

# MESTECH Quarterly Newsletter

October 2012

## Welcome from Director

Our DCU environmental sensing researchers this summer grabbed the imaginations and interest of many visitors to the Marine Pavilion at the Volvo Ocean Event in Galway – from the family fun boat race by Dr. James Chapman, to attracting interest from industries at the autonomous sensor demos.

There were many highlights in this period, but the Technology Touchdown event was a great success and this has kick-started an exciting new collaborative opportunity for MESTECH researchers as well as others in DCU. This will see the establishment of student exchanges between MESTECH and the University of Notre Dame Environmental Change Initiative in 2013.

The SmartBay Ireland research activity is growing and we have been

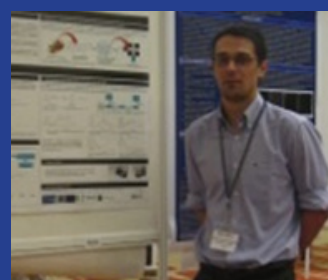
facilitated in deploying sensors and materials in Galway Bay. SmartBay Ireland has now appointed its five staff, funded under PRTL I IV, and we will see further opportunities for DCU academics and others across Ireland.

MESTECH's mission is to engage with industry in driving its research activity, and we will host its second Our Environmental Economy Event in January 2013 along with our first industry advisory board meeting.

Many new projects are being developed with opportunities in FP7 calls. In addition we are establishing unique linkages between agencies, industry and other specialist researchers to establish projects with significance for Ireland. We will update you on these projects over the coming issues.

## Conferences Attended Biosensors 2012

MESTECH and ATWARM-funded postgraduate student Ciprian Briciu attended the Biosensors 2012 conference from 15-18 May in Cancun, Mexico. There he presented his poster at this event.



Mr. Ciprian Briciu

## HEFAT Conference

Dr. Lorna Fitzsimons from the Marine and Environmental Sensing Technology Hub (MESTECH) travelled to Malta for the Heat transfer, Fluid Mechanics and Thermodynamics conference (HEFAT 2012) held from the 16th - 18th July. Dr. Fitzsimons presented a paper entitled **Modelling the Activity of Seawater and Implications for Desalination Exergy Analysis**.

## SESEH Conference

MESTECH researchers Dr. Tim Sullivan and Mr. Dian Zhang presented posters at the Sino-European Symposium on Environment and Health (SESEH) conference. SESEH was held in the National University of Ireland, Galway from the 20th - 25th August 2012.

## Analytical Research Forum

Ms. Louise McKeon presented a poster at the Analytical Research Forum (ARF) in Durham University during July. The annual ARF is the premier analytical science meeting of the Royal Society of Chemistry (RSC).

## Second International Symposium on Functional Nanomaterials

MESTECH researchers Prof. Dermot Diamond, Prof. Fiona Regan and Dr. Aoife Morrin all presented at the Symposium International Symposium on Functional Nanomaterials (ISNF2). The symposium was held in DCU on the 6th and 7th September and was chaired by Prof. Dermot Diamond.

## SPIE Conference

Dr. Edel O'Connor attended the SPIE Conference on Remote Sensing in Scotland during September. Edel presented a poster and chaired a session at this conference.

## Watch this space



# DCU/University of Notre Dame Technology Touchdown

The DCU/University of Notre Dame Technology Touchdown collaborative conference took place in DCU on the 30th and 31st of August on the eve of the 86th playing of the American Football game between Notre Dame and the U.S. Navy in the Aviva Stadium.

The conference brought together researchers from University of Notre Dame's Environmental Change Initiative (ECI) and the Advanced Diagnostics and Therapeutics Initiative (AD&T) with DCU's MESTECH researchers. The ECI and AD&T are new initiatives at the University of Notre Dame that aim to foster interdisciplinary research within science and technology that is focused on societal challenges.

The Technology Touch-

down conference had three thematic areas that were aimed at exploring environmental challenges, sensing platform development and nano-material design & characterisation.

