



Eye to the future

The new postgraduate centres training
the next generation of science leaders

... **CENTRE PAGES**



FIGURE HEADS

Data Science
Institute
to harness
information
revolution

PAGE 3



GIVING BACK

Students explore
not-for-profit
careers

PAGE 10



BEAUTIFUL BRAINS

Neuroscience
and art combine
in new exhibit

PAGE 14



EDITOR'S CORNER

Smoothing the road

Doing a PhD isn't easy. It's a **lonely rollercoaster** ride that sometimes seems to have no end in sight (certainly for me, I didn't finish). In a way, that reflects the scientific process – small surges forward punctuated by periods of inertia. Still, it can be quite a leap for undergraduates. In part, Centres for Doctoral Training (CDTs) were established to smooth that transition with a four year, cohort-based programme allowing students to get up to speed with the background to their research project. In recognition of the increasingly **collaborative nature of modern science**, students then work alongside their peers, researchers in other departments, other universities and industry (opposite and centre pages). Our established CDTs can boast a host of measurable successes, such as patents and papers, but perhaps the most telling one is the **human aspect**. Since 2003, over 97% of students starting a PhD at the Chemical Biology-CDT have graduated – a worthy investment.

ANDREW CZYZEWSKI, EDITOR

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Euro IT centre for Imperial West

Technology, business and political leaders gathered at Imperial West to launch the London Node of a major European ICT innovation network last month.

The European Institute of Innovation & Technology's (EIT) ICT Labs London will enable university and industry researchers to collaborate and create the next generation of smart city infrastructure.

Start-ups, spin-outs and established businesses will co-locate with academic experts at Imperial West as they exploit ICT innovations to improve health and wellbeing, urban life and mobility, develop smart energy solutions and more.

The London Node is led by Imperial, UCL, Intel and BT, with further support from Vodafone, IBM, the University of Edinburgh and Institute of Sustainability.

Speaking at the event, Deputy Mayor of London Kit Malthouse said: "The UK has been great at inventions, but not good enough at commercialising them. Establishments like this in the heart of Imperial's new campus, with a focus on commercialisation, are very welcome. Science and technology will create many jobs for London over the coming years."

Willem Jonker, Chief Executive of EIT ICT Labs, said: "London will be a key part of the Europe-wide EIT ICT Labs ecosystem. This is not just a project, but a long-term strategic investment. We are addressing Europe's challenge of translating our excellent education and research, to turn it into economic value."

—ANDREW SCHEUBER, COMMUNICATIONS AND PUBLIC AFFAIRS

Dozen doctoral centres put Imperial in front

Postgraduate training at Imperial received a further boost last month, as the Chancellor George Osborne announced further Centres for Doctoral Training (CDT).

CDTs aim to bring together diverse areas of expertise to train engineers and scientists with the skills, knowledge and confidence to tackle evolving issues and future challenges (see pages 8 & 9). The multi-million pound centres are funded by the Engineering and Physical Sciences Research Council and partners from industry and elsewhere.

Following the announcement by Chancellor George Osborne, two further CDTs will be housed at Imperial in addition to ten announced in November 2013 and January 2014.

Professor Peter Cawley (Mechanical Engineering) will lead a CDT in Non-Destructive Evaluation and Dr David McPhail (Materials) will lead a CDT in the Advanced Characterisation of Materials. With 12 new centres overall, Imperial will be home to the largest number of CDTs in the country. The College is also partner in a further six. The UK will have 113 CDTs in total.

Chancellor Osborne said: "A forward looking, modern industrial strategy is part of our long term economic plan to deliver security, jobs and growth to all parts of the UK. Our £500 million investment in Centres for Doctoral Training will inspire the next generation of scientists and engineers, ensuring Britain leads the world in high-tech research and manufacturing."

Imperial's Provost, Professor James Stirling, added: "Imperial's position as the UK's number one host of CDTs is a mark of the College's ability to foster excellence in education, research and translation, and reflects the very high quality and impact of our postgraduate offering."

"We look forward to using these Centres to create a host of exciting new opportunities for postgraduate students and researchers."

—LAURA GALLAGHER, COMMUNICATIONS AND PUBLIC AFFAIRS

£2m for synthetic biology facilities

A new research and training facility at Imperial that will construct DNA at industrial levels has been announced by the Universities Minister.

Designing, constructing and testing DNA is a crucial element of synthetic biology, an area of science which combines biology and engineering to create new biologically based devices that will help solve a range of global challenges such as making vaccines or turning agricultural waste into biofuel.

The new 'DNA Synthesis and Construction Foundry' will establish a common framework to build interchangeable bits of DNA by using an automated robotic system. With this in place, synthetic biologists will be able to scale up the volumes of DNA produced to more easily test their new function.

David Willetts, Universities and Science Minister, announced the funding for the Foundry at the opening address of the SynBioBeta Conference, an annual synthetic biology conference that links research and industry, held for the first time at the College.

The establishment of DNA Synthesis and Construction Foundry will complement the Innovation and Knowledge Centre, based at Imperial's Centre for Synthetic Biology and Innovation (CSynBI), which aims to bridge the gap between academia and industry to speed up developments in new synthetic biology technologies.

—GAIL WILSON, COMMUNICATIONS AND PUBLIC AFFAIRS



Global data science hub launches at Imperial

Unleashing the huge potential of data will be the focus of a new global institute, which was officially launched at the end of March.

In the past two years the world has produced more data than in all of human history. The Data Science Institute (DSI) at Imperial aims to capitalise on this data revolution, by underpinning multidisciplinary collaborations between the College's academic experts and research partners.

Sir Keith O'Nions, President & Rector, said: "Imperial is uniquely placed to play a leading role in data science. Our critical mass of scientific, medical, engineering and business expertise puts us in a strong position

to harness the power of the data generated by our research. Industrial partnership is a key component of our work to apply the fruits of this research for the benefit of our society and economy."

The DSI is developing a range of industrial collaborations. For example, Imperial and Huawei signed an agreement last year to develop a data science lab to bring together researchers with cutting-edge facilities. These partnerships build on the College's long standing collaborations with companies such as IBM and Thompson Reuters.

Professor Yike Guo, Director of the DSI, said: "From the development of large data sensor networks to mitigate the effects of flooding in the UK, to using information collected from satellites to understand how changes in the Sun may affect our climate, there is already a wealth of research, which the DSI is seeking to harness.

"This launch is an invitation to industry and academia to let you know that the DSI is open for business."

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS



Mayor Johnson visited Imanova – a pioneering imaging company formed by Imperial, the MRC, UCL and King's

Mayor launches MedCity at Imperial

The Mayor of London Boris Johnson launched MedCity, a major new medical research and translation initiative at Imperial's Hammersmith Campus, this month.

The new body brings together leading centres of medical research to develop new healthcare applications for the benefit of patients and the economy.

MedCity has been established by the Mayor of London and Imperial College Academic Health Science Centre, King's Health Partners and UCLPartners with cooperation from the Universities of Cambridge and Oxford. The organisation's advisory board includes leading life sciences figures such as Imperial's Vice President (Health) Professor Dermot Kelleher and Sir Paul Nurse, Director of the Crick Institute, alongside leading business, political and charitable figures.

Professor Kelleher said: "This collaboration will lay the foundations for the next generation of medical advances while helping secure the capital's long-term growth. London is powering ahead to a healthier and wealthier future."

Mayor Johnson added: "I am in no doubt that having companies doing their research, clinical development and manufacturing here in London and the South East can be as important to our economy as the financial services sector is today."

MedCity is funded by £2.92 million from the Higher Education Funding Council for England and £1.2 million from the Mayor of London's Office.

