BIOENGINEERING NEWSLETTER SEPTEMBER 2013

Volume 7 Issue 9

THE LEADING DEPARTMENT OF BIOENGINEERING IN THE UK

Inspiration and innovation

by Jenna Stevens-Smith

The Department is buzzing again with the return of students this week. For those students reading this newsletter for the first time this is the monthly newsletter for the Department. Each month we cover a range of activities, successes and stories from students, researchers and academics in the Department, so if you have news you would like to share do email me.

But for the editorial this month I was inspired by Brian Cox's newest series, Science Britannica. For those who missed the three part series it was a homage to British Science.

The first episode tackled some of the public science controversies in recent years, from MMR and GM food to animal research. Cox emphasized the importance of dialogue with the public in all areas of science and engineering, so that the public are informed. The importance of this dialogue and consideration of ethics will grow in the field of bioengineering as the role of engineering continues to grow in healthcare, and more people come into contact with the technology.

The second episode covered the evolution of the scientific method. Yet again Professor Cox emphasized the need to communicate this to the public, and how often the process of research is forgotten in the headlines highlighting the breakthroughs. As engineers and scientists we can appreciate the importance of the scientific process.

"The inquiring mind should be given freedom to explore."

The finale of the series was all about curiosity-driven research. To me it is the drive to understand how things work or don't work in the case of disease that inspired my passion for science and engineering. The discovery and creativity of science is often lost in school science education, where focus is on exam results and regurgitation of facts.

Given the multidisciplinary nature of bioengineering there are many opportunities to communicate, innovate and explore the unknown.

IN THIS ISSUE

The undergraduates return

This week the undergraduates returned to Imperial for Welcome Week and had their year group photos.

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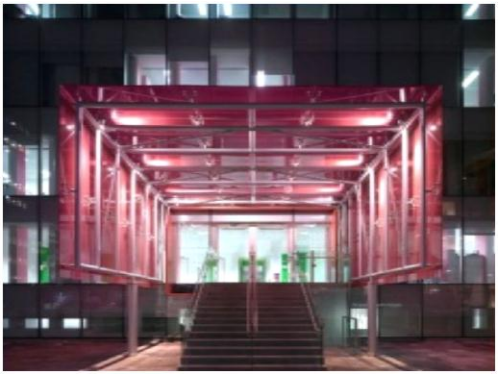

CBIS Networking event

On 17th October the Centre for Blast Injury Studies are holding a networking event and symposium.

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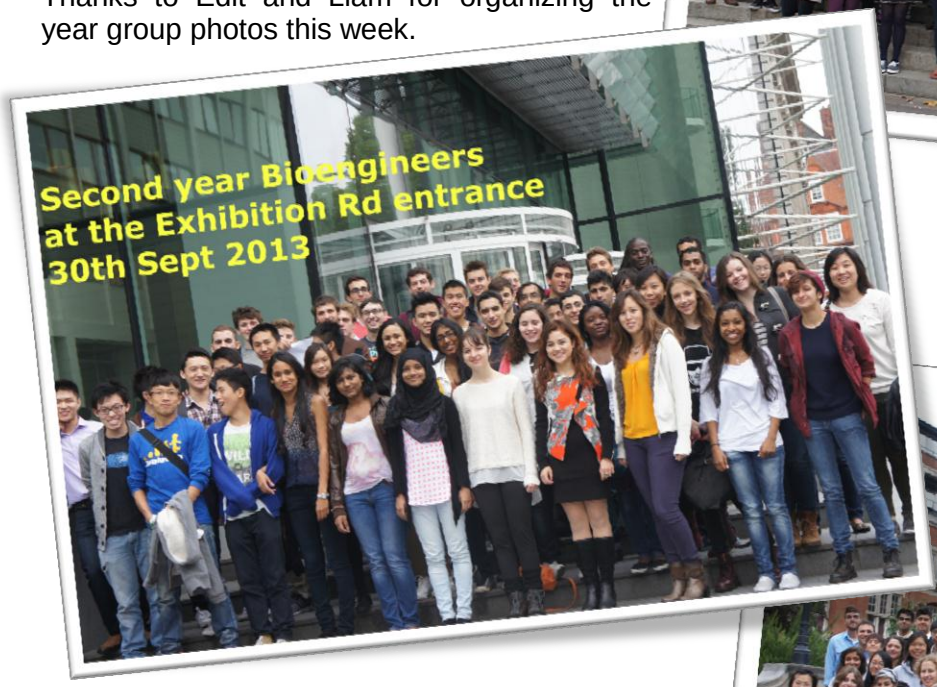
THE UNDERGRADUATES

The return of the students signals the start of a new academic year for the Department.

We are pleased to welcome our new first years and welcome back the returning students.

Thanks to Edit and Liam for organizing the year group photos this week.



FACEBOOK STATUS

There are one or two competitive people in the Department so it is not surprising that a Facebook based contest has arisen after these photos were posted.

