Student Awards & PhD Theses

Student Awards and Prizes

Student Awards and Prizes 2016

The Tyndall Postgraduate Student Poster Competition is an annual event organised by the Student Committee. It aims to provide a common platform for students working in different domains.
to come together and exchange ideas thus creating an atmosphere ideal for collaborative outcomes. The competition is judged by a panel which include Tyndall board members, giving them an opportunity to get a glimpse of the ground breaking research being undertaken by our students. There were 39 entries in this year’s competition. First prize was awarded to Stefano Facchin, Photonics Systems Group, for his poster entitled “A linear optical receiver in 65nm CMOS technology for 56Gb/s PAM-4 signalling”. Lisa Helen, Life Sciences Interface Group, won second prize for her work on “A ‘Smart’ Needle for Objective Nerve Localisation During Ultrasound Guided Peripheral Nerve Block”. Lisa’s research was also awarded Best Commercial Pitch at the Tyndall Internal Conference in April 2016. Third prize in the student poster competition was awarded to Muhammad Umar Khan, III-V Materials and Devices Group, for his poster entitled, “The resonant waveguides: the future in on-chip sensing?”. Congratulations also to the other finalists in the poster competition: Natalia Canas Estrada; Ekaterina Filatova; Daniel Lordan; Louise Mc Grath and Roxane Puicervert

The BOC Bursary is an annual award presented by BOC Gases to outstanding Tyndall students. In 2016, the award was presented by Eamon Bolton, Ireland Sales Manager of BOC Gases, and Kieran Drain to the joint winners Ricky Anthony and Dhiman Mallick. Ricky, Electrochemical Materials and Energy group, received the award for his research on developing integrated magnetics technology for power conversion applications. Ricky, along with his teammates Mahbub Akhter and Ertugrul Karademir(TCD), was also awarded runner up prize at the IPIC SFI/NDRC Entrepreneurship Bootcamp. Dhiman, Micropower Systems and Nanomagnetics group, received the BOC award for his work on Wideband Vibration Energy Harvesting using Electromagnetic Transduction for Powering Internet of Things.

Justin Alexander, IPIC -Integrated Photonics Group, won Best Presentation for his 3 minute elevator pitch at the Tyndall Internal Conference. Justin’s presentation was entitled “Integrated optical comb source”.

Joveria Baig, III-V Materials and Devices Photonics Group, was part of the winning team at the IPIC SFI/NDRC Entrepreneurship Bootcamp. The team of Joveria Baig, Muhammad Junaid Amin and Philip Marraccini impressed the judges with their winning pitch on AutoAssist.

Niamh Creedon, MNS Technology group, was awarded first place for best presentation for her research on “Soda Can Templated Flexible Polymer SERS Substrates for multiple sensing applications” at CASi (Conference on Analytical Sciences Ireland) 2016. Niamh was also awarded for her work on “Development of smart nanosensor systems for on-Farm disease diagnostics” when she won a gold medal for most innovative research emerging from 3rd Level, at the 2016 Enterprise Ireland Innovation Arena Awards at the National Ploughing Championships. The award recognises innovative agri-tech capability and new product development in the agriculture sector.

Natalia Canes Estrada, Photonics Systems group, was selected as a Student Ambassador by the Education in Ireland Enterprise Ireland sponsored initiative. Natalia’s research is in the area of terabit superchannels using all-optical technology.

Jennifer Halpin, Advanced Materials and Surfaces group, received first prize in UCC’s Postgraduate research showcase in the three minute masters category. Jennifer’s PhD research is in the area of ferroelectric metal oxides deposited using atomic layer deposition.

Moises Jezzini, Integrated Photonics group, was awarded Best student presentation on Packaging at SPIE’s Silicon Photonics and Photonic Integrated Circuits Conference, part of Photonics Europe International Symposia held in April. For the paper “Design of a high-speed vertical transition in LTCC for interposers suitable for packaging photonic integrated circuits”.

Amandeep Kaur, Adrian Walsh and Marco Dallasanta were chosen as finalists in UCC’s
Entrepreneur of the year 2016 for their project on Light Solutions. Amandeep and Marco are PhD students with the Photonic systems group and Adrian’s PhD research is with the Nanoelectronic Materials and Devices group.

Niamh Kavanagh, Photonics Systems group, was awarded the Rosse Medal Award by the Institute of Physics for winning the postgraduate student poster competition. In April, Niamh received first place in the national final of “Famelab”. She was named as one of “6 Rising Stars of Irish Research” and one of “20 incredible women leading the way to scientific advancement” by Siliconrepublic. Niamh received the Institute of Physics Early career Physics Communicator Award in November. Niamh research is in the area of Dense Wavelength Division Multiplexing at 2mm.

Catherine Ryan, Advanced Materials and Surfaces group, received the 3rd place poster award at the 3rd International Conference on Bio-based Polymers and Composites in August. Catherine’s research is the area of design, synthesis and characterization of chitosan-based interpenetrating polymer networks and thin film systems.

Stephen Rhatigan, Materials Modelling for Devices group, was joint winner of a 3 Minute Thesis competition at the H2FC conference held in Ulster University. Stephen’s talk was "Water Splitting -an atomistic study."

Shauna Scanlon, LSI (Integrated Biosensor Technologies), received the Best Poster award at the Smart Systems Integration conference in Munich in March 2016 for her poster entitled “Development of a multi-parameter sensing system for PAT application in the food and beverage Industry”.

Student Awards and Prizes 2015

The annual Tyndall postgraduate poster competition is organised by the Postgraduate Student Committee and was judged by a panel consisting of: Kieran Drain, Tyndall CEO; Bernie Di Capraro, Intel Ireland Research; John Power, Engineers Ireland and Paul Ross, UCC College of SEFS. There were 29 entries in this year’s competition. First prize was awarded to Niamh Kavanagh, a PhD student with the Photonics Systems Group for her poster entitled “Dense Wavelength Division Multiplexing at 2mm”. Niamh Creedon received second prize for her poster entitled “Novel Single Gold Nanowire –based Electrochemical Immunosensor for Rapid Detection of Bovine Viral Diarrhoea Antibodies in Serum”. Ian Seymour was awarded third prize for his poster on “Detection of Active Pharmaceutical Ingredients in Drug Formulations at Flat Gold Microdisc Electrode Arrays vs Nanaporous Gold Modified Microdisc Electrode Arrays.”

