware that their children had reported this.

The impact of cyberbullying is striking: over half of all children bullied online said they were ‘very upset’ or ‘fairly upset’ (52%). For 44% this has a lasting effect—14% were more deeply affected for a couple of months or more. This is a very high level of impact compared to the equivalent European finding (2%). Most young people who have been bullied talk to somebody about it (71%), mostly a friend or one of their parents. Very few (6%) speak to a teacher. Of children who have bullied others online, 44% have themselves been bullied online. Few (just 15%) children who were bullied online reported the problem using an online reporting tool. Only 9% of those who had been bullied found this helpful, indicating that much work needs to be done to improve the effectiveness of technical solutions.

At the launch of Safer Internet Day 2013 Minister Quinn said: *“Along with schools, parents, and industry, young people themselves have an important role to play in combating online bullying. When a bystander intervenes in a safe and effective way to support victims or lets the bully know that their behaviour is unacceptable, this action can inspire positive action by other bystanders and can reduce the negative effects of bullying on the victim.”*

Safer Internet Day is co-funded by the Department of Education and Skills and the EU Safer Internet Programme. Partners include: Webwise, RTE Young Persons Programming, NPC Primary, NPC Post Primary, An Garda Síochána, Trend Micro, SPHE Support Service (Post-primary), Belong, and Spunout. As part of Safer Internet Day 2013 a new anti-cyberbullying awareness campaign was launched entitled the “Watch Your Space” campaign. The key messages of the campaign are that bystanders can make a positive impact by showing solidarity with the victim of online bullying and by sharing useful advice on how to cope with these situations. **Download the full report: <http://arrow.dit.ie/cserrep/31/> e: brian.oneill@dit.ie**

The future is bright for digital entrepreneurs



More than 50 apps and games developed by students as part of their DIT Creative Digital Media Masters programme were on display at the Mobile Moguls digital media showcase organised by DIT Hothouse by Entrepreneur Of The Year™ and Innovation Dublin in December 2013. The student developers showcased their products to industry, DIT colleagues and members of the public. Attendees also had an opportunity to hear about future developments in the sector and learn how to become a digital entrepreneur during expert panel discussions.

Hugh McAtamney, Head of the School of Media and Owen Harris, game designer and CEO of bitSmith Games discussed best practice in digital media education and future trends in the sector. MC Paul Hayes of Beachhut PR also chaired a discussion between Eamonn Fallon, CEO of Distilled Media Group, Connor Murphy, CTO and Co-founder of Datahug and Frank O'Keeffe of EY Entrepreneur Of The Year™. The panel discussed digital media entrepreneurship, the rate of change in digital media technology and the tools available to help aspiring entrepreneurs market and publicise their creations.

Frank O'Keeffe, Partner-in-Charge of EY Entrepreneur Of The Year™ (EOY), said it was vital to promote entrepreneurship as a career path to young people. He said the EOY University initiative came about because the alumni community felt it was important to give back to the community of students.



L-R: Paul Hayes (MC and Beachhut PR), Connor Murphy (CTO and Co-founder Datahug), Eamonn Fallon (Distilled Media) and Frank O’Keeffe (EY Entrepreneur of the Year)

“By bringing leading entrepreneurs into lecture halls across the island of Ireland to engage with students and share their stories, EOY hope to inspire the next wave of enterprising graduates to go on and found dynamic new ventures, create jobs and transform the organisations they join or manage,” he said.

Tom Flanagan, Head of Commercialisation at DIT Hothouse, said, “This event enables the general public to interact with the students’ projects providing a fantastic opportunity for them to gauge the potential commerciality of their products.”

City Council Director of Economy, Peter Finnegan, remarked: “Innovation is essential to the future growth of Ireland’s economy and Innovation Dublin works to showcase the creativity and innovation alive in our city. These students are the digital entrepreneurs of tomorrow and their ingenuity will play a significant role in building a world class digital media sector in Ireland.”

The Mobile Moguls digital media showcase was sponsored by Dublin City Council’s Innovation Dublin and INTERREG IVB Open Innovation Project.

e: hugh.mcatamney@dit.ie

Some of the apps on display at the event

Little Details by Hola Mariquita

Little Details is an interactive graphic novel for the iPad. Combining beautiful artwork and lush sounds, Little Details brings an all new graphic novel experience to the iPad and other tablet devices. Little Details tells the story of Bella, a young woman who upon discovering an old photograph in a book is compelled to take a journey through memories in order to find its owner. Little Details was named as The Irish Times “App of the Week” and came second in the Appy Awards 2013.

Fun Laoghaire by Spraoi

Fun Laoghaire is a GPS game based on Dún Laoghaire Pier. The overall concept is to encourage kids to get active by giving them the incentive of unlocking a mini game every time they go out and go for a walk. It involves using GPS coordinates at a particular point of interest in a popular walking area in Dublin called Dún Laoghaire Pier.

Blend by Olly

Blend is a spice blending starter kit for the iPad. Blend allows the novice chef to spice up their meals using blends from around the world, and provides them with the steps, tips and tricks to make them successfully. The interactive interface is designed to accompany you as you cook, providing recipes, ingredients and tutorial videos that can be searched by region or spice.

Feá by Morigame

Feá is a magical side-scrolling game for iPad, set in ancient Ireland. The player controls both the mysterious cloaked girl, Feá and her companion, the crow. Together they make their way across valleys, forest and caves, battling enemies along the way.

The Nightingale by NCreative

NCreative presents a magical new interactive fairy tale story based on a Hans Christian Anderson tale for children. Immerse yourself in a story set in Imperial China and help the Great Emperor find the most beautiful bird in his kingdom—The Nightingale. Filled with breath taking illustrations, fun and creative touch interaction, immersive music and narration, The Nightingale is an interactive story that will delight young readers and adults alike.

Remember toddler privacy online!

Research finds there is an emerging trend for very young children (toddlers and pre-schoolers) to use internet connected devices, especially touchscreen tablets and smartphones. This is likely to result in an increasing number of very young children having access to the internet, along with a probable increase in exposure to risks associated with such internet use, including risk generated by parents.

A new report critically reviews recent research to understand the internet use, and emerging policy priorities, regarding children from birth to eight years old. Researchers find a substantial increase in usage by very young children. Unfortunately this has not yet been matched by research exploring the benefits and risks of their online engagement, so there are many gaps in our knowledge.

Brian O'Neill, responsible for the EU Kids Online project in Ireland, explains:

“EU Kids Online has spent seven years investigating 9–16 year olds’ engagement with the internet, focusing on the benefits and risks of children’s internet use. While this meant examining the experiences of much younger children than had been researched before EU Kids Online began its work in 2006, there is now a critical need for information about the internet-related behavior of 0–8 year olds. EU Kids Online’s research shows that children are now going online at a younger and younger age and that young children’s lack of technical, critical and social skills may pose a greater risk”.

Parents need to take better care when publishing online

One of the main concerns relates to parents posting pictures and videos of their children online, and the potential effect these postings may have on their children’s digital footprint. Researchers urge that action is taken:

“Specifically engagement with online service providers to review their user consent policies and responsibilities to ‘take-down’ information in a wide range of circumstances. This includes confidential, risky and erroneous information inadvertently posted by minors—as well as parental postings”, says Brian O’Neill.

The number of children accessing virtual worlds is on the increase with the most significant growth expected in pre-teen users aged 3–11. More children are using the social network functions on sites such as Club Penguin, Minecraft and Moshie Monsters. However, there is insufficient research to show that children under the age of nine have the capacity to engage with the internet in a safe and beneficial manner in all circumstances, especially when it comes to socialising online, either within age-appropriate virtual worlds or as under-aged participants in sites intended for teenagers and adults (Facebook, You Tube etc.).

Key recommendations from the report include:

1. The development and promotion of realistic, evidence-based guidelines for parents/carers regarding very young children’s engagement with digital technologies and the internet. Parent education packages should

be aimed at specific age groups (0-2, 3-4, 5-8) and outline ways in which parents can maximise the benefits and minimise the risks of their children going online.

2. The development and promotion of age-appropriate internet safety education for all age groups—including pre-primary school or nursery/kindergarten settings.
3. Continued engagement with device designers to encourage the integration of default privacy protections within the design of smart phones, tablets and other mobile devices.
4. Continued engagement to ensure the provision of greater transparency regarding how data is collected, collated, used and shared via children’s apps, and the provision of straightforward opt-out choices for parents and children within these apps.
5. Engagement with online service providers to review their user consent policies and responsibilities to ‘take-down’ information in a wide range of circumstances. This includes confidential, risky and erroneous information inadvertently posted by minors—as well as parental postings.
6. Parental education regarding posts, pictures and videos of their children, and the potential effect these postings may have on their children’s digital footprint.
7. The development of appropriate investigative methods so as to include very young children’s own experiences and opinions.



The report “Zero to Eight—Young children and their Internet use” critically reviews recent research to understand the internet use, and emerging policy priorities, regarding children from birth to eight years old and provides ten research based recommendations on how we should address young children and online risk.

The EU Kids Online project aims to enhance knowledge of European children’s and parents’ experiences and practices regarding risky and safer use of the internet and new online technologies, and thereby to inform the promotion of a safer online environment for children. The project is funded by the EC Safer Internet Programme (SI-2010-TN-4201001).

EU Kids Online conducted a face-to-face, in-home survey among 25,000 9–16 year-old internet users and their parents in 25 countries: Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, the Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Turkey and the UK. In addition the project includes research teams from Croatia, Iceland, Latvia, Luxembourg, Malta, Russia, Slovakia and Switzerland
 e: brian.oneill@dit.ie
www.eukidsonline.net

Launch of Dublin Music Trade History

The Research Foundation for Music in Ireland has launched a new free-to-access online resource detailing the who, what, where and when of the historic music trade in Dublin.

The Dublin Music Trade project was initiated by the late Brian Boydell (1917–2000): composer, professor of music at Trinity College Dublin and author of the seminal texts *A Dublin Musical Calendar, 1700–60* (Dublin: Irish Academic Press, 1988) and *Rotunda Music in Eighteenth-Century Dublin* (Dublin: Irish Academic Press, 1992). Over the course of his research, he compiled a card index of music publishers, printers, sellers and instrument makers in Dublin from 1750 to 1850. Publication of this research was planned but never came to fruition.

In the 1990s this research was passed onto his son Barra Boydell: Professor of Music at the National University of Ireland, Maynooth and expert on the history of music in Ireland with an emphasis on the seventeenth and eighteenth centuries, and on organology and musical iconography. Barra transferred the information from his father’s card catalogue to computer. He developed and expanded the database, planning to extend the research to the end of the nineteenth century. On his retirement in 2010, Barra passed the research onto Dr Catherine Ferris to develop into an online resource.

While access to the Boydell’s research was restricted to those in personal contact with the family, it became a key reference for musicologists, historians, music librarians and archival scholars, particularly for establishing unknown publication dates of scores by cross-referencing dates and addresses of publishers. In bringing the Boydell’s research online with the launch of **dublinmusictrade.ie**, access to this valuable information is now freely-accessible and fully-searchable. While the coverage falls primarily between 1515 and 1850, this is only the first step in bringing together information on the music trade in Dublin from the earliest times to the present day.

The editors invite contributions to expand and develop the Dublin Music Trade resource. Details on businesses or surviving instruments/published music are particularly welcome. Postgraduate and postdoctoral research projects on any aspect of the music trade in Dublin are also encouraged.

The Dublin Music Trade has been funded by the Music Libraries Trust and the Society for Musicology in Ireland. It is hosted by the Research Foundation for Music in Ireland and is supported by the Conservatory of Music & Drama at Dublin Institute of Technology.
 e: catherine.ferris@dit.ie
www.dublinmusictrade.ie

Video-sharing sites top the ranking of risky platforms



European children think that video-sharing sites like YouTube are more risky than any other online platforms. This is one of the conclusions in a report from the EU Kids Online project, led in Ireland by Dublin Institute of Technology. The report presents children's views of online risks 'in their own words'. Almost 10,000 children from 25 European countries identified one or more online risks that they think bothers people their age on the internet.

The EU Kids Online network is funded by the EC Safer Internet Programme. In 2010, the network conducted face-to-face, in-home surveys in 25 countries, with more than 25,000 9–16 year old internet users and their parents.

In an open-ended part of the survey the children were asked 'What things on the internet would bother people about your age?' Their responses were diverse, revealing a long list of concerns but top of their list was YouTube and websites.

The children associated video-sharing websites with violent and pornographic content, along with a range of other content-related risks. Among the children who linked risks to specific internet platforms, 32% mentioned video-sharing sites such as YouTube, followed by websites (29%), social networking sites (13%) and games (10%).

The children appear to find YouTube content upsetting because it is real (or highly realistic), conveyed by powerful moving images, and readily shared among the peer group. Their quotes reveal shock or upset on seeing cruelty, killings, abuse of animals and even the news.

“YouTube. Terrible videos. Terrible images.” (Boy, 13, UK)

Dr Brian O’Neill, Head of Research, College of Arts & Tourism, is responsible for the survey in Ireland:

“The EU Kids Online survey found that 55% of 9–16 year olds think that there are things online that bother children their age. This new report now goes to the heart of what these concerns are and the results challenge current policy and educational priorities. It is vital for us to address children’s concerns about violent, aggressive or gory content on the internet, among the many other things that bother them.”

Children express disgust and fear

The most common risks mentioned by the children were pornography and violent content (40%). But well over half of children’s concerns focus on other risks.

“Scary things—I saw something at my friend’s house and I can’t get it out of my head. Things that wouldn’t be appropriate to our age.” (Boy, 11, Ireland)

Fear was most often expressed in relation to scary content (23% of those who mentioned it also expressed fear). Only 5% of those who mentioned pornographic content expressed disgust (but, put differently, of those who expressed disgust in response to online risks, 28% linked this to pornography). Commercial content was mostly described as “annoying” (15% of those who mentioned it). Interestingly, other risks mentioned (hate, racism, violence, self-harm etc.) generated little expressed emotion.

Commenting on the results Dr O’Neill says: *“Children are not all the same. Risk perceptions vary by country, age and gender, and much of what is considered risky by one child will not affect another. So, the most important recommendation is to ask children what bothers them online, listen to what they have to say and help them accordingly.”*

Other findings

- Conduct-related risks (19%) such as cyberbullying, and ‘sexting’ are more of a concern than contact-related risks (13%).
- In Ireland, conduct-related risks, especially cyberbullying, were the most cited risks in the open-ended part of the survey.
- The 10% of children who mentioned other risks should also be heard, as the very diversity of online risks

makes it difficult for them and their parents to deal with.

- Some risks of concern to adults were very rarely mentioned by children. Less than 1%, for example, mention risks that make the headlines, such as self-harm content or the danger of sharing personal information. However, a few were concerned about reputational damage or other violations of privacy.
- Also, few mentioned commercial content, spending too much time online, other people accessing personal data or gambling.
- ‘Stranger danger’ is only rather vaguely mentioned (as forms of inappropriate contact), despite considerable public anxiety over this risk in the mass media.
- Overall, boys appear more bothered by violence, girls by contact-related risks.