—ANDREW SCHEUBER, COMMUNICATIONS AND PUBLIC AFFAIRS

in brief

Darzi passes health mantle to Dixon

Imperial College Health Partners has appointed Sir Peter Dixon as its new Chair. Sir Peter takes up the post with immediate effect. The previous Chair, Lord Ara Darzi, stepped down in October 2013 to lead the London Health Commission. Imperial College Health Partners brings together some of the world's most respected health and academic institutions, including Imperial, all focused on delivering demonstrable improvements in the health and wellbeing of the 2.3 million people living in North West London.

Robotic surgery first for Imperial

An Imperial team is the first in the UK to run a robotic surgery course combining practice on soft tissue with computer simulations. Minimally invasive surgery using robots has become increasingly popular over recent years. The training course at Imperial focused on using the popular 'da Vinci' robot to treat mouth and throat cancers. The benefits include faster recovery times and smaller incision scars. There are currently 42 da Vinci robots in the UK and one is already in clinical use at Imperial's Surgery Innovation Centre at St Mary's Hospital.

Business School thanks alumni

The Business School has held its first ever volunteering reception for alumni as a way of thanking them for their support. The Alumni Volunteer Reception, which took place on Thursday 27 March, was an opportunity for former students to meet Dean Professor G 'Anand' Anadalingam and hear about the latest news. Alumni can volunteer in areas such as helping with student recruitment, encouraging prospective students to enrol, as well as offering career advice, giving talks and organising events.

“There is clear evidence that species and ecosystems are already being affected by climate change, as well as our crops and livestock.”

PROFESSOR E.J. MILNER-GULLAND RESPONDS TO THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE'S (IPCC) REPORT ON HOW CLIMATE CHANGE WILL IMPACT THE PLANET AND PEOPLE ON A GLOBAL SCALE.

See other academics' responses here: bit.ly/QXbwfF



Medics reclaim JPR Williams Cup in Varsity finale

The Imperial Medics 1st XV rugby team emerged triumphant as Imperial's annual Varsity tournament came to a climactic close.

After an exciting day on 12 March which saw 58 teams compete across 11 different sports, the competition culminated with Imperial Medics reclaiming the coveted JPR Williams cup.

However the Medics' impressive rugby win could not prevent Imperial College from claiming overall Varsity victory, winning the majority of the 29 matches played.

The final Varsity showdown took place at Twickenham Stoop, where an enthusiastic crowd gathered to watch the Imperial College rugby team try to defend their title against the Medics for the third year running.

Despite a spirited performance by Imperial College, Imperial Medics came out top with the scoreboard reading 37–11 when the final whistle blew.

The match marked the end of a full day of sporting events which began in Ethos, where Imperial College and Imperial Medics teams battled it out in netball, squash, water polo and basketball, while hockey, rugby, football and lacrosse teams clashed at Harlington. Badminton took place in Charing Cross Leisure Centre and Hyde Park played host to the men's tennis.

Speaking of the rugby match, Professor James Stirling, Provost, said: "Having followed university sport from my time as an undergraduate rugby player, I can say that last night's quality of rugby and atmosphere was among the best I've ever experienced.

"Varsity is, however, about much more than first-class rugby. It is a superb showcase for Imperial sport at all levels. Throughout the day, hundreds of students competed in scores of disciplines, from basketball to water polo, in front of over a thousand spectators."

—DEBORAH EVANSON, COMMUNICATIONS AND PUBLIC AFFAIRS

Researchers bring MPs upto speed with science

Imperial researcher Dr Claire Donoghue was awarded a silver medal at the national SET for Britain competition held at Parliament.

The event, hosted annually by the House of Commons, aims to promote Britain's early-career researchers and give them the chance to discuss their work with Members of Parliament.

Exhibitors were shortlisted from hundreds of applicants, and were entered into five categories: Engineering; Biological and Biomedical Sciences; Chemistry; Physics; and Mathematics.

Dr Donoghue (Bioengineering) was awarded the silver medal in the Engineering category for her work in designing software that can interpret

MRI scans without human assistance and predict osteoarthritis, potentially allowing for earlier treatment of the disease.

"I am thrilled to have been chosen to receive this award and I really enjoyed getting a chance to discuss my research with MPs," she said. "The event highlighted some of the exciting research taking place across UK universities and it was great to be a part of this."

Anthony Lim, a PhD student from the Department of Physics who also exhibited his work at the event, said: "Increasing and improving communication between scientists and MPs is really important, as often both sides lack an understanding of the work and pressures of the other. SET for Britain gave us an opportunity to bridge this gap."

—DEBORAH EVANSON, COMMUNICATIONS AND PUBLIC AFFAIRS



Staff commitment celebrated

Some of Imperial's longest serving members of staff gathered recently to celebrate giving decades of service to the College.

President & Rector Sir Keith O'Nions was joined by Director of Human Resources Louise Lindsay in congratulating staff on milestones at a reception for those serving 20, 25 and 30 years' service and a dinner for those seeing 35, 40, 45 and 50 years.

Sir Keith said: "The Imperial you joined was, in some ways, quite a different place. But amidst the change there has been important continuity. The College remains an agile, can-do place, proud of its history but always looking to push itself for better ways to do things."

"This continuing excellence is because of people like you, and I am

delighted to have the opportunity to recognise your extraordinary contributions and the way that you have helped shape the College we know today."

Nostalgia abounded at the events as staff, boasting almost 3,000 years of collective service, reminisced about the changes they had witnessed at Imperial over the past three decades.

Professor Sandro Macchietto (Chemical Engineering), Professor of Process Systems Engineering, said: "My trip to be interviewed at Imperial in 1982 was the first time I had ever visited England. Despite my preconceptions about British weather, I arrived to three days of blue skies and sunshine and I thought to myself: 'this isn't too bad at all'. I took the job and then turned up in a freezing, grey UK – paralysed by industrial strikes. I was left wondering what on earth I had done.

"However there's no question it proved to be the right decision. I've had an exciting career here – having had the opportunity to be involved in launching our Centre for Process Systems Engineering and the formation of the Energy Futures Lab."

—DEBORAH EVANSON, COMMUNICATIONS AND PUBLIC AFFAIRS

media mentions

—BY GAIL WILSON, COMMUNICATIONS AND PUBLIC AFFAIRS



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Proof of the Big Bang

THE TELEGRAPH ▶ 17.03.14

A stunning discovery made at a research station in Antarctica indicates that Albert Einstein was right about the nature of the universe. Speaking to *The Telegraph*, Professor Andrew Jaffe (Physics) said that this is ‘almost’ proof of inflation theory, which states that the universe expanded exponentially in the fractions of a second after it came into existence. “Inflation is the only way we know of to produce gravitational waves in the early universe,” he said, adding that although there are other possible explanations, they are “less compelling.”

Circassia gets the cream

LONDON EVENING STANDARD ▶ 13.03.14

A piece of Imperial College research that created a cat allergy vaccine and could end the misery of hayfever has led to the UK’s largest biotech stock market listing in more than a decade. The *London Evening Standard* reports that allergy treatment-maker Circassia raised £200 million, listing at the top of its range at 310p per share, valuing the business at £581 million. It means Imperial Innovations, the business which invests in spin-out companies from the UK’s top universities, has turned its £25.5 million investment into a stake worth £82 million.

A spark to a flame

THE ECONOMIST ▶ 17.03.14

Britain is growing faster than any other country in the G8, says the *Economist* – yet the Chancellor of the Exchequer grimaces, talks of ‘hard truths’ and warns that ‘the recovery is not yet secure’. Indeed the revival has been sparked largely by fickle consumer spending. But, after a long wait, businesses at last seem ready to provide a more durable fuel. Official data show that business investment rebounded by 8.5%

in real terms over 2013. And that might understate the rise. The data omit some types of intangible investment, such as in staff training and research and development. These are increasingly important as Britain’s economy becomes more knowledge-oriented, according to Peter Goodridge and Professor Jonathan Haskel, economists at the Business School.