As the newsletter went to press the current standings were:

1. First years (21 likes)
2. Third years (8 likes)
3. Fourth years (3 likes)
4. Second years (2 likes)

Imperial Bioengineering on Facebook

WOMEN IN SCIENCE AND ENGINEERING

Imperial chemists get gold for promoting women in science

Imperial's Department of Chemistry has become one of only four university departments across the UK to win an Athena SWAN Gold Award.

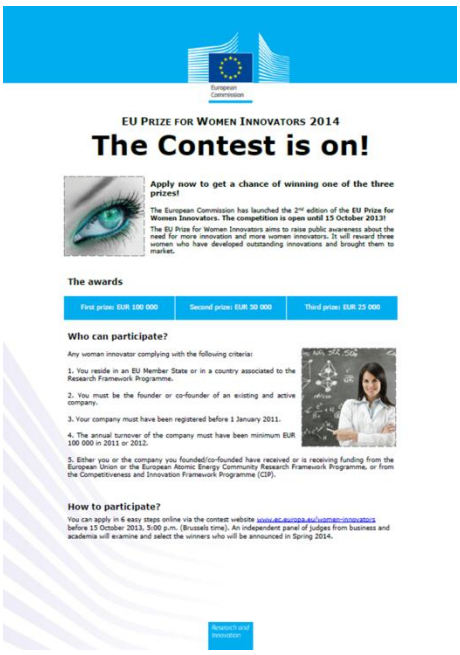
The award recognises success in growing the number of women students in science, increasing equality in career progression and influencing others to do likewise.

This is the first gold award for Imperial College London, which already has an institutional silver award as well as six previously awarded silver and four bronze departments.

Women in STEM

In the last few years there has been a rise in initiatives to encourage women and girls to stay and get into science, technology, engineering and maths (STEM) professions.

This has also inspired the formation of an informal group in the Department coordinated by Dr Jennifer Siggers for female PhD, post-doctoral and academic researchers. If you are interested in finding out more about this group or getting involved please email Jennifer.



Nuffield Summer Project student, Shivang Handa with Dr Chiu Fan Lee

Nuffield Project with Dr Chiu Fan Lee at Imperial College London

by Shivang Handa

Carrying out an independent research project of my interest was an amazing experience. I worked on a recent scientific discovery "Small unicellular organisms can anticipate periodic events" in the Department of Bioengineering at Imperial College London. I was able to explore my mathematical horizons during the project. Also it enhanced my ability of applying a mathematical model in a scientific scenario. During the course of my project I learned powerful computational tools such as MATLAB which will be a very beneficial skill in my career as use of such software is a necessity in an engineering discipline. The success of this project would not have been possible without the help and guidance of my supervisor, Dr Chiu Fan Lee. He guided me in various aspects of the project such as removing any bugs from the MATLAB functions. It was a wonderful opportunity to work with him.

Here is a brief summary of my project:

Physarum polycephalum is a unicellular organism which has exceptionally surprising forms of intelligence. Its ability to efficiently form networks (better than the rail systems of many countries), solve a maze and anticipate periodic events has perplexed scientists all over the world, who are working to justify this primitive intelligence through mathematical models. Experimental observations revealed that the organism can remember and recall a periodic pattern previously applied to it. My project was aimed towards building a mathematical model exploring this "event anticipation" skill of the organism and to consider the limitations of it. It was assumed that the intelligence shown is due to the continuous movement of biochemical oscillators which are equally distributed throughout the organism.

Using the virtue of synchronisation as a basis to structure my model, I interpreted the movement of oscillators in terms of periodic motion of clock needles. With the help of MATLAB, I was able to form two mechanism models based on four parameters: T, X, h, S where T differs for the two models. In first model, T represents the "period inside the plasmodium" whereas in the second model it represents the "number of periods/ frequencies inside the plasmodium". The other three parameters are X – waiting time interval (stimulation is given after this fixed time interval), h – number of hours the clock is winded by (severity of unfavorable conditions) and S – number of times the clock is winded (number of times subjected to stimulations). It was believed that these parameters define the underlying potential to this type of behavioural skill. Interesting relations between the parameters and synchronisation were observed and it was noted that determinant of synchronisation was h/X in the first model and T in the second model. The results also show that there is high tendency of synchronisation for low periods and less number of periods. My first model showed a more realistic effect of synchronisation with respect to X and S. Interactions between "T" were not considered in both the models which could be improved.

Shivang was a Nuffield Summer Project Student, for more information on the Nuffield schemes please go to their website.

For undergraduates, the Royal Academy of Engineering funds the equivalent undergraduate research bursaries scheme.