Prof. Fiona Regan,

“

*Devices should be deployed all around the country and we should monitor the quality of our water continuously*

”

MESTECH Director, when asked about the conference said, “This event is a unique collaborative technical exchange where research ideas in the area of marine pollution and sensing technology from our two Universities will

be shared. In light of the recent pollution which closed beaches in Cork and Galway, we really see the need to develop low cost monitoring devices like that being presented by DCU researcher, Dr. Lorna Fitzsimons. De-

vices should be deployed all around the country and we should monitor the quality of our water continuously, so that we can be informed in real-time when events like that in Cork happen. We don't need sophisticated

sensors everywhere, we just need the information at the right time.”

Dr.s Gary Lamberti and Jennifer Tank from Notre Dame also presented water monitoring devices that they have developed and they discussed their application in the field.”

The event was opened by Mr. John Hennessy-Niland, Deputy Chief of Mission at the United States Embassy in Ireland, Commodore Mark Mellett, Flag Officer Commanding the Irish Naval Service, and Prof. Brian MacCraith, President of DCU. The opening event was held in the Helix and over 40 invited delegates attended. A full day of conference talks took place in the conference rooms in the R&E building. Overall was a huge success for it's organisers.



(L-R) Commodore Mark Mellett, Prof. Fiona Regan (DCU), Dr. Gary Lamberti (ND), Dr. Jennifer Tank (ND), Prof. David Lodge (ND), Dr. Carol Tanner (ND), Dr. Steve Ruggerio (ND) and Mr. John Hennessy-Niland (Deputy Chief of Mission, US Embassy)



# Dr Aoife Morrin - MESTECH Researcher Profile

Dr. Aoife Morrin is a Lecturer in the School of Chemical Sciences at DCU, as well as being a Principal Investigator at the National Centre for Sensor Research (NCSR) and a PI for the MESTECH research initiative.

Aoife's primary research objectives are in the areas of functional (nano) materials, electrochemical sensor platforms and microfluidics for chromatographic applications.

She is involved in an FP7 programme looking at the development of a printable diagnostic sensor for cholesterol monitoring and has been awarded Enterprise Ireland (EI) commercialisation funding looking at lab-on-a-chip technology for

diagnostics.

She has a growing interest in environmental sensing as demonstrated by some current research funded by Science Foundation Ireland (SFI), where Aoife is looking at developing printable hydrogel sensors for steroid detection in natural waters. Under this project, Aoife hosted Prof. Paul Calvert from the University of Massachusetts Dartmouth (UMassD) in DCU for the summer, under the Walton Visitor Programme.

Aoife has also been involved in the development of an inkjet printable electrochemical ammonia sensor, capable of detecting dissolved ammonia in water to low



Dr. Aoife Morrin

ppm levels. The low cost of this printed sensor permits its pervasive application in water moni-

toring. Testing of these sensors in natural waters will be carried out later this year.

## Hamilton/Beaufort Symposium

This year's Hamilton/Beaufort Symposium was held on 16th August to mark the conclusion of the 2012 Hamilton and Beaufort scholarships. During the symposium each of the students delivered excellent presentations describing the research projects they had carried out over the ten-week duration of the programmes. The event concluded with each of the students being presented with a certificate. The scholars' posters were on display and there was an opportunity for the scholars to answer questions regarding their research. The NCSR would like to congratulate each of the students on the successful research they carried during the summer. We would also like to thank the students supervisors and particularly the BDI Education and Outreach team, for all their assistance.



(L-R) Eolann Kitteringham (Beaufort Scholar), Claire O'Connell (Beaufort Scholar), Jonathon Yamada (Hamilton Scholar), Sonia Russell (Beaufort Scholar) and Barry Reid (Hamilton Scholar)

## MESTECH Book Released

MESTECH researchers, Prof. Fiona Regan, Dr. James Chapman and Dr. Tim Sullivan recently launched a book entitled: *Nanoparticles in Anti-Microbial Materials*.

The book describes the most up-to-date research in the area of nanoparticles that show anti-microbial activity. It looks at the types of materials and their applications in the area of environmental science, medical devices and coatings for a range of applications, as well as describing the techniques that are being used to characterise the materials and nanoparticles.