Coal is new black gold

THE SUNDAY TIMES ▶ 30.03.14

Scientists have discovered vast deposits of coal lying under the North Sea, potentially holding enough energy to power Britain for centuries. They have studied data collected all over the North Sea for oil and gas exploration, but instead used it to build a picture of coal deposits. This revealed between three trillion and 23 trillion tonnes of coal buried under the North Sea. Professor Richard Selley (Earth Science and Engineering) told the *Sunday Times* discoveries of such unconventional resources were changing the energy landscape. “The big game-changer is seismic imaging, which has become so sensitive that we can now pinpoint the ‘sweet spots’ where shale gas, oil and coal are to be found.”

awards and honours



ENGINEERING

Armstrong Medal for Maria

Dr Maria Fernanda Jimenez Solomon (Chemical Engineering) has been awarded the College’s Henry Armstrong Memorial Trust Medal. The prize, which was awarded at the Dudley Newitt Lecture, is presented to exceptional PhD students undertaking research that can be applied to help tackle industrial problems. Maria was awarded the medal for her research into polymeric membranes – plastic microporous films which are used as a kind of filter to remove impurities and toxic substances from pharmaceutical products.

NATURAL SCIENCES

Royal honour for Kibble

The Royal Society of Edinburgh has bestowed one of its prestigious Royal Medals to Professor Tom Kibble (Physics) for his involvement in the research and discovery of the mechanism that gives mass to elementary particles. The Society must receive the permission of Her Majesty The Queen to grant the medals and this year only two are being issued.

NATURAL SCIENCES

Science scribe commended

Life Sciences PhD student Christopher Waite has been commended in a science writing competition run by the Science Team at the British Library and Europe PubMed Central. The international Access to Understanding competition attracted entries from 300 early-career researchers, who were asked to summarise a cutting-edge research article in a simple and accessible way.



BUSINESS SCHOOL

Students win FT quiz

A team of students and staff from the Business School has won an international competition organised by the *Financial Times*. The aim of the competition was for teams to answer questions about stories that had featured in the FT over the past year. The Imperial team consisted of students Tomas Foley, Weifan (Ethan) Gao, Harsh Pershad and Thomas Gray. Professor Richard Green and Dr Robert Kosowski also took part. The Imperial team competed against six other business schools from around the world and were named the ‘smartest’ business school in the competition.

Londoners will feel heat of climate change

Warmer summers brought on by climate change will cause more deaths in London and South East England than the rest of the country, scientists predict.

Matching temperature records with mortality figures, the research team found that the odds of dying from cardiovascular or respiratory causes increased by over 10 per cent for every 1°C rise in temperature in the most vulnerable areas.

Study author Dr James Bennett (School of Public Health), said: “It’s well known that warm weather can increase the risk of cardiovascular and respiratory deaths, especially in elderly people. Climate change is expected to raise average temperatures and increase temperature variability, so we can expect it to have effects on mortality even in countries like the UK with a temperate climate.”

The effects of warm temperature were similar in urban and rural districts. The most vulnerable districts included deprived districts in London such as Hackney and Tower Hamlets. Districts in the far north were much more resilient, seeing no increase in deaths at equivalent temperatures.

“The reasons for the uneven distribution of deaths in warm weather need to be studied,” said study lead Professor Majid Ezzati (School of Public Health). “It might be due to more vulnerable



With every 1°C rise in temp, mortality increases by 10% in vulnerable areas

individuals being concentrated in some areas, or it might be related to differences at the community level, like quality of healthcare, that require government action.

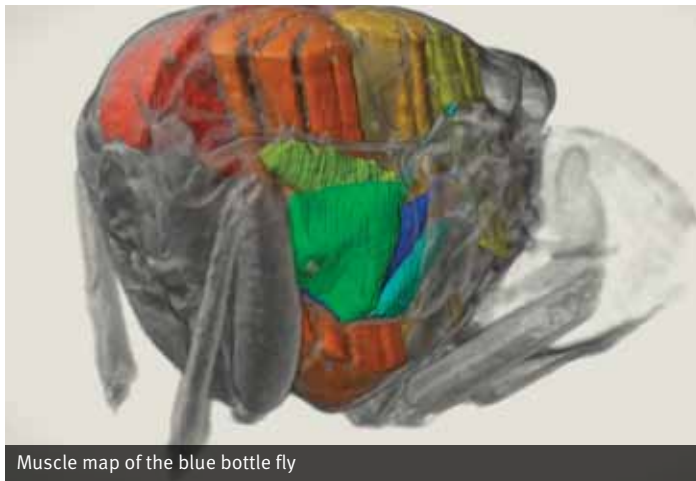
Professor Ezzati noted though that many things can be done at the local level to reduce the impact of warm spells, like alerting the public and planning for emergency services. Detailed information about which communities are most at risk from high temperatures can help to inform these strategies.

—SAM WONG, COMMUNICATIONS AND PUBLIC AFFAIRS



Human cost

Across England and Wales as a whole, a summer that is 2°C warmer than average would be expected to cause around 1,550 extra deaths, the latest study found. Just over half would be in people aged over 85, and 62 per cent would be in women. The extra deaths would be distributed unevenly, with 95 out of 376 districts accounting for half of all deaths.



Muscle map of the blue bottle fly



In the method

To obtain the 3D models of the fly’s muscles the team went to the Swiss Light Source, near Zurich, and used their synchrotron facilities. Synchrotrons enable the generation of X-ray radiation that penetrates tissue that would otherwise block visible light. The fly was secured to a device that enabled them to turn it around so that they could make images or radiographs of the power muscles from multiple angles and at multiple stages of the wing beat.

“Before you next think about swatting a fly, take some time to marvel at its incredible aerial acrobatics.”

Secret of a fly’s acrobatics revealed

The muscles that help a blue bottle fly to perform incredible aerial acrobatics have been mapped in action in full 3D for the first time.

The resulting video models could inform the design of new micromechanical devices and miniature unmanned aerial vehicles, which attempt to mimic flies’ aerial skills.

The *Calliphora vicina* fly, or blue bottle, is one of nature’s most complex flying machines. Its flight is controlled by ‘power’ muscles, which give the fly lift, and ‘steering’ muscles, which help the fly to manoeuvre. These muscles enable the creature to perform highly complex manoeuvres, even in the face of unpredictable wind turbulence. However, scientists have previously not been able to properly visualise these sets of muscles in action.

Dr Holger Krapp (Bioengineering) says: “Before you next think about swatting a fly, take some time to

marvel at its incredible aerial acrobatics. In the time it takes a human to blink, a blue bottle has flapped its four wings 50 times and manoeuvred them at different angles to fly out of range to avoid your swats.”

The next phase of the research will see the team further developing their technique so that they can simultaneously carry out x-ray scanning of muscle movements and take measurements of parts of the fly’s brain responsible for controlling these muscles. The ultimate goal is to apply what they learn to new generations of autonomous robots and assistive systems.

Dr Krapp adds: “Evolution has had hundreds of millions of years to overcome many of the problems that creatures like insects face. It is certainly worthwhile identifying the solutions nature has come up with and exploiting them in a way that benefits many areas of human life, where autonomous robotics will pay an increasingly significant role in the future.”

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS

New lab method may reduce need for animal testing

Scientists at Imperial are aiming to cut the need to use animals in research by improving methods for growing human heart cells in the lab.

Many new drugs fail to reach the market because of toxic effects on the heart. Research involving animals is currently integral to drug safety screening, but animal studies don't always reveal side effects that might occur in humans.