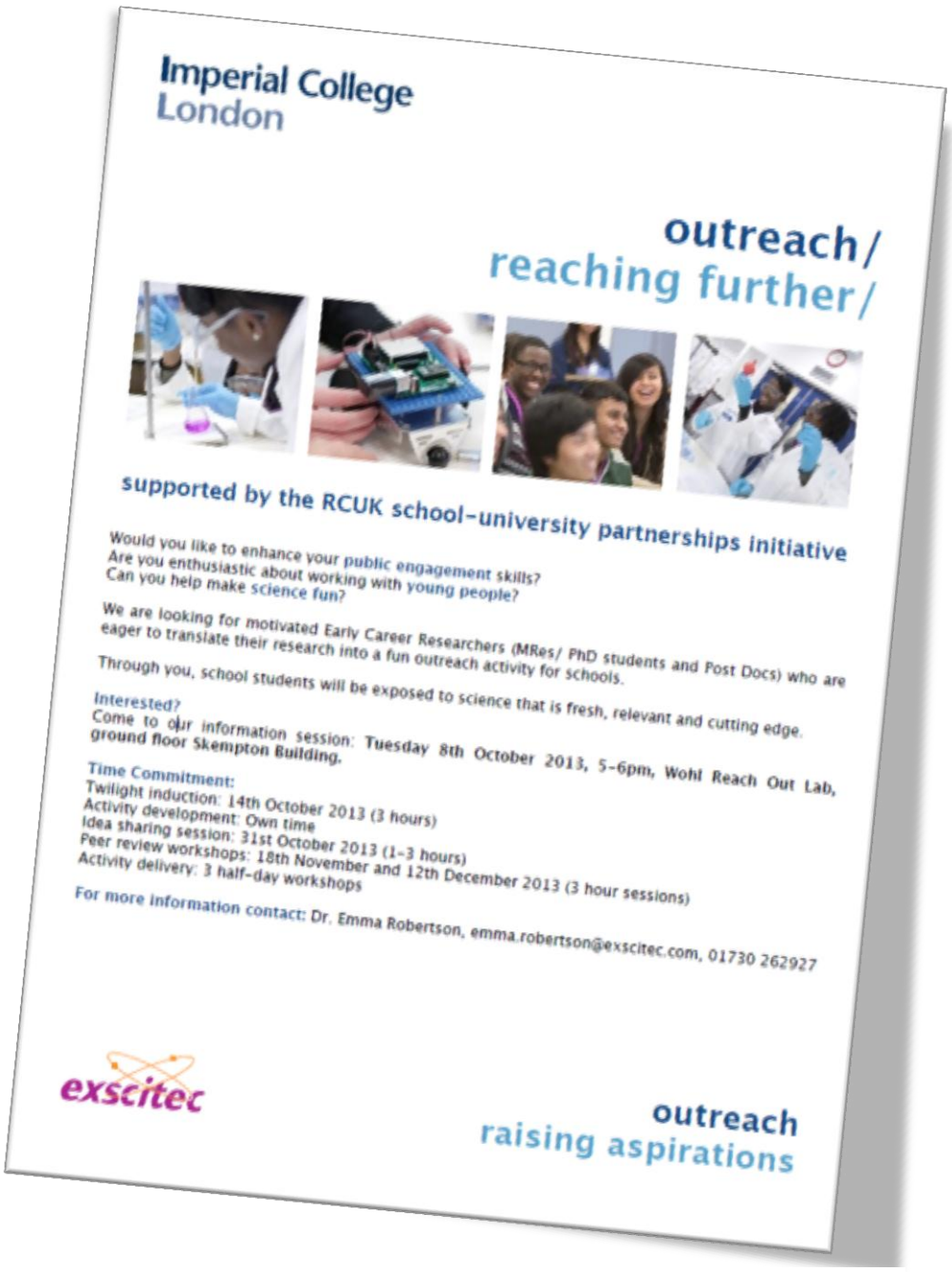
Reaching Further

Reaching Further is one of the 12 projects in the UK belonging to the School-University Partnerships Initiative (SUPI) that secured 3-year funding from RCUK in January 2013. The programme provides an opportunity for Early Career Researchers based at Imperial College London to develop outreach activities in partnership with school teachers. This collaborative enterprise will enable researchers to develop their transferable skills and teachers to engage in new ways of teaching science by building their knowledge and understanding of contemporary research issues. Because Early Career Researchers provide positive role models for school students, they will increase the motivation and aspiration of the many pupils that will participate in the activities they will have developed through the programme. This is the way Reaching Further aims to impact on the future lives of many young people.

Training motivated Early Career Researchers to deliver hands-on science programmes for school students is at the heart of Reaching Further. Every year there will be two cycles of recruitment, training, testing and delivery starting in February and October. Early Career Researchers willing to get on board would have to be able to commit to a twilight induction, an idea sharing session, two peer review workshops and three half-day trials of their activities before starting delivering their full-developed sessions in the Wohl Reach Out Lab and/or our partner schools at varied events. We understand this might be challenging, so we will ensure the commitment will be compatible with the researchers' work.

If you are an Early Career Researcher wanting to hear more about Reaching Further, email Dr. Emma Robertson.

For general enquiries on the RCUK S-UPI and Reaching Further, do not hesitate to contact Alan West



If you are a masters student, PhD or postdoctoral researcher and are interested in finding out more about reaching further the **information session** is on **Tuesday 8th October,** 17.00-18.00 in the Wohl Reach Out Lab.