Abulaiti Hairisha, PhD Eng Sc student with the Molecular Modelling for Devices group was awarded a scholarship for outstanding Xinjiang students studying abroad. This scholarship is awarded for outstanding Xinjiang students studying outside China and who are originated from Xinjiang Uyghur Autonomous. The aim of this scholarship is to recognise the students’ current achievements and to encourage students to achieve even better academic results and excel in their future career. This scholarship also encourages the students to return to Xinjiang after they complete their study and contribute toward the development of the region.

Anne Marie Mc Garrigle, PhD student with the Heterogeneous Integration Group, was presented with the Best Poster award at the 6th Annual Scientific Meeting of the Irish Association of Physicists in Medicine for the work on “Characterisation of Radfet Devices at the Diagnostic Energy Range”.

Carola Schopf, PhD student with the Nanotechnology group, won best young scientist award at the
NanoSMA conference in Japan in July 2015 for her research on “Single Gold Nanorods for Mercury Detection.”

**Gioele Mirabelli** is a PhD student with the Nanoelectronic Materials and Devices Group undertaking research on *Electrical and Material characterization of 2D materials as replacement of Silicon in future electronics*. He was awarded an IRC-EPS (Irish research council – Enterprise postgraduate scholarship) award with Intel Ireland as the Enterprise Partner.

**Ian Seymour**, PhD Eng Sc student with the Electrochemical Materials and Energy Group, was awarded Best Presentation for his work on *The use of Gold Micro-Electrode Arrays for Sensing Applications and Subsequent Enhancement of Sensing Capabilities by Modification of Electrodes with Nanostructures* at the 2nd Annual George Guilbault Symposium held in Tyndall.

**Joveria Baig**, PhD student in the III–V Materials and Devices Photonics Group, is undertaking research in *InP Based Devices for Communications and Sensing*. She was awarded a SPIE Travel Scholarship for her potential contributions to the field of optics and photonics. She was also awarded an IEEE Women in Engineering International Leadership Conference Travel Grant.

**Lisa Helen** is a PhD student with the Life Science Interface Group. She won the Best Poster Presentation in Smart Health at Evolve Biomed 2015 for her poster entitled “Characterisation of a Prototype Smart Needle”. She was awarded Best Presentation at South of Ireland Association of Anaesthetists Autumn Scientific Meeting 2015 for her presentation on “A ‘Smart’ Needle for Objective Nerve Localisation during Ultrasound Guided Peripheral Nerve Block”. At the SFI Technology Innovation Development Award (TIDA), Lisa was awarded Pitch-off winner 2015.

**Niamh Kavanagh** is a PhD student with the Photonic Systems Group. At Tyndall’s internal conference she was awarded 2nd place for her Elevator Pitch on “Photonic Communications In The 2µm Wavelength Band”. She was a Grand Plan Finalist at the UCC Doctoral Showcase and presented on: “The Internet is not Limitless”. In November, she presented “A new Suitcase for Travelling Light” at the Thesis in 3:Elevator Pitch for A PhD National Competition and won 2nd place.

**Ricky Anthony**, PhD student with the Electrochemical Materials and Energy Group, was selected as one of the two international student ambassadors from University College Cork for 2014-2015 by Enterprise Ireland for Education in Ireland's student ambassador programme. He was awarded for his services for promoting education in Ireland in April 2015, by Minister Jan O'Sullivan in presence of the Indian ambassador to Ireland HE Mrs. Radhika Lal Lokesh at Farmleigh, Dublin. He is one of the 42 international ambassadors from more than 9 nationalities and representing 23 higher education institutes across Ireland."

**Shane O’Mahony**, PhD student with the Materials Theory Group, was awarded an Irish Research Council (IRC) Government of Ireland Postgraduate Scholarship to pursue a PhD investigating the Relaxation of Electronic Distributions and Atomic Forces in Materials following Illumination by a Short, Intense Burst of Light.

Tyndall PhD Students **Jan Kegel, Prasanna Ramaswamy** and **Ruggero Loi** and **Conor O’Shea** (Electrical and Electronic Engineering, UCC) were presented with the award for Most Technologically Innovative Idea at the UCC Entrepreneur of the Year Awards 2015.

**Student Awards and Prizes 2014**
The annual Tyndall postgraduate poster competition is organised by the postgraduate student committee and judged by the members of the Tyndall board. There were 45 entries for the competition in 2014. First, second and third prizes were awarded to **Rosemary O’Keefe, Svetlana Slepneva** and **Cormac Ryan**. Rosemary a PhD Eng Sc student with the Heterogeneous Systems group, won first prize for her poster entitled, “Piezoelectric Energy Harvesting for In-Vivo Applications”. Svetlana, a PhD student in the Photonics Centre won second prize for her poster entitled “Swept Sources for Optical Imaging” and Cormac, A PhD Eng Sc student with the Heterogeneous Systems Integration Group, won third prize for his poster entitled, “Reliability Study of Radio-Frequency Microelectromechanical Switches” Rosemary also received the Best 2 Minute Presentation award at the Tyndall Internal Conference for her presentation on “Energy Harvesting from Bloodflow”.