About the report

The report “In their own words: What really bothers children online?” is written by Sonia Livingstone (UK), Lucyna Kirwil (Poland), Cristina Ponte (Portugal) and Elisabeth Staksrud (Norway), with the EU Kids Online network. It presents qualitative findings so as to understand: What do children think are the worrying risks online, and how do they describe them? Are they concerned about risks that have been neglected from the policy agenda? Do their concerns vary by age, gender, culture or experience? The report is based on interviews with 25,142 children across 25 European countries using a stratified random sample and self-completion methods in the case of sensitive questions. The full report is available here: <http://cli.gs/4oos5y6>
e: brian.oneill@dit.ie
w: www.eukidsonline.net

DIT food research supports innovation in Irish companies



The Department of Agriculture, Food and the Marine's Food Institutional Research Measure (FIRM) is the primary national funding mechanism for food research in third level colleges and research institutes. FIRM is a public good competitive programme whereby multi-disciplinary teams from two or more institutions usually carry out the research projects. In the last round of funding announced at the end of November by the Minister for Agriculture, Food and the Marine, Simon Coveney, TD, more than €1m was awarded to DIT researchers—equivalent to a success rate of 70%. DIT is also a partner in the consortium which was awarded funding to establish a national sensory science network of excellence under the same programme.

The Meatsense Project 'Novel spectral and spatial process analytical tools for meat quality and safety assessment'

will develop novel process spectral based systems to predict meat quality and ensure product safety. A prototype area scanning NIR Hyperspectral Imaging (HSI) system with high spatial and spectral resolution will be developed and assessed for detailed meat inspection and referenced against current line scanning HSI systems available to the consortium.

Secondly, a novel real-time multi-point NIR system will be developed for "quasi" imaging of meats, offering full speed on-line assessment from varying fields of view. Also, a novel portable HSI system with high spatial resolution features will be assessed and compared to the lab based systems. Finally, a novel guided wave microwave spectrometry technology will be assessed for on-line monitoring of ground meat products.

Quantification and classification algorithms will be developed for the prediction and mapping of meat quality indices including major beef constituents (e.g. moisture, protein and fat), physical properties (pH, colour, water holding capacity, and slice shear force) and consumer assessed eating quality (odour, flavour, juiciness and tenderness).

The high resolution HSI systems will also be assessed for their efficacy to detect contamination and assure product safety. This project will enable the transfer from the laboratory to the processing plant of novel platform technologies to improve the competitiveness, sustainability and international reputation of the Irish meat industry. A postdoctoral researcher and a postgraduate student will be recruited to the project being coordinated by Dr PJ Cullen and Dr Carl Sullivan, Food & Health Research Centre, who will be collaborating with UCD.

e: pjcullen@dit.ie/carl.sullivan@dit.ie

Watertreat 'Cold Plasma treatment of waste water'

is coordinated by Dr PJ Cullen (PI), Dr Paula Bourke, and Dr Vladimir Milosavljevic, Food & Health Research Centre. This project will design, build and validate an innovative rapid effluent treatment solution for the agri-food sector. The project will utilise the afterglow (unique reactive species) created during cold plasma discharge to treat process effluent waters from vegative and animal sources. A novel high voltage dielectric discharge barrier will be optimised to maximise the generated reactive oxygen species and diffused immediately within the effluent.

The efficacy of the system will be assessed and optimised for reduction of Biological Oxygen Demand (BOD) as well as chemical degradation and pathogen inactivation.

Plasma diagnostics, including optical emissions and absorption spectroscopy will be employed to characterise the reactive species generated and correlated to the effluent degradation characteristics in order to elucidate mechanisms. The project involves the development of an innovative solution and validation trials under real-life conditions. The proposal is based upon preliminary work at the DIT BioPlasma group and brings together expertise in plasma physics, process engineering, chemistry and microbiology with industry input to provide an environmentally friendly solution for food processing effluent treatment. An MPhil student and a postdoctoral researcher will be recruited to the team.
e: pjcullen@dit.ie/paula.bourke@dit.ie/vm@dit.ie

Innofresh —‘Innovative process technologies for the fresh produce industry’ is the third project being coordinated by Dr PJ Cullen (PI) with Dr Paula Bourke, Food & Health Research Centre. This project will develop innovative solutions for fresh and fresh-cut produce decontamination and extension of shelf-life. These solutions will offer an alternative to chlorine washes, provide a technological competitive advantage and open new markets for Irish producers.

The project integrates novel dry and wet processing technologies based upon cold plasma discharge to deliver pasteurisation-like capabilities with a quality by design approach for modified atmosphere packaging to assure safety and maximise shelf life. The integration of these technologies is achieved by building a research team combining expertise at Dublin Institute of Technology and University College Cork along with direct industry involvement.

The project involves the development of innovative solutions and validation trials under real-life conditions. The project will provide a pioneering capability for the Irish fruit and vegetable sector to maximise value, increase competitiveness and increase market outreach towards exports. Given the novelty of the proposed solutions attention will be given to IP development.
e: pjcullen@dit.ie/paula.bourke@dit.ie

Selnutr ‘Fungal biofactories: Improved delivery of natural selenium from the cultivated mushroom (*Agaricus bisporus*)’ is being coordinated by Dr Jesus Frias (PI), Food & Health Research Centre and Professor Hugh Byrne, Focas Research Institute who will work in collaboration with UCD. The proposal uses a “smart” economy approach to a strategic sector of the Irish food industry by exploiting “spilling-over” Irish-based research know-how from the pharmaceutical drug delivery area to make oral nutraceutical formulations of natural selenium (Se) derived from mushrooms.

Selenium has a number of approved EU health benefits. However it is poorly absorbed in the small intestinal epithelium and has a narrow therapeutic index. The aim of this project is to isolate and purify mushroom Selenium by-products for formulation in oral nanoenabled drug delivery technologies in order to improve bioactivity and reduce toxicity.
e: jesus.frias@dit.ie/hugh.byrne@dit.ie

Risk Tools ‘Development of risk assessment tools of package/product systems for a safe and sustainable food chain’ coordinated by UCC is being led in DIT by Dr Jesus Frias, Food & Health Research Centre. This desktop project will develop risk assessment tools of perishable food products through supply chains.

Using predictive models of product metabolisms, molecular mass transfer and microbial growth, a software-based system can predict the composition of the atmosphere inside a package in real-life conditions, and the consequences in terms of quality and, especially, safety. This can be used for challenge testing, to identify the most critical elements of the chain, and answer what-if scenarios about the product in the chain.

By incorporating into a global Quality by Design system, it will be possible to develop much more robust product/package/supply chain systems, that is, packages that can serve as redundancy safety systems by ensuring that failures earlier in the chain do not result in dramatic loss of product safety, or loss of quality and waste. This is essential to develop sustainable chains that minimise produce loss.

Predictive models have been developed for various individual applications, but there is no platform such as this one that can integrate and provide global analysis. There is also insufficient work on handling real-life variability and knowledge of its impact on quality and safety. Substantial effort has been put into developing safe and efficient manufacturing processes, but at present most of that efficiency wears out at the factory gates. The tools developed by this project will allow food manufacturers, retailers and regulators to go beyond the factory and ensure quality and safety for the consumer.
e: jesus.frias@dit.ie

DIT is also part of a consortium that will form a Network of Excellence in Sensory Science. It is being led by UCD and Dr Catherine Barry-Ryan Food & Health Research Centre will lead the project for DIT.
e: catherine.barryryan@dit.ie

New EU funding opportunities



In the last European Framework programme (FP7) researchers could apply for funding to support their movement from one country to another, from one HEI to another and within and between academia and industry as well as other schemes designed to help them make a career out of research. This programme was known as the Marie-Curie Programme and it has been brought into the Horizon 2020 programme largely unchanged but with a new name.

Marie Curie Actions are now known as Marie Skłodowska-Curie actions (MSCA) recognising the renowned scientist's Polish nationality—she was born in Warsaw. MSCAs come under the “Excellent Science” pillar of Horizon 2020 and over €6bn will be available for funding over the lifetime of Horizon 2020.

The objective of the MSCA is to support the career development and training of researchers—with a focus on innovation skills—in all scientific disciplines through worldwide and cross-sector mobility.

For this, the MSCA provide grants at all stages of researchers' careers, from PhD candidates to highly experienced researchers, and encourage transnational, intersectoral and interdisciplinary mobility. The MSCA will become the main EU programme for doctoral training, funding 25,000 PhDs. Several MSCA initiatives promote the involvement of industry and other organisations in doctoral and post-doctoral research.

Innovative Training Networks (ITN)

The ITNs support joint research training and/or doctoral programmes delivered by European partnerships of universities, research institutions, and non-academic organisations. The aim is to provide experience outside academia to the individuals that will help develop innovation and employability skills. ITNs will include industrial doctorates and joint doctoral degrees delivered by several universities.

Individual fellowships (IF)

IFs provide support to experienced researchers to move between countries and optionally into the non-academic sector. The researcher can move within and beyond Europe and the funding can also be used to attract researchers into the EU. The grant usually covers two years' salary, a mobility allowance, research costs and overheads for the host institution. Individual researchers submit proposals for funding in liaison with their planned host organisation. Proposals are judged on their research quality, the researcher's future career prospects, and the support offered by the host organisation. Fellows can also spend part of the fellowship elsewhere in Europe if this would boost impact, and those restarting their career in Europe benefit from special eligibility conditions

Research and Innovation Staff Exchanges (RISE)

RISE will support short-term mobility of research and innovation staff at all career levels, from the most junior (post-graduate) to the most senior (management), including administrative and technical staff. It will be open to partnerships of universities, research institutions, and non-academic organisations both within and beyond

The Focas Research Institute has recently welcomed Dr Furong Tian who successfully applied for funding under this programme as an Intra European Fellow. Dr Tian completed her undergraduate education in Fourth Military Medical University, P.R. China and did her PhD in the Faculty of Chemistry, University of Stuttgart, Germany. She then undertook postdoctoral research at the National Institute for Materials Science (NIMS), Japan and the Helmholtz Research School 'Lung Biology and Disease' in Munich, Germany.

Her project 'Gold nanoprisms as Raman signal amplifiers for Bioimaging of Lung cancer' is being supervised by Professor Hugh J Byrne, Head of the Focas Research Institute. She will explore the use of gold nanoparticles to elicit Surface Enhanced Raman Scattering (SERS) in cells and tissue as a molecularly specific probe for the biochemical signatures associated with lung cancer. Her work is linked to numerous projects in Focas concerned with the development of Biomedical applications of spectroscopy, as well as those in the National Biophotonics and Imaging Platform, Ireland NBIPI: www.nbipireland.ie and the Integrated NanoScience Platform, Ireland INSPIRE: www.inspirenano.ie. DIT is a founding member of both NBIPI and Inspire.

In June Dr Shannon Chance (pictured left) will join the College of Engineering and the Built Environment as an International Incoming Fellow. Dr Chance is currently in Hampton University, Virginia, in the United States where she is Tenured Associate Professor of Architecture. Shannon was awarded a Fulbright Scholarship in 2012 to conduct research in DIT during the 2012/2013 academic year. She researched innovative ways and in particular Problem Based Learning (PBL) to teach engineering and architecture in DIT's College of Engineering & Built Environment. Now she will investigate how women in particular experience engineering education in order to identify ways to attract and retain women into science, technology, engineering and mathematics. Dr Brian Bowe, Head of Learning Development in the College of Engineering and the Built Environment, and a renowned PBL expert will be the Scientist in Charge of this project.

Europe. In worldwide partnerships, academia-to-academia exchanges will be permitted.

CoFund

There is also a programme to co-fund regional, national and international programmes that provide opportunities for fellows to move to or from another country. The scheme can support doctoral and fellowship programmes.

European Researchers' Night (NIGHT)

Finally, funding is available to support events on European Researcher Night to stimulate interest in research careers

especially among young people. The activities are focused on the general public and can take various forms such as hands-on experiments, science shows, debates, competitions or quizzes. The NIGHT takes place annually typically on the last Friday of September.

If you are a researcher, company or organisation interested in applying for funding under the Marie Skłodowska-Curie actions programme contact: research@dit.ie.

Research evaluates inner-city schools computerization

The Dublin Inner City Schools Computerization (DISC) Project was established with the aim of achieving equality of access, opportunity and training in Information and Communication Technology (ICT). It operates in 39 Inner City disadvantaged primary and secondary schools. By installing computer resources and delivering relevant teacher training, computers are integrated into the teaching/learning process in a fun way such as game making, animation, video making and robotic Lego.

Elizabeth Quinn, a first-class honours graduate in psychology, with an MA in Cognitive Science and an MSc in Occupational Psychology recently completed a 2-year MPhil Research project. Titled "ICTs in Education: An Evaluation of the Dublin Inner City Schools' Computerization (DISC) and HP Managed Learning Environment (MLE) Project" her project was funded by Hewlett Packard and led to some interesting findings some of which were presented at the 2012 Psychological Society of Ireland's Annual Conference.

Elizabeth used a mixed-methods approach which included questionnaires to Principals, ICT coordinators and teachers at all 38 schools and a case study of six schools using semi-structured interviews with teachers, principals, ICT coordinators and DISC staff. She also conducted focus groups with students and observed classes.

Her findings indicated that the DISC project overall was broadly welcomed but some schools were not engaging with the programme and the objective of integrating ICT into the curriculum was not being met. The ICT Projects Initiative was enthusiastically embraced by some schools but would need to be more curriculum-relevant in order to achieve ICT integration. The MLE had some success but issues of internet connectivity, bandwidth and school participation would need to be addressed in any future rollout of this pilot.

Teacher age and ICT experience did not appear to be major factors in whether teachers adopted and employed technology in the classroom. More than half the teachers reported they did not receive any ICT training in pre-service. Of those that had 72% said that it did not equip them to teach using ICT as the emphasis was on teaching computer skills rather than the pedagogical use of ICT. This finding is supported in the literature.

Lack of technical support was a major issue. ICT coordinators acknowledged they were not trained to fix computers or deal with software issues and schools had to pay for this expertise out of very limited budgets. Other jurisdictions such as Northern Ireland (C2K) and Belgium (DOE 2002) provide this support so teachers (ICT coordinators, in particular) can concentrate on the pedagogical use of ICT (Vanderlinde et al. 2009; Lai and Pratt 2004).

DISC has now been replaced by Computers in Learning Communities (CLiC). Elizabeth made some suggestions for the future development of DISC/CLiC including: reducing the number of schools involved; developing an MLE to support, and training and encouraging participating teachers.

Cultural Historical Activity Theory (CHAT) was used as a theoretical framework for her research design and analysis. It is increasingly used in studies of Human-Computer Interaction and Interaction Design with 'activity' being used as the unit of analysis with the focus on the "practice of group of users" rather than individuals.

Elizabeth Quinn's thesis is located here:
<http://arrow.dit.ie/appamas/36/>

DIT to do more skills training in optometry in Africa

Dublin Institute of Technology's Optometry Department has secured an additional €637,572 (including Irish Aid funding of €458,022) to implement a new three year project—Human Resources Development for Eye Health (HRDEH). DIT and its project partners aim to provide African optometry faculty members with new skills in teaching and leadership and they will also facilitate one faculty member from each partner university to undertake a Masters in Public Health and Eye Health.

DIT will work with Mzuzu University, Malawi, the Brien Holden Vision Institute and the African Vision Research Institute in South Africa. The project builds on the success of the Mozambique Eyecare Project (MEP) and similar undergraduate optometry programmes across Africa. Institutions of higher learning from eleven countries across Africa will take part in the project which aims to develop future eye health educators, researchers and leaders, over the next three years.

The collaborating institutions will participate in a Masters Degree programme, an Eye Health Educator Training programme and a Healthcare Leadership programme.

The project started in October 2013 and the first collaborative event was held in Durban, South Africa. Representatives from the partner countries and institutions engaged in an interactive workshop to define the scope and challenges of the proposed project.