Dr Cesare Terracciano (National Heart and Lung Institute) and his colleagues at Imperial are developing methods that would allow large amounts of human heart tissue to be grown in the lab and used for drug testing. Researchers can already grow small amounts of heart muscle from

“If we're successful in developing a platform that can be widely used for drug testing.”

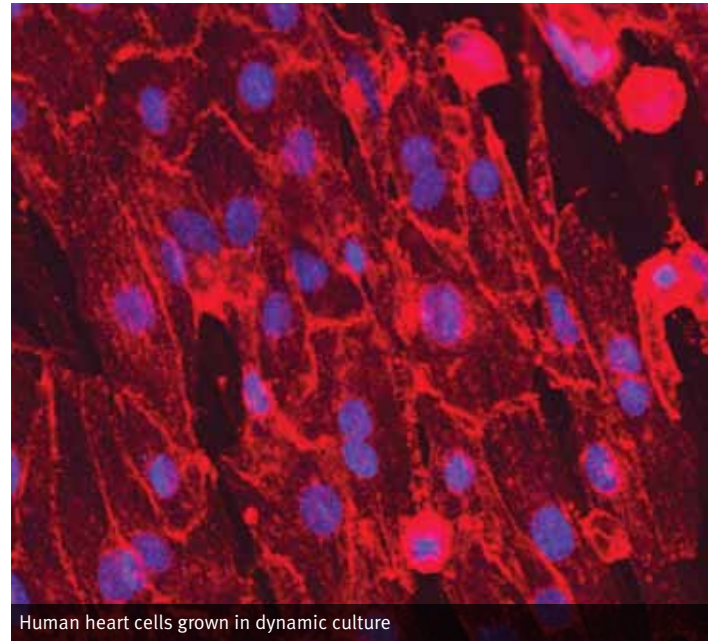
human cells, but in a petri dish the cells don't develop all of the features of heart cells in the body.

“These cells tend to be round and tend to be rather slow in their activity, simply because they're not challenged by their environment,” said Dr Terracciano. “The heart is a very dynamic organ which beats continuously and is subjected to very high pressures, and these are not present in culture.”

In collaboration with the Institute of Biomedical Engineering at Imperial and the University of Southampton, Dr Terracciano's team have developed new surfaces that encourage cells to grow into regular lines as they do in the heart. Their studies so far have shown that cells grown using their methods behave more like cells in the heart.

“If we're successful in developing a platform that can be widely used for drug testing, we will be able to reduce dramatically the number of animals used for research and avoid harmful effects that new drugs might have on patients,” said Dr Terracciano.

—SAM WONG, COMMUNICATIONS AND PUBLIC AFFAIRS



Human heart cells grown in dynamic culture



Another way

The study was boosted by a grant from the CRACK IT Challenges programme, run by the UK's National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs) in association with pharmaceutical companies. The scheme aims to support research teams to solve major challenges in drug discovery and development with the goal of reducing, refining and replacing the use of animals in research.



Spinal cord damage is currently irreparable

Research could pave way to spinal cord regrowth

A new discovery suggests it could one day be possible to chemically reprogram and repair damaged nerves after spinal cord injury or brain trauma.

Researchers from Imperial and the Hertie Institute-University of Tuebingen have identified a possible mechanism for re-growing damaged nerve fibres in the central nervous system (CNS). This damage is currently irreparable, often leaving those who suffer spinal cord injury, stroke or brain trauma with serious impairments like loss of sensation and permanent paralysis.

The research highlights the role of a protein called P300/CBP-associated factor (PCAF), which appears to be essential for the series of chemical and genetic events that allow nerves to regenerate.

When researchers injected PCAF into mice with damaged central nervous systems, this significantly increased the number of nerve fibres that grew back.

“The results suggest that we may be able to target specific chemical changes to enhance the growth of nerves after injury to the central nervous system,” said lead study author Professor Simone Di Giovanni (Medicine). “The ultimate goal could be to develop a pharmaceutical method to trigger the nerves to grow and repair and to see some level of recovery in patients.”

Professor Di Giovanni says the next step is to see whether they can bring about some form of recovery of movement and function in mice after stimulating nerve growth through the mechanism identified. If this is successful, then there could be a move towards developing a drug and running clinical trials with people.

“We hope that our new work could one day help people to recover feeling and movement, but there are many hurdles to overcome first,” he added.

—FRANCESCA DAVENPORT, COMMUNICATIONS AND PUBLIC AFFAIRS



Growth potential

If damage occurs in the peripheral nervous system (PNS), which controls areas outside of the brain and spinal cord, about 30% of the nerves grow back and there is often recovery of movement and function. The researchers were interested in understanding how axons in the PNS make a vigorous effort to grow back when they are damaged, whereas central nervous system axons mount little or no effort. Using cell cultures and mouse models they found that non-coding ‘epigenetic’ mechanisms were at the core of this capacity to regenerate – and that the protein PCAF plays a central role.



Quantum Dynamics CDT student Naomi Nickerson demonstrates a 'hold the cloud' experiment at the Imperial Festival. Outreach is a part of the training programme at the CDT.

A DIFFERENT DOCTORAL EXPERIENCE

A wave of new centres will train postgraduates to tackle big future challenges

“Scientists and engineers are vital to our economy and society. It is their talent and imagination, as well as their knowledge and skills, that inspire innovation and drive growth across a range of sectors.”

These were the words of Universities and Science Minister David Willetts in November last year, as he announced renewed funding from the Engineering and Physical Sciences Research Council (EPSRC) for Centres for Doctoral Training (CDTs) across 24 UK universities to train over 3,500 postgraduates.

The aim is to produce scientists, engineers and leaders equipped to take on big societal challenges. For the postgrads themselves, that means more than just toiling towards a PhD in relative isolation for three years. It means working alongside a tightly-knit cohort of peers and forging links with different departments, other universities and industrial partners. It also means students developing important transferrable skills – such as communication and outreach, team building, management and leadership.

With 12 CDTs, Imperial has more than any other institution (see box, opposite). Four of these centres have been running successfully for several years and their alumni are now having a real impact, putting into practice what they've learned.

Bridging disciplines

Since 2003 the Institute for Chemical Biology (ICB)-CDT has been operating at the interface between life sciences and physical sciences.

It takes a fresh approach to problems in biology, healthcare and agricultural sciences, developing new technologies and solutions from scratch – for example microfluidic chips for manufacturing artificial cells, new drug targets for parasite infection and techniques for studying single rare cells in isolation.

“There’s a growing need for innovation in this area and a new generation of multidisciplinary researchers who can drive that,” says Centre Director Dr Oscar Ces, adding: “We’ve been very successful in stimulating collaborations with industry and the clinic that have a real world impact.”

Over a decade on, the Centre now boasts a number of student-developed innovations that have attracted some £50 million in follow-on funding; a raft of publications in top journals; and an impressive retention rate of 85% of its alumni staying in science after graduating.

The Centre recruits physical science graduates – chemists, mathematicians, physicists, engineers – and brings them up to speed with core biology in an initial Master’s (MRes) year including a nine month research project. Students then continue their research into their three-year PhD projects under at least two supervisors, including a biologist and a physical scientist.

“I loved chemistry and particularly the practical side of things but I found it hard to relate what I was doing in the lab to the wider world,” says student Kerry O’Donnelly, who’s project focuses on improving crop yields by boosting photosynthesis. “The ICB offered a rare opportunity: I got to take chemistry and apply it in the biological sense to see a problem through to the end.”

The overall structure of the Centre allows for more research freedom than is usual for a traditional PhD – and students even get to manage some of their own funding in order to pay for lab consumables or travel to conferences for example.