**Ricky Anthony**, a PhD student with the ICT for Energy Efficiency Group, received the Best Poster Award at the IEEE 3D Systems Integration Conference for his poster entitled: “Advanced Processing for High Efficiency Inductors for 2.5D/3D Power supply in Package”; Authors: Ricky Anthony, S. Kulkarni, N.Wang and C.O’Mathuna

**Abulaiti Hairisha**, PhD Eng Sc student with the Materials Modelling for Devices Group, received a Poster Prize at the Irish Polymers & Materials Conference for her poster entitled: “Polymerization of Cyanoacrylate: A density functional study with van der Waals interaction”; Authors Hayrensa Ablat, I.Povey, R.O’Kane, S.D.Elliott

**Lisa Helen**, PhD student with the Life Science Interface Group, won the Best Poster 2014 award at the Smart Systems Integration 2014 conference in Vienna, Austria for her poster entitled; “Development of a 'smart' needle integrated with an impedance sensor to determine nerve proximity for nerve blocking (anaesthetic) procedures”. Authors: Lisa Helen, W Messina, B O’Donnell and E Moore”. She also received the Best Student Presentation- runner up at the 8th International Conference on Sensing Technology (ICST) 2nd – 4th September 2014, Liverpool for her presentation entitled: “Investigation of tissue bioimpedance using a macro-needle with a potential application in determination of needle-to-nerve proximity”. Authors: Lisa Helen, W Messina, B O’Donnell and E Moore. Lisa presented a paper entitled; “Investigation of Tissue Bioimpedance using a Macro-needle for Biomedical Applications” at Biomedica 2014 in Dublin. The paper was highly commended and awarded second prize for originality and innovation in the President’s Prize competition.

**Tuhin Maity**, PhD student with the Micropower Systems and Nanomagnetics Group received the Tyndall Bursary award for his research on Manipulation of magnetic anisotropy in nanostructures.

**Dhiman Mallick**, PhD student with the Micropower Systems & Nanomagnetics Group was awarded UCC Strategic Research Fund PhD Studentship Programme 2014 award for his research in the area of Vibration Based Electromagnetic Micro-power Generators using MEMS/NEMS Techniques.

**Carola Schopf**, PhD student with the Nanotechnology Group, was awarded second place in the Poster competition at NANOSMAT September 2014, Dublin for the poster entitled; “Single Gold Nanorods for Optical Mercury Detection”; Authors Carola Schopf, A Martin Ruano, D Iacopino. Carols also received an attendance bursary for E-MRS 2014 in Lille

**Jing Tao**, PhD student with the Heterogeneous systems integration group received the Best Contribution award at the MINAPAD Conference May 21-22, 2014, Grenoble for her presentation entitled: “Nanowire based anisotropic conductive film (NW-ACF) for low temperature 3D stacking applications”; Authors Jing Tao, A.Mathewson and KM Razeeb
Student Awards and Prizes 2013

In 2013, Tyndall’s annual Student Poster Competition was held in conjunction with the Internal Conference. There were 61 student entries in the competition. First prize was awarded to Padraic Morrissey for his poster entitled, “On-chip optical phase locking of single growth monolithically integrated slotted Fabry Perot lasers PM”. Farzan Gity won second prize for his work on “Ge/Si heterojunction photodiodes fabricated by low temperature wafer bonding” and third prize was awarded to Michele Conroy for her poster entitled “Nano-patterning of nitride materials for the manipulation of threading dislocation densities within novel nitride based UV multiple quantum wells”.

Christopher Broderick and Farzan Gity were jointly awarded the 2013 BOC Gases Bursary. Christopher, a PhD student in the Photonics Theory Group, received the award for his research on the theory of novel highly-mismatched semiconductor alloys, with a view to the development of next-generation semiconductor optoelectronic devices with reduced power consumption. Farzan, PhD student with III-V Materials and Devices Group, was awarded the prize for his research on Development of Germanium/Silicon Integration for Near Infrared Detection.

Lisa Helen, PhD student with the Life Science Interface, Sensing and Separation Group was selected to present her final year project, “Investigation of Tissue Bioimpedance using a Marco-needle for Biomedical Applications” at the Academy of Medical Laboratory Science Annual Conference, BioMedica 2014, to compete for the President’s Prize in April 2014. Lisa’s PhD research is focussed on development of a “smart” needle integrated with an impedance sensor to determine nerve proximity for nerve blocking (anaesthetic) procedures. She received a Government of Ireland Postgraduate Scholarship from the Irish Research Council.

Tuhin Maity, PhD student with the Micropower-Nanomagnetics Group, is undertaking research in the area of static and dynamic magnetic properties of nanoscale materials for miniaturised ICT devices. He received an IEEE student travel grant of $1000 to attend the 12th Joint MMM/Intermag Conference, Chicago, USA, January 14th – 18th 2013, organised by IEEE Magnetic Society. This prestigious award is given to typically 20 students in a worldwide competition. Tuhin also receive a student travel grant of €500 to attend JEMS 2013, Rhodes, Greece, August 25th-30th. This is a competitive award given to a select number of students worldwide by the conference organisers.

Eoin O’Connell, PhD student with the Wireless Sensor Networks Group received a Best Paper award at the Seventh International Conference on Sensor Technologies and Applications, SENSORCOMM 2013, August 25th – 31st, Barcelona. Eoin’s paper was entitled “Techniques for Increasing Network Functionality while Remaining within Legal Maximum TX Duty Cycle Requirements”, authors Eoin O’Connell, Victor Cionca and Brendan O’Flynn.

Nicola Pavarelli, PhD student with the Photonic Device Dynamics Group, received the Instrumentation, Systems, and Automation Society 2013 Post Graduate Award for his research on “Carrier Dynamics in Optical Semiconductors”.

Cormac Ryan & Rosemary O’Keeffe, PhD Eng Sc students with the Heterogeneous Systems Integration Group, received 2nd place in the UCC Entrepreneur of the Year Competition, Dynamic and Emerging Award category. The competition involved developing and presenting a plan for a new business called RunSmart. RunSmart is a running shoe designed to provide real time information on a runners gait, allowing them to correct bad running techniques and reduce injury. Rosemary was also awarded joint second place for best presentation at the Tyndall Internal Conference. Her presentation was entitled “Low Frequency MEMS Energy Harvesting using ALN” and was based on collaborative work with Analog Devices undertaken as part of a CCAN project.

Shauna Scanlon, PhD Eng Sc student with the Life Science Interfaces group was awarded an IRC Enterprise Partnership Scheme Postgraduate Scholarship. Shauna’s research is focussed on development of a multi-parameter sensing system for use with in-line monitoring of PAT in the food and beverage industry.