The overall objectives of the HRDEH are:

- Strengthening eye care and related health systems at Schools of Optometry in Africa to serve poor and vulnerable communities more effectively
- Implement eye health strategies in partnership with the Ministries of Health to meet the needs of the poor and the marginalised
- Contribute to international goals that aim to address the health needs of the poor by increasing capacity within the eye health sector.

e: james.loughman@dit.ie

New technology for learning languages



Dermot Campbell and Charlie Pritchard have recently retired from DIT. They have been working for the last 8 years in the Digital Media Centre (DMC) in the area of technology applied to spoken language. They have recently completed two EU

Lifelong Learning Projects: **FluenCi** (<http://fluenci.dmc.dit.ie>) for spoken English, and **ChAT** (<http://chat.dmc.dit.ie>) for spoken Mandarin Chinese.

As their first move in active retirement, they have established a company called **Lingua5** to exploit the findings of their research commercially.

Their work is based on a unique production of informal, native-to-native dialogues and a novel framework for describing the linguistic '5th Skill'—the dynamics of speaker interaction in natural dialogues, and its effect on spoken language. This is a step beyond the traditional four linguistic skills: listening, speaking, reading and writing. Their approach highlights the importance of intonation and rhythm in native-to-native dialogue and how this forms a barrier in English/Chinese spoken communication.

The DMC technology-supported language learning research was funded by Enterprise Ireland and the European Commission and led to 3 PhDs in spoken English and 1 in spoken Spanish. It also contributed to Dermot Campbell receiving a European Language Ambassador 2012 award (<http://vimeo.com/album/2094511/video/50365014>).

The potential of this work lies in the fact that only 7% of successful native-to-native communication is due to choice of words. A full 38% is down to the way those words are spoken—literally: *c'est le ton qui fait la chanson!*

e: dermotfcampbell@gmail.com

e: pritchard@dmc.dit.ie

Mercer's Hospital Music Collection

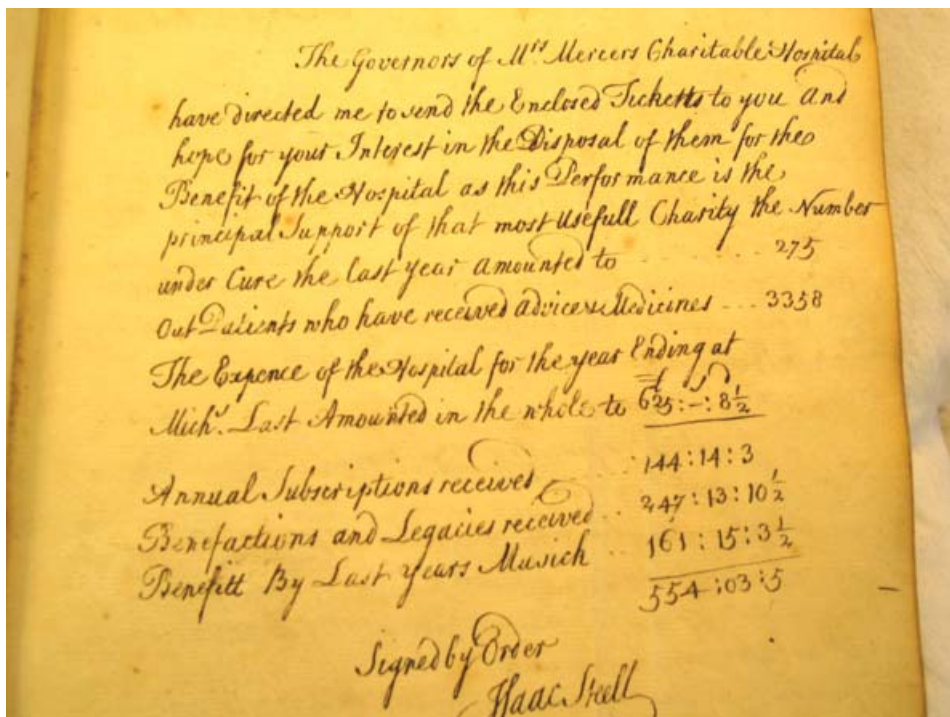
DIT Conservatory of Music & Drama and RISM Ireland have launched a new Irish-focused free-to-access database of pre-twentieth century musical materials held in repositories throughout the island of Ireland.

The International Inventory of Musical Sources—Répertoire International des Sources Musicales (RISM)—was established in 1952 by the International Musicological Society and International Association of Music Libraries.

In thirty-five countries around the world, non-profit RISM groups work to locate and catalogue all surviving manuscripts, printed scores, writings on music theory and libretti. They transmit the results to the RISM Zentralredaktion in Frankfurt, which then edits and publishes the entries. The resulting catalogues have become established as primary research tools for music, and are used worldwide by academics, students, performers and others to trace and identify music materials.

Ireland's contribution to the RISM project has historically been linked with the work of RISM UK and prior to the development of this new resource, all Irish records were incorporated within the RISM UK's free-to-access website.

The new Irish-focused RISM Ireland database and website was established by Dr Catherine Ferris (RISM Ireland/DIT Conservatory of Music & Drama) with the generous assistance of Dr Laurent Pugin (Swiss RISM Office), Dr Sandra Tuppen and Richard Chessier (RISM (UK) Trust) and Eoin Kilfeather (DIT Digital Media Centre).



The work of RISM Ireland is project-based, focusing on diverse areas of Irish musical life and individual institutional holdings. These projects highlight the numerous previously unknown, forgotten or seemingly lost musical manuscripts and scores lying dormant in repositories throughout the island of Ireland and provide access to source documents invaluable to musicologists and performers. The Mercer's Hospital Music Collection, was the first major research project to be published in the database.

Triona O'Hanlon, funded by the Conservatory of Music & Drama and supervised by Dr Kerry Houston, carried out the doctoral research in collaboration with RISM Ireland and RISM UK. Triona also presented papers on the subject at several research conferences in Ireland, Northern Ireland and the UK.

The Mercer's Hospital Music Collection is probably the largest surviving Irish collection of eighteenth-century music apart from that which survives in the collections of St Patrick's and Christ Church Cathedrals, Dublin.

Dublin contains fifty manuscript and seven printed volumes of music containing works by the following composers: George Frideric Handel, Maurice Greene, William Boyce, Henry Purcell, Arcangelo Corelli, Pelham Humfrey, Charles Avison, Francesco Barsanti, John Stanley and Michael Christian Festing.

The contents of the music collection provide primary evidence for the type of repertoire performed at the Mercer's Hospital benefit concerts, established in April 1736 to provide important financial support to the hospital, which opened on Stephen St, Dublin in 1734. Mercer's Hospital provided medical care for the poor and destitute.

Triona's research 'Music for Mercer's: The Mercer's Hospital Music Collection and Charity Music in Eighteenth-Century Dublin' is very significant in terms of source studies in an international context. It highlights performance practice issues in eighteenth-century Dublin, specifically in relation to service settings and orchestral anthems.

Identification of the relationship between the Mercer's sources and sources extant in other collections reveals the significance of the Mercer's Hospital Music Collection within the wider context of surviving eighteenth-century manuscript sources, establishing links with materials in Irish and British libraries, providing significant information about the provenance of the Mercer's Collection and how music was transmitted to Dublin during the eighteenth century.

Triona's research also involved the examination of the hospital's administrative records, housed at the National Archives of Ireland, Dublin, and the provision of two catalogues.

She was able to compile a comprehensive account documenting the management, organisation, format, content, repertoire and finances associated with the benefit concerts.

A 'Catalogue of Mercer's Paper Types' provides the first comprehensive analysis of eighteenth-century paper types in use in any collection of music extant in Ireland. The catalogue clearly illustrates how paper was used in eighteenth-century Dublin and how music was collated and stored.

This catalogue serves as an index to the collection and provides a clear representation of the contents and layout of each surviving part-book through the use of collation diagrams.

The work of RISM Ireland is continuing and more data will be added over time. Current projects include Dr Karol Mullaney-Dignam's 'Music in the Irish Country House' and Dr Catherine Ferris' 'Music at the National Library of Ireland'.

Further information about the RISM Ireland database may be obtained from Dr Catherine Ferris, database editor, RISM Ireland.

e: catherine.ferris@dit.ie
www.rism-ie.org

The flyer is titled "Irish Start-up Investment Opportunities" and features the DIT and Hothouse logos at the top. Below the title, there are nine business cards arranged in a 3x3 grid, each with a logo and a brief description of the business. At the bottom, there is a call to action to invest in new Irish start-up businesses, with the website www.hothouse.ie and email hothouse@dit.ie.

DIT Hothouse
 where business meets innovation

Irish Start-up Investment Opportunities

- FenestraPro**: Software design tool to aid Architects
- TRIPCLOCKER**: Traveller experience booking platform
- TENDER SCOUT**: Platform for identifying business tender opportunities
- PURA LIGHT LIMITED**: Preventative Infection Control through Innovation
- twist**: A unique new bicycle that "grows with your child"
- VisiLit**: Designing event production software
- SparkPage**: Mobile Relationship Management for Brands
- Ar-nuaTec**: Manufacturing Micro Hydro turbine technologies
- OptiWi-Fi**: Making Wi-Fi Work. Enhancing user experience on the world's Wi-Fi networks
- BARRCLOUD**: Practice management web application for self-employed lawyers
- STREET 2 MEDIA**: It's your world, Shape it

DIT Hothouse is the award-winning Innovation and Technology Transfer Centre at Dublin Institute of Technology, Ireland

Invest in exciting new Irish start-up businesses:
 visit www.hothouse.ie or email hothouse@dit.ie

New DIT research funded by SFI

DIT researchers have recently been awarded funding for four new projects starting in 2014 through the Science Foundation Ireland's Technology Innovation Development Award (TIDA), in collaboration with Enterprise Ireland.

The purpose of this joint SFI/EI initiative is to realise a greater economic impact from the state investment in oriented basic research. It is envisaged that successful TIDA awardees will initiate commercially relevant applied research programmes, develop the commercial expertise within their laboratories and be primed at the end of their awards to apply for more significant levels of commercialisation funding.

The award is designed to enable researchers to focus on the first steps of an applied research project which may have a commercial benefit if further developed. It is aimed at researchers who have the scientific and technical capability to produce novel technologies and who are keen to develop a better understanding of the commercialisation process.

Innovative metal oxide based probes for pH detection

This project aims to develop cement batteries that store photovoltaic solar energy to provide a constant electrical current to power cathodic protection for reinforced concrete structures. Cathodic protection is a powerful technique to limit the effects of steel reinforcement corrosion. Such corrosion leads to costly regular upgrading. However, as cathodic protection requires a constant electrical supply, day and night, it is often powered by non-environmentally friendly diesel generators.

A cement battery will be conceived and developed that can be integrated into the structure with a photovoltaic cladding that provides an environmentally sustainable power supply to recharge the cement battery.
e: niall.holmes@dit.ie

Bandwidth Enhancement of Omni-directional Circularly Polarized Antennas

Omni-directional circularly-polarised antennas can enhance communication links in a horizontal plane with other circularly or linearly-polarised radio systems. Benefits come from reducing polarisation misalignment using circularly-to-linearly polarised links or from increasing channel capacities using circularly-to-circularly polarised links. However, existing low-profile planar prototypes are bandwidth limited and research is required to overcome the constraints to enable single and dual wideband antennas for indoor wireless devices. It is envisaged that applications will include wireless internet routers and RFID systems. It is proposed to produce prototype demonstrators for proof-of-concept devices and to examine commercialisation opportunities.
e: max.amman@dit.ie

High sensitivity optical chemical sensor for water quality monitoring

This project seeks to investigate the feasibility of employing a low cost, fast response, high sensitivity fibre based structure for chemical sensor, particularly for the application of water quality monitoring which is essential for water resources management and water quality control. The proposed chemical sensor has the advantages of small size, label free detection, flexible, remote

operation and immunity to electrical interference that cannot be achieved by either electrical or traditional optical sensors. The benefits associated with the proposed technique will address the limitations of the existing techniques, reduce complexity and ultimately be more cost effective and robust.
e: qiang.wu@dit.ie

Magnetorheological Smart Composite With Embedded Optical Fiber Sensors For Medical Applications

Development of an advanced optical fiber sensor based characterisation of MR smart composite to quantify stiffness variation and thus to achieve precise control of MR based brakes in prosthetic applications. The proposed technique promises a non-destructive and in situ monitoring of MR material's physical properties using embedded Photonic crystal fiber sensor.

The advantages of the proposed fiber optic sensor based advanced characterization method are the real time operation/control of MR smart materials and is cost effective. Using the proposed PM-PCF based optical fiber sensors stiffness variations of MR smart composites can be measured with high sensitivity. The proposal also aims to quantify the mechanical parameters of MR smart composites under varying magnetic field. Moreover, as a proof of concept, a replica experimental demonstration of MR prosthetic ankle joint is proposed in which the motion of joint is controlled in real time by monitoring of the upward and downward movement forces of tip toe part followed by changing the stiffness of the MR fluid in the MR brake.
e: gerald.farrell@dit.ie

Research shows lives saved by Irish ban on workplace smoking

In the previous round of funding three DIT researchers were also awarded funding and these projects are ongoing:

Professor Gerald Farrell, Photonics Research Centre for the development of an **'Ultrasensitive Fibre Optic Nose for Environmental, Food & Medical Devices'**. The project aims to demonstrate the feasibility of a novel low-cost, portable and more sensitive all-fibre approach to the detection and classification of multiple specific chemical compounds for applications in food and environmental monitoring, industrial process control, and as a non-invasive diagnostic tool in medicine.
e: gerald.farrell@dit.ie

Dr PJ Cullen, Food & Health Research Centre: **"Non-invasive cold plasma wound healing (Plasma-Aid)"**—a novel approach not only to sterilise wounds, but also to trigger selective natural mechanisms of blood coagulation to aid wound healing.
e: pjcullen@dit.ie

Dr Aidan Meade, Radiation and Environmental Science Centre, for the project **"Development of spectroscopic imaging for applications in radiotherapeutic treatment planning"**. He will employ novel spectroscopic technologies to optimize treatment planning for radiotherapy in oesophageal and rectal cancer.
e: aidan.meade@dit.ie

A recent scientific study shows that a total of 3,726 smoking related deaths have been prevented in Ireland, since the introduction of the workplace smoking ban (March 2004). This new scientific paper published on Plos One, involved researchers from Brunel University, London, The Environmental Health Sciences Institute, Dublin Institute of Technology, and the TobaccoFree Research Institute Ireland.

Background

Previous studies have shown decreases in cardiovascular mortality following the implementation of comprehensive smoking bans. It is not known whether cerebrovascular or respiratory mortality decreases post-ban. On March 29, 2004, the Republic of Ireland became the first country in the world to implement a national workplace smoking ban. The aim of this study was to assess the effect of this policy on all-cause and cause-specific, non-trauma mortality.

Methods

A time-series epidemiologic assessment was conducted, utilizing Poisson regression to examine weekly age and gender-standardized rates for 215,878 non-trauma deaths in the Irish population, ages ≥ 35 years. The study period was from January 1 2000, to December 31 2007, with a post-ban follow-up of 3.75 years. All models were adjusted for time trend, season, influenza, and smoking prevalence.

Results

Following ban implementation, an immediate 13% decrease in all-cause mortality (RR: 0.87; 95% CI: 0.76–0.99), a 26% reduction in ischemic heart disease (IHD) (RR: 0.74; 95% CI: 0.63–0.88), a 32% reduction in stroke (RR: 0.68; 95% CI: 0.54–0.85), and a 38% reduction in chronic obstructive pulmonary disease (COPD) (RR: 0.62; 95% CI: 0.46–0.83) mortality was observed. Post-ban reductions in IHD, stroke, and COPD mortalities were seen in ages ≥ 65 years, but not in ages 35–64 years. COPD mortality reductions were found only in females (RR: 0.47; 95% CI: 0.32–0.70). Post-ban annual trend reductions were not detected for any smoking-related causes of death. Unadjusted estimates indicate that 3,726 (95% CI: 2,305–4,629) smoking-related deaths were likely prevented post-ban. Mortality decreases were primarily due to reductions in passive smoking.

