

# FACULTY OF Science + Engineering

## Newsletter

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#### New Headquarters for CONFIRM



CONFIRM, the world-leading SFI research centre in Smart Manufacturing hosted by University of Limerick, is to break ground on its bespoke new €3.1m headquarters at Park Point. With a tender process now concluded, CONFIRM will commence building works at its new headquarters, a bespoke 1619 m<sup>2</sup> facility based in Park Point, adjacent to UL.

The build of the new headquarters will see a design team consisting of 12 people and 40 builder and construction managers, depending on stage of build, employed to create a centre of excellence for Smart Manufacturing, facilitating a community of practice between researchers, industry and the general public. The headquarters will be a fit for purpose facility that will host 70 research, 12 operational and management staff, resident and visiting investigators from CONFIRM's 9 national research partners, international collaborators, industry partners, as well as test-bed and prototype facilities.



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The construction of the CONFIRM Park Point headquarters will enable Ireland to be at the forefront of the fourth industrial revolution with world-leading Smart Manufacturing practices by becoming the centrepiece of a new community of practice where researchers and industry can come together to transform manufacturing as well as providing an innovative new space where the general public, including schools, can gain awareness of research and developments in the manufacturing industry. CONFIRM HQ will become a facility to futureproof Ireland so that it is best placed to adapt and thrive in Industry 4.0.

Professor Conor McCarthy of UL, CONFIRM Director and Co-Principal Investigator, said: "We are delighted to begin construction on our central headquarters, which will be a national facility to enable Irish and international industry to research cyber-physical manufacturing systems.

"Such systems create the overarching technology that enables mass customisation of discrete products, such as personalised medical devices, all the way to bespoke and customer-specific utility products. "Our centre design has emerged as best in class from a year long study of best practice in manufacturing and innovation research centres globally."

## European Research Council Advanced Grant Funding

Prof. Michael Zaworotko, Bernal Chair in Crystal Engineering and Professor Orla Muldoon, Director for the Centre for Social Issues have been successful in securing a combined €5m in European Research Council Advanced Grant funding. The funding awards for UL are two of just four awarded to Ireland and are the first ERC Advanced Grants to be hosted at the University.

UL Vice President for Research Professor Norelee Kennedy said the awards were a “fantastic achievement” for Professor Muldoon and Professor Zaworotko and reflected their standing as “world leaders” in their respective fields. “These are very significant funding awards for our researchers and for the University. The research speaks to the University’s research profile of excellent research with impact that addresses societal challenges,” said Professor Kennedy.

“Both Prof Muldoon and Zaworotko lead high calibre research groups and these awards will add further to the knowledge and understanding of these major challenges. We are delighted with the success of these applications,” she added.

Professor Zaworotko was also awarded almost €2.5m for his project ‘SYNSORB – SYNergistic SORBents’. Which will address the high energy footprint of gas and vapour purification by single-step purification processes that involve the use of a new generation of solid materials called sorbents. These sorbents act like sponges for impurities by capturing them spontaneously and releasing them upon mild heating. The most important vapour is water vapour. Water vapour is everywhere in the atmosphere, even in the most arid regions, but harvesting pure water from water vapour using existing desiccants uses so much energy that it is not commercially viable despite the water stresses faced by much of humanity. Gases such as CO<sub>2</sub> and acetylene are impurities in commodity production and must be removed using processes that typically involve chemical reactions. These processes collectively use around 20% of global energy supplies and demand for water and industrial commodities continues to grow. Our goal is to discover and develop new sorbents that reduce the energy footprint of these processes by 50-90%, thereby significantly reducing the energy and, in turn, carbon footprint of these processes.”

## Teaching Excellence Awards

### UL Excellence in Teaching (Individual) 2017/8

S&E Recipient: Audrey O’Grady

### UL Excellence in Teaching (Individual) 2018/9

S&E Recipient: Michael Ryan

### UL Excellence in the provision of Pedagogic Support 2018/9

Teaching Impact with large classes – First Seven Weeks: Teresa Curtin



*Dr. Teresa Curtin receiving her award*

### UL Excellence in Teaching (Team) Winner 2018/9

Prof. Conor Ryan and his teaching team won the Team Teaching Award. The team consisted of four postgraduate students (Atif, Sheraz Anjum, Aidan Murphy and Muhammad Sarmad Ali) and three members of the charity, Loss of Generality (Dara Shayda, Muhammad Abubakar and Wayne Allen). The team created a new approach to delivering a first year module that ran in just six weeks. The students were immersed in module activities spanning lectures, on-line quizzes, forums and labs, with a large component of group work. This led to a very close knit class cohort that helped each other and, in turn, to higher average grades and better pass rate than previous years.