Please let Jenna know if you are intending to go.

COMING SOON....

It's up to you! The newsletter is for you and about you. Whether you've been to a conference, won a prize, scholarship or know of a good place to apply for funding. Whatever you want to read about in the newsletter can be in the newsletter. Email Jenna with content and ideas.

EMAIL
Jenna Stevens-Smith

BRITISH SCIENCE FESTIVAL 2013

by Haroon Chughtai (Second Year Undergraduate)

On 6th September I began a 280 mile trip from the familiar streets of London to Newcastle upon Tyne in the North. Why? For science of course; specifically in the form of the British Science Festival which was being hosted in the city (7th -12th September). For those of you that have not heard of the festival, it is described by its organisers, the British Science Association, as “one of Europe's largest celebrations of science, engineering and technology”. Thanks to nomination by the department and sponsorship by the College I was able to attend the entirety of this spectacular event.

Each of the six days of the festival was filled with a multitude of lectures, talks, debates and practical demonstrations as well as a variety of evening entertainment. The fields ranged from anthropology to zoology and everything in between including astrophysics, geo-engineering, medicine, and science communication and policy. The sheer variety of topics and renowned speakers on offer was astounding and clearly highlighted the important fact that a particular field of science/engineering does not exist apart from everything else. Indeed, in addition to the clear message that the festival relays that scientists must communicate with the public, there seemed to be an emphasis in some of the talks of scientists, engineers and policymakers collaborating with each other.

So much was on offer at once that it was impossible to go to everything and I had to forgo much that was of interest. However, I managed to attend enough events to ensure that I scarcely had a couple of hours free each day. Some intriguing questions were asked and attempted to be answered. Are we still evolving? Can we cure the disease of ageing? What does the future hold for us in 2050? Every one of these and many more talks were engaging and informative in their own right and I will be unable to do each justice in this article. Instead I shall highlight some of the most memorable parts of the week.

One such talk was entitled “Dark Knights: What comic book characters tell us about the world” and given by Dr Jamie Lawson. Did you know that the changing morphometric measurements of Batman’s body and face relate to cultural shifts and changes in crime rate? For example there is a relationship between increased crime rate in the USA and Batman’s face becoming narrower/ meaner. Imagine the research for this study, going through hundreds of comic books. A brilliant speaker was Dr Nick Hawes on the topic of artificial intelligence and robotics. He delivered an engaging and informative talk that communicated the possibilities of this field to an audience ranging from 5 year olds to experts in other technical fields. The use of an autonomous robot (“Dora”) that mapped and navigated its surroundings brought this all to life to an enthralled audience. An unexpected surprise was the presence of Brian Cox at a physics talk, distilling the mathematics of the Standard Model to a 30 minute talk.

Not everything was of a serious nature. There were plenty of more light-hearted happenings in the evening. My favourite has to be the Festival of the Spoken Nerd, with their show entitled “Full Frontal Nerdity”, fresh from the Edinburgh Festival. This consisted of Imperial alumnus and songstress Helen Arney, stand-up mathematician Matt Parker and BBC1 experiments guy Steve Mould wowing us with the geekiest science-comedy show you can imagine. Highlights included electrocuting a pickle, a fire tornado, disproving magenta (it’s an extra-spectral colour) and lots of spread-sheets (I kid you not).

Hearing Professor Lord Robert Winston speak about his House of Lords Bill on labelling animal tested pharmaceuticals to Dr Adam Rutherford was one of the highlights of the week. The importance of public awareness on the common and vital use of animal testing was addressed but the morality of its use was not discussed. There was an interesting discussion on whether the use of animals is too strict in the UK and that this prevents important research from being conducted here.

In my opinion the preeminent speaker of the week was without a doubt the Astronomer Royal and former president of the Royal Society, Lord Martin Rees. He talked about the technical and related political challenges that the world faces in the next few decades. Climate change, overpopulation, energy needs, space exploration and synthetic biology were all touched upon. There was clear emphasis that these were not solely scientific and engineering challenges, but there must be political will and ethical oversight with them. Clearly I was not the only one who appreciated the lecture as it ended with a standing ovation and was a fitting end to the festival.

Overall I had a thoroughly enjoyable week, immersed in science that I would not otherwise come in contact with. Next year the British Science Festival goes to Birmingham and if you get the chance I strongly recommend that you go either as a volunteer or as an attendee.

Interested in outreach?

by Jenna Stevens-Smith

There are many ways to get involved with outreach in the Department of Bioengineering and this page covers all the current opportunities available that may be of interest.

Department outreach

TECHNOPOP LONDON
1 March- 21 April, Stratford, London

Big Bang Fair

13-16 March 2014,

NEC, Birmingham

The Big Bang
UK Young Scientists & Engineers Fair

IMPERIAL FESTIVAL
May 2014,

South Kensington Campus,

Imperial College, London.

Imperial College London

Imperial Open Day
June 2014, South Kensington Campus, Imperial College, London.