“You can’t get away with just one supervisor telling you exactly what to do all the time; you very much have to take the initiative yourself,” says student James Clulow.

The students also go through an entrepreneurship training programme in partnership with the Business School and Imperial Innovations, which culminates in a Dragons’ Den style competition (CDT-Den) where students bid for £20,000 of real funding by pitching a proposal that exploits the commercial potential of their research.

Dr Ali Salehi-Reyhani, now a postdoc at Imperial, is a former CDT student and joint winner of the 2010 CDT-Den for his team’s handheld device that instantly analyses mixtures such as groundwater or blood. This is being commercialised through spinout company anywhereHPLC.

“By the time you’ve completed your PhD you have ownership of your research that’s akin to a postdoc in his second or third posting. You become quite mature,” Ali said.

“There’s a growing need for innovation in this area and a new generation of multidisciplinary researchers who can drive that.”

Free thinking

Another, quite different, Centre also now entering its second phase of funding is the Controlled Quantum Dynamics (CQD)-CDT.

Quantum mechanics is an enormously successful theory that describes with incredible accuracy the world at the very smallest scales. The really interesting thing about this area of science though, is that it seems to allow impossible things to happen – a single particle can be in two different places



Imperial's EPSRC Centres for Doctoral Training

The College offers 12 EPSRC Centres for Doctoral Training that bring together diverse areas of expertise to train engineers and scientists with the skills and knowledge to tackle future challenges.



Physical Sciences Innovation in Chemical Biology for Bioindustry and Healthcare, Dr Oscar Ces



High Performance Embedded & Distributed Systems, Professor Wayne Luk



Controlled Quantum Dynamics, Professor Myungshik Kim



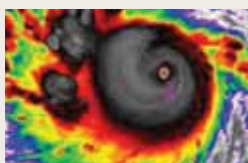
Quantitative Non-destructive evaluation, Professor Peter Crawley



Fluid Dynamics across Scales, Professor Christos Vassilicos



Advanced Characterisation of Materials, Dr David McPhail



Mathematics of Planet Earth (in partnership with the University of Reading), Professor Dan Crisan



Plastic Electronic Materials, Dr Paul Nicholas Stavrinou



Neurotechnology for Life and Health, Dr Simon Schultz



Sustainable Civil Engineering, Professor Christopher Cheeseman



Theory and Simulation of Materials (involving King's College London and University College London), Professor Peter Haynes



Nuclear Energy, Professor Bill Lee

at the same time and two different particles can communicate instantaneously with each other despite being light years apart. Attempting to control such phenomena is one key aim of the CQD-CDT and may eventually lead to the development of a host of transformative technologies, such as quantum computing; ultra-secure telecommunications; and high precision measurement.

While these technologies remain some way off, Professor Myungshik Kim, Director of the CQD-CDT, says that it's important to train the future scientists who might make these things a reality in the coming decades.

"I think the paradigm for technology development has changed: in the 20th century developers tested and experimented with products exhaustively in-house, then brought them to the market. Now prototypes are released much earlier, with the market helping to develop the final product. In a sense, our approach is similar. We certainly don't have all the answers, but we're advancing theory and application in tandem."

One notable recent alumnus of the CDT is Dr Matt Pusey, who gained his PhD this October. Whilst at Imperial, Matt wrote a paper in *Nature Physics* that caused quite a stir. It sought to refine the famous Schrödinger equation, which describes all the possible locations that a single particle can be located at any given time. The paper was picked up in blogs and websites all over the world, with one top US physicist commenting: "I don't like to sound hyperbolic, but I think the word 'seismic' is likely to apply to this paper."

Matt is now a post-doctoral researcher at the Perimeter Institute (PI) in Canada – a mecca for theoretical physicists pondering the really deep questions about reality. Matt says the freedom that the CDT encouraged set him up well for his burgeoning career.

"The fact that the money was attached to you rather than the individual project changed the dynamic and meant that you were more in control of your research. That's the same kind of environment I work in now at the PI, where I'm centrally funded, rather than being attached to a specific fellowship."

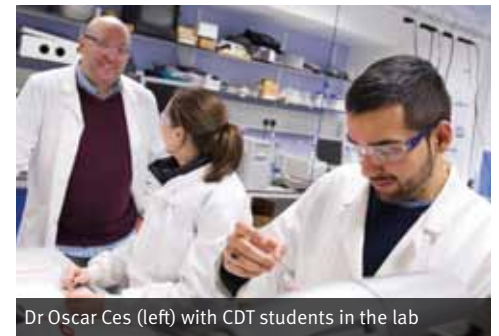
Director Myungshik is also keen to point out that CQD-CDT alumni who do not wish to pursue a career in the field are still well prepared. Because quantum mechanics challenges many of our most basic assumptions about the world we live in, it can instil in its practitioners true freedom of thought and a willingness to challenge orthodoxy. That's important in business,

politics and even art, Myungshik points out.

"You don't have to see things in absolute terms and that's a very valuable approach," he says.

Perfect fit

The strategic aims of the CDT programme match the College's own mission – championing world class research with an eye to applications in industry, commerce and healthcare. Which is why from October the Imperial CDT family will grow quite substantially.



Dr Oscar Ces (left) with CDT students in the lab

One of the eight new centres, the Neurotechnology for Health and Life-CDT, will look for novel ways to tackle brain-related illnesses that affect more than two billion people worldwide. Much like the Institute for Chemical Biology-CDT it will operate at

the interface between biology and physical sciences, to develop computational brain models, biosensors, brain-machine interfaces and neural prosthetics.

"In effect we've been planning for this for three or four years and we borrowed from the ICB's model because it works well and because like them we are very interdisciplinary," says Centre Director Dr Simon Schultz.

In common with the ICB, students will be brought up to speed with biology, specifically neuroscience, in the first year. "They're going to be doing a human brain dissection in their first week – as engineers; we're going to take them out of Kansas!" Simon adds.

There is also a course in the MRes year on the 'social and ethical implications of neurotechnology,' which will help to give the students a wider perspective on their research.

The long-term legacy of the CDT programme looks set to be a whole generation of very well-rounded science professionals ready for anything the world throws at them.

“They're going to be doing a human brain dissection in their first week – as engineers.”

GIVING BACK

Students explore not-for-profit careers



Selection of scenes from Rathlin Island and rural Ethiopia

For Imperial graduates, with their highly sought after analytical skills, there's often a two-way fork in the road when it comes to career choices – do I go into the public sector, in say research and consultancy services or the lucrative commercial world?

But there is a third option, so diverse and widespread it can be easily overlooked, that can make a great fit for some graduates.

The not-for-profit sector, which includes charities and voluntary organisations, employs around 2% of the UK's paid workforce (with another 3 million unpaid volunteers). In 2010 the sector's income was nearly £60billion.

Now Imperial students are being offered a unique opportunity to kick-start careers in the exciting 'third sector' with Charity Insights – an initiative from the College's Careers Service.

Open to continuing students, the scheme is designed to help undergraduate and PhD students gain skills and experience working in not for profits. Lasting up to four weeks (or a part-time equivalent), the internship can take place at any point over the summer break.

As part of the scheme, students are required to find their own placement and create a proposal for a graduate level project to complete during their time there. Once accepted onto the programme students will receive a bursary of £245 per week to support them during their internship as well as ongoing training and support from the Careers Service throughout the placement.

Ben Fernando and Emily Lehtonen were two of the students who took part in the scheme last year.

Ben, a second year physics student, was already involved in fundraising with Birmingham based international development charity LUCIA when he decided to apply to the Charity Insights scheme to support a placement with the charity.