### Mathematical Olympiad

Lucas Bachmann (6th year, Glenstal Abbey) won a silver medal (the second in Ireland) at the 2019 International Mathematical Olympiad in Bath. Lucas was coached by Gordon Lessells, Mark Burke, Jim Leahy, Eugene Gath (M&S) and colleagues from Mary Immaculate College

### European H2020 Funding

Dr. Sinead O'Keeffe (ECE) was awarded €4.8M funding as co-ordinator for the European H2020 project "ORIGIN – Optical Fibre Dose Imaging for Adaptive Brachytherapy".

### Royal Irish Academy Member

Bernal Chair of Crystal Engineering and SSPC Director, Mike Zaworotko was formally admitted to the Royal Irish Academy on Tuesday, October 1st in Dublin. Membership is by election and considered the highest Academic honour in Ireland. The Royal Irish Academy identifies and recognises Ireland's world class researchers. The RIA is an all-island independent forum of peer-elected experts. Drawing on their Members' expertise who make a significant contribution to public debate and policy formation on issues in science, technology and culture. They bring together academia, government and industry to address issues of mutual interest by providing an independent forum. The Academy leads important national research projects, particularly in areas relating to Ireland and its heritage. They represent the world of Irish learning internationally, have a unique globally recognised library, and are a leading academic publisher. Past Members have included Nobel laureates: WB Yeats; Ernest Walton, Erwin Schrödinger and Seamus Heaney.



### Kevin Hayes Memorial Medal

The Kevin Hayes memorial medal for the student(s) with the top QCA in LM123 was awarded to Sarah Beck and Emily Hill who are now in second year of Biosciences and Pharmaceutical & Industrial Chemistry.

### Regeneron Awards

Regeneron awarded prizes to 3rd year Industrial Biochemistry and Chemical Engineering students: QC award: Emily McMahon, Manufacturing Award: Fiona Neylon. Chemical Engineering Award: Aoife Walsh.

### SSPC Award Winners



SSPC, the SFI Research Centre for Pharmaceuticals was awarded Pharma Research Centre of the Year and the Pharma Education and Training Award at the recent Pharma Industry Awards 2019. The awards recognise SSPC, a national research centre, led by the University of Limerick (UL) at the Bernal Institute, for its outstanding national and international industry-academia, inter-industry collaborations.

### BOC Postgraduate Bursary 2019



Prof. Tewfik Soulimane, supervisor, postgraduate student and recipient of the BOC Postgraduate Bursary Award 2019 Michele Dully, Kieran Hennessy, Business & Relations Manager BOC Gases, Dr Sarah Hudson, supervisor.

## Improving the Reliability of Software Applications Funding

Lero, the Science Foundation Ireland Research Centre for Software, has secured a €6 million investment from Huawei to fund a research programme aimed at improving the reliability of software applications. The investment funding is in joint cooperation with Huawei's Research Centre in Ireland and Sweden.

Lero researchers from UL, Trinity College Dublin, NUI Galway and Dublin City University will take part in the four-year research programme which begins formally in early 2020. The President of Huawei's Sweden Research Centre, Frank Du and Yargin Xiao, President of Huawei's Ireland Research Centre were in UL for the announcement. Lero Director, Professor Brian Fitzgerald, said: "Lero is working on implementing advanced software engineering techniques across a range of topics. This research programme brings together top software researchers from around Ireland to work with Huawei on a series of projects aimed at making software more efficient and reliable." "There has been a dramatic increase in both the volume and complexity of the software that needs to be produced globally. This project will help industry generate the best possible software over the four years of the strategic research partnership. As a company who have a strong record of research-led innovation, we look forward to working with Huawei on this programme," he added.