Tingcong Ye, PhD student with the Wireless Sensor Networks Group, received Best Paper award at the Seventh International Conference on Sensor Technologies and Applications, SENSORCOMM 2013, August 25th – 31st, Barcelona. Tingcong’s paper was entitled “Transceiver –power-Control for 802.15.4a UWB-IR Ranging in the Presence of Multipath Propagation”; Authors Tingcong Ye, Brendan O’Flynn, Michael Walsh and Cian O’Mathuna

Student Awards and Prizes 2012

The annual Tyndall postgraduate poster competition attracted a record number of 42 entries this year. The event is organized by the Postgraduate Student Committee and judged by the members of the Tyndall Board. The board praised the high level of science and quality in the preparation and presentation of the posters. First, second and third prizes were awarded to Michael Burke, Colm Barrett and Keith Linehan respectively. Michael, Colm and Keith are all students in Tyndall’s Nanotechnology Group. Michael received first prize for his poster entitled “Passivation and Non-Covalent Functionalisation of Graphene using Self-Assembly of Alkane-Amines”. Colm received second prize for his poster entitled “Replication of Micro-needles for Electro-Biochemical Applications”. The title of Keith’s poster was “Size control of Silicon Nanocrystals using Cationic Surfactants”.

The board also shortlisted 3 additional students in recognition of the quality of their posters. These were:  Carola Schopf, a PhD student with the Nanotechnology for her poster titled “Correlated Electron Microscopy/Optical Imaging and Spectroscopy of Single Au Nanorods and 2D Nanorod Assemblies”; Monika Zygowska, a PhD student with the Life Science Interface Group for her poster entitle “Mathematical Model for the Catalytic System of Enzymatic Biofuel Cells” and Gangotri Dey, a PhD student of the Electronics Theory Group for her poster titled “Transmetalation Reaction Mechanism for ALD of Cu to be used in Interconnects – A study through Density Functional Theory”. 2012 was a very successful year for Gangotri as she also won the student poster prize at both the ALD conference in Dresden, Germany 2012 and the Chemistry Colloquium 2012, University of Limerick, Ireland for her poster titled “Mechanism for ALD Reaction of Cu”.

The 2012 BOC Gases Bursary Award was presented to Lida Ansari, a PhD student with the Electronics Theory Group. The title of Lida’s PhD thesis is “Atomic Scale Simulation of Nanowire and Nanotube Transistors”.

Una Crowley, a PhD Student with the Life Science Interface Group, was awarded the Overall Best Student Award at the NanoBio Europe Conference in Varesse, Italy, June 2012 for her presentation titled “Toner-based Microchips with Luminol Chemiluminescence Detection and In-channel Amperometric Detection”.
Naoise MacSuibhne, PhD student with the Photonics Systems Group was part of a Tyndall team (Jian Zhao, Vivian Bessler, Naoise Mac Suibhne, Andrew Ellis, Patrick Morrissey) that was highly commended in Alcatel Lucent at the first Bells Labs Open Innovation Entrepreneurial Bootcamp. The goal of the bootcamp was to identify high potential, high-tech start-ups that Ireland has to offer. Naoise’s team developed an innovative transceiver design that is hoped can help reduce cost and increase performance of transceivers that are the back bone of today’s metro and cloud computing networks.

Danish Rafique, PhD student with the Photonics Systems Group was a semi-finalist for the Corning Outstanding Student Paper Competition at the Optical Fiber Communication Conference and Exposition (OFC) and the National Fiber Optic Engineers Conference (NFOEC) for his paper titled “Nonlinearity Compensation via Spectral Inversion and Digital Back-Propagation: A Practical Approach.”

Ehsan Sooudi, PhD student with the Optoelectronics Group was a semi-finalist for the Corning Outstanding Student Paper Competition at the Optical Fiber Communication Conference and Exposition (OFC) and the National Fiber Optic Engineers Conference (NFOEC) for his paper titled “Phase Synchronization of a Two-Channel Phase-Sensitive Amplifier based on Optical Injection-Locking of InP Quantum-Dash Mode-Locked Lasers.”

Mark Szepieniec, PhD student with the Electronics Theory Group, received the David Poster prize for Theory Posters at the Trends in Nanotechnology conference in Madrid in September 2012. The title of Mark’s poster is “Influence of Electron Correlation on Single Particle State Energies and Lifetimes in an Atomic Chain Model of a Tunnel Junction”.

Student Awards and Prizes 2011

The annual Tyndall postgraduate poster competition attracted 32 entries this year. The event is organized by the Postgraduate Student Committee and judged by the members of the Tyndall Board. First, second and third prizes were awarded to Tuhin Maity, Laura Russell and Keith Linehan.

Tuhin Maity, a PhD student in the Micropower-Nanomagnetics group won 1st prize for his poster entitled “Symmetry of Magnetic Anisotropy in Nanomodulated Continuous Thin Ferromagnetic Film”. Tuhin also received 1st prize in the poster competition in the “X-ray Studies of Magnetism” session and overall conference (among all sessions) of the Synchrotron User Meeting, Diamond Light Source, Oxford, UK. Laura Russell, a student with the Quantum Optics Group, received 2nd prize for a poster entitled “1- and 2-photon absorption by laser-cooled \(^{85}\)Rb via an optical nanofibre”.

Keith Linehan, PhD student with the Nanotechnology group, received 3rd prize for a poster entitled “Synthesis and Characterisation of Monodisperse Silicon Nanocrystals for High Efficiency Light Emitting Devices”.

Brian Fitzgibbon, PhD student in the Circuits and Systems group, won the Microelectronics Industry Design Association (MIDAS) Ireland outstanding PhD Research Publication award 2011 for his paper entitled, “Hardware Reduction in Digital Delta-Sigma Modulators Via Bus-Splitting and Error Masking—Part I: Constant Input”.