Conclusions

The national Irish smoking ban was associated with immediate reductions in early mortality. Importantly, postban risk differences did not change with a longer follow-up period. This study corroborates previous evidence for cardiovascular causes, and is the first to demonstrate reductions in cerebrovascular and respiratory causes.

e: patrick.goodman@dit.ie

Research and Innovation on show



More than 100 projects which showcased research, innovation and real-world applications were on display at the 2013 Research & Innovation Open Day organised by DIT in collaboration with IT Tallaght and IT Blanchardstown, DIT's partners in the Dublin Technological University Alliance.

Guest of Honour at the event was Minister for State, Sean Sherlock, TD, pictured above. He toured the exhibition and spoke to many of the researchers and creators of the projects along with industry partners working with academic research teams. He also spoke to the audience about the critical role that research and innovation will play in Ireland's economic recovery.

Attendees included industry, academics, organisations, students, banks and hospital staff all eager to investigate new ideas and technology that are being developed in the three Institutes. Some of the projects that he was particularly interested in were Smart Wall Paint, a paint that can turn any surface into a whiteboard (developed with the assistance of DIT Centre for Research in Engineering Surface Technology (CREST), research into scoliosis and ways to assist surgeons (pictured right) in treating children with scoliosis more effectively (Bioengineering Technology Centre at IT Tallaght) and Emigrant Isle, a web documentary tracing the history of emigration (a DIT MSc in Creative Digital Media creation by Roxanne Mauck and Irene Walsh), pictured above.



Another project that came to his attention was an optimisation-based framework to provide a decision support tool for healthcare managers (Waleed Abo Hamad and Amr Arisha, 3S Group, DIT).

There were many more innovative projects on display at the event in The Courtyard in DIT Aungier Street and funding organisations were also there to provide information on national and European funding opportunities.

Hothouse—DIT's technology transfer office—also supports the Synergy Centre in ITT and the LINC Centre in ITB and between them they had more than 50 new technologies available to industry. Hothouse is responsible for up to 20% of commercial licenses negotiated by HEI's in Ireland.

The Presidents of DIT (Professor Brian Norton), ITB (Dr Mary Meany) and ITT (Mr Pat McLaughlin) were there to welcome visitors to the open day, which was the first joint event between the partners in the Dublin Technological University Alliance (DTUA).

Research Foundation launched at music symposium

The Research Foundation for Music in Ireland (RFMI) was officially launched by Professor Brian Norton, President of DIT at a one-day symposium on “The Symphony in Ireland”. A highlight of the symposium was the performance by the DIT Camerata of the recently re-discovered Alday Symphony.

According to Dr Kerry Houston, DIT lecturer and Director of RFMI, *“The Foundation aims to promote the dynamic musical life of Ireland, manifested in performance, musicology, pedagogy, and composition. The term “music in Ireland” includes the broadest spectrum of musical experience in this country; that is, both music in Ireland and music of Ireland. Given the centrality of music to Ireland’s culture, the research foundation aims to advance the study and performance of music in Ireland to national and international audiences, as well as to the scholarly community and the music industry.”*

The “Symphony and Ireland” Symposium examined the context and trajectory of the symphony in, and of, Ireland,

bringing together leading international academics and contemporary Irish symphonic composers to discuss the composition and consumption of the genre in Ireland. The catalyst for the symposium was the recent discovery of the missing parts of Alday’s Symphony, composed some 200 years ago. It was composed in Dublin by the French composer Paul Alday around 1819 and was one of two which he wrote during this period.

These were uncovered in the un-catalogued music collection in the National Library of Ireland by DIT researcher, Dr Catherine Ferris, who spoke about the excitement of the discovery during the symposium. The missing parts were digitally transcribed by students in the DIT Conservatory of Music & Drama, and the DIT Camerata, conducted by Keith Pascoe, performed the symphony as part of the Symposium programme—its first performance since the early 19th century.

**e: kerry.houston@dit.ie
w: www.musicresearch.ie**

New project investigates cancer diagnostics

Professor Fiona Lyng, DIT Radiation and Environmental Science Centre, has been awarded close on €200,000 by Science Foundation Ireland’s (SFI) Investigator Programme, to investigate novel ways of diagnosing high risk oral lesions that will progress to cancer.

The project is entitled ‘Identification of clinically important, high risk oral lesions using Raman spectroscopy’ and Dr Lyng’s collaborator on the project is Professor Stephen Flint, Dublin Dental School and Hospital, Trinity College Dublin.

Professor Lyng’s application was summarised by the evaluation panel as follows: *“an outstanding application from an outstanding applicant. The therapeutic and economic potential for this proposal is high”.*

SFI’s Investigator Programme is designed to support the development of world class research and human capital in the areas of science, engineering and mathematics that demonstrably support and underpin enterprise competitiveness and societal development in Ireland.

Speaking on the SFI Investigator announcement, Minister for Research and Innovation Sean Sherlock said, *“Over the past decade, Ireland has invested heavily in R&D and the rewards are clearly visible. What is particularly heartening about today’s announcement is that much of this excellent research, which was selected competitively following international peer review, is being done in collaboration with companies who are seeking to find new products and services, including IBM Ireland, Intel Ireland, HP, EMC and Bord Gáis.”*

Commenting on the announcement, Minister Bruton said: *“By supporting these world-class researchers in their ground-breaking work we will ensure that we continue to maintain, attract and develop dynamic companies and create the quality jobs we need.”*

Professor Mark Ferguson, Director General of SFI, said, *“These 85 funded research projects were selected from 419 applications following rigorous competitive peer review and ranking by eminent international scientists. This 20% success rate is comparable to international funding success rates for example that of the National Institutes of Health, USA at 18%.”*

e: fiona.lyng@dit.ie

Wind Energy Forecasting using Non-Gaussian Statistical Models



Funded by Enterprise Ireland's Commercialistaion Fund, DIT researchers are working on a project that aims to:

- develop a more accurate wind energy forecasting tool;
- deliver a software package that integrates unique wind data processing algorithms.

The expected technical outcome of the project is the development of a system where the end user can readily submit raw wind data information sets with the intention of generating an industry standard wind energy forecasting report. The software will be based on a novel mathematical approach developed by researchers in DIT's Dublin Energy Lab and the Wind Energy Research Group using a non-Gaussian statistical approach which is significantly different to current approaches used in the wind energy industry.

The principal drive behind this project is to provide wind energy developers and grid system operators with a more accurate forecasting tool. The current industry standard wind forecasting models used are somewhere in the region of 61% accurate. From work to date, it is clear that the Non-Gaussian Forecasting model has the potential to be more accurate than current industry standard models. However further work is required to develop the technology so it can be accurately assessed. Even a 2% increase in effective accuracy has the potential to drive significant cost savings via better site selection, cost management and supply-side bid management. The aim of the project is to spin out a new company which will be capable of commercializing the technology via a licensing model across multiple global markets.

e: jonathan.blackledge@dit.ie

Innovation award for novel paint company



L – R: Stephen Wall, Smart Wall Paint, Dr Brendan Duffy, CREST, Ronan Clarke, Smart Wall Paint, Minister Sean Sherlock, TD.

The winner of the 2013 Docklands Innovation Park Award for Best Investment Proposal was Smart Wall Paint—a participant on DIT's New Frontiers Programme for business start-ups.

The company develops and distributes a range of products with unique applications and its original smart product transforms any smooth surface into a wipe-on wipe-off whiteboard surface. The research underpinning the development of this unique product was carried out by DIT's Centre for Research in Engineering and Surface Technology (CREST).

The company was also shortlisted for the Innovator of the Year award at the 3rd Annual Docklands Business Awards and Ronan Clarke, Founder and MD of the company was winner of the 2013 David Manley Emerging Business Entrepreneur Award.

OptiWi-fi, another DIT spin-out, was a runner up in the Docklands Innovaton Park Award. It is an Irish software company that produces highly innovative software for the telecommunications industry to help optimise bandwidth usage on wifi networks to improve download speeds for end users. The product was developed by the Communications Network Research Institute.

DPP launches new research publication

The Director of Public Prosecutions, Ms Claire Loftus, visited the School of Social Sciences and Law in DIT Mountjoy Square to launch the second edition of “New Irish Research in Criminology, Law, Childhood, Family and The Community”. The publication is a collection of MA theses by students on the MA in Criminology, MA in Law, MA in Child, Family and Community Studies, and the Internatioal Masters in Early Childhood Education which is co-delivered with Oslo and Akershus University College of Applied Science in Norway and the University of Malta.

Welcoming Ms Loftus to DIT, Dr Kevin Lalor, Head, School of Social Sciences and Law, explained that the publication aims to highlight the excellent work carried out by students on the programmes.



Dr Carmel Gallagher pictured with some of the MA students who contributed to the book

“Each of these theses has been judged to be at a very high academic standard. Many shine a spotlight on little researched aspects of Irish society and provide empirical recommendations for policy makers and future researchers. We are hopeful that highlighting graduates’ research in this way may encourage them to further develop their work for publication in peer review journals.”

Launching the publication, Ms Loftus praised the quality of the work and commended the School of Social Sciences and Law for making it available online in a very accessible way through the DIT repository, Arrow. Mentioning that she had studied law at DIT herself, she congratulated DIT on providing opportunities for students to undertake study in such key areas, including criminology.

<http://arrow.dit.ie/aaschssldis/68/>





IRC and Bord Bia support DIT research student

DIT graduate Lisa Koep has been awarded an Irish Research Council (IRC) Enterprise Partnership Scheme Award to pursue doctoral research in collaboration with Bord Bia. She is researching the effective communication of sustainability and corporate social responsibility (CSR) and investigating how these achievements can be used to improve corporate and brand reputation.

Bord Bia—the Irish Food Board—is using its Origin Green programme to establish Ireland as a world leader in sustainably produced food and drink. Origin Green is an ambitious internationally-focused programme that is verifying the green/sustainable credentials of Irish food and drink producers, and promoting these standards and commitments to a global market. Lisa’s work will support this important endeavour to establish the best way to promote and communicate sustainability and social responsibility claims and actions to various target markets.

Lisa is well qualified for this research project both academically and professionally. She is a graduate of Trinity College Dublin in economics and geography, and has a Masters qualification from DIT in public relations and marketing communication. She has worked for seven years with Lidl, the leading discount retailer, in various management positions.

Lisa is based in the School of Marketing and in the Business, Society and Sustainability Research Centre in the College of Business. Her research is interdisciplinary and she liaises with a range of national and international centres and institutes in the food and retailing domain, including DIT’s Arthur Ryan Retail Centre. Her work is supervised by Professor Aidan O’Driscoll who leads a group of researchers in the area of sustainability, consumption behaviour and business. Lisa has presented some early stage results of her work at the 2nd International CSR Communication Conference at Aarhus University, the Netherlands, and also at the Corporate Responsibility Research Conference at the University of Graz, Austria.

e: aidan.odriscoll@dit.ie

DIT academic chairs expert advisory group



DIT academic Dr Brian O’Neill has been appointed as Chair of the Internet Content Governance Advisory Group, recently announced by the Minister for Communications, Energy and Natural Resources, Pat Rabbitte TD.

This specialist working group, consisting of experts in the fields of child safety and online behaviour as well as technical and industry experts, will consider the emerging issues in the area of online content and its general impact on the lives of children and young people.

The forum will take submissions from the public or interested groups and will produce a report for the Minister by the end of May 2014. The group will cover a number of issues arising for society, and in particular for children and young people, from the dramatic growth in internet use over the last decade, and particularly since the advent of affordable internet connected mobile devices.

Specifically, it will deal with bullying and harassment online and issues around age inappropriate viewing of content. Minister Rabbitte said he very much looked forward to the advice of the Group. He stressed that, *“Fundamental to their work is the question of striking an appropriate balance in policy terms that ensures the protection of children and young people but does not limit their opportunities and rights online”*.

The full membership of the Internet Content Governance Advisory Group is Chair Dr Brian O’Neill (DIT), Mary Aiken (RCSI), Professor Joe Carthy (UCD), Áine Lynch (National Parents Council—Primary), Kate O’Sullivan (UPC) and barrister Ronan Lupton. Dr Brian O’Neill, Head of Research, College of Arts & Tourism, is a member of Ireland’s Internet Safety Advisory Council. He was also appointed as an Independent Assessor to the ICT Coalition for a Safer Internet for Children and Young People.

e: brian.oneill@dit.ie

Industry-led research centres



The Technology Centres programme, a joint initiative between Enterprise Ireland and IDA Ireland, provides funding to establish collaborative research entities led by industry. The Centres are resourced by highly qualified researchers associated with different institutions and they undertake market focused strategic R&D for the benefit of industry. Currently, there are 12 industry-led Technology Centres and DIT is a research partner in three of them, two of which were launched in 2013.

The **International Energy Research Centre (IERC)** focuses on research and innovation in integrated sustainable energy system technologies. The IERC is led by companies such as Alcatel-Lucent Bell Labs Ireland, IBM, Intel, and Bord Gais. It is based in the Tyndall Institute, Cork and focuses on four strategic research areas:

- Commercial Building: Integration of Energy Systems
- Home area: Networks to drive energy reduction
- Smart Energy Networks in Factories
- Scoping New Potential Research Areas

A number of projects are currently underway bringing together expertise from Ireland and abroad. One of the first projects funded under this scheme is led by Dr Mick McKeever, DIT School of Electrical & Electronic Engineering. Mick has been working on this in partnership with Cork Institute of Technology and Warsaw University of Technology. The project which is nearing completion is to design, prototype, test and demonstrate a full scale novel phase change material based thermal energy storage heat exchanger.

Through collaborative research and technological development activities between the research groups and companies the team will exploit and prove the commercial potential of a novel thermal energy storage unit and heat exchanger for heating systems in large commercial and residential buildings.

The project will deal with cost effectively allowing the system to improve heat transfer within the system based on well-established phase change materials. The on-site demonstration will form part of Cork Institute of Technology's "National Sustainable Building Energy Test Bed" for whole building power and energy management currently being developed at the NIMBUS centre in CIT, Cork.

e: mick.mckeever@dit.ie

The Centre for Applied Data Analytics Research (CeADAR)

will work with a group of companies to accelerate the development, deployment and adoption of Data Analytics technology. It was officially launched in March 2013 by the Minister for Jobs, Enterprise and Innovation, Richard Bruton who announced an initial investment of €1 million at the launch.

Data Analytics is about the conversion of large amounts of raw data into valuable information through the use of statistical techniques and advanced software. The initial research phase of the Technology Centre will aim to make Ireland a world leader in this area.

Based in University College Dublin, the research consortium includes Dublin Institute of Technology and University College Cork. CeADAR will conduct initial research into technology challenges that have been identified by industry representatives. It will use the funding to work with a group of companies to accelerate the development, deployment and adoption of Data Analytics technology. Its lead team comprises Padraig Cunningham (UCD), Barry O'Sullivan (UCC) and Brian Mac Namee (DIT). Top-tier multinational and Irish ICT companies will lead the research agenda at the technology centre, including eBay, Accenture, Dell, Fidelity Investments, Adaptive Mobile, Climote, Cylon, GBR, HP, Moving Media, Nathean Technologies, Nucleus Venture Partners, and Qumas.

