There are more than 20 nationalities represented by our student population, ensuring a multi-cultural and vibrant atmosphere.

The Tyndall Sports and Social Club organise monthly activities for all staff and students. A wide range of activities are offered; from bowling evenings, to days out spent whale watching, to summer
BBQs; there’s something for everyone.

Tyndall has a Postgraduate Students Committee that organises further activities especially for students. This committee are also tasked with highlighting areas of concern to students.

The best way to find out what life as a Tyndall student is like is to hear from our students themselves!

See what our students say about life in Tyndall
Azrilawani Ahmad

Where are you from?
Malaysia

Undergraduate Degree:
Bachelor of Science (Chemistry), Universiti Malaysia Terengganu, Malaysia

Title of PhD Research:
Development of cell-based biosensors for cytotoxicity monitoring of polycyclic aromatic hydrocarbons in environmental monitoring of water

When did you start your PhD?
May 2008

A (very brief and simple) explanation on the Research

Techniques based on biosensors have been rapidly developed for environmental monitoring over the past few decades, and one of the recent developments is cell-based biosensors. The difference of these type of sensors is the fact that they use cells as the detecting agent. This system will utilize biochips that will operate in a ‘plug and play’ mode inside a microfluidic platform, involving cell impedance sensing that offers great opportunities for PAHs toxicity determination in environmental monitoring. This technique relies on electrical measurement of cell behavior and its specific relationship to cell attachment, cell spreading and cell locomotion.
The objectives of this study are to develop cell based-biosensors for toxicity screening of target polycyclic aromatic hydrocarbons in environmental monitoring and also will be focused on integration of electrochemical and optical detection technique.

**Why this topic? How was it funded?**

I did my master degree in National University of Malaysia in 2007, which my research was based on development of optical chemical sensor for the detection of ammonia in aqueous surrounding. I was interested to go further in this area, and found that cell based biosensor is quite interesting to investigate.

It was funded by EU project called Toxichip, Ministry of Higher Education of Malaysia and also Universiti Malaysia Terengganu.

**How did you hear of the Tyndall National Institute originally?**

While searching the place to further PhD in analytical chemistry, I have contacted a professor in Department of Chemistry in UCC and learned that Tyndall is also offering PhD studies in chemistry, specifically in biosensors.

**Why was Tyndall the place for you to do your postgraduate research?**

As an excellence nanotechnology-related research institute, I believe Tyndall will offer more knowledge and experiences during my studies. Besides, the supervisors are full time researchers and will always support me and at the same time, they will guide me to be independent in planning every step in my research.

**How do you find student life in Tyndall?**

I admit, being away from family is not easy, and I tried to get used with new environment, new culture, different peoples and for me it’s not hard to get along with Tyndall community. I found that there are numbers of International students all over the world in Tyndall, and if they can survive, why can’t I?

**What kind of job would you like to get after your research?**

Actually, my PhD is funded by Ministry of Higher Education of Malaysia and Universiti Malaysia Terengganu. I am bonded to them and after finishing my PhD, I will serve Universiti Malaysia Terengganu as a lecturer.

**Do you think your postgraduate research in Tyndall will help you get this job?**

Yes

**What advice would you give to students considering a research postgraduate programme?**

If you are given an opportunity to pursue your study based on research programme, the most important thing is to choose the right field which you are interested in, and it suits you well, so that you will go for it with no regret.

**What advice would you give to students interested in coming to Tyndall?**

Make friends with people and getting involved with the activities will definitely enhance your experience at Tyndall and will help your future as well.
Lida Ansari

Where are you from?
I am from Iran.

Undergraduate Degree:
Bachelor of Science and Master of Science, both in Electronics Engineering. Title of Masters “Circuit Modeling and Analysis of Separate Confinement Heterostructure-Quantum Well (SCH-QW) Laser Diodes”

A (very brief and simple) explanation on the master’s research:
In my M.Sc. project, after reviewing the physical phenomena that govern a quantum well (QW) laser, we modeled a SCH-structure Fabre-Perot laser based on the rate equations which describe the behavior of the laser. In this regard, I used SPICE to simulate a SCH-QW laser. Considering basic parameters of the quantum well, the laser characteristics such as transient response, L-I characteristics, large and small signal responses, time delay, modulation response and bandwidth, on/off relaxation frequencies and the output chirp characteristics were analyzed. The effects of the SCH region length, which is one of the most important parts in this structure, on the above parameters were also analyzed.