The 2011 BOC Gases Bursary Award was presented to Jeffrey Godsell, a PhD student with the Micropower-Nanomagnetics group. The title of Jeffrey’s PhD thesis is “Modelling and Characterisation of Nanostructured, High-Frequency Magnetic Materials for Integrated Passives”.

Nick Holubowitch, PhD student, Microelectronics Applications Integration group, received
honourable mention for the Dr Bernard S Baker Student Award for Fuel Cell Research at the 26th Fuel Cell Seminar and Exhibition in Florida. This award, made by the organisers, recognises exceptional students in the field of fuel cell related technologies. Nick is researching Nanostructured Platinum-Based Electrocatalysts for Micro-direct Methanol Fuel Cells. Nick was also awarded one of two $750 travel grants by the Electrochemical Society Electrodeposition Division for the Annual meeting in Boston in Oct 2011. His paper “Platinum alloy nanotubes for methanol fuel cells”, detailed the fabrication and use of metal alloy nanotubes for energy applications

**Joe McGrath**, PhD student with the Advanced Materials Systems Group, received an Internship Program Fellowship award from the National Institute for Materials Science (NIMS) Japan. Joe’s research project is “Large Area Defect Free Colloidal Photonic Crystals using an Under Oil Crystallisation Technique”.

**Feroze Nazneen**, PhD student with the Life Science Interface (LSI) group, won the Biointerphases Best Poster award at the European Society for Biomaterials Conference. Feroze’s poster was entitled “Development of Nano-structured Stent Surfaces for Cardiovascular Applications”.

**Carola Schopf** and **Andrea Pescaglini**, PhD students in the Nanotechnology Group, were awarded a prize for best poster for their poster entitled “Dark field optical microscopy of single nanoparticles and ordered nanoparticle arrays”. Authors C. Schopf, A. Pescaglini, A. O’Riordan, D. Iacopino, at the Sensors and their Applications XVI conference in Cork.

**Carola Schopf** and **Ethel Noonan**, PhD students in the Nanotechnology Group, were awarded a prize for best poster for their poster entitled “Correlated Optical/Electron Microscopy Imaging and Spectroscopy of Metal Nanostructures” Authors C. Schopf, E. Noonan, A.J. Quinn, D. Iacopino, at the Royal Society of Chemistry (RSC) Postgraduate symposium on Nanotechnology in Birmingham.

**Irene Yeriskin**, PhD student with the Electronics Theory group, won the outstanding poster prize at the Nano and Giga Challenges in Electronics, Photonics and Renewable Energy Symposium and Summer School (Tutorial Lectures) in Russia for a poster entitled “Electronegativity and Electron Currents in Molecular Tunnel Junctions”

**Amelie Wahl**, PhD student in the Nanotechnology Group, was awarded a prize for best poster for her poster entitled “Nanomolar Trace Metal Analysis of Copper at Gold Nanowire Electrodes” – Authors A.Wahl, K.Dawson, A. O’Riordan, at the Sensors and their Applications XVI conference in Cork.

**Monika Zygowska**, PhD student in the Life Science Interface group, won 2nd prize for the Best Poster Presentation at the 9th Environmental Protection Agency (EPA) Postgraduate Conference in Dublin in November 2011. Monika’s poster was entitled, “Fabrication, Characterization and Modelling of Microfluidic Devices for Efficient Energy Bioconversion”

**Student Awards and Prizes 2010**

The annual Tyndall postgraduate poster competition attracted 30 entries this year. The event is organized by the Postgraduate Student Committee and judged by the members of the Tyndall Board. First, second and third prizes were awarded to Karen Dawson, Martina Minicca and Nicola Pavarelli. **Karen Dawson**, a PhD student in the nanotechnology group, won 1st prize for her research on: “Direct Electrochemical Detection of H₂O₂ at Single Gold Nanowire Electrode Sensors”. Karen also received joint 1st prize at the INSPIRE/ICGEE summer school poster competition.
Second prize, Tyndall postgraduate poster competition, went to Martina Mincica, a visiting student with the Circuits and Systems Group, for: “Wearable CMOS System-on-Chip UWB radar sensor for contactless cardiopulmonary monitoring”. Nicola Pavarelli, a PhD student with the Optoelectronics Group, won 3rd prize for his work on “Emission Dynamics of Tensile Strained Ge QW”.

Azrilawani Ahmad, PhD student of the Life Sciences interface group won the best poster presenter award in United Kingdom-Malaysia-Ireland Engineering Science Conference (UMIES) that was held in Queen University of Belfast, Northern Ireland in June 2010. Her poster was entitled “Cytotoxicity Monitoring of Benzo[a]pyrene using Impedance Cell-based Biosensor”.

Ki-Yeol Byun, a PhD student of the Advanced Materials Systems Group, won the European Materials Research Society Young Scientist Award at the 2010 E-MRS Spring Meeting in recognition of his outstanding paper on “Post-Si CMOS Electronic Devices: The Role of Ge and III-V materials”.

Mark Daly, student with the Quantum Optics Group, won the Institute of Physics in Ireland Rosse Medal for Graduate Research. Mark's poster was on “Laser Cooling and Trapping of Neutral Alkali Metals”.

Francesco Dicorato, PhD student of the Life Sciences interface group, won 1st prize for his poster at the INSPIRE Postgraduate workshop in UCD. His poster was entitled: “Development of a Modular Integrated System with Amperometric Detection for Capillary Electrophoresis”.

Brice Jamieson, a PhD student with the Microelectronics Applications Integration group, won the best commercial pitch of PhD research, as part of the PG6006 Commercialisation Skills for Research module. This generic skills module gives PhD students an understanding of the relationship between research and commercial opportunity. Brice, with a presentation titled “Power Supply on a Chip - Next Generation inductive Components” won the best presentation prize, which was sponsored by the Cork City Enterprise Board.

Chi-Woo Lee, a PhD student with the Silicon Research Group, received the best paper award at the IEEE NANO 2010 Workshop in Korea for his research on “Nanowire Zero-Capacitor DRAM Transistors With and Without Junctions”.