Research will be focused on developing ways of generating business, profit and ultimately jobs from the high-growth area of data analytics.

This initial research programme is a significant step towards a government funded 5-year investment in a Technology Centre for Data Analytics which is a key target sector identified as a Disruptive Reform in the Government's Action Plan for Jobs 2013, growing at 40% per annum worldwide and offering major potential to Ireland due to established advantages in this area.

e: brian.macnamee@dit.ie

The Pharmaceutical Manufacturing Technology Centre (PMTTC)

also launched in 2013 will be hosted by University of Limerick from 2014. It will support and develop the Irish pharmaceutical industry by improving manufacturing competitiveness and enhancing the research and development mandate and activity of Irish pharmaceutical manufacturing sites and companies. Sixteen multinational companies and nine SMEs are currently members of the PMTC including: Allergan Pharmaceutical, Pfizer, Janssen, Innopharma labs, and Leo Pharma. The lead researchers in DIT are Dr Suzanne Martin (Centre for Industrial and Engineering Optics) and Dr PJ Cullen (School of Food Science & Environmental Health). International partners include Purdue University and University of Sheffield. The Centre will conduct and co-ordinate innovative, high quality research in advanced pharmaceutical manufacturing technologies which have a wide application across the pharmaceutical industry.

The current research themes are:

- Advanced rapid micro-analytical techniques
- Enabling and control of continuous processing
- Soft sensor modelling tools
- API real time release PAT
- Pharmaceutical packaging technologies for anti-counterfeiting.

It will be a central point of contact for industry to access specialised research facilities and expertise and will support industry-academic collaboration and exchange of knowledge.

Enterprise Ireland hosted a Technology Centres Expo in the Pavilion at Leopardstown Racecourse in November. This half-day event brought together key representatives from Irish industry and the main players from Ireland's research community.

e: suzanne.martin@dit.ie

New DIT Adjunct Professors

The position of DIT Adjunct Professor is awarded to those who are eminent leaders in their field and distinguished by high achievement in the world of industry, business, science, the professions, the arts or public service. In recent years DIT has appointed eight adjunct professors who are involved with research and teaching activities in DIT.

Professor John Taylor had over 20 years of experience as a senior manager in higher education, working at the Universities of Leeds, Sheffield and Southampton before moving into an academic career. As Director of Planning at the University of Southampton, he was responsible for all aspects of strategic and operational planning as well as management information and resource allocation.

He played a central role in the analysis of national and international trends in higher education and in developing University strategy in key policy areas such as selectivity in research, broadening access, lifelong learning and diversification of funding.

He is particularly known for the development of research strategy that helped to elevate the University of Southampton to its present position among the leading research universities in the UK and for his leadership of highly successful returns to the Research Assessment Exercises in 1996 and 2001. As Director of Planning, he was involved with all the main policy developments in UK higher education. With his deep interest in higher education and strong commitment to teaching and research, John moved into an academic career, first at the University of Bath, then as Professor of Higher Education



Management and Policy at the University of Southampton, and now as Professor of Higher Education Management and Special Advisor to the Vice Chancellor, University of Liverpool.

This combination of high level practical management experience and international recognition for teaching and research provides an unusual and distinctive approach to the study of higher education, combining a practical understanding of leadership and management issues and higher education policy with cutting edge research.

Professor Chongxiu Yu (pictured above) is a professor of Beijing University of Posts and Telecommunications and Director of the Research Centre of Optoelectronic and Lightwave Technology. She has been collaborating with and supporting the research activities of DIT's Photonics Research Centre for a number of years.

Her support has resulted in a range of valuable outcomes including publications, research exchanges and successful funding applications. She is a Fellow of the China Institute of Communications, Director of the Chinese Optical Society, Deputy Director of the Material Construction Committee and consultant member of the Academic Committee of the State Key Laboratory of Information Photonics and Optical Communications.

Professor Yu has been working in the optoelectronics field, including optoelectronic devices, optical fibre communication, optical fibre sensing, holography and optical information processing technology for 43 years. As principal investigator or co-principal investigator, she has been awarded more than 20 projects, including precious Chinese national "973", "863" projects.

She holds 15 national patents and has published over 200 academic papers in journals, and co-authored three books and two textbooks and is editor of the Optoelectronics Laser Journal.

She has been invited to give keynote speeches, chair and is a member of the Technical Program Committee Members of several international conferences and symposiums. She has supervised more than 20 PhD students and 60 research master students. Due to her significant contributions to research and teaching, she was recognised as one of the national outstanding experts in China in 1993 and she enjoys a special government allowance.



Dr Soteris Kalogirou, Cyprus University of Technology is considered an international expert in the field of solar thermal collectors

and the use of artificial intelligence techniques for the performance prediction of energy and renewable energy systems. Dr Kalogirou has 25 years of research experience in the areas of energy systems and heat transfer.

He has published widely including 116 papers in international peer reviewed journals and 148 papers in conference proceedings, mainly on solar thermal systems, on computational simulation and optimization of solar systems and on the use of artificial intelligence systems for the performance prediction of energy and renewable energy systems.

His specific areas of research include:

- Solar energy systems and applications
- Desalination of sea-water
- Engineering applications of artificial neural networks
- Heating Ventilating and Air Conditioning (HVAC) systems
- Other energy systems including solar heating and cooling, and cogeneration.

There is a significant overlap between his research areas and those of the Dublin Energy Lab (DEL) at DIT. Dr Kalogirou has solar energy research facilities in an outdoor environment that complement those in DEL. Initially, comparative studies of solar device performance can be undertaken. In the longer term there are opportunities for joint research projects. He is of excellent standing in the international community, as evidenced by his role on editorial boards, fellowships and by his prestigious awards including, the World Renewable Energy Network (2006) and the WREN Pioneer Award (2008).

Associate Professor William L Miller, University of Houston, College of Optometry is Chair of the Clinical Sciences Department. He publishes and conducts research in



the area of contact lenses and the ocular surface. As part of an active research institute, Texas Eye Research and Technology Center, Dr Miller has presented his research in multiple venues including Canada, Australia, Hong Kong, Sweden, Mexico and India.

He has authored or co-authored in peer reviewed and non-peer reviewed publications and maintains an active column as a contributing editor in the journal Contact Lens Spectrum, with an international readership of nearly 35,000. Dr Miller is the author of a chapter entitled “Refractive Correction with Refractive Surgeries and Prosthetic Devices” for the most recent edition of Borish’s Clinical Refraction (2006) as well as authoring chapters in the Ocular Therapeutics Handbook—A clinical manual (2011). He has also maintained an active role in continuing education by lecturing to fellow colleagues nationally and internationally in the area of ocular surface, contact lens research and evidenced-based patient care. He serves on the editorial board of Eye and Contact Lens and Optometry (Journal of the American Optometric Association). Dr Miller also writes a research column for the Ocular Surface Society of Optometry Newsletter and is Editor of Contact Lens and Anterior Segment.

He is a Fellow of the American Academy of Optometry and a member of the European Academy of Optometry and Optics, American Optometric Association, Association for Research in Vision and Ophthalmology, Ocular Surface Society of Optometry and Tear Film and Ocular Surface Society. He is involved in both didactic and clinical education at the University of Houston as well as providing patient care in the University Eye Institute. He is a licensed therapeutic optometrist with glaucoma certification in the state of Texas. Dr Miller’s clinical research focuses on the effects of contact lenses and refractive surgery on the ocular surface. He currently serves as the liaison for selected DIT students who attend, as part of an exchange program with the University of Houston College of Optometry, an extern clinical practice rotation within the University Eye Institute of the University of Houston.

Professor Seamus Curran, a graduate of Trinity College Dublin, is director of the Institute for NanoEnergy which focuses on energy related challenges using the techniques of nanomaterial fabrication and control. He is Associate Professor of Physics at the University of Houston (UH) and also the CEO of C-Voltaics, nanotechnology company spun out of UH.

He was previously an Assistant Professor of physics at the New Mexico State University and held postdoctoral positions at the Max Planck Institute in Stuttgart, CNRS in Nantes and Rensselaer.

Professor Curran's research focus is in nanotechnology and renewable energy where his program consists of understanding and developing new materials and systems in the fields of hydrophobicity, nanophotonics, nanoelectronics and nanophononics. In the materials area, the focus is on nanostructuring on multiple surfaces, nanocomposite formation and coatings using organic polymers (conjugated and non-conjugated) as hosts and filler nanomaterials (nanotubes, fullerenes, nanowires, nanodots); understanding their constituent and combined properties.

He has published over 100 articles and papers, has over 3,750 citations, a h index of 24 and has been awarded 7 patents with a further 12 applications under PCT review. In 2013 he was the winner in two entrepreneurial prizes for technology developed in his labs including the international competition 'COMS Young Technology Award' and the US competition 'Goradia Innovaton Prize'. He has been the PI and Co-PI on over \$5 Million in private, state and US federally funded grants and contracts.



Professor Luke Clancy, (above) Director General of the Research Institute for a Tobacco Free Society is an internationally acclaimed and highly respected expert in the areas of tobacco control, respiratory physiology and environment and health. Recognising his contribution to society, sciences and health, DIT awarded Professor Clancy with an honorary Doctorate in 2009. Professor Clancy will engage in collaborative research with DIT colleagues, apply for research funding and recruit postgraduate students.

His major research contributions have been in Air Pollution, Tuberculosis, Asthma, Lung Cancer and Smoking Related Diseases. He reported hugely increased mortality from the Dublin smog at a time when it had been assumed that smog consisting mainly of increased particles was only a nuisance. Despite industry and scientific opposition, he campaigned through the 1980s for a coal ban and was rewarded when he saw respiratory mortality decline by 20 % following the ban.

He has played a very significant role in TB control, both nationally and internationally. He was elected President of the International Union against Tuberculosis and Lung Diseases (IUATLD) (Europe), Chairman of the European Respiratory Society TB Scientific Group and an Advisor to the WHO and Dept of Foreign Affairs. His TB research has centred on Epidemiology and the Infectiousness of TB. His Asthma work has included the International Survey on Asthma and Allergy in Children (ISAAC) that showed that Ireland has one of the highest asthma rates in the world in children. His current focus is on the prevention of smoking related diseases by research and advocacy.

Professor John Heywood, Professional Fellow, Emeritus of Trinity College, Dublin. His research interests are in the education of professional people more especially engineers, managers and teachers. His focus is on the curriculum to include assessment, curriculum design, instruction and learning. He has a special interest in the relation between theory and practice and the design of integrated and interdisciplinary studies.

His areas of research focus are:

- Management, in particular organisational theory and practice and the analysis of jobs in engineering and education.
- Engineering and Scientific Literacy.
- Liberal education and technology.
- Technology and Education.

He was the first Director of the British Astronomical Associations Radio-Electronics section. At Norwood he was jointly responsible for the provision of liberal studies in the full-time course in telecommunications engineering. More recently he has been engaged in a series of studies on the role of philosophy in engineering education. He is a Fellow of the American Society for Engineering Education.

He will be providing guest lectures and acting as external examiner from undergraduate to postgraduate programmes. He works closely with DIT's Engineering Education Research Group and providing his considerable expertise on engineering education to the College of Engineering & the Built Environment.



Professorial Fellow Bernard Stiegler (Pictured above right with Dr Noel Fitzpatrick, DIT) is the director of the IRI (Insitut de recherche et innovation) at the Georges Pompidou Center in Paris and founder of the Digital Studies Network at the IRI, he is also a professor at the University of Technology of Compiègne where he teaches philosophy.

Before taking up the post at the Pompidou Center, he was program director at the International College of Philosophy, Deputy Director General of the Institut National de l'Audiovisuel, then Director General at the Institut de Recherche et Coordination Acoustique/Musique (IRCAM).

Professor Stiegler has published numerous books and articles on philosophy, technology, digitization, capitalism, consumer culture, etc. Among his writings, his three volumes of *La technique et le temps* (English Translation: *Technics and Time*), two volumes of *De la misère symbolique*—three volumes of *Mécréance et Discrédit*, two volumes *Constituer l'Europe* and more recently two publications on his central concept of *Pharmacology*.

Professor Stiegler has a long term engagement with the relation between technology and philosophy, not only in a theoretical sense, but also situating them in industry and society as practices. He is one of the founders of the political group *Ars Industrialis* based in Paris, which calls for an industrial politics of spirit, by exploring the possibilities of the technology of spirit, to bring forth a new “life of the mind”.

He published extensively on the problem of individuation in consumer capitalism, and he is working on the new possibility of an economy of contribution Professor Stiegler will be associated with the College of Arts & Tourism where he plans to deliver seminars and supervise postgraduate students.

Enjoying a Fulbright experience



Brendan Cleary who started his PhD in October 2011 is investigating the economics of wind power and large scale energy storage at Dublin Energy Lab, Dublin Institute of Technology. In July 2013, following a rigorous application and interview process he was delighted to hear that he had been awarded a prestigious Fulbright-Enterprise Ireland Student Award.

The award has given him the opportunity to spend 6 months in New York where he is collaborating with the Center for Life Cycle Analysis (CLCA) at Columbia University. Here he tells us how he is getting along and what the award means to him and his research career:

Initially I formed a relationship with the CLCA back in February 2013 when I was there as a visiting PhD researcher for 3 months. This was partially funded by the DIT Fiosraigh Student Internship Award 2012. The Fulbright Award allows me to strengthen this relationship and refine my research methodology with influential experts in energy related fields.

Currently, the All-Island of Ireland power system can accommodate a 50% penetration limit of electricity generated from renewable energy sources. To achieve our binding 2020 renewable energy targets, the limit needs to reach 75% and subsequently reduces the flexibility of the system. The use of compressed air energy storage (CAES) to provide flexibility and increase the integration of wind generation across the All is one such solution.

Therefore, my research involves identifying, simulating and optimising future energy policy scenarios using power systems simulation software PLEXOS. PLEXOS is an integrated energy software tool developed by Energy Exemplar and is used for power and gas market modelling worldwide. PLEXOS allows me to simulate the half hourly dispatch of the generation portfolio to meet demand at least cost taking into account each generator's costs and technical constraints as well as any system wide constraints.

My colleagues at the CLCA are very interested in my research and in particular the synergies of CAES, wind and solar generation in the New York State power system. This provides an opportunity to exchange thoughts and ideas around the integration of renewable energy sources in the Irish and New York State power systems. For the first half of my Fulbright I wrote a journal paper entitled 'Assessing the Economic Benefits of Compressed Air Energy Storage for Mitigating Wind Curtailment' which is under review. The findings from this paper brought about engaging discussions at the CLCA weekly group meetings. Subsequently, we hope to collaborate on improved modelling of CAES in the PLEXOS and Matlab models developed already.

I believe my Fulbright experience to date has enhanced my international experience and allowed me to engage with new people and strengthen relationships. I look forward to the remainder of my time in New York as a Fulbrighter and I would encourage fellow researchers to pursue and embrace the Fulbright experience.

The Fulbright Commission provides various different grants to Irish citizens and EU citizens who have been resident in Ireland for three or more years to research, study, or lecture in the United States on annual basis.

There are also other discipline-specific and Irish language focused grants available for students and academics. More information from the Fulbright Commission: www.fulbright.ie

Awards for outstanding research

Dr Sue Mulhall of the School of Management has won the Emerald/EFMD Outstanding Doctoral Research Award in the Human Resource Management Category.

Her thesis "Celtic Tiger, Hidden Tales: Living Stories of Career Success for Community Employment Scheme Participants—A Critical Interpretive Analysis" was chosen, by the editorial team of Personnel Review, as the winner of this important international award. The research explores how Community Employment scheme participants (former non-employed individuals on Irish active labour market programmes) construct and interpret their career experiences in changing micro-individual and macro-social contexts.