Title of PhD Research:
Atomic Scale Simulation of a Gate-All-Around Filed Effect Transistor

A (very brief and simple) explanation on the PhD research:
This project will develop simulations for electronic transport in silicon nanowires, and relate the theoretical analysis to experimental work on multiple-gate FETs and silicon nanowires on-going at Tyndall National Institute and University College Cork. The project aims to develop atomistic scale simulator incorporating a Schrödinger - Poisson solver to investigate nanowire transistors with a few nanometer cross section and to develop modifications to allow treatment of different oxide interfaces and to explicitly include gating fields.

Why this topic? How was it funded?
CMOS technology has already entered the nanoscale regime and faces strong limitations. The nanowire transistor is one candidate which has the potential to overcome the problems caused by short channel effects in SOI MOSFETs and has gained significant attention from both device and circuit developers. In addition to the effective suppression of short channel effects due to the improved gate strength, the multi-gate NWFETs show excellent current drive and they are compatible with conventional CMOS processes. To simulate these devices, accurate modeling and calculations based on quantum mechanics are necessary to assess their performance limits, since cross-sections of the multi-gate NWFETs are expected to be a few nanometers. It is funded by Tyndall National Institute - Science Foundation Ireland (SFI).

How did you hear of the Tyndall National Institute originally?
I heard about Tyndall National Institute from a few friends who are doing their post graduate
education in Tyndall.

Why was Tyndall the place for you to do your postgraduate research?

The articles published by Tyndall’s professors and the summary of the research projects described on its website were very inspiring and made me wish to study at Tyndall, and later when I met with my professors I found that this university is an ideal institution for my academic ambitions.

How do you find student life in Tyndall?

The friendly and respectful relationship among the students and the professors / researchers has created such a delightful environment that has made student life so pleasing to me.

What kind of job would you like to get after your research?

I like to continue for my post doc and work as a lecturer and ultimately join the academia in a research institute or a university.

Do you think your postgraduate research in Tyndall will help you get this job?

I think Tyndall has everything to help the students to reach their goals. The good facilities, high standard equipment and educational resources and most importantly the high advisory and guidance capacity of Tyndall academicians are there to help students to reach their goals.

What advice would you give to students considering a research postgraduate program?

I believe a research postgraduate program requires the students to have rigorous enthusiasm and perseverance, and in order to be able to push the technology forward they have to try and examine different approaches toward achieving their targets. Although one may face failure at some point along the course or in the event of slow progress, they should never get disappointed.

What advice would you give to students interested in coming to Tyndall?

There is a very friendly relationship among the students and the academic / administrative staff of Tyndall and I am sure you will be more than satisfied studying here.

Mark Szepieniec

Where are you from?

I have an international background, but spent the last several years in Belgium.

Undergraduate Degree:

Bachelor in Electrical Engineering; Master's in Nanoscience and Nanotechnology, both at K.U.Leuven, Belgium.

Title of PhD Research:

Simulation of Molecular Electronics

A (very brief and simple) explanation on the Research
The aim of the project is to develop a software system capable of simulating the operation of molecular-scale electronic devices. For current-generation devices (such as the transistors in your computer's processor), quantum mechanical effects only need to be dealt with implicitly, by making certain corrections, if at all. For molecular-scale devices however, to accurately model the behaviour, a fully quantum mechanical approach is required, which makes the simulations much more complex and computationally demanding. Initially, the focus is on calculation of currents through simple systems such as chains of Silicon or Carbon atoms fastened between two electrodes, but eventually we hope to be able to treat more extensive and complex systems, beginning to resemble real (opto)electronic devices. This research could potentially be applied wherever accurate knowledge of the electronic behaviour of molecular-scale systems is required, for example future generations of transistors, LEDs, solar cells, (super)capacitors, or molecular systems designed to catalyse certain chemical reactions.

Why this topic? How was it funded?

This project appealed to me because of the wide potential applicability and the interdisciplinarity it requires; it combines aspects of Computer Science, Physics, Chemistry, and Electrical Engineering. The work is funded by Science Foundation Ireland.

How did you hear of the Tyndall National Institute originally?

I noticed an ad for the project at Tyndall while looking at a paper on a scientific journal's website.