At the 12th International Conference of Advanced Materials and Technologies; Olan Lotty and Colm O'Regan of the Materials and Supercritical Fluids group were presented with prizes for their posters. Olan’s poster was entitled “Controllable Synthesis of Single Crystalline Uniform Arrays of Silicon Nanowires”. Colm’s poster was entitled “Electron Micoscopy Analysis of Nanoscale Materials”.

The 2010 BOC Gases Bursary award was presented to Eamon O'Connor, a PhD student with the Silicon Research Group. Eamon was presented with the award for his work on “High Dielectric Constant Thin Films on III-V Semiconductors for Future CMOS Processes”.

Aileen O'Mahony, a PhD student of the Advanced Materials Systems Group, was awarded a student travel grant to present at the 218th meeting of the Electrochemical Society (ECS). Aileen’s research concerns Atomic Layer Deposition of High-κ Oxides for Application in Electronics.

Anna Paschero, PhD student of the Life Sciences interface group, won an award for her oral presentation at the NanoBioTox conference. Anna is investigating the Development of an integrated sensor platform to monitor cell behaviour for screening of anti cancer drugs.

Laura Russell, a PhD student with the Quantum Optics Group, was awarded the Shell and Institute of Physics Very Early Career Woman Physicist Award (for UK and Ireland) in recognition of her
scientific and outreach contributions. Laura’s research explores the behaviour of “cold” atoms using pioneering new micro-optic technology.

**Amy Watkins**, student with the Quantum Optics Group, received the 2010 Incubic/Milton Chang travel award from the Optical Society of America. She was awarded this for her research on: “Atom Optics Tools: Optical Nanofibres, Microspheres and Microbubble Resonators”

**Ran Yan**, a PhD student with the Silicon Research Group, received the best paper award at the 10th Electron Technology Conference ELTE 2010 for her research on “Performance Analysis of SOI Junctionless Nanowire Transistors”

**Liqiang Zheng**, a PhD student with the Microelectronics Applications Integration group, received an Excellent paper award at the International Symposium on Embedded Systems Design and Applications (ESDA) 2010 for his work on “Miniaturization of Wireless Sensor Network Nodes”.

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### PhD Theses

#### PhD Theses 2016

**Electronics**

- **Colm Barrett**, “Low-cost fabrication of nanoelectrodes for electrochemical applications”

- **Sean Barry**, “Development of nanoelectrodes for electrochemical applications”

- **John Buckley**, “Antenna design for wireless sensor network applications”

- **Paul Cahill** “Vibration based health monitoring of civil infrastructure using energy harvesting techniques”.

- **Ilias Chlis**, “Analysis and design of low phase noise CMOS oscillator circuit topologies”

- **Mark Hartnett**, “Role of sulfur in vibration spectra and bonding and electronic structure of SiGe surfaces and interfaces”
Anna Hauber, “Carrier momentum relaxation in highly doped polar semiconductors and polar semiconductor heterostructures”

Jun Lin, “An investigation of border traps in high-k/InGaAs metal-oxide-semiconductor systems”

Daniel Lordan, “Alternative materials for flexible transparent electrodes”

Brendan O’Flynn, “Development and Deployment of Wireless Sensor Networks”

Cormac Ryan, “Characterisation and modelling of degradation mechanisms in RF MEMS capacitive switches during hold down operation”

Niall Savage, “Development of a novel probe integrated with a micro-structured impedance sensor for the detection of breast cancer”

Jing Tao, “Nanowires for 3D silicon interconnection”

**Photonics**

Thomas Butler, “Real-Time Characterisation of Dynamic Laser Fields”

Tung Chung, “Arrays of quantum-light-emitting diodes with site-controlled pyramidal quantum dots”

Simon Fabbri, “All-optical systems for the terabit network era”

Patrick Finch, "Ultrashort Pulse Generation in InAs Quantum Dot Semiconductors"

Umar Khan, “Design and implementation of micro-structures with refractive index contrast for optical interconnects and sensing applications”

Katarzyna Komolibus, "Emission Properties and Carrier Dynamics of III-V Nanostructures for
Next Generation Photonic Devices

Micki Mitchell, “Development and optimisation of photonic crystal based nanosensors”

Finbarr O’Callaghan, “Dynamics of coupled modes in two-section semiconductor lasers with saturable absorption”.

David O’Shea, “Optically injected multi-mode semiconductor lasers”

Silvino Presa, “Characterization of GaN-based light-emitting diodes”

Muhammad Usman Sadiq, “Design and characterization of InP based Mach-Zehnder modulators”

Nan Ye, “High speed photodiode and 90° optical hybrid for 2 μm optical communication systems”

PhD Theses 2015

Michael Schmidt, “Beyond Simple Imaging in Electron Microscopy”

Tingcong Ye, “The Development of a Bilateral Transmitter Output Power Control Algorithm and a Fully-Coupled Architecture for Hybrid UWB and IMU Positioning”

Christopher Broderick, “Theory of the Electronic and Optical Properties of Dilute Bismide Alloys”

Tuhin Maity, “Manipulation of Magnetic Anisotropy in Nanostructures”

Merid Legesse, ”First Principles Simulation of Amorphous Silicon Bulk, Interfaces, and Nanowires for Photovoltaics”


Daniel Jones, “Nanofabrication towards Biophotonics”

Darragh Carolan, ‘Synthesis, Functionalisation and Characterisation of Germanium Nanocrystals & their Applications”

Hadi Arefi, “A Microscopic Study of Structural and Electronic Properties of Functionalized Silicon Surfaces Based on First-Principles”

Patrick Harnedy, “Experimental Analysis of Novel Telecom Source Materials and Devices”

Conor Coughlan, “A Tight-binding Analysis of the Electronic Properties of III-nitride Semiconductors”
Yasheng Maimaiti, “Computational Study of the Growth of Copper Thin Films by Atomic Layer Deposition”

Carola Schopf, “Plasmonic Gold Nanostructures: Optical Properties and Application in Mercury Detection”