The research makes three contributions to the careers literature:

- 1. fusing career theory with narrative inquiry within a systems framework to develop the Three-Dimensional Career Success Inquiry Systems Framework;**
- 2. proposing seven categories of career success for the sample; and**
- 3. recommending that a career should be synonymous with life career development, entailing one's whole life, not just that which is occupationally orientated.**

The necessity to incorporate the multifaceted, micro-dynamics of career and identity to comprehend career (re)construction for individuals, in addition to the requirement to take account of structural influences in narrative inquiry in the field of career research, is underlined from the findings.

As well as receiving this important accolade Sue also receives a prize of €1500 and an invitation to publish her research in Personnel Review.

e: sue.mulhall@dit.ie

Getting ready for Horizon 2020

Horizon 2020 is the new €80bn EU programme for funding for research and innovation. It was launched in Ireland in the Convention Centre in Dublin in December 2013 and officially opened in January 2014 along with the first round of calls. Horizon 2020 will run for 7 years and there will be a wide range of options available to researchers and companies, organisations and individuals.

With the programme aiming to drive economic growth and create jobs there is a greater emphasis on expected impact within programme calls.

There are three main sections: Excellent Science, Industrial Leadership and Societal Challenges and with the programme aiming to drive economic growth and create jobs there is a greater emphasis on expected impact within programme calls.

Social Sciences and humanities research is embedded across the programmes and researchers are expected to consider all players when preparing consortia and planning their projects no matter what the field of research.

There is a strong SME programme and opportunities for companies of all sizes to take part as well as opportunities to collaborate with countries outside the EU and in some cases these international partners will also be funded.

DIT and Horizon 2020

Research in DIT is organised through its Research Institutes, Centres and Groups and clustered within the overall research areas of Environment, Energy and Health; Information, Communications and Media Technologies; New Materials and Devices; and Society, Culture and Enterprise.

Projects address key issues of national and global strategic importance. Across the Institute researchers and graduate students are working hard to develop innovative solutions to next generation problems and translating their research into the development of new products, processes and policies.

Research excellence contributes to the quality of all DIT's programmes, the ability to attract funding, high quality faculty and excellent students, to provide useful knowledge to stakeholders, and to strengthen the reputation of DIT.

DIT researchers have been active in FP7 as both co-ordinators and partners and have been particularly successful in the FP7 SME programme with 8 new projects awarded in the last 2 years. Some examples are provided below:

PV CROPS

This FP7 funded project—PhotoVoltaic Cost reduction, Reliability, Operational Performance, Prediction and Simulation—addresses 3 key objectives:

- Improvement of performance, reliability and lifetime.
- Cost reduction of PV systems.
- Better integration of PV into the grid.

The 2 first objectives lead to a lower Levelized Cost of Energy, LCoE. The main aims of PV CROPS are:

- Reduction of 30% of the LCoE of PV to achieve 0.14-0.07 €/kWh by 2020 and 0.20-0.09 €/kWh by 2015 and an increase of 9% in the performance ratio of PV systems
- Enhancement of the grid integration of PV by mitigating PV power fluctuations and integrating energy management and storage to allow 30% of PV penetration by 2020.

There are 5 fields of work:

- Robust modelling, advanced simulation and design optimization: through an open source, simulation and design toolbox incorporating built-in learning tools.
- Prediction of system output with respect to solar resource, local weather and system behaviour: including prediction and mitigation of PV power fluctuations.
- Integration of energy management and storage strategies: using innovative batteries and allowing PV to participate in the secondary regulation of the grid.
- Monitoring, real time follow-up and advanced diagnoses of performance: providing performance analyses including the detection of hidden problems reducing operational costs.
- Hardware, software and contractual solutions for field and laboratory testing: developing kit solutions for the commissioning of PV plants and BIPV.

The PV Crops consortium has partners in Spain, Portugal, Bulgaria, Morocco, France and Belgium and includes Irish company REDT (Renewable Energy Dynamics Technology). The co-ordinator is Universidad Politecnica de Madrid, Spain.
e: michael.conlon@dit.ie

Wheysan—whey based formula

In the context of an increasing demand for food disinfectants as an alternative to chlorine, the main purpose of the project WHEYSAN is to develop a natural and whey-based sanitizer that will be suitable for the disinfection processes.

Whey and its derivatives have shown promising perspectives as natural preservatives for disinfection of fruit and vegetables. The project WHEYSAN aims to develop new technologies for the decontamination of whole and fresh-cut fruit and vegetables and for the processing of whey to achieve a profitable by-product with sanitizing properties.

This FP7 project is led by Dr Catherine Barry-Ryan, Food & Health Research Centre, and is co-ordinated by a Spanish company Agrofield SL an expert in the sanitation of fruit and vegetables. The consortium contains SMEs, associations and RTDs from Ireland, Portugal, UK, Serbia and Spain.

e: catherine.barryryan@dit.ie

SAFE BAG

A second FP7 funded project looking at the preservation of fruits and vegetables using a different technology is SAFE BAG which aims to develop a novel continuous in-pack decontamination system for fresh produce, in line with market trends and consumer demands to move away from the use of methods such as chlorine washing. SAFE BAG will deliver an alternative which is free from harmful chemicals, resulting in products that are safer for human health and indeed the environment.

The SAFE BAG consortium is made up of experienced research performers with the technical expertise required to achieve the scientific and technological objectives of this project, as well as industry representatives from the fresh-cut processing supply chain and engineering and equipment industries, who will ensure that the results of this project are used and exploited in the marketplace. The consortium is composed of 11 project partners from 8 Member States (Austria, Czech Republic, Italy, Ireland, Slovenia, Spain, Italy, the United Kingdom) and Turkey. The project co-ordinator is IRIS Research based in Spain and Ireland.

e: paula.bourke@dit.ie

DECIPHER

This three year, €4.3 million Specific Targeted Research Project (STREP) project was co-ordinated by the Digital Media Research Centre (DMC). The objective was to change the way people access digital heritage by combining much richer, event-based metadata with causal reasoning models.

Digital heritage and semantic web technologies hold out the promise of almost unlimited access to cultural knowledge. The difficulty is that cultural meaning does not reside in individual objects but in the patterns of knowledge and events, belief and thought that link them to each other and to the observer. This is why story is so important to the communication of, and meaningful understanding of culture.

The Decipher project will result in a reasoning engine, virtual environment and interfaces that can help curators and visitors to present digital heritage objects as part of a coherent narrative that is directly related to a user's interests. This will allow the user to interactively assemble, visualise and explore, not just collections of objects, but the knowledge structures that connect and give them meaning.

The DMC, together with its European partners bring together great skills and experience in the technical fields required by this project, with the authorial and curatorial authority of national institutions, the innovative impetus of a technology-based SME, and the drive to market of a large company that combines heritage and media interests.

e: eoin.kilfeather@dit.ie

Researchers are now forming consortia, writing proposals and getting ready to play an even more active part in EU funded projects through Horizon 2020. If you are interested in getting in touch with experienced researchers or if you would like to find out more about how you can get involved with DIT and this new programme contact research@dit.ie.

Novel packaging system to improve meat safety

A consortium led by Spanish RTD Innovacio i Recerca Industrial i Sostenible (IRIS) aims to improve the safety and quality of meat as well as extending shelf-life. Dublin Institute of Technology and consortium partners from Ireland (McCarren & Co Ltd, Holfeld Plastics, and Irish Country Meats), Spain (Embutidos Daza), UK (Stephens Fresh Foods), Denmark (Danish Technological Institute, Danish Meat Research Institute), Turkey (Altin Gida Mamulleri Ticaret Ve Sanayi Anonim Sirketi) and Slovak Republic (Kamea Electronics) will collaborate to develop a novel novel in-pack meat decontamination system.

Meat and poultry products are vehicles for millions of cases of foodborne illness globally each year. Controlling pathogens such as campylobacter, Escherichia coli O157:H7, Listeria monocytogenes, Salmonella, and Yersinia enterocolitica, is a primary goal for industry. Indeed, in 2011 the European Food Safety Authority (EFSA) estimated that 80% of chicken carcasses on the European market are contaminated with Campylobacter, which infect nine million people annually at a cost of 2.4bn.

Moreover, the damage of outbreaks to the European meat industry image is devastating. It is critical that effective decontamination is in place to ensure consumer protection and confidence



in Europe's meat supply globally. The €1m EU-funded project (MEATPACK) aims to improve consumer protection, consumer and market confidence in European-produced meats, as well as significantly extending shelf-life by up to 60% opening up new export markets for the European meat industry.

The project estimates a sales income of up to €25.5m by 2021 with a consequent growth in job numbers within the participant companies. The novel technology simultaneously addresses pathogen reduction, control of spoilage microflora and organoleptic quality retention and aims to provide a significant competitive advantage for the European meat industry.

e: pjcullen@dit.ie

Research students establish construction innovation lab



Two postgraduate research students in the School of Surveying & Construction Management recently founded the Construction Innovation Lab (CIL). **Paul Ebbs** and **Vincent Gibson** developed the initiative to assist undergraduate and postgraduate students with research topics identified by industry.

Outlining its purpose they said: *"We believe the revival of the Irish construction industry will be decided through innovation by research. The primary function of the lab will be to align postgraduate research students with industry to solve problems identified by their commercial partners. It will complement DIT's commitment to excellence in research and dramatically increase the level of R&D in the AEC industry. We want to highlight how academic research can not only benefit industry but lead to innovation and create jobs for the sector."*

www.dit.ie/cil

Effective and reliable optical system for the pharmaceutical industry

The aim of OPTICLEAN an EU-funded project under the FP7 SME programme was to produce an effective and reliable optical system for cleaning validation in the pharmaceutical industry. The 2 year project finished in October 2013.

Current cleaning validation techniques are largely based on laborious, time consuming and expensive swab sampling techniques, whereby swabs of the cleaned surface are taken and then tested using HPLC techniques in the laboratory. Equipment can be down for days, which poses enormous economic burden in the pharmaceutical industry.



The OPTI-CLEAN consortium was made up of experienced research performers with the technical expertise required to achieve the scientific and technological objectives of this project, as well as end-user and industry representatives from the pharmaceutical industry and engineering and equipment industries, who ensured that the results of this project will be used and exploited in the marketplace.

The consortium had 9 project partners from 3 Member States (Ireland, Finland and Spain). The SMEs involved in the project were: Innopharma Labs (Ireland) Coordinator, Merrion Pharmaceuticals Ltd. (Ireland), Manufacturas Serviplast. S.A. (Spain), Kuava Ltd. (Finland), Rikola Ltd. (Finland). The RTD providers were: VTT Research Centre of Finland (Finland), Dublin Institute of Technology DIT (Ireland), Innovació i Recerca Industrial i Sostenible IRIS (Spain).

The results have shown the feasibility of the technology to provide accurate information in real-time, facilitating the development of a custom-made version of the technology that will be trialed in the pharmaceutical industry as a cleaning validation tool.

A portable imaging device will be designed and built and tested on a commonly used APIs and detergents in real pharmaceutical environments in order to validate its effectiveness and reliability.

The impact of the uptake of the technology will enable rapid turn-around times, increased through-put and profitability in EU pharmaceutical plants, as well as increased safety standards, which are paramount to safeguarding the health and safety of EU citizens.

e: pjcullen@dit.ie

DIT Research Institutes

Environmental Health Sciences Institute (EHSI) brings together research across the fields of environment, energy and health, from the bio-sciences to the social sciences, with a strong focus on solving the challenges associated with the quality and sustainability of our environment including the built environment, bio-monitoring, lifestyle and policy, assistive technologies, energy, and food quality & safety.

Focas Research Institute brings together strengths across bio and nano technologies, biospectroscopy, medical devices, new therapeutics, advanced surface coatings and engineering—and related social and economic research. Focas is a founding member of the National Biophotonics and Imaging Platform, Ireland (NBIP) and the Integrated NanoScience Platform for Ireland (INSPIRE).

Information, Communications and Entertainment Institute (ICE) will consolidate existing strengths across information, communications and entertainment, including computing, digital media, electrical and electronic engineering, and telecommunications creating vertical integration from the enabling technologies to software development to content and entertainment applications.

AHSS Institute will evolve to bring together researchers across business, entrepreneurship and management, social and public policy, creative & performing arts, education policy and organisation, justice and human rights as appropriate. The focus will be on translating research into ideas and actions which impact on and inform social and public policy, whatever the field of inquiry.

Research investigates alveolar bone support

Michael Freedman (Dublin Dental University Hospital) completed his clinical doctorate under the supervision of Michael Ring (Department of Applied Technology, College of Engineering & Built Environment) and Professor Leo Stassen (Dublin Dental University Hospital).

His research project: 'The effect of alveolar bone support on zygomatic implants using Finite Element Analysis' investigated the influence of maxillary alveolar bone (the roots of the upper molars are embedded in this bone) on the stress distribution of zygomatic implants. Zygomatic implants are threaded titanium bars which are screwed through the alveolar bone and into the zygomatic bone (the cheek bone) as shown in Figs 1 and 2. The implants can be inside or outside the sinus as shown.

The implants hold a metal bridge in place beneath the upper gum as shown in Figs 3 and 4. This bridge supports fixed or removable teeth. These were built virtually in SolidWorks. Zygomatic implants provide an alternative for patients who do not have sufficient bone in the upper jaw to retain conventional dental implants and for whom bone grafting procedures are unsuitable.

Originally zygomatic implants were placed, via the sinus, into the zygomatic bone with support from the maxillary alveolar bone. This, along with cross arch stabilization from other conventional implants provided a sound foundation for a fixed arch bridge. Since then, new protocols have been developed, showing similar success rates for bridges supported by zygomatic implants without conventional implants.

The implants can be set inside or outside the sinus cavity. At times the section of the implant not enclosed in bone may be encased in a bone like material (a kind of bone graft). The many restraining conditions required a large range of models to be developed in order that the various supporting mechanisms and locations could be tested and compared.

A CT scan of a consenting female undergoing zygomatic implant placement was used as the basis for a three dimensional model. The CT slices were extracted from the scan using the Mimics software package. This produced a stereolithography file which was reversed engineered using a plug in for the Rhinoceros software package. The NURB polysurface produced was compatible with the SolidWorks solid modelling software.

The model was halved vertically and the top removed to reduce the analysis time. The finite element analysis add-in software “Simulation” was used to analyse the various models which were developed within SolidWorks. Mesh creation, bone material properties, restraints and relevant forces were then applied to the models. Mesh creation proved to be one of the most difficult elements of the analysis due to the highly organic shape of the model.

Occlusal (vertical) and side forces were applied in order to simulate mastication. The maximum stresses observed in the model with alveolar support were lower than those in the model with no alveolar support regardless of the direction that the force was applied. However, support from the alveolar bone had the greatest impact on the maximum Von Mises stresses when occlusally directed forces were applied. This is clinically significant as most chewing forces are directed occlusally. The Von Mises stresses are shown in Fig 5 below. The results of this study suggest that the support provided by alveolar bone is valuable for zygomatic implants. Although the amount of the implant that is supported by alveolar bone is very small compared to the zygomatic bone, it is much closer to the force that is being applied to the implant. This allows chewing forces to be distributed throughout the maxilla and facial skeleton, rather than solely to the zygomatic bone.