During his four weeks at LUCIA, Ben was involved in a range of areas working on plans for new projects in rural Ethiopia. "I was responsible for looking at project briefs and developing proposals and funding grants to support the charity's work." The type of work Ben was doing gave him the chance to experience a different working environment to that of the physics lab back at Imperial. "The skills I gained in developing my project proposal were ones I wouldn't have necessarily developed studying physics. It was really interesting to experience working in such a different environment," he said.

Emily is in her final year studying zoology and spent three weeks last Easter working with the Royal Society for the Protection of Birds (RSPB) on Rathlin Island, six miles off the Northern Irish coast. She was inspired to work at the conservation organisation after hearing about the work they do at an ecology careers conference. "I was really keen to gain some experience in the different aspects of conservation the RSPB offered. In my placement I got the chance to work with local people, RSPB members as well as working with the conservation staff themselves," said Emily.

The Careers Service first piloted Charity Insights in 2012, with 15 students taking part. Due to its popularity and success the initiative will now take place every year.

Elsbeth Farrar, Director of the Careers Service, said: "We had tremendous success with last year's Charity Insights Bursary Scheme with a number of students taking part in a variety of challenging projects with a diverse range of charities. By focusing on opportunities in the charity sector, the scheme is an excellent opportunity for students to gain new skills and experience in a different working environment. We are looking forward to seeing what kind of exciting projects our students do in this year's scheme."

For both Emily and Ben, their Charity Insights experience has inspired them to continue working with their charities in the future. "I would definitely recommend it," said Ben. "Working with a small charity like LUCIA I got to see first-hand how they work to engage people on a local level. You can really easily see the impact they have and the work that has been done thanks to individual support." he added.

For Emily the opportunity has inspired her to stay involved with the RSPB and she is planning on taking part in another placement with them this Easter.

"In April I'm heading to Fairburn Ings Reserve in South Yorkshire. It's a wetlands reserve so I'm looking to experiencing a different environment to Rathlin Island and continuing to develop my conservation skills and knowledge."

—JON NARCROSS, COMMUNICATIONS AND PUBLIC AFFAIRS

Applications for this summer's Charity Insights programme are now open. To be eligible to apply you must be a current Imperial undergraduate or PhD student who will be continuing your studies at the College in the 2014–15 academic year. The deadline for applications to the scheme is 16 May at 12.00.

“I was really keen to gain some experience in the different aspects of conservation the RSPB offered.”

inside*

story

mini profile

Dr Laura Childs

Laura is undertaking an events internship and working on aspects of the Imperial Festival and Fringe programmes, with Communications and Public Affairs, whilst studying for the MSc in Science Communication at Imperial. She has a PhD in fluid dynamics from the University of Bristol, in which she explored the non-Newtonian behaviour of mud flows.



“I love getting some of this research out to a wider audience.”

science communication is the right choice for me. Seeing that the public do want to know about contemporary research, and that it can be communicated in such an engaging way, has definitely inspired me to take part in more events like the Fringe and Festival.

What is your hot tip for readers to see at the Imperial Festival?

The other interns and I will be talking about questioning perceptions of science, and showing the group projects we've been working on over the last term of the science communication course. I'm also excited to see 'chemistry of cocktails', the vascular-science-meets-knitting project 'blood lines', and a 16ft mechanical dragon!

—SIMON LEVEY, COMMUNICATIONS AND PUBLIC AFFAIRS

What makes you passionate about putting on science events?

During my PhD, I saw a lot of the amazing research that goes on at universities, but always thought it was sad that so few people outside of academia got to know about it. I love getting some of this research out to a wider audience, and seeing that they're interested too.

What's it like making the shift from PhD to science communicator?

Research can feel quite isolated, and it's often hard to take the time to appreciate the broader work that's going on outside your own research area. It's great to change the focus from actually doing research to thinking of inventive ways of presenting science and getting people excited about it.

Has the internship helped you decide what to do next? It's confirmed that a career in



Improbable awards reach operatic climax

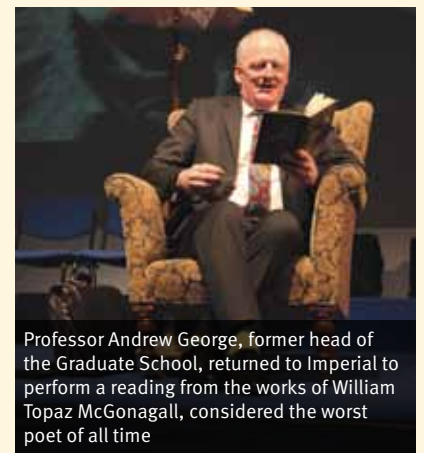
Aliyah Kovner, MSc student in Science Media Production, reviews the Ig Nobel Awards Show 2014 hosted in the Great Hall at Imperial.

Nothing remedies end-of-term stress at a research institution quite like the opportunity to laugh at the often overlooked absurdities in science itself. On 14 March, staff, students and members of the public got a glimpse into the elusive, silly side of STEM with the Ig Nobel Awards Show 2014. Hosted for the 9th year in a row at the College, the event included an overview of the year's winners and much more, including a medley of readings by a host of QI Elves, bad poetry, an unusual mathematics lecture, and the world premiere of a mini opera – complete with a classical quartet accompaniment and dancers.

The ideology of the Ig Nobel Awards, founded by the editor of *The Annals of Improbable Research* Marc Abrahams, is “to make you laugh, then make you think”, and they succeeded in doing just that.

Although the winning research was all carried out with serious intent by its authors, the Igs have a history of genuinely pleased, albeit surprised recipients. This is the case for 2003 Ig Nobel laureate Kees Moeliker, whose paper on an observation of very peculiar duck behaviour won the biology prize.

Moeliker presented the history of his research in the lead up to the evening's operatic finale: “The Homosexual Necrophiliac Duck Opera”, written by Daniel Gillingwater. The delightfully camp performance



Professor Andrew George, former head of the Graduate School, returned to Imperial to perform a reading from the works of William Topaz McGonagall, considered the worst poet of all time

used two dancers to symbolize the ducks, and the libretto was the exact words of Moeliker's paper. Judging by audience reaction, it was a hit.

Moeliker had no idea at the time that his observation would be making people laugh for years to come nor did he realize how much it would change his life. “People started to send me their observations of remarkable animal behaviour and now I'm kind of expert in that. So if something happens in nature, if an animal misbehaves or does something strange, I know about it,” said Moeliker.

With tickets running out in less than two weeks, it seems the Ig Nobel Tour will remain a much-anticipated event for years to come. Event organizer Rebecca McKone chalks the success up to the complementary philosophies of Imperial and the awards “something that might seem a bit unusual, a bit out of the ordinary at first, can actually spawn really great results,” McKone said after the show.

The underlying ambition of the show, to provoke curiosity on top of the amusement, was also quite a success. After all, thanks to hearing about the 2013 joint biology/astronomy prize, I absolutely had to look up dung beetles navigating using the Milky Way when I got home.

Student blogger Richard

Taking on a grandmaster

On most Tuesday and Thursday nights, I go to Room 307 in the Skempton building to play chess in the club.

Very soon we'll have our Mestel Challenge, in which one of our very own professors, Jonathan Mestel (chess grandmaster and winner of several international chess tournaments), will be playing all of the members who participate at once! Although the percent chance of any of us beating him is about the same as the number of people who will read this blog, it would still be worth it to say that one has played a game against a chess champion.



blog
SPOT



Educationalists from across the college were joined by keynote speaker, Dr Janet De Wilde, Head of STEM at the Higher Education Academy (HEA) Scotland

Learning curves

Staff and representatives from Imperial College Union came together last week to hear a range of speakers and discuss the key issue of academic transitions as part of this year's Education Day.

Introducing the annual event and welcoming guests, Professor Debra Humphris, Vice Provost (Education), said it was an opportunity for staff from across the College to come together to discuss key academic issues.