Headstart EDT

Headstart workshop
July 2014,
South Kensington Campus,
Imperial College, London.

Summer schools
Selected dates through July-September 2014, South Kensington Campus, Imperial College, London.

Training opportunities

For undergraduates
Communicating Science course which is part of the Imperial Horizons scheme.

IMPERIAL HORIZONS

For Early Career Researchers
(MSc, MRes, PhD, PostDoc)
Reaching further (Details on page 4)

For academics
Specialist group or individual training can be provided for all members of academic staff with advance notice of an outreach activity.

Want to find out more about…



Science Policy | Science in the Media | Science on TV

There are many ways to use your bioengineering knowledge outside of research such as in science policy, on the radio or in the newspapers and on TV.

If you would like to find out more just get in contact.

Where else can you do outreach?

In public

- Medical charity groups
- Women's Institute
- Rotary Club
- Scouts/ Brownies
- Community centres

In schools

- Science clubs in local schools
- STEM ambassador
- Careers talks

Social media

Got an idea for an outreach activity?

I am happy to help develop ideas for outreach activities and help with applications for funding.

Please email me in advance of deadlines.

Upcoming events

Great Western Lego show

5-6 October, 10.00-17.00, Steam, Museum of the Great Western Railway, Swindon, Wiltshire. Tickets: £10/£8.50, family ticket from £26.

Those bricks can create some mightily impressive models, from railways to spacecraft. Think you can do better? Now's your chance

3D: Printing the Future

9 October 2013 - 10 February 2014, Science Museum, London. Free.

Need a new liver? An intricate sculpture? Or just a new breakfast bowl? This new exhibition covers it all, revealing the power of 3D printing.

Biology Week

12-18 October, various

A week of events celebrating the life sciences, including UK fungus day, 24 hour lecture on ants and bees, a public debate at the Royal Institution - The good, the bad and the genetically predetermined and Annual Award Ceremony.

Ada Lovelace Day

15 October, 18.00-21.00, Great Hall, Sherfield Building, South Kensington Campus, Imperial College, London. Tickets £15/£5.

Comedians, scientists and technologists join forces to entertain at this show celebrating women in science and tech.

Wildlife Photographer of the Year

18 October 2013-23 March 2014, 10.00-17.50

Natural History Museum, South Kensington, London.

Tickets £12/£6, family ticket £33

Roll up and see this year's breathtaking collection of images from the field.

Apps Hackfest (part of the Apps World event)

22-23 October, from 8.00

Earls Court 2, Warwick Road, London SW5 9TA. Admission free, but must register in advance.

Will you be crowned a hackfest winner?

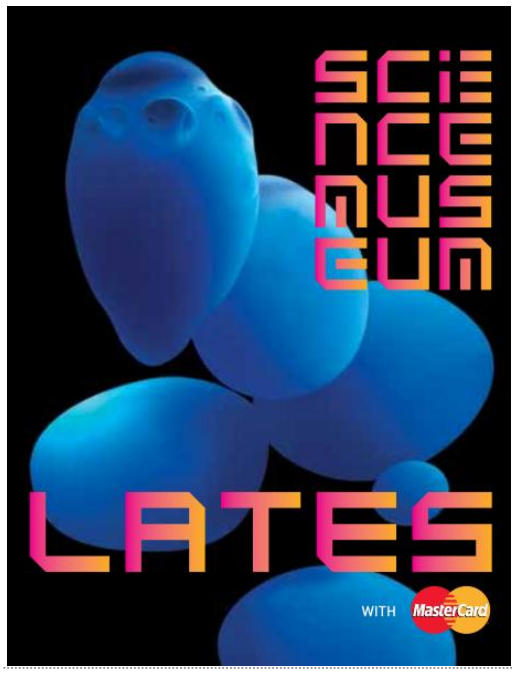
Monthly events

Natural History Museum After Hours

25 October, 18.00-22.30

Natural History Museum, London, Free

On the last Friday of every month the Natural History Museum opens up its doors after hours. This month includes an opportunity to go to the **evening premiere** of the eagerly-anticipated Wildlife Photographer of the Year 2013 exhibition.



Science Museum Lates: Space

30 October, 18.45-22.00

Science Museum, London. Free.

On the last Wednesday of every month the Science Museum have a themed Lates event.

Royal Institution

Various

The Royal Institution of Great Britain

21 Albemarle Street, London, W1S 4BS

The Ri is an independent charity that has been dedicated to connecting people with the world of science through lectures and debates for hundreds of years.

Imperial events

Beyond the engineer of 2020 – what is the future for engineering education?

7 October 2013

This perspective in education lecture will be given by Professor Daniel Hastings, formerly Dean for Undergraduate Education at MIT.

Rio Tinto Exhibition

7-11 October

A week of events celebrating the projects developed by students for the Rio Tinto Sports Innovation Challenge and masters students from the Innovation Engineering Design programme.