In line with other FEA studies in implant dentistry, this study assumed that the bone supporting the implants was homogenous, isotropic and linearly elastic in all directions. This assumption is not supported by laboratory studies of human skulls, but has been shown to be a valid method of estimating stress distribution using FEA. It is important to understand that the magnitude of the stresses described cannot be directly transferred to the patient reliably. Despite this, the differences in stress distributions demonstrated between the two models show that the model with alveolar support was more effective at distributing the applied forces than the model without. Within the limitations of the study, alveolar bone support for zygomatic implants reduces the internal stresses generated by occlusal and lateral forces, when compared to implants not supported by alveolar bone.

e: michael.ring@dit.ie

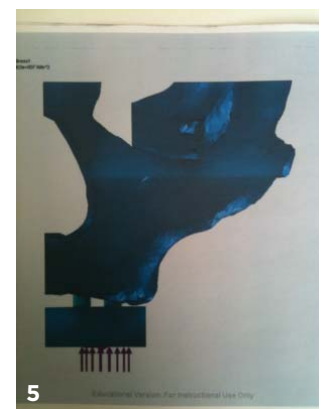
Fig 1, Skull, bridge, implants inside sinus

Fig 2, Skull, bridge, implants outside sinus

Fig 3, Bridge and implants front view

Fig 4, Bridge and implants top view

Fig 5, Von Mises stresses for internal and external implants



New technologies developed by DIT researchers

In 2013, DIT Hothouse filed nine patent applications on novel technologies arising from DIT research projects. Three were for network communications technologies, two for materials science, two for industrial technologies, one for life science and one for food science technology. A number of these new technologies are now available for commercial license.

SatMon: Saturation Monitoring in Wi-Fi networks

A software tool that passively monitors for node saturation in Wi-Fi networks, SatMon enables network operators to manage and respond to user demands more efficiently and effectively. Node saturation can result in congestion and deterioration of Wi-Fi service quality due to high packet data delays and losses over the network. By using nodes to monitor their neighbours to detect the on-set of saturation, wireless network operators can make better decisions with regard to routing, channel selection, bandwidth provisioning and admission control.



OPTIN: Optimised Data Transfer for Improved Internet User Experience

A novel software tool to optimise data transfer on both wireless and wired networks, OPTIN maximises the level of data transfer and minimises delays to ensure a seamless internet user experience. The technology is particularly useful for rich media content, such as VoIP and video that requires a reliable and uninterrupted network service.



Auto-Chan: Automatic Channel Selection for Wi-Fi Networks

This automated channel selection technology for WLAN ensures user quality of service on busy Wi-Fi networks. Auto-Chan improves the use of available bandwidth by minimising data packet loss due to node congestion, and removes the need for a central controller to assign channels. This results in an autonomous network that incurs no management overhead or signalling.

VHF Casemate: Waterproof and Shockproof Smartphone Casing

This is a novel design for a waterproof and shockproof smartphone casing that enables VHF (Very high frequency) radio functions through a mobile phone. The device is designed to improve the speed of emergency rescue on open water, as VHF is an extremely reliable signal which can be tracked easily.



Strata-Vision: Cleanroom Inspection System

Strata-Vision is an automated scanning and fault detection system for personal protective equipment (PPE), designed specifically for cleanroom compliance and anti-contamination. The Strata Vision system aids in the gowning process through the use of a novel software device and camera mounted next to a full size mirror. When the worker checks their PPE in the mirror, the system automatically scans for faults in the PPE (i.e. failure to wear gloves or masks, non-compliance with cosmetic protocols, or high temperature indicating illness).



Cold Plasma Fat Reduction Technology

This novel technology enhances the spreadability of oil on food products. The process involves passing dry snack foods through a plasma curtain before spreading food-grade oil (e.g. vegetable or sunflower oil or animal fat) over the product surface. This method can reduce the fat content of food by 50 to 75% while maintaining its palatability and aesthetic appearance.

To learn more about these technologies or to discuss commercial opportunities: e: stephen.davis@dit.ie

For a full list of DIT technologies currently available to industry: www.hothouse.ie



Optometry graduates (Sergio Uageito, Angela Efeso, Nordino Mboti, Ceren Figueiredo, Ramos Manuel Antonio, Janet Eugenia, Neusa Bucudade Namburete, Hermenegildo Tomo) toss their graduation hats

First Irish-trained optometrists graduate in Mozambique

The Mozambique Eyecare Project, the Dublin based Irish Aid funded initiative has announced the graduation of the first nine Mozambican eye healthcare specialists (Optometrists) from its degree programme in the University of Lúrio, Mozambique. The project based in the Department of Optometry in Dublin Institute of Technology plans to have 170 fully qualified Mozambican optometrists trained to deliver eye care and glasses to millions of visually impaired people in Mozambique by 2020.

Established in 2008, the Mozambique Eyecare Project is a €1.5 million Irish Aid funded project to tackle the interdependent problems of avoidable blindness and poverty. It aims to develop and implement a sustainable model for optometric education and eyecare service delivery in developing nations.

The establishment of the first degree course in optometry in the University of Lúrio in Mozambique under the direction of Professor James Loughman was key to the achievement of this goal. As part of the Project, nine optometry faculty members and 11 final year optometry students from Ireland assisted in the training of the first optometrists in Mozambique who are now fully qualified to deliver primary eye care services and thereby help to reduce rates of visual impairment in Mozambique.

Commenting on the success of the project to date, Professor James Loughman, Director of the Mozambique Eyecare Project, Optometrist in the Department of Optometry, DIT, said: *“We are delighted to partner on this project with the University of Ulster in Coleraine and the University of Lúrio in Mozambique. Our students in Dublin, Ulster and Africa have worked hard to share their skills and expertise and the successful graduation of the students in Mozambique is testament to the hard work of all involved. I would like to take this opportunity to welcome our newly qualified optometrists to the field, the first optometry graduates ever in Mozambique and all of Portuguese-speaking Africa, and I look forward to welcoming many more graduates in Mozambique in the years ahead.”*

“There are approximately 285 million people worldwide who are visually impaired and 39 million people are blind. Including the need for reading glasses as a cause of near visual impairment, 670 million people, or more than 10% of the world’s population, are without access to this simple means to restore their vision. Our research shows that 80% of the visual impairment in the world can be corrected with the prescription of corrective lenses to treat refractive errors, such as long sightedness, shortsightedness and age related reading problems.

However we need qualified optometrists to provide this eye care. This is something that is sorely lacking in the developing world where millions of people are living with impaired vision because of a lack of access to qualified optometrists. For example, Mozambique has a population of 23 million but has 17 ophthalmologists (eye surgeons) and no optometrists until now. In Ireland we have almost 750 optometrists and 150 ophthalmologists for a population of four million.



Left: First lady of Mozambique, Maria da Luz Guebuza, arriving at the launch.



Above: Professor James Loughman, DIT and Dr Celso Belo, Dean of the Faculty walking to the launch of the Dr Agarwal Eye Hospital in Nampula.

Our project’s aim is to put educational, research and eye care measures in place that will significantly reduce incidences of avoidable blindness and visual impairment in Mozambique by the year 2020.”

DIT Student, Emma Hyland, who travelled to Mozambique to assist in the training and outreach programme added: *“Something so simple like reading glasses can make a huge difference to a person’s quality of life.*

In Mozambique, we saw entire families and communities of people who were poverty stricken as a result of poor eye healthcare. We saw people who had to give up any sort of work like reading, crafts or sewing as soon as they hit their late 30s due to poor sight. People with cataracts or other diseases that can be so easily treated will eventually become blind as there is limited access to healthcare. We tend to take these things for granted because they are so readily available to us in Ireland.”

The Mozambique Eyecare Project is an Irish Aid funded initiative, involving partners from the Optometry Departments at Dublin Institute of Technology and University of Ulster, in collaboration with Lúrio University in Mozambique and the Brien Holden Vision Institute in South Africa. The Project aims to address the problem of avoidable blindness and poverty in Mozambique, Lusophone Africa and across developing nations.

For further information on the Mozambique Eyecare Project and its work visit www.mozeyecare.org e: james.loughman@dit.ie

New control technology for infant formula



Pureformula is an EU-funded project that aims to develop a hybrid technology that is capable of assessing the physical and nutritional characteristics of powdered infant formula (PIF) in real time. This should significantly advance process control leading to greater product quality, process validation, and ultimately infant safety.

PIF is a milk-like food which is intended to supplement or replace the milk of the baby's mother. It is the most widespread and established alternative to the breastfeeding of the newborn and is characterised by a rapidly growing market, which was estimated to be worth US\$20.2 billion in 2010 and is expected to reach US\$23.8 billion by 2015.

The project is led in DIT by Dr PJ Cullen and has partners in Ireland, Turkey, Finland, UK and Spain. Two Irish companies Innopharma Labs (overall co-ordinator of the project) and Dairygold Food Ingredients Ltd are included in the consortium which also includes research organisations and SMEs.

The €1m project aims to generate €5m in direct economic benefits to the companies. The development of a technology capable of monitoring critical physical and chemical parameters of both dry and wet PIF production processes in-line would significantly increase process understanding and control. The proposed solution also has the potential to improve the production of other food powders such as soups, juices, coffee.

e: pj.cullen@dit.ie

Process analytical technology to characterise physical properties of crystals

An active pharmaceutical ingredient (API) is the substance in a pharmaceutical drug that confers pharmacological activity. The manufacture of pharmaceutical products based on small-molecule API remains critical to global healthcare. Generic drug companies have historically sourced active pharmaceutical ingredients from European manufacturers. Today, lower cost producers based in China and India pose a significant threat to the future livelihood of European API manufacturers.

In addition, the API industry in Europe is facing other obstacles including a lack of differentiation in manufacturing capabilities, excess capacity, among others. For this €1m EU-funded project a group of industrial SMEs came together to outsource the development of a revolutionary imaging-based physical characterisation device (CRYSTAL—VIS) that will provide the API industry with real-time in-line information of all crystal physical characteristics within a crystallisation process, thereby allowing this critical of processes for the behaviour of the end-product to be controlled.

The consortium members from Ireland, Finland and Spain, include two Irish SMEs—Innopharma Labs (co-ordinator of the project) and TOPCHEM as well as Dublin institute of Technology, VTT Research Centre of Finland, Innovacio i Recerca Industrial i Sostenible (IRIS), Labiana Pharmaceuticals and RIKOLA Ltd.

Process Analytical Technology (PAT) is now the buzzword in the pharmaceutical industry. It is the new framework for better understanding in pharmaceutical processes of which crystallisation is a critical part. Central to PAT is improving final product quality by process design through knowledge of the fundamental scientific principles behind it, and continuous online control of a process.

The DIT PAT team are involved in a number of projects investigating the use of PAT in both the pharmaceutical and food industries. The CRYSTAL—VIS project which will generate new technology that will be available to commercialise is estimated to generate revenue of more than €40m by 2021 and to create 67 new jobs.

e: pj.cullen@dit.ie

Research on non-routine problem solving in multinationals

Dr Pamela Sharkey Scott, College of Business, and co-authors Dr Esther Tippmann (UCD and formerly of DIT) and Professor Vincent Mangematin (Grenoble Ecole de Management).

The paper focuses on non-routine problem solving, a critical activity for developing and renewing the knowledge and competence base of any established organisation, and a way in which subsidiaries can contribute strategically to their multinational corporations (MNCs). The research involved an in-depth qualitative study into 38 problem solving processes of four Irish subsidiaries of foreign-owned MNCs.

The findings depict how the way problems are framed influences how subsidiary managers lead their unit's knowledge search and solution finding efforts. Most importantly the study identifies which approaches are more likely to develop locally implemented solutions and which go on to create global solutions and so renew MNC competences.

The four problem solving approaches are categorised as— local template adapting, superior technology creating, local template creating and global principle creating. This study represents a valuable contribution to understanding the role of the subsidiary in MNC competence development and renewal, extending previous MNC innovation and entrepreneurship frameworks. Reference: Tippmann, E.,P Sharkey Scott and V. Mangematin (2012), Problem solving in MNCs: How local and global solutions are (and are not) created, *Journal of International Business Studies* (2012) 43, 746–771.

email: pamela.sharkeyscott@dit.ie

Launch of new sustainable design journal



Back Row: James Duff, Eamonn Murphy, Derek Kearney, Keith Sunderland, Thomas Woolmington, (all DIT). Front Row: Dr Kevin Kelly (DIT), Sean Dowd (Chairman CIBSE), Gerald Farrell (Head of School of Electrical and Electronic Engineering)

DIT's School of Electrical and Electronic Engineering and CIBSE (Chartered Institution of Building Services Engineers) officially launched SDAR Journal 2013 at DIT Kevin Street. SDAR is the online journal of sustainable design and applied research edited by Dr Kevin Kelly, Head of School of Multi Disciplinary Technologies.

The 2013 edition was formally launched by Forfás Chief Executive Martin Shanahan. A copy of the journal can be obtained from its editor.

e: kevin.kelly@dit.ie w: <http://arrow.dit.ie/sdar/>

Analytical technology for particle characterisation

Particles and granules play a key role in process efficacy and final product quality for numerous industries including pharmaceuticals, food, nutritionals and cosmetics. Particle physics governs process variables such as flow, blending, granulation, compression and coating. These variables can have a significant effect on final product behaviour ie blend homogeneity, drug absorption rates, product robustness, etc.

The identified key physical parameters include particle/granule size and shape. Similarly the chemistry variation within the products has a critical effect on product quality. The current method of determining the end-point of pharmaceutical processes such as granulation is a combination of off-line or in-line analysis of size and shape characteristics and of moisture content and end product analysis of active content uniformity. The size and shape characteristics are important as they can significantly impact on compression processes.

The moisture content is important as it can impact on compression processes and product stability (negatively leading to hydration of the active ingredient). The active content uniformity is important to ensure that each patient receives the correct dosage quantity. The development of one hybrid technology that is capable of assessing these three characteristics in real time will significantly advance pharmaceutical manufacturing control and assure greater product control and patient safety. The PARTICLE-PRO project aims to develop a technology that is a hybrid of imaging-based physical characterization and NIR-Chemical Imaging technologies that will provide physical and chemical granule characterisation in-line in a manufacturing process.

The 2-year project is funded by the Seventh Framework Programme of the EC under the "Research for SMEs" sub-programme. This project started in December 2012 and will end in November 2014. The SMEs involved in the project are: INNOPHARMA Innopharma Labs, Ireland, SIGMOID Sigmoid Pharma, Ireland, SERVIPLAST Manufacturas Seviplast. S.A, Spain, RIKOLA Rikola Ltd., Finland, EXENS Exens Ltd., Finland, TAKEDA Takeda Ireland Ltd, Ireland. The RTD providers are: VTT Research Centre of Finland, Finland, Dublin Institute of Technology, Ireland, and Innovació i Recerca Industrial i Sostenible, Spain.

e: pjcullen@dit.ie

Energy Training for Construction Workers for Low Energy Buildings

The target group of EU-funded BUILD UP Skills QualiBuild is Craft Workers and Operatives in the Building Construction Sector. A core principle of the Irish Build Up Skills Roadmap is one of Quality Building. By focusing on quality buildings, of which low-energy buildings is a priority theme, this creates greater opportunities for the construction supply chain to take ownership of the issue.

QualiBuild will address one of the main issues identified within the Irish Build Up Skills (BUSI) Roadmap i.e. all construction workers lack the core knowledge in relation to low energy buildings. It will do this by A. Developing a Foundation Energy Skills Programme for the target group B. Implementing a Train the Trainers programme to increase the knowledge and competency of trainers involved in construction training.

The Irish Build Up Skills Roadmap highlighted the need to back up training provision with mechanisms which allow workers to benefit, in the market place, from having taken such training. Building on experiences from other schemes in Ireland, the project will develop and implement an industry backed Quality Building Training Registration Scheme.