With its user-friendly approach to applications, this book is an excellent reference for practical use in the lab. Its emphasis on material characterisation will benefit both the ana-

lytical and materials scientist.

Frequent references to the primary literature ensure that the book is a good source of information to newcomers and experienced practitioners alike. Chapters devoted to nanoparticles, microbial impacts on surfaces and molecular biology will be essential reading, while chapters on characterisation ensure this book stands out in the field.

# MESTECH at the Volvo Ocean Race, Galway

The 2012 Volvo Ocean Race ended in Galway this year on the 30th June, and the city welcomed over 250,000 visitors for the event. The Global Village, a 17 acre business expo, played host to a series of conferences, seminars, exhibition space and networking hubs in an atmosphere of sporting, lifestyle, cultural and entertainment events.

The MESTECH and CLARITY teams hosted a series of events, that appealed to families, industry, and academics alike.

Dr. Edel O'Connor and Mr. Dian Zhang demonstrated some of the visual and satellite sensing research being carried out

at DCU.

Dr. Tim Sullivan presented current research aimed at developing envi-

ronmentally sustainable antifouling, including bio-inspired design of anti-fouling and novel surface

structure designed to reduce the onset of early biofouling development.

Dr. John Cleary and Ms.

mental waters. Autonomous monitoring platforms that enable remote data acquisition with cloud-based visualisation was presented by Dr. Fiachra Collins and Mr. Dylan Orpen.

Dr. Lorna Fitzsimons presented an optical colorimetric sensor that detects colour-linked events in the marine environment.

Dr James Chapman demonstrated and explained biofouling to children visiting the exhibition and they had a chance to race boats that were covered in biofilm.

The event was a huge success, congratulations to all involved.



Prof. Fiona Regan (middle) meeting Pat Rabbitt TD, Minister for Communications, Energy and Natural Resources (left) and Yvonne Shields Chief Executive of the Commissioners of Irish Lights (second from left) at the DCU stand at the Volvo Ocean

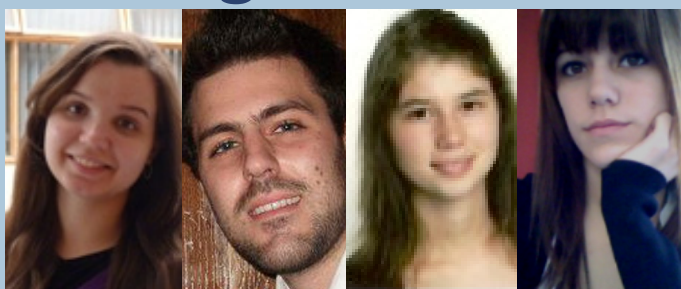
ronmentally sustainable antifouling, including bio-inspired design of anti-fouling and novel surface

Deirdre Cogan, showcased their autonomous microfluidic sensor for phosphate in environ-



(L-R) Edel O'Connor, Dian Zhang, Fiachra Collins, Dylan Orpen, Deirdre Cogan, John Cleary, Tim Sullivan, James Chapman & Lorna Fitzsimons

## Visiting Researchers



(L-R) Camila Nardi Pinto, Paulo Santos, Liliane Tavares & Ria Guidone

During the summer months, a number of researchers from around the world, carried out research projects in MESTECH laboratories.

Camila Nardi Pinto visited from the University of Sao Paulo in Brazil. Paulo Santos and Liliane Tavares are both currently studying at the College of Health Technology of Coimbra in Portugal, while Ria Guidone is a final year student at the University of Ottawa in Canada.

To read about our visiting researchers visit, [www.mestech.org/visiting-researchers.html](http://www.mestech.org/visiting-researchers.html).

## MESTECH in the News

MESTECH research was the subject of an article featured in Silicon Republic on the 29th August 2012.

The article details the need for an increase in

real time water quality monitoring in Ireland.

Prof. Fiona Regan was interviewed for the piece and the full article can be found on [www.silicon-republic.com](http://www.silicon-republic.com).

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