## Naughton Scholarships

Congratulations to Department of Chemical Sciences students Caitriona Ní Ríordáin and Fiona Neylon, who were presented with their Naughton Scholarships on Saturday 21st September 2019. Chemical Sciences, Head of Department, Prof Tewfik Soulimane represented the University of Limerick at the awards where School of Engineering student Leah Connaghton was also a recipient. Caitriona, Leah and Prof Soulimane were pictured with Mr and Mrs Naughton of the Naughton Foundation and also the Minister for Finance Pascal Donoghue.



## Rapid Innovation Unit

Professor Leonard O'Sullivan, School of Design, secured funding of €2 million to develop the Rapid Innovation Unit, the first hospital based innovation and additive manufacturing testbed of its kind in Ireland. The Unit will enable much more rapid innovation and development of medical devices on site in the hospital. The programme of research is a collaboration between the School of Design, CONFIRM, the Heath Research Institute and Johnson and Johnson.

## H2020 NMBP Award

Dr Andy Stewart, Department of Physics and Bernal Institute, has been awarded €300k as part of the H2020 NMBP funded project, entitled 'Process Analytical Technology Tools for Real-Time Physical and Chemical Characterization of Nanosuspensions (PAT4NANO)'.

## Young Entrepreneur

Eoghan Mulcahy, a Ph.D. student in the Department of Electronic & Computer Engineering (Project: Deep learning models for aerial search and rescue operations) was named the Mid/South West Region's Best Young Entrepreneur for 2019

## Highly Cited Researcher

Professor Michael Zaworotko, (Department of Chemical Sciences and Bernal Institute) has been named again on this year's Web of Science Group list of highly cited researchers.

## Autonomous Vehicles Research Programme

Lero, the Irish Software Research Centre, will lead a new Science Foundation Ireland backed €4.2m research collaboration on driverless vehicles. The programme was launched by Heather Humphreys TD, Minister for Business, Enterprise, and Innovation. As part of the programme, researchers from Irish academia, global automotive and Irish firms will collaborate on key international challenges facing the development of driverless vehicles, especially those working in the same environments as pedestrians, animals and human-operated vehicles. The project brings together 11 companies to work on a variety of autonomous systems projects across the automotive, industrial and agricultural sectors.

Researchers from across Lero along with SFI research centres CONNECT and Insight, will work with multinational industry partners such as Jaguar Land Rover, Kostal, Liebherr and Valeo; large indigenous Irish companies like Combilift and Dairymaster and smaller Irish companies including Greenval, Mobimetrix, PMS Pavement Management Services Ltd, Reamda and Transpoco.

## Producing Water from Air

A revolutionary new material developed at University of Limerick could “help solve the global water crisis” by producing water from air, even in the most remote of locations. Professor Michael Zaworotko, Bernal Chair of Crystal Engineering and Science Foundation of Ireland Research Professor at University of Limerick’s Bernal Institute, has developed the crystalline material after decades of research. His lab discovered a material with favourable properties for absorbing and releasing water from the atmosphere that could revolutionise dehumidification systems in buildings and the availability of water in regions of drought.



It has been developed as a commercially viable nanomaterial by Molecule RND LTD, an international think tank, research group and incubator fund that has located in University of Limerick (UL) to work in collaboration with Prof Zaworotko. In practice, the low energy desiccant – essentially a water capture material – could replace the silica traditionally used in dehumidification systems in buildings, explains Prof Zaworotko. “Silica has been used for a long time as a desiccant to pull water from the atmosphere, but it is not very efficient,” he says. “If we replaced silica with this crystalline material, it would require substantially less energy to maintain air quality in buildings around the world.” The material could also capture water from the atmosphere in arid regions, he adds. “Even in zones of very low humidity on Earth, even in deserts, there is still some water in the atmosphere. This material could be applied to capture the water from the air, meaning you could potentially grow crops there.