"This year's theme, academic transitions, lies at the heart of our Education and Student Strategy and supporting these transitions – for example between school and university – is an integral part of what we do here at Imperial."

Nat Kemptson, Deputy President (Education), and Andrew Keenan, Education and Welfare Manager from ICU, offered a range of student perspectives on transitions from school to university, and from undergraduate to postgraduate education across issues such as teaching styles, learning habits and academic freedom and flexibility.

Dr Julie King, Director of the new Centre for Academic English, discussed some of the challenges faced by international students including not only a new country and a new language, but mastering that language in an academic context and the role the Centre plays in supporting them in this.

The day ended with a panel discussion providing attendees with an opportunity to pose questions on the day's topic and share good practice from around the College.

—JON NARCROSS, COMMUNICATIONS AND PUBLIC AFFAIRS

Tackling trauma together

Involving patients in the process of medical research and giving them the chance to help shape future life-saving work was the laudable aim of a recent event put on by Imperial's Traumatic Brain Injury (TBI) research team.

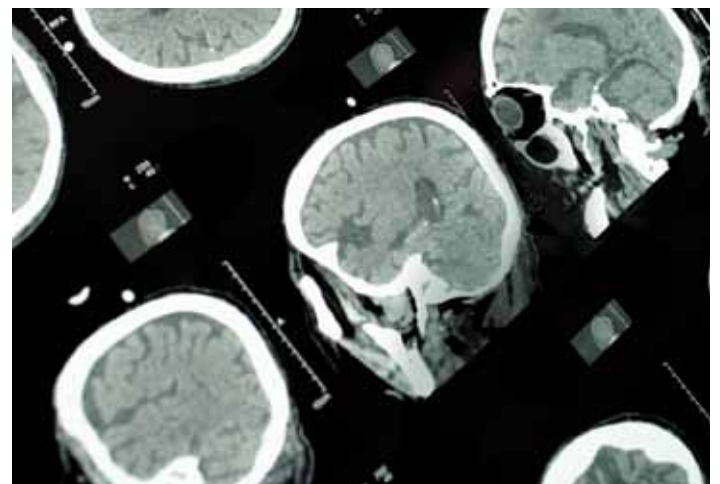
The informal event took place at the Burlington Danes Building at the Hammersmith Campus, and centred around a series of fascinating talks on topics such as hormone imbalances and inflammation after TBI, studies to improve thinking ability after TBI as well as brain stimulation as a treatment after injury.

Speaking at the event, David Sharp (Medicine), Professor of Neurology and honorary consultant neurologist, said:

"We aim to improve patients' and carers' understanding of what we do and actively involve them in the research process through steering groups linked to our research".

One of the most inspiring talks was given by Temoor Naeem, a junior doctor and former patient with TBI who shared his own experiences: "TBI can happen to any one of us," he said. "I blacked out and fell backwards 6 ft below. I was fortunate to receive treatment at the St. Mary's Major Trauma Centre. The specialists explained the care plan at my level of understanding and included me in discussions about my treatment options."

Mr Norman Keen, a founder member of Headway East London, a brain injury charity, and carer for his son who had suffered TBI, explained that the carer is often the support system of a patient with TBI and can



be their main supervisor as well as the recipient of their frustrations. He championed the services offered at Headway – which provides support, information and services to patients with a brain injury, their families, carers and professionals.

—SAM HIEW, FACULTY OF MEDICINE

“Traumatic brain injury can happen to any one of us.”



INVENTOR'S CORNER

Pump up the volume

Dr Ravi Vaidyanathan (Mechanical Engineering) is a Senior Lecturer in Bio-Mechatronics and is looking for ways to better monitor and measure the activity of patients undergoing physical rehabilitation.

Tell us about your invention?

My team began by looking for a simple way to gather continuous information on muscle activity. We developed what we now call a myographic muscle sensor, which detects the acoustic signature of muscles to measure their underlying activity. Essentially it's a small microphone and an echo chamber set up to detect the specific low frequency sound waves that muscles emit when contracting. The major challenge with the sensor is to filter out interfering frequencies, which we do using computer algorithms.

We've coupled this myographic sensor with an accelerometer and a gyroscope. This way we can get a complete view of the limb, how it moves, and what muscle activity correlates with those movements.

How does this compare with current technology?

Clinicians are only able to get a snapshot in time of how a patient moves using electromyograms – technology that can be traced back to the 17th century with the work of

Francesco Redi in electric eels. It is challenging outside of a lab environment, and sensors are usually only for one-time use. It isn't that convenient for the patient either – you typically need conductive gel for the electrodes, and sometimes you have to shave and clean the skin with alcohol.

We've produced a small, unobtrusive and reusable sensor that transfers information to a device, like a smartphone and then onto a database for review. This way, a patient can go about their day and, at the same time, give their therapist more accurate information on how they're moving. From there, a more effective therapy strategy can be developed.

What's next?

We'd like to refine the myographic muscle sensor a little more so we can hone in on specific muscles, measure if they're contracting or relaxing and by what degree. In terms of commercialisation, we've been in discussion with Imperial Innovations and they've been a great help in terms of navigating the intellectual property world. We're hoping to eventually create a spinout with this technology.

—DAVID BARRETO IAN, IMPERIAL INNOVATIONS

For help in finding a commercial application for your research visit: bit.ly/YQZ1Vi

Hack to the future

An application that helps dyslexics to read while wearing Google Glasses was just one of the ideas developed at a 'hack-a-thon' held this month.



This year's IC Hack event – organised by the Department of Computing Society and Business School – brought together students from across the College to develop applications for devices that could help solve everyday problems.

Developers had access to emerging technologies such as Google Glass, Pebble smart watches and Oculus Rift virtual reality headsets.

The 'hackathon', which ran for 24 hours, ended with teams presenting their ideas in front of a panel of judges, including Professor Eric Yeatman (Electrical and Electronic Engineering), David Slocombe, Vice President of Product at Race Yourself and Joe Charlesworth, Partner at Playfair Capital.

There were eight prize categories and winning teams shared a cash pot of £1200, devices such as the Tobii Rex as well the chance to pitch for investment from the venture capitalists on the judging panel.

The overall winner, with 'the idea most likely to change the world' was a team composed of Nandor Licker, Niklas Hambüchen and Daniel Simig (all Computing). They developed an app employing the Oculus Rift virtual reality headset and Microsoft Kinect that allows computer users to manipulate windows in 3D space.

"It tracks the position and the gestures of the user, so that they can walk around in the virtual space and use their hands to move the windows around – giving a complete virtual reality experience," said Daniel. He added that the app could be particularly useful for people like stock brokers and power plant managers who have to maintain long periods of concentration on multiple displays.

Other prize categories included 'best concept applicable in an e-learning environment', which went to an app using Google's Glass headset that could track a child's gaze whilst reading and provide assistance when they struggled with specific words.

—MAXINE MYERS, COMMUNICATIONS AND PUBLIC AFFAIR



The truth will out!

Imperial alumnus Dr James O'Shea (Chemistry, 1976) has built a lie detector device called the 'Silent Talker' that he believes could help to improve criminal investigations.