CBIS Networking event

17 October

An opportunity to meet and network with researchers in the Centre for Blast Injury Studies. The symposium programme will include talks from Professor Anthony Bull, Professor Sir Simon Wessely, Kings College London, Dr Spyros Masouros, Squadron Leader Ed Spurrier, Surgeon Captain Mark Midwinter, Wing Commander Alex Bennett and Major James Singleton.

Accreditation visit

30-31 October 2013

The Engineering Accreditation Board (EAB) will be visiting the Department for two days at the end of October. For more information about this please contact Liam Madden.

Imperial Fringe

31 October, 17.00-20.00

Main Entrance, Imperial College London, Exhibition Road, SW7 2AZ

The Imperial Fringe is a series of public events exploring the unexpected side of science. This month the theme is big data.

Centre for Blast Injury Studies News

by Melissa Sullivan and Martin Dansey

As I write this I find myself distracted by the appalling news of the al Shabaab terrorist attack on the Westgate Shopping mall in Nairobi. Reportedly some 68 people have been killed with over a 100 injured from small arms and grenade attacks. Having spent some time in that very shopping centre it is disturbing to think that anyone of us could find ourselves in the position where one minute you are enjoying a stroll around the aisles buying goods or presents for loved ones and the next surrounded by a surreal and unimaginable nightmare. As a soldier there is an expectation that during your service such events may occur whereas within the general public such events are more akin to fiction. Within both groups however it is almost impossible to prepare for something like this. It is sobering to think that living through an experience such as this is the reality for the people we are trying to help within the Centre. Blast or traumatic injury is not the preserve of the military, far from it, as civilian cases far outreach those of military casualties year in year out. The events in Nairobi refocus the mind on the unpredictable nature of the modern world and our need to continue research in order to help all victims, civilian and military alike, whilst our thoughts are with those affected.

Turning back to CBIS events September brought with it the International Research Council on Biomechanics of Injury (IRCOBI) conference in the city of Gothenburg, Sweden at which two of our researchers, Nicolas Newel and Spyros Masouros were invited to present. IRCOBI is a premier forum for researchers in the field of injury biomechanics bringing researchers in the fields of crash mechanics, accident reconstruction, sports injury, tissue modelling, epidemiology and all other fields relating to the biomechanics of injury together.

Professor Bull also presented at the 'Defence Security and Equipment International Conference 2013 (DSEI)' at the ExCel Centre in London, the world leading defence and security event to which 30,000 international visitors attended this year. One of the specific areas of interest at DSEI 2013 was Medical and Disaster relief and as guests of the UK Defence Medical Services (DMS) Professor Bull presented 'Recovery and Rehabilitation' as part of the programme. The DSEI conference stirred mixed feelings within the nation, with arms-trade protests blocking access to the ExCel, including 5 protestors who glued their hands together to block the entrance to the fair. Fortunately the CBIS delegation escaped unscathed and weren't ejected for use of the electric batons!

As we move toward a new term our UROP students are coming to the end of their time with CBIS and are completing their summer projects. We will be sorry to see both their enthusiasm and creativity go but are delighted that many have enjoyed their time at CBIS so much so that they have opted to complete a blast related final project for their MSc. This bodes well for the future but back in the here and now the Centre continues to offer opportunities for those seeking to study in the field with PhD vacancies available. Several PhD's are currently advertised across the academic themes within the Centre with Cellular Biomechanics supervised by Darryl Overby on offer within Bioengineering.

Looking forward to October we see this is an exciting month for CBIS with a multitude of events taking place. The Centre will be hosting its second Networking event on the 17th October which will provide a stimulating multidisciplinary programme of presentations covering medical, technical and other scientific aspects of blast injury research. Confirmed speakers include Professor Anthony Bull, Professor Sir Simon Wessely of King's College Centre for Military Health Research, Wing Commander Alex Bennett from the Defence Rehabilitation Centre at Headley Court, Major James Singleton, whom is shortly to complete his MD with us and Dr Spyros Masouros amongst others. This will be an excellent opportunity to meet and exchange ideas with colleagues from across Imperial College and all are warmly invited to register their intent to attend via blast@imperial.ac.uk.

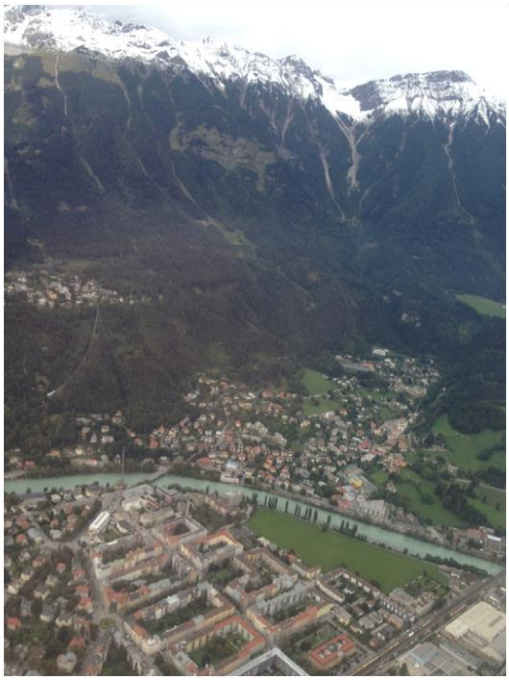
In conjunction with the Network event, we will be running a poster competition with a first prize of £100. All PhD students and Post-Docs in relevant disciplines are encouraged to participate. Further details of how to submit a poster and register for our Network event can be found on our webpage.