## Pharma Innovation Programme Singapore (PIPS)

SSPC hosted a selection of Singapore’s A\*Star Pharmaceutical Innovation Programme, known as the Pharma Innovation Programme Singapore (PIPS), a partnership between the Agency for Science, Technology and Research (A\*Star), the National University of Singapore (NUS), the Nanyang Technological University (NTU), the Singapore Institute of Technology (SIT), and pharma companies GlaxoSmithKline (GSK), MSD International GmbH (Singapore branch), and Pfizer Asia Pacific. The group are providing a platform to build a well-connected pharma manufacturing ecosystem that catalyses collaboration and drives the strategic evolution of pharma manufacturing capabilities in Singapore. PIPS is also engaging other firms including multinationals, large local enterprises, and small and medium-sized enterprises that are “technology enablers” which can add value to the pharmaceutical manufacturing industry.



## Summer Bursary Scheme

This year marked the 7th running of the Science & Engineering Summer Bursary Scheme: thirty-six bursary recipients received their certificate awards on Friday September 27th. The aim of the scheme is to expose undergraduate students to the research environment, working alongside post-graduates and post-doctoral researchers over the Summer, ultimately to encourage the students to apply for postgraduate research funding, so that they can continue their studies to Masters or PhD Levels. The scheme also has an additional goal of supporting Academics to investigate new areas of research, or to work on research funding grant proposals.



## User Centred Human Robotic Interface Project



Confirm, the Science Foundation Ireland funded research centre for Smart Manufacturing, are delighted to announce a new industry research project supported by Mullingar based automation specialists Robotics and Drives. The 2-year research project, which focuses on a user-centred Human-Robotic Interface (HRI) that considers usability, safety and utility, will be undertaken by Athlone Institute of Technology's Dr Niall Murray and researcher Xue Er (Shamaine) Chung. The project was officially launched at Robotics and Drives headquarters in Mullingar and was attended by members of Confirm, Athlone Institute of Technology and Robotics and Drives.

## Invited Keynote Speaker

The World Sensors Summit (WSS) 2019 was held in Zhengzhou, China from 9 to 11 November. Professor Elfed Lewis, Electronic & Computer Engineering Dept, IEEE Sensors Council and Director of the Optical Fibre Sensors Research Centre was an invited keynote speaker.

## EU ISFP Project

entitled "Stronger Training and Increased Knowledge for better Enforcement against Waste & Mercury (STRIKE)" is an EU ISFP project led by Principal Investigator Dr. Colin Fitzpatrick, Electronic and Computer Engineering Department. The STRIKE project aims to further enhance operational activities & capacities of authorities involved in addressing illegal trade & management of problematic waste streams (e.g. e-waste, end-of-life vehicles, batteries & waste mercury), as well as illegal production & trade of mercury-added products (MAPs). Objectives will be achieved through enhanced knowledge & understanding of the risks & threats; advancement of practical tools & methods; and tailored multi-stakeholder capacity building. UL is a coordinator of the programme, with a value of €146,000 to the University.

## Published Papers

*'Synergistic sorbent separation for one-step ethylene purification from a four-component mixture'* by Kai-Jie Chen, David G. Madden, Soumya Mukherjee, Tony Pham, Katherine A. Forrest, Amrit Kumar, Brian Space, Jie Kong, Qiu-Yu Zhang, Michael J. Zaworotko (the Crystal Engineering Group) was published in the international high impact scientific journal; SCIENCE, the paper outlines a radical one step process for purification of ethylene.

*'Domain Wall Engineering for Novel Nanoelectronics'* by Bernal researchers Professor Ursel Bangert, Dr Michele Conroy and Kalani Moore, was published in Advanced Materials (impact factor 24), and has been highlighted in Nature Materials Reviews.

## Space Week 2019

As part of Space Week the Faculty of Science & Engineering and the Department of Physics hosted a Space Career Roadshow in conjunction with Science Foundation Ireland, ESERO Ireland and CIT Blackrock Castle Observatory. These roadshows provided students with an excellent opportunity to engage with space industry professionals, and third level institutions, so that they can get a taste of the exciting opportunities that a STEM career in Space has to offer.

In addition to excellent speakers, flash talks, and project demos, students had the opportunity to mingle with space industry groups, interactive artists, and more during an interactive lunchtime exhibition. Participants had the opportunity to win a telescope and a souvenir mission patch signed by NASA Astronaut Dan Tani.

## Make your very own Doodlebot

Fab Lab Limerick invited kids from ages 6 to 8 years to build their very own doodle bot. A DoodleBot is a small robot that does random doodles/drawings. Under the guidance of the Fab Lab team kids were involved in Arts and crafts and some basic electronics.