Project aims:

- Development of a Foundation Energy Skills programme targeted at all construction workers and operatives with content available in hardcopy and on-line.
- A Train the Trainers programme to increase the knowledge and competency of trainers involved in construction training in Ireland with content available in hardcopy and on-line.
- A proposal for a Continuous Progressional Development (CPD) scheme for trainers in the construction sector.
- A Quality Building Training Registration System to provide a transparent means of demonstrating the level of competency and knowledge workers or operatives have in relation to low energy buildings.
- 200 construction workers complete the training, 100 trainers are trained, mobilisation of EUR 1 million of additional funding for additional training and support activities. The project partners are: Construction Industry Federation (CIF), Ireland, Dublin Institute of Technology, Ireland, Institute of Technology Blanchardstown, Ireland and Irish Green Building Council Limited (IGBC), Ireland.

e: timothy.oleary@dit.ie

Irish Software Association award



DIT researcher **Dr Mark Davis** (pictured left with Paul Maguire, DIT Hothouse) has won the ISA Software Industry Award for Outstanding Academic Achievement of the Year 2013. Mark is a researcher with the DIT Communications and Network Research Institute (CNRI).

The award recognises his invaluable contribution to the success of DIT spin-out company, Opti-Wifi, where

he holds the position of Co-Founder and Chief Technology Officer. Opti-Wifi is a newly established Irish company that produces highly innovative software for the telecommunications industry.

The company helps to optimise bandwidth usage on wi-fi networks in order to improve download speeds for end users. OptiWi-fi was runner-up in the PWC sponsored Docklands Innovation Awards 2013. OptiWi-fi recently announced its agreement with O2 Wifi to deploy industry-first wireless network bandwidth optimization across their UK and Ireland networks. This will revolutionise user experience by significantly improving Wi-Fi quality at congested hotspots.

www.optiwifi.com

DIT staff edit new issue of CERP

Dr Michael Seery and Dr Claire Mc Donnell, School of Chemical and Pharmaceutical Sciences, were guest editors of a special issue of the peer-reviewed journal Chemistry Education Research and Practice (CERP) published in November. The theme of the issue was the application of technology to enhance chemistry education.

Ten articles featured in the issue and contributions came from researchers in the United States, Germany, Turkey, Greece, Israel, and Ireland (Dr Catherine Barry-Ryan, DIT College of Sciences and Health). CERP is the premier journal in chemistry education, and is published quarterly by the Royal Society of Chemistry. The journal's editor is Dr Keith Taber, University of Cambridge. It is a free-to-access journal.

www.rsc.org/cerp



Pictured L-R: Jim Lawler (Klondike Innovations Ltd), Mark Bowkett (T.E. Laboratories Ltd), Denis Healy (Curtiss-Wright Surface Technologies), Minister Sean Sherlock TD, Dr Brendan Duffy (CREST), Professor Declan Mc Cormack (School of Chemical & Pharmaceutical Sciences), Mohamed Oubaha (CREST).

Surface Technology Gateway for DIT

Enterprise Ireland has awarded DIT's Centre for Research in Engineering Surface Technology (CREST) €1.2m to support companies to develop technology based solutions for their business. The CREST Gateway can deliver coating innovation solutions to the engineering, construction, healthcare and biomedical industries. CREST has expertise in:

- Protective Coatings for challenging environments.
- Surface treatment of metal components.
- Coatings for Environmental Applications.
- Biomedical Devices.

e: brendan.duffy@dit.ie

www.crestdit.com



Conor Norton, DIT and panel at RBTC

Regeneration—beyond the crisis

A DIT conference in November brought together experts in regeneration from Ireland and the UK to discuss cutting edge themes in urban renewal and development. The event was hosted by the School of Spatial Planning and Transport Engineering in association with the Institute of Economic Development.

Speakers presented economic strategies that promote sustainable development, the importance of urban design in reshaping our towns and cities and new approaches to community involvement in renewal.

DIT lecturer Ciarán Cuffe also presented the new Masters in Urban Regeneration and Development which is being delivered for the first time in January 2014.

The syllabus includes collaborative planning, place-making in towns and villages, and tackling the challenge of unfinished developments. It will appeal to built environment practitioners and others who wish to broaden their skills in understanding, and managing urban renewal and development.

e: ciaran.cuffe@dit.ie

New chair of European research body

Dr John Donovan has been elected Chair of the Board of the European Association of Research Managers and Administrators (EARMA). The organisation plays an important role in developing policy as well as acting as an interface between research funding organisations and the scientific community, and between industry and academia.

w: www.earma.org

DIT represented at EUA Council

Professor Mary McNamara is a member of the EUA Council for Doctoral Education Steering Committee (EUA-CDE). The Council was established in 2008 to create a strong voice for European universities on doctoral education both inside Europe and internationally and to contribute to enhancing the visibility of doctoral schools and programmes. Professor McNamara is Head of the Graduate Research School in DIT and works with schools and colleges to develop structured PhD programmes.



Dr John Donovan

DIT member of H2020 Expert groups

Jean Cahill, Directorate of Research and Enterprise, has been appointed to two Horizon 2020 Expert Advisory Groups: an Ad Hoc Expert Advisory Group on Gender and an Expert Advisory Group on Societal Challenge 2 “Food, Security, Sustainable Agriculture, Marine and Maritime Research and the Bio-Economy”. She is rapporteur to the second group.

A call for expressions of interest from those interested in participating in one of the H2020 Expert Groups was issued by the European Commission in January 2013. Over 11,000 people applied. The call remains open throughout Horizon 2020 as the Expert Groups are changed every two years.

<http://ec.europa.eu/research/participants/portal/desktop/en/home.html>

DIT student wins top marketing award



Sarah Browne, PhD student

An international judging panel at the UK Academy of Marketing Conference 2013 awarded the prize for Best Overall Paper to **Sarah Browne**, a PhD research student in the College of Business. Sarah competed against 480 UK and European academics, all of whom were her senior both in experience and age. Her paper was drawn from her PhD thesis titled: 'From strategy-making to strategy-shaping: Exploring the strategising practices of marketing middle managers'.

She examined the direct and indirect influence of marketing on strategy-shaping activity within organizations. Sarah adopted a multiple case study methodology across the increasingly competitive Irish grocery retail sector. Her winning paper will be published in the *Journal of Marketing Management* in 2014. Sarah has also presented papers at conferences of the Strategic Management Society, the British Academy of Management and the European Group for Organization Studies (EGOS).

She graduated from DIT with a BSc in Marketing and won three gold medals for excellence in her final year. She also successfully competed for both DIT ABBEST and DIT Fiosraigh research scholarships to fund her postdoctoral research. She is supervised by Dr Katrina Lawlor, Dr Pamela Sharkey Scott, and Laura Cuddihy all of whom are based in the College of Business.

e: katrina.lawlor@dit.ie

Best paper awards at macromarketing conferences

A paper co-written by **Professor Aidan O'Driscoll** of the Centre for Business, Society and Sustainability and the School of Marketing, **Dr Norah Campbell**, Trinity College Dublin, and **Professor Mike Saren** of Leicester University won the award for best paper at the 37th Annual Macromarketing Conference, in Berlin. The paper 'Reconceptualising resources in service-dominant logic' was chosen from among 70 competitive papers presented at the conference, attended by delegates from over 20 countries.

e: aidan.odriscoll@dit.ie

Best paper at Commercial Distribution conference

Dr Edmund O'Callaghan, Head of Department of Retail Management Studies in the School of Retail and Services Management, won best paper at the 17th International Conference on Research in the Distributive Trades of the European Association of Education and Research in Commercial Distribution (EAERCD) held in Valencia, Spain.

The paper, entitled "Internal Brand Commitment, a multi-dimensional construct? Case Study Evidence within a Collaborative Independent Retail Network Context" explored the dimensionality of the internal brand commitment construct within the business-to-business context of a collaborative independent retail network.

Using a qualitative case study methodology, based primarily on interviews with owner-managers, the study provides empirical evidence of the multi-dimensionality of the internal brand commitment construct, with both attitudinal and behavioural dimensions. Although the importance of internal branding has been acknowledged for service sector organisations, this is the first empirical evidence to document the complexity of internal brand commitment in a retail context.

The research concludes that while calculative commitment builds organisational commitment, internal brand commitment requires an affective dimension, which leads to what can be interpreted as brand citizenship behaviour and/or conceptualised as the formation of a brand community. The research has since been published in the *International Review of Retail, Distribution and Consumer Research*. Edmund previously co-edited "Retailing in Ireland", published by Gill and Macmillan.

e: edmund.ocallaghan@dit.ie

Outstanding paper award

Dr Kevina Cody's paper "BeTween two worlds: critically exploring marketing segmentation and liminal consumers" published in *Young Consumers: Insight and Ideas for Responsible Marketers* has been chosen as an Outstanding Paper Award Winner at the Literati Network Awards for Excellence 2013. The award follows a review by the journal's editorial team, many of whom are eminent academics or practitioners, of the outstanding papers published in the journal. Kevina's paper contributes to an expanding body of literature that critically engages with both the theory and practice of market segmentation. Through the theoretical lens of liminality and its implicit elements, the notion of boundary creation inherent in age-based market segmentation of the youth market is explored. The paper highlights the fluidity and porous nature of such constructed boundaries, rendering attempts at creating discernable, knowable segments, potentially futile.

By critically viewing this segment, not just as a marketing demographic, but as a liminal zone, an alternative consideration of the theory and practice of age segmentation is presented. Kevina's research offers tangible insights into the social worlds of a burgeoning market segment, albeit a liminal one, offering actionable realities based on the inextricable intertwining of their consumption practices and lived experiences. Rather than view children as socio-cultural non-descriptors who are of interest to marketers purely for their ability to be located along a continuum of cognitive development, the research explore the specific intricacies of the tweens' mediation of their liminal world using consumption practices. Kevina is a lecturer in the School of Marketing where she lectures on brand management, consumer behaviour, communications, and dissertation research methods on undergraduate and postgraduate programmes.

e: kevina.cody@dit.ie

Prestigious Taiwan Fellowship

College of Business Research Fellow (2013–2015), Senior Lecturer and Irish Fulbright Alumni Association (IFAA) President, **Dr Paul Donnelly**, is the recipient of a highly prized Taiwan Fellowship.

The Taiwan Fellowship is the most prestigious of Taiwan's eight fellowship and scholarship programmes, and is awarded following a rigorous, formal, peer assessment process. Altogether, there are 81 recipients of the 2013 Fellowship, who hail from 35 countries. Paul is the only recipient from Ireland—indeed, he is the first Irish scholar to receive the Fellowship. Established by Taiwan's Ministry of Foreign Affairs in 2010, the aim of the Fellowship is to encourage experts and scholars

worldwide with an interest in Taiwan, cross-Strait relations, mainland China, Asia-Pacific, and Sinology to conduct advanced research in Taiwan's universities or research institutes, in the process promoting international partnership and mutual understanding.



Representative Dr Harry Tseng (Taipei Representative Office) with Dr Paul Donnelly (College of Business, DIT).

Paul will spend a year in Taiwan (December 2013 to November 2014) researching the country's path to 'tiger hood', which parallels his doctoral work tracing Ireland's path to outward-looking economic/industrial development. He will be hosted by the College of Management at National Taiwan University (the country's top-ranked university and a Times Higher Education Top 100 World University) and by the Institute of Sociology at Academia Sinica (the country's pre-eminent research institution).

For Paul, this *"is a really exciting opportunity on a number of levels. Academically, it affords me the opportunity to immerse myself in an area of research that is of interest to both Taiwan and Ireland, namely pathways to economic/industrial development. From the perspective of teaching, it will allow not only for the transfer of research to teaching, but also of the experience of Taiwan's society and culture. It will also allow me to learn Mandarin through immersion, which will be of immense benefit both personally and institutionally. All in all, the Taiwan Fellowship presents the potential, in a small, but tangible way, to increase mutual understanding between the peoples of Taiwan and Ireland, and all to mutual benefit"*. Taiwan's Representative in Ireland, Dr Harry Tseng, remarked: *"The Taiwan Fellowship is one of the scholarships our government offers to encourage foreign scholars and experts to come to our country for more advanced study and research. It is also the most prestigious one. It is my hope that, as the first Irish scholar to receive this Fellowship, Paul's successful experience in Taiwan will serve as both a reference point and encouragement for Irish scholars to similarly apply for the Fellowship"*.



Prizewinning inventions

The winners of the “What’s the Big Idea? Inventor Competition 2013” were announced at the annual Research and Innovation Open Day in DIT Aungier St. Guest of Honour at the event, Minister Sean Sherlock TD, along with the Presidents of the three Dublin Technological University Alliance institutions, presented the winners with their prizewinners’ cheques.

The prize fund of €2,000 is co-sponsored by patent company Hannah Moore Curley and this year the competition was open to all students and members of staff in DIT, IT Blanchardstown and IT Tallaght. It attracted a significant number of entrants and its aim was to identify projects, innovations and well structured ideas with commercial potential. The winners were:

Best Overall Invention Award

Invention: Hy-GENSOR: A Hand Hygiene Assessment Device for Healthcare Professionals

Inventors: Brian Seddon, Dr Baljit Singh, Dr Rodica Doaga, Dr Santhosh Padmanabhan, Dr James Hayes and Dr Eithne Dempsey (MICRA Research Centre, IT Tallaght)

Best Researcher Invention Award

Invention: Novel Diffractive Optics

Inventors: Dr Suzanne Martin and Dr Vincent Toal (Industrial and Engineering Optics Centre, DIT)

Best Undergraduate Researcher Award

Invention: Enhanced Emergency Lighting (EEL) Barrier

Inventor: Ian Burnell (DIT).

Launch of language therapy report

Mícheál ÓMuircheartaigh, commentator and RTE presenter, pictured at the launch of a research report: “Evaluation of the Speech and Language Therapy Service of Tallaght West Childhood Development Initiative”.



The report was written by Emeritus Professor Nóirín Hayes, Siobhán Keegan and Eimear Goulding, Centre for Social and Education Research (CSER), DIT and funded by the Office of the Minister for Children and Youth Affairs and Atlantic Philanthropies.

Research guide to help dissertation students

“Approaches to Quantitative Research: A Guide for Dissertation Students” takes a practical approach to quantitative research techniques by providing step-by-step guides to their application and interpretation and demonstrating how to use the appropriate quantitative methods to answer different types of research questions.

This book edited by Dr Helen Xiaohong Chen, (DIT School of Marketing) is aimed at novice researchers. It shares many valuable lessons on the tools and techniques used in business and society research.

Most of the contributors are from the College of Business. For example, Dr Eddie Rohan provides a guide to SPSS for ‘real beginners’ and Dr Pamela Sharkey Scott and Siobhán McCarthy deliver advice based on their own cutting-edge research.

The book is available to buy online and in book shops in paperback, wire-bound, Kindle or ebook versions.

Contact: helen.chen@dit.ie



GRANGEGORMAN BUILDING DUBLIN'S FUTURE

Dublin Institute of Technology is one of Ireland's largest education institutions, representing almost 10% of all students in higher education. Our new campus at Grangegorman, Dublin 7, will be at the heart of the regeneration of the northwest quarter of Dublin city centre. Working with DIT, the HSE, the City Council and the local community, the Grangegorman Development Agency is preparing to deliver a unique campus that will contribute not only to higher education and health, but will also deliver an economic and social dividend in terms of employment, enterprise and innovation. Connecting with the extended LUAS CrossCity with a stop at DIT Broadstone, it will be an important part of Dublin's future infrastructure.



Follow progress on the Grangegorman project at www.ggda.ie or www.dit.ie