Parallel with the Network Event, CBIS is delighted to announce our formal VVIP opening ceremony. Attendees at our Networking event will come together with our VIP guests for the address by our esteemed guest of honour in order to unveil a plaque to commemorate the event. This provides a perfect opportunity to celebrate how far our unique Centre has come since launching in December 2011 thanks to the dedication and innovation of our amazing collaboration of researchers and staff. I am sure the occasion will be a great success and if the VVIP guest doesn't entice you to attend then hopefully the drinks reception at 5pm will.

Also next month the internal CBIS quarterly presentation day is planned for the 24th October providing our PhD students and PDRA's with an opportunity to provide research updates. The CBIS Sporting Challenge will be renewed at the Go-Karting track with all eyes on whether Ashton Barnett-Vanes can hold on to his early lead under intense pressure from Spyros "Red Bull" Masouros and Nic "The Prancing Horse" Newell. The tussell will be the last for Nic as he sails off to Oz embarking on life's next adventure to which all here at CBIS wish him the very best.

We sign off this month with a final thought toward those still held captive in Nairobi wishing a swift and peaceful resolution to the situation.

OUT AND ABOUT



Academics in Austria

Professor Martyn Boutelle, Susan Mulcahy and Toby Jeffcote all presented talks at the COSBID meeting (Cooperative Study on Brain Injury Depolarisations) in Innsbruck Austria in September.

Scandinavian vision

Kit Longden, Holger Krapp and Ben Hardcastle travelled to Backaskog Castle in Sweden for the International Conference on Invertebrate Vision. Kit gave the closing talk, Holger a plenary, and Ben Hardcastle a poster at the conference, which only happen once every 5 years.

CONGRATULATIONS

Binks Trust Award for Bailey

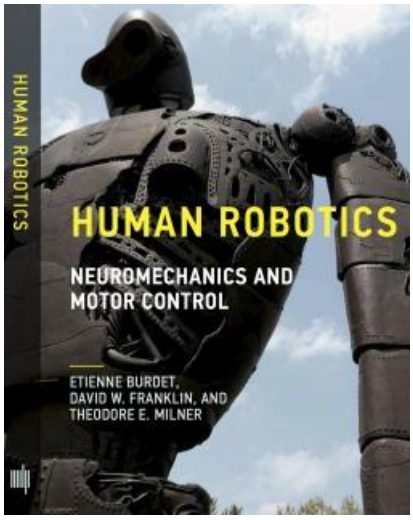
Emma Bailey received a Binks Trust Award after presenting at the British Atherosclerosis Society's Autumn meeting in Cambridge (5-6th September). The award recognizes and supports the atherosclerosis-related research of young investigators from the laboratories of BAS members in the UK.

Peter's poster success

Peter Swart, a first year grad student with Holger Krapp won the runner-up poster award at the Tomography for Scientific Advancement symposium (ToScA) at the Natural History Museum. The title of Peter's poster was *Characterising the neck motor system of the blowfly*.

Human Robotics

Congratulations to Professor Etienne Burdet whose new book on "Human Robotics - neuromechanics and motor control" written with David Franklin of Cambridge University and Ted Milner of McGill has just appeared at MIT Press. The book describes human motor sensorimotor control from muscle to behaviour and will be used as support material for the "Neuromechanical control and learning" course of next term.



Fellowship success for Diego

Diego Oyarzun has been awarded a prestigious Imperial College Junior Research Fellowship 2013. After his postdoc at the Centre for Synthetic Biology and Innovation (Dept. of Bioengineering), with the Fellowship he will become an independent researcher in the Biomathematical Sciences group of the Department of Mathematics at Imperial. His research in Systems and Synthetic Biology aims at understanding how cells self-regulate and survive in changing environmental conditions. He uses a combination of control theory, mathematical modelling and cell biology to analyse and design biomolecular networks. This 3 year post will allow him to establish and develop his independent research programme, laying the path for his future academic career.

Viva success

Congratulations to Erica Buckeridge who passed her PhD viva this month. Her PhD was on "Biomechanical asymmetries and joint loading in elite rowers" and her supervisors were Alison McGregor (Surgery) and Anthony Bull. Erica is now working in Canada in Professor Benno Nigg's group.

Forging a Bioengineering career

Congratulations to Sian Watkins who graduated from the Biomedical Engineering undergraduate this year and has now started working at BioMet. Biomet specialise in the design and manufacture of implants which replace hips, knees, shoulders, and elbows, biomaterials, bone cements and accessories and orthopaedic surgical instruments.