## Postdoctoral Fellowship Programme

CONFIRM has launched a postdoctoral fellowship programme aimed at providing world-class training and research opportunities to 16 fellows in the area of Smart Manufacturing. SMART 4.0 will offer fellowships to experienced researchers to take part in a 24-month training and career development programme at one of its partner institutes. SMART 4.0 is funded under the Horizon 2020 Marie Skłodowska-Curie Actions COFUND initiative.

On their visit to the University of Limerick, a delegation of California state legislators and industry leaders were welcomed to the Bernal Institute by Confirm post-doc, Dr. Eoin Hinchy and Confirm PhD student, Damian MacCarthy along with Minister of State Patrick O'Donovan, Prof Luuk van der Wielen, Bernal Institute Director and UL Deputy President, Chief Operating Officer and Registrar Gerry O'Brien. The visiting group came to the region to learn about recent economic successes, particularly in the area of research, that is being catalysed by the University and the 3 SFI funded research centres (Confirm, SSPC & LEro) which it hosts. Among the delegation was California State Senator Susan Rubio, pictured below with Dr. Hinchy and Damian McCarthy getting a tour of the Confirm JAMIR (Joining of Advanced Materials using Industry 4.0) joining suite which is located in the Bernal Institute. JAMIR is one of several assets that are available for use by Confirm industry partners and researchers, aiding in effective collaboration between research and industry

## Science Week

The Faculty of Science and Engineering kicked off Limerick Festival of Science events on 9 November as part of National Science Week. Science Week is an annual event, hosted across the nation that celebrates the fascinating worlds of science, technology, engineering and mathematics (STEM).

Throughout the week scientists, engineers and technologists put on a range of activities and talks designed to spark curiosity, inspire imagination and unleash the potential that helps shape the future. One of the Festival aims was to challenge stereotypes so young people could see the diversity of people that work in STEM.

Over 55 events were run by UL as part of the Festival involving in excess of 5000 young and older participants attending throughout the week. Science Shows for Science Week were featured on the front pages of the Irish Times and Irish Independent.

## 'What Planet Are You On'

Professor JJ Leahy (Department of Chemical Sciences and Bernal Institute) participated in the Science Foundation Ireland sponsored programme on the environment, "What Planet Are You On" on RTE1 where he served as the panel expert on energy and assessed the energy consumption of the three participating families.

## California Visitors





## CONFIRM Welcomes New Academic Partner

We were delighted to formally welcome our newest Academic Partner, IT Tralee to the Confirm group. IT Tralee is the 9th addition to the consortium along with existing member: Athlone Institute of Technology, Maynooth University, University of Limerick, Limerick Institute of Technology, NUI Galway, Cork Institute of Technology, University College Cork and Tyndall National Institute.

Professor Joseph Walsh (ITT) has become a Funded Investigator with Confirm and will act as the point of contact between IT Tralee and the Centre.

Professor Walsh is Head of the School of STEM and Head of Intelligent Mechatronics and RFID (IMaR) Research Centre at the Institute of Technology, Tralee (ITT), Co Kerry. He has a PhD in Electronic Engineering from the University of Limerick and an M.Sc (Eng) in Bio-engineering jointly from Trinity College Dublin (TCD), University College Dublin (UCD) and the University of Limerick (UL). Professor Walsh's research experience encompasses the field of intelligent mechatronics and sensors, dairy technology, robotics and automation, autonomous systems, bio-instrumentation and STEM education and is well published in these areas. He has over 20 years research and development experience in both industry and academia and has (co-)authored over 100 scientific articles and has received circa. 10 million in research funding over the past 5 years.

Professor Walsh is a very welcome addition to the Confirm team and we look forward to working with him and the Institute of Technology Tralee going forward.