Why was Tyndall the place for you to do your postgraduate research?

The initial draw for me was the project itself and the interesting opportunities it provides. However, there were other factors which also helped me make my decision. Firstly, the fact that at Tyndall, all the people involved in theory and modelling are grouped into a separate division was a big plus; I hope to learn a lot from interactions with other members of the theory division. Also, I like the fact that Tyndall is partially supported by industry; I think this forces researchers to consider potential applications of their work more than they would in a purely academic setting.

How do you find student life in Tyndall?

In the short time I've been here, I've already made plenty of friends and found many ways to have a good time. I haven't followed any courses yet, so I can't comment on that, but I'm convinced I'll enjoy my time here.

What kind of job would you like to get after your research?

It's early days for me still, having just started this summer, so I haven't thought seriously yet about what to do after I finish. However, one option I think I would find appealing is starting a start-up company. I think I would love the independence, the opportunity to achieve something substantial, and the potential for a big pay-off!

Do you think your postgraduate research in Tyndall will help you get this job?

Obviously, you need a technological idea to start a technology company, so guess I'm hoping that my work at Tyndall leads to that. As far as I can see now, Tyndall seems a good place to create a start-up from, not just because of the advanced research going on, but also because they have the infrastructure in place to set up exploitation of new technology-based business ideas.

What advice would you give to students considering a research postgraduate programme?
If you think of studying and doing research as "work", then it's not for you. I personally however, enjoy both, and don't consider them work at all. In fact, right now I'm being funded to do what I would probably do anyway: explore and learn new things every day.

**What advice would you give to students interested in coming to Tyndall?**

Tyndall is a nice place to do research; plenty of smart people around, good infrastructure, and a nice location right on the river and in the city centre. Also, Cork is a friendly city with an international flavour and plenty of things to do, whatever you're into.

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**Yuqiang Wu**

**Where are you from?**

China

**Undergraduate Degree:**

Bachelor of Applied Physics, Beijing University of Technology, Beijing

**Title of PhD Research:**

Characteristics of Whispering Gallery Mode Microresonators

**A (very brief and simple) explanation on the Research:**

Microcavity confines light into a small volume by resonant recirculation. Light travelling inside the cavity strikes the interface at an angle of incidence greater than the critical angle, then undergoes total internal reflection and generates whispering gallery modes (WGM). In recent years, microcavities have become a very active area of research, with applications in nonlinear optics, sensing, and cavity quantum electrodynamics.

I am particularly interested in investigating 1) upconversion and lasing behaviour in microspheres made from Er$^{3+}$-doped fluoride glasses and 2) optomechanical effects of silica microsphere pendulum. These two particular microspheres have the potential application in photonic circuits as microlasers and tunable filters.

**Why this topic? How was it funded?**

I have done some work on microspheres as an SFI-funded undergraduate UREKA student in 2006 and found it very interesting. So I rejoined the group and picked microsphere as my PhD project. I am funded by IRCSET and the project is also partially funded by SFI.

**How did you hear of the Tyndall National Institute originally?**

I got to know Tyndall through the UREKA programme.

**Why was Tyndall the place for you to do your postgraduate research?**

The facilities are fantastic and Tyndall has a very good reputation in photonics research.
How do you find student life in Tyndall?
Experiencing a completely different culture and life style is one of my main reasons of doing a PhD abroad. Here, in Tyndall, we've got students from every corner of the world which gives me a great opportunity to make friends with different cultures.

What kind of job would you like to get after your research?
Research jobs in industry.

Do you think your postgraduate research in Tyndall will help you get this job?
No doubt about it.

What advice would you give to students considering a research postgraduate programme?
Think carefully about if you are really interested in the programme because research is going to be tough, and you do need strong motivations to do it.

What advice would you give to students interested in coming to Tyndall?
Be aware that Cork people have strong accents and enjoy the weather here!

Life in Cork
Residents of Cork refer to their city as “The Peoples Republic of Cork”! The 2010 Lonely Planet guide listed Cork as one of it’s top 10 places to visit! lonelyplanet.com/cork-city.
There’s always loads to do in Cork. Check out what’s on at the moment!

- discoveringcork.ie
- cork-guide.ie
- whazon.com

International Students
The International Education Office in UCC has lots of useful information for students. ucc.ie/international

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