A graduate leader

Third year PhD student Andreas Thomik is the President of the Graduate Students Union. Andreas is a PhD student in Aldo Faisal's lab.

ENGINEERING IN SOCIETY

Students often have misconceptions about a career in engineering. They often underestimate the importance of communication and negotiation, or don't realise the amount of responsibility that they are likely to have, and the extent to which they will have to use their own judgement, and make their own decisions.

Engineering in Society therefore aims to give students new to engineering an initial insight into the profession of engineering and some idea of what their future career might look like.

Engineering in Society is available to download for free on 5 consecutive Fridays starting on **27th September.**

www.amazon.co.uk/dp/B00FBDCZJ0

INNOVATION

Bioengineering lends itself to innovation and if you have aspirations to be an entrepreneur or are just interested in finding out more, Imperial College London is a good place to do that.

The Innovation, Entrepreneurship and Design (IE&D) Project allows you to build your knowledge, skills and experience in innovation, entrepreneurship and design. You will explore the key challenges of introducing products and services to market. The process is relevant whether you are examining innovation within an organisation or planning to start your own business.

Operating as part of a self-selected, multi-disciplinary team, you will explore the latest developments in science, technology, design and business. Collaborating with key researchers and practitioners in the field, you will investigate the commercial potential for your own idea, or one being developed by one of our project partners, including Imperial Innovations and the Royal College of Art.

By the end of the IE&D course, you will have explored the process of preparing a start-up and will be able to exploit the power of design and innovation to transform ideas into a new product or service.

You will embark on an entrepreneurial journey as you work with a team of MBA students and designers to turn your idea into a potentially viable and interesting business proposition.

The submission of projects is open from 13 September 2013 until 20 October 2013. From this year, students will screen and scout external projects themselves.

We would strongly suggest **submitting your proposal** sooner rather than later as students will be keen to secure projects as soon as possible. Project submissions will be added on a rolling basis to an online platform for students to view.

Find out more:

To learn all about this unique opportunity and to submit a proposal, please visit our website:

www.imperial.ac.uk/entrepreneurship/services/ied-projects

Benefits of participation include:

- Work with a team of highly skilled MBA students and designers to improve the idea's feasibility, develop a business case and prepare a business plan which could be presented to investors and potential funders.
- Attend coaching workshops and receive guidance from academic and practitioner coaches.
- The opportunity to enter business plan competitions, including the IE&D Business Plan Competition, pitching before a panel of professional investors for a prize of £10,000.
- Receive all these amazing benefits and more, **free of charge!**

Biomedical Catalyst Grant

Funded by the Technology Strategy Board and Medical Research Council, this programme offers funding to innovative small and medium sized businesses (SMEs) and researchers to develop solutions to healthcare challenges.

The next available opportunity to apply for a Feasibility Award will be in round 5 **opening October 2013**.

This grant enables the exploration and evaluation of the commercial potential of an early-stage scientific idea, through: review of research evidence and identification of application assessment of business opportunity investigation of intellectual property position experimental studies to validate initial concepts or existing pre-clinical work scoping for further development.

Key features:
Duration – up to 12 months
Maximum grant – £150k
Funding proportion – up to 75% of total eligible project costs

For more information about the award scheme, check out the biomedical catalyst website.

A reason to be optimistic (or pessimistic)

by Romain Cazé

In an article* published soon, a researcher, from our department - Dr Cazé -, and his collaborator - Dr Van Der Meer - are demonstrating that an optimistic or a pessimistic behaviour can outperform a rational behaviour. This computational work contrasts with existing economic theory assuming that rational estimation is optimal behaviour in all contexts. Indeed, their study shows that when we must choose among actions with different - low - reward probabilities, a rational behaviour yields less reward than an optimistic behaviour. To understand this observation they had first to understand the origin of optimism. We are optimistic when we learn more from reward than punishment, because of this asymmetric learning an optimist will globally overestimate probabilities of reward; but this overestimation will depend on the real reward probability. Because of this dependence the distance between the estimations of two low reward probabilities is larger than the rational estimation, making the optimist choice the easiest to make. But, in a context where all actions are rewarded with a high probability, the worst performer is the optimist and the best is the pessimist. Pessimism contrary to optimism arises when one learns more from punishment than reward, in this case the pessimist will underestimate all reward probabilities, but alike optimism this bias will depend on the reward probabilities. Because of that, the choice between two highly rewarded actions is the easiest to make for a pessimist. In a nutshell, the optimal behaviour is to be optimistic in a low reward context and pessimistic in a high reward context. They propose that a normal subject should be capable of adapting his or her level of optimism/pessimism depending on the context. Moreover their study might explain pathological behaviours, like pathological gambling or certain forms of addiction, where a deregulation of dopamine is involved.

*Romain D. Cazé, Matthijs A. A. Van Der Meer "Adaptive properties of differential learning rates for positive and negative outcomes", Biological Cybernetics, 2013, in press

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