*Pictured, from left; Professor Joseph Walsh (IT Tralee), Professor Conor McCarthy (Director – Confirm Centre), Dr Brendan O'Donnell (Acting President, IT Tralee)*

## 'Making the Leap'

CSIS, ECE, and CTL launched the LM121 Computer Science initiative "Making the Leap: a pathway to success". Twenty 2nd year Student Leaders volunteered to mentor and support small groups of LM121 first years in transitioning from 2nd to 3rd level. Similar initiatives in the UK have been empirically proven to enhance first year student engagement and progression. All 2nd year Student Leaders received training for the role, and all will be eligible for a bronze PVA upon completion

## Research Workshop on Crime Networks

On 8 November, the Department of Mathematics and Statistics and the School of Law came together for a research workshop on two diverse methodological approaches to examining crime networks. An RTÉ Brainstorm article from Dr Bruno Requião da Cunha on "How criminal gangs could be stopped by maths" published earlier that week was one of the most read articles on the national platform and was picked by the RTÉ news website and Apple news.

## Funding for PMTC



*Pat Macken, Chair, PMTC, Darren Whitaker, Perceptive Engineering Limited and Sarah Hayes, Director, PMTC attending the PMTC Knowledge Day*

The Pharmaceutical Manufacturing Technology Centre at University of Limerick's Bernal Institute is embarking on a 'new phase' after securing €5m in funding. One of the leading state funded, industry informed research centres providing advanced technology solutions for the pharma-sector, PMTC has appointed a new director and will expand its research focus to include data analytics as it launches 'PMTC Phase 2' following confirmation of funding from Enterprise Ireland, with support from IDA Ireland. A key objective for PMTC is to place small and medium enterprises (SMEs) into direct contact with multinational corporations (MNCs) operating in the pharmaceutical and biopharma sectors in Ireland, allowing them to collaborate in an innovative research programme.



## Composites manufacturing facility opens in Birr

EJ Access Solutions Ltd in Birr (formerly Cavanagh Foundry) lost its metal access cover business when production was transferred to France with the loss of approximately 70 jobs in 2016. The American owners of the company wished to develop a composite access cover manufacturing facility in Birr and requested the support of IComp who advised on the most appropriate process for the manufacture of bespoke, high added-value composite access covers.

Enterprise Ireland awarded EJ an Innovation Partnership grant for R&D work by IComp. The company received further support from the Irish Development Agency. Dr Walter Stanley of UL was the IComp Principle Investigator and his team successfully completed the necessary product and tooling design, down-selection of materials and process development. IComp provided on-going support throughout both the transfer of the technology to a newly installed production line in Birr and commissioning of the plant. Production of bespoke access covers is proceeding apace, creating new high quality jobs with more to follow very soon. Expansion into international markets continues, as well as ongoing marketing into Irish companies and organisations. EJ is developing new access cover ranges for different markets.



*Dr Norah Patten, Dr Walter Stanley, Dr Terry McGrail, Mr. Vincent Cooper EJ pictured at EJ Access Solutions in Birr.*

Dr Norah Patten, as IComp Project Manager and Ireland's Scientist-Astronaut Candidate with Project PoSSUM, officially opened EJ's new Composite Manufacturing Facility at Birr on 17 October 2019. For this auspicious occasion, the America owner and family members attended alongside dignitaries including the local TD Marcella Corcoran-Kennedy who is on the Government's Climate Change Committee and now fully appreciates the value of composites to both the Irish economy and the fight against global warming.



*Pharmacy students, Fiona Hogan and Caoimhe Murphy*

## Bernal Institute helps train pharmacists of the future

To qualify as a pharmacist in Ireland a person must complete a Master of Pharmacy programme accredited by the Pharmaceutical Society of Ireland (PSI). In Ireland, approved programmes are delivered by Trinity College Dublin, the Royal College of Surgeons in Ireland and University College Cork. The programme includes a number of practice placements for students throughout the five years in traditional pharmacy environments or roles of emerging practice. The Bernal Institute in collaboration with Affiliation for Pharmacy Practice Experiential Learning (APPEL) have expanded the options of practice settings this year by hosting two fourth year pharmacy students from UCC.

Bernal offers pharmacy students unique access to world class facilities and expertise in Chemical Engineering, Crystallography, Bio Science, Pharmaceutical and Nano technology. The students are supervised by Pharmacist and Department of Chemical Sciences PhD Student Oisín Kavanagh, their training includes building fundamental research skills to enable them to enter novel areas of pharmaceutical practice in the years ahead.