Nazmul Hossain, “Design, fabrication and characterization of resonant waveguide grating based optical biosensors”

Anushka Gangnaik, “Electron Beam Lithography Assisted High-Resolution Pattern Generation”

Michele Conroy, “Preparation and Characterisation of III-N Nanorods”

Matthew Smith, “Development of InAlN/GaN High Electron Mobility Transistors for Space Applications”

Haoning Li, “AlGaN Materials Growth for UV Devices”


PhD Theses 2014

William Cotter “Photonic Integrated Circuit for the Manipulation of Coherent Optical Combs”

Amelie Wahl, “Fabrication, Characterisation and Electroanalysis at 1-D nanostructures”

Aidan Daly, “Voltage Properties of Optically Injected Long Wavelength VCSELs”


Anna Iwaszuk, “Engineering of Metal Oxide Interfaces for Renewable Energy Applications”

Nitin Deepak, “Growth and Characterisation of Oxide-Based Ferroelectric, Ferromagnetic and Multiferroic Thin Films”

Nasir Quadir, “Research and Design of High-Speed Advanced Analogue Front-Ends for Fibre-Optic Transmission Systems”

Dirk Hagen, “Atomic Layer Deposition of Copper”

Azura Said, “Electrochemical Biosensor Based on Microfabricated Electrode Arrays for Life Science Applications”

Joe McGrath, “Development of Large-Scale Colloidal Crystallisation Methods for the Production of Photonic Crystals”

Alan Naughton, “Analysis and Optimisation of Semiconductor Reflective Modulators for Optical Networks”


Padraic Morrissey, “Photonic Integrated Circuits for the Generation of Coherent Optical Signals”
Monika Zygowska, “Design, fabrication and characterisation of components for microfluidic enzymatic biofuel cells”

John Mullins, “Atomic layer deposition of interface control layers for the fabrication of III/V MOS devices”

Mark Power, “All-Optical Signal Processing using SOAs for Next Generation Optical Networks”

Stefano Porto, “Burst-Mode Electronic Dispersion Compensation in Long Reach PONs”

Eoin Clerkin, “Closely Coupled Lasers: Dynamics & Applications”

Eamon O’Connor, “Investigation of electrically active defects at the interface of high-k oxides and III-V semiconductors”

Syara Kassim, “Polymer and Metallodielectric Based Photonic Crystals”

Maryam Shayesteh, “Novel Processes, Test Structures and Characterisation for Future Germanium Technologies”

Walter Messina, “Micro and Nanostructured Impedance Sensors for biological and biomedical applications”

Andrea Pescaglini, “Hybrid Nanostructures : Nanofabrication Techniques and Optoelectronic Properties”

Gangotri Dey, “Atomic layer deposition of copper - study by density functional theory”

Alfonso Martin, “Highly sensitive Surface Enhanced Raman Scattering (SERS) detection platforms formed by large area self-assembled Au nanorod arrays”

Keith Lenihan, “Synthesis, Characterisation and Applications of Group IV Nanocrystals”


PhD Theses 2013

Lida Ansari “Atomic Scale Simulation of Nanowire and Nanotube Transistors”

Des Brennan “Integrated Systems for Genetic Analysis”

Micheal Burke “Development of CMOS-Compatible Electrostatic Supercapacitors”

Miguel Caro “Theory of elasticity and electric polarization effects in the group-III nitrides”

Ciaran Cleary “High Speed Nonlinear Optical Components for Next-Generation Optical Communications”

Vladimir Djara “Development of Inversion-Mode and Junctionless Indium-Gallium-Arsenide MOSFETs”

Farzan Gity “Development of Germanium/Silicon Integration for Near Infrared Detection”

Konstantin Grygoryev “Investigations of micro-devices for neurobiological applications”

Laura Horan “Hollow Core Photonic Crystal Fibre as a Viscosity and Raman Sensor”
Sarah Jones “Carbon Nanotubes as Materials in Nanotechnology”

Gediminas Juska “Pyramidal Quantum Dots: single and entangled Photon Sources and Correlation Studies”

Sylwia Klejna “First principles modelling of nucleation and growth during atomic layer deposition onto III-V substrates”

Ian Mathews “Mechanical Stacking for High Efficiency Photovoltaics”

Nicola Pavarelli “Optical Emission Properties of Band Structure Tailored Semiconductor Nanostructures”

Jaroslaw Pulka “Ultrafast Carrier Dynamics in Semiconductor Nanostructures”

Pedram Razavi “Simulation of Multigate SOI Transistors with Silicon Germanium and III-V Channels”

Natalia Rebrova “Dynamics of Passively Mode-Locked Lasers with Optical Injection”

Laura Russell “Characterisation and spectroscopy of laser-cooled atoms with an optical nanofibre”

Monika Rutowska “Biosensors Using a Photonic Crystal Fibre”

Masoud Seifikar “Dilute Nitride Semiconductors: Band Structure, Scattering and High Field Transport”

Dimpy Sharma “Investigation of numerical atomic orbitals for first-principles calculations of the electronic and transport properties of silicon nanowire structures”

Robert Sheehan “The Design of Curved Optical Waveguide: Analytical and Numerical Analysis”

Mahdi Shirazi “Multi-scale modelling of atomic layer deposition”

Brad Snyder “Hybrid Integration and Packaging of Grating-Coupled Silicon Photonics”

Ehsan Sooudi “Properties and Applications of Injection Locking in 1.55 μm Quantum-Dash Mode-Locked Semiconductor Lasers”

Jiri Thoma “Novel GaAs-based materials for reconfigurable electro-modulated lasers in optical interconnects”


Andreas Wieczorek “Integrated Spot Size Converters for InP based Photonic Systems”

Irene Yeriskin “Properties of Molecules in Tunnel Junctions”

Ran Yu “A Study of Silicon and Germanium Junctionless Transistors”

Aleksandra Zydor “Ab initio calculations of group 4 metallocene reaction mechanisms”

PhD Theses 2012

Azrilawani Ahmad, “Development of Biosensors for the Determination of Polycyclic Aromatic
Hydrocarbons in Environmental Monitoring of Water