Fiona Hogan and Caoimhe Murphy from UCC were selected to complete their placements at the Bernal Institute; both have a keen interest in pharmaceutical research and are delighted with the opportunity to learn about novel formulations and plans for pharmacies of the future



# Autumn Conferring 2019

- 1. Receiving the “Chemifloc Edward Storey Award” from Christina Storey, Chemifloc (middle) were Jenna Bromell - BEng in Chemical & Biochemical Engineering (left), and Ciara Leahy - Industrial Biochemistry (right)
- 2. Students receiving their PhDs were, Dr. Rana Sanii, Dr. Micheál Howard, Dr. Krzysztof Zacharski, and Dr. Gayathri Kollamaram and Dr. Claire Heffernan
- 3. Gold Medal Recipients: Eoin O’Brien, Bachelor of Science in Computer Systems, Ciara Leahy, Bachelor of Science in Industrial Biochemistry, and Jenna Bromell, Bachelor of Engineering in Chemical and Biochemical Engineering pictured with UL President Dr Des Fitzgerald
- 4. Lauren McCutcheon, Industrial Biochemistry, received the Serosep Award for exceptional performance in Industrial Biochemistry. Lauren is pictured with Dermot Scanlon, Serosep and Luis Padrela, Course Director. Lauren also received the University of Limerick Silver Medal Award
- 5. Kevin Kinane graduated with a Bachelor of Engineering Design and Manufacture.
- 6. Receiving their doctorate award were Dr. Shayon Bhattachary, Dr. Azalden Alakrot and Dr. Muftah Fraifer



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## Mental Practice may improve Golfers’ Putting Performance

Researchers from Lero, the Science Foundation Ireland Research Centre for Software, hosted at University of Limerick (UL), are lending support to Arnold Palmer's famous assertion that golf is predominantly played in "the six inches between the ears". According to research by Lero and UL, kinaesthetic ability, which is an individual's ability to feel an action without actually performing it, may improve their golf game. Niall Ramsbottom, a researcher at Lero and UL, explained that recent research carried out by the team indicates that with mental practice, golfers can improve their putting. "Our results indicate that a form of mental practice, i.e. the combination of action observation and motor imagery, may enhance the golf putting ability of experienced golfers," he said, "and that could well mean a reduction in a golfer's handicap".

## Mica Nanotechnology

Bernal spin-out Mica Nanotechnology was listed among the Sunday Business Post 100 Hot Start-Ups. Textilise™ is a coating technology proven to be effective against MRSA, E Coli, Cholera within 1 hour of the coating being applied. The founders are Dr. Patrick Cronin and Ray Kirwan

## New Bernal Chair

Professor Vivek Ranade took up his appointment as Bernal Chair of Process Engineering.

## Dates for your Diary

Winter Conferring	20 – 23 January 2020
Spring Semester	27 January – 18 May 2020
UL Postgraduate Fair	February 2020
UL Open Day	18 January 2020
Engineers Week	2 – 8 March 2019
S&E Summer Camp	June 2020
S&E Faculty Board	13 February and 27 March 2019
Summer Exam Board	11 June 2020
Graduate Career Information Evenings	<b>23<sup>rd</sup> January</b> – LM121 Computer Science and LM122 Creative Media and Interaction Design
	<b>13 February</b> – LM116 Engineering & LM125 Physics
	<b>4 March</b> - LM099 Architecture and LM076 Product Design & Technology
	<b>26 March</b> - LM077 BE Aeronautical Engineering LM115 BE Chemical & Biochemical Engineering LM118 BE Electronic & Computer Engineering LM063 BSc Technology Management LM082 BSc Construction Management & Engineering

## Bereavements

The Faculty extends its deepest sympathies to the following:

Mr Leo Kirby, Dept of Chemical Sciences, on the death of his brother, Rev. Fr. Jim Kirby

Sorcha Prendergast and Maria McDonald, School of Engineering on the death of their father and father-in-law respectively, Mr Gerry Prendergast.

To the family of Ms Josephine Ryan, (retired) PA to the Dean.

Dr. Damian Coughlan, Dept of Electronic & Computer Engineering, on the death of his wife Ms Sinead Dinneen.

Prof Catherine Adley on the death of her husband Dr. Brian Adley, Dept. of Electronic and Computer Engineering.