Nicola Brandonisio “Dynamics of dual-mode semiconductor lasers with current modulation and delayed optical feedback”

David Burke “Porous Carbon Nanomaterials as Heavy Metal Ion Adsorbents”

Ragh Charash “Design and Characterisation of GaN based Light Emitting Devices”

Chris Daunt "The Optimisation of Electro-Absorption Modulators for Photonics Integrated Circuits"

Brian Fitzgibbon “Contributions to the Understanding and Application of Digital Delta-Sigma Modulators”

Paola Frascella “High-Capacity Direct Detected Coherent WDM”

Tatiana Habruseva “Quantum-Dot Mode Locked Lasers with Optical Injection”

Clive Harris “Application of Pseudopotential and Tight Binding Methods to the Theory of Semiconductor Materials”

Patrycja Heinricht “Wavelength Switching in a two-colour semiconductor laser”

Nick Holubowitch “Platinum Nanomaterials for Direct Methanol Fuel Cells”

Feroze Nazneen “Nanoscale Engineering of Biomedical Surfaces for Cardiovascular Applications”

Roberto Pagano “Design and Characterisation of High Power Semiconductor Laser Diodes”

Danish Rafique “Electronic Signal Processing in Optical Communications Analysis and Application of Nonlinear Transmission Limits”


Justin Varghese “Nanostructured Ferroelectric Materials”

PhD Theses 2011


John Buckeridge “Theoretical study of local defect structures in dilute nitride semiconductors”

Ki Yeol Byun “Comprehensive Study of Wafer-Bonded Si-Si and Si-Ge Structures”

John Cuffe “Phonon-photon interactions in nanostructures”

Tassilo Dannecker “Electronic and Thermoelectronic Properties of GaAsN”

Karen Dawson “Fabrication and Characterisation of Novel Nanostructures for Electrochemical Applications”

Kieran Deasy “Quantum Engineering of Laser-Cooled Atoms: Experiments and Theory”
Nima Dehdashti “Quantum Mechanical Modeling of Silicon Nanowire Transistors”

Valeria Dimastrodonato “Growth Epitaxy and growth mechanism of site-controlled nanostructures”

Jeffrey Godsell “Modelling and Characterisation of Nanostructured, High-Frequency Magnetic Materials for Integrated Passives”

David Goulding “Nonlinear dynamics of optically injected quantum-dot lasers”

Jeff Hamilton “Chemical Vapour Deposition of Zinc Oxide and Doped Zinc Oxide Thin Films”

Pio Jesudoss “Development and reliability assessment of a direct access sensor using Flip Chip on flex technology and Anisotropic Conductive Adhesive”

Lorenzo Mereni “On the Optical Properties of Pryamidal Quantum Dots”

Aileen O’Mahony “Atomic Layer Deposition of High-κ Oxides for Application in Electronics”

Nicolas Sassiat "Formation and Electrical Interfacing of Nanocrystal-Molecule Nanostructures"

Selim Tanriseven “Quantum dot devices”

Ruwana Weerasuriya “Data Retiming for Multi-Wavelength Regeneration”

Yuqiang Wu “Microspherical Resonators: Upconversion Processes and Optomechanical Behaviour”

PhD Theses 2010

Mark Crowley: “Electronic and Optical Properties of InAS/GaAs Semiconductor Quantum Dots”

Mary McCarthy: “Phase estimation receiver for full field detection”

Courtney Collins: “Liquid-Liquid Extraction and Detection of Drug Molecules”

Pawel Sajewicz: “Investigation of Loss Mechanisms in Edge Emitting Semiconductor Laser Diodes”

Ronan Meere: “Magnetics on Silicon for Power Supply on Chip”

Zbigniew Olszewski: “Dielectric Charging in RF MEMS Capacitive Switches”

Rathanait Long: “A Study of the Electronic and Structural Properties of the high-k/In0.53Ga0.47As System”

Yan Lai: “Antimony as Source/Drain Extension Dopant for Relaxed and Strained Si MOSFETs”

Saeid Daneshgar: “Observations Concerning the Locking Range in LC Injection-Locked Frequency Dividers”


Tamjidi Chowdhury: “Electrodeposited Copper Composites for Advanced IC Interconnect”

Iris Choi: “Quantum Key Distribution on Multi-User Optical Networks”
Brice Jamieson: "Integrated Magnetics for Future DC-DC Microprocessor Power Delivery".
Ran (Ruby) Yan: “A study of Doping Schemes and Fluctuations in Nanoscale SOI Devices.”
Wenbin Chen: “Electrical Characterisation of Novel High-k Materials”
Jakub Baran: "A Theoretical Study of Organometallic Molecules on Metal Surfaces"
Chi-Woo Lee: “Physics and Characterization of Silicon Nanowire FETs"
Shane O'Donoghue: "Characterisation and optimisation of passively mode-locked quantum dot semiconductor lasers"
Cleitus Antony: “10Gb/s burst mode transmission in long reach passive optical networks”
Boyang Ding: “Development of heterogeneous and hybrid opal-based 3-dimensional photonic crystals for extended light moulding and trapping”

PhD Theses 2009

Claire Barrett “Charge Transport in Nanoscale Structures and Devices”

Peter Engelstaedter “Laser Diodes for Photonic Integrated Circuits”

Greg Gannon: “A Molecular Dynamics Based Study of Nanopatterning Relevant Self-Assembled Monolayers”

Sean Harte “Hardware and Software Architectures for Miniaturised Heterogeneous Wireless Sensor Networks”

Maksudul Hasan: “Micro Lithium Ion Advanced Integrated Rechargeable Batteries.”

Mathieu Hautefeuille: “MEMS-based Environmental Monitoring

Contact

- Orla Slattery
  Graduate Studies - Graduate Studies
  +353 (0)21 2346174
  orla.slattery (at) tyndall (dot) ie

- Jim Greer
  Graduate Studies - Graduate Studies
  +353(21)234 6345
  jim.greer (at) tyndall (dot) ie