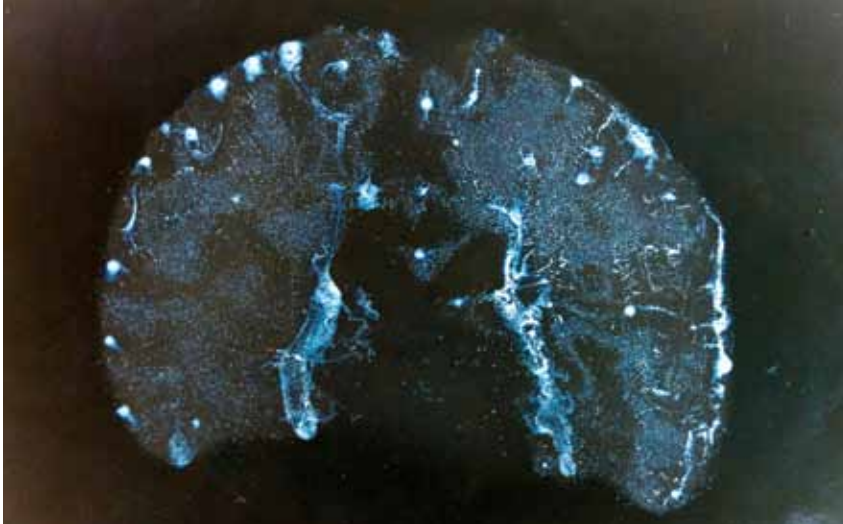
It consists of a digital video camera that is hooked up to a computer. It runs a series of

programs called artificial neural networks.

But how does it know when someone is lying? The inventors claim it's written all over your face.

The camera records the subject in an interview and the artificial brain identifies non-verbal 'micro-gestures' on people's faces. These are unconscious responses that Silent Talker picks up on to determine if the

interviewee is lying. Examples include signs of stress, mental strain and what psychologists call 'duping delight'. This refers to the unconscious flash of a smile at the pleasure and thrill of getting away with telling a lie. Dr O'Shea says these 'tells' are extremely fine-grained and exceedingly difficult for the interviewee to have any control over.



A cerebral showing

Transience, a collaborative exhibit between artist Susan Aldworth and Professor David Dexter (Medicine) opens in the Blyth Gallery this month. Aliyah Kovner reports.

David Dexter works with brains and understands all too well the visceral effect this crucial organ can have on members of the public.

“We used to do outreach at the Science Museum with children, and it’s probably at about 11 or 12 years that they develop this ‘eew’ factor about the brain that stays with them through to adulthood,” David says.

As a top Parkinson’s disease researcher and Scientific Director of the Parkinson’s UK Tissue Bank, David sees engagement as crucial. Neurodegenerative disease treatment cannot advance without pre-consent for post mortem tissue removal by both afflicted and healthy individuals.

Stemming from a desire to promote discussion, and from his own love of art, David joined the GV Art Gallery group called the Arts and Minds Movement. Several artists expressed a desire to see a brain dissection, and

from that a series of neural-inspired artistic endeavours were launched.

The works featured in *Transience* were created by Susan Aldworth, using both traditional etching techniques and digital photography. The former involved contacting brain slices directly with zinc plates, which were then put into acid baths to form etchings of each organ’s unique architecture. The photographs, meanwhile, were taken after the brain slices contacted paper and the patterns created by the moisture were captured before they dried out and disappeared – thus inspiring the title of the exhibit. After the pieces were made, David returned the specimens to the tissue bank, where they continued their role in medical research.

Before being displayed at Blyth Gallery, the pieces were shown at GV Art with David fielding a Q&A session.

“They’d come along to see the artwork primarily, but they were starting to ask about the tissue, who donates it, the donation procedure and if it’s something anyone can do. It does work at bridging the gap between the art and the science”.

Transience is open until 1 May 2014. Prints are for sale, and a portion of the proceedings go towards Parkinson’s Disease research.

**long
service**

Staff listed below celebrate anniversaries during the period 01 April – 30 April. The data is supplied by HR and is correct at the time of going to press.

20 years

- Sandie Bernor, Group Administrator, Physics

30 years

- Kay Neale, Registry Manager & Trans Research Co-ordinator, Surgery & Cancer
- Dr Iain Phillips, Senior Lecturer, Computing,

40 years

- Professor Peter Sever, Professor of Clinical Pharmacology & Therapeutics, National Heart & Lung Institute
- Miss Christine Gale, Customer Account Specialist, ICT

obituaries



GULJAR SINGH

Guljar Singh, a technician in the Research Divisional Workshop of the Mechanical Engineering Department, died unexpectedly on 21 February 2014, aged 42 years. His colleague and friend Ian Wright (Mechanical Engineering) pays tribute.

Guljar began his working career at Imperial in August 1990, as an apprentice training at several departmental workshops at the South Kensington Campus, before taking up a permanent position in Mechanical Engineering. It was there he spent the next 20 years, working with research staff and students on their various projects – always providing the best possible help and service that he could.

Guljar specialised in the design and manufacture of advanced components and experimental rigs for the thermofluids and applied mechanics research divisions, using his extensive skills in computer numerical control (CNC) machinery. He was also one of the Department’s Safety Officers, an important responsibility that he carried out with care and diligence.

Outside of work Guljar was proficient and skilled in martial arts, with a black belt in Karate. He was also one of the first practitioners at Imperial of the Filipino martial art ‘Eskrima’ and was on course to become an instructor.

Guljar will be sorely missed by all his colleagues, not only in the Department but across College, as he was such a cheerful person who would always go that extra mile to help someone.

He is survived by his wife and three young children.

Farewell

moving on

Dr Paolo Actis, Medicine
 Dr Cristobal Aguilar Gallardo, Chemical Engineering
 Mr Osman Ahmed, Public Health
 Professor Tim Aitman, Clinical Science
 Dr Ioannis Alexiou, Bioengineering
 Miss Olajumoke Arogundade, Faculty of Medicine Centre
 Mr Santosh Atanur, NHLI (5 years)
 Dr Stavros Athanasopoulos, Medicine
 Professor Denis Azzopardi, Clinical Science
 Mr Sarat Babu, Surgery & Cancer
 Dr Minas Bacharis, Physics
 Mr Yousif Bahoshy, Finance (18 years)
 Mr Guillermo Barinaga, Medicine
 Dr Alexandra Bazeos, Medicine
 Dr Daniel Bedingham, Physics
 Dr Adel Benlahrech, Medicine (7 years)
 Dr Wojciech Bialek, Life Sciences
 Ms Jennifer Biggs, Clinical Science
 Dr Jonny Blaker, Chemical Engineering (6 years)
 Mr Andrea Boccia, EEE
 Dr Alessandro Bolis, Aeronautics
 Ms Sonia Brownsett, Medicine (7 years)
 Dr James Buckley, NHLI
 Dr Jochem Caris, Surgery & Cancer
 Dr Katie Chapman, Surgery & Cancer
 Dr Sergio Coda, Medicine
 Mr Dalton Coker, Public Health
 Mr John Cooper, Faculty of Medicine Centre
 Miss Nicola Cursiter, NHLI
 Dr Katherine Cysz, Surgery & Cancer
 Miss Shreelata Datta, Surgery & Cancer
 Mr Nicola De Laurentis, Mechanical Engineering
 Mr Charles Dean, Chemical Engineering
 Mr Saeed Dehghanpoor Abyaneh, Civil and Environmental Engineering
 Miss Raquel Diniz, Library (5 years)
 Miss Natalia Do Couto Francisco, NHLI
 Mr Jimanta Dutta, NHLI
 Miss Catherine England, Public Health
 Dr Tariq Fellous, NHLI
 Miss Claire Fives, Medicine
 Dr Catherine Fletcher, Chemistry
 Dr Mark Fowell, Mechanical Engineering (5 years)
 Dr Joseph Franklin, Materials
 Dr Katharine Fraser, Bioengineering
 Mr Joseph Fryer, Public Health
 Dr Maria Gallina, Surgery & Cancer

Dr Rene Gaudoin, Public Health
 Mr Giorgio Geraci, Aeronautics
 Dr Christopher Green, Mathematics
 Dr Cristina Guallar Hoyas, Surgery & Cancer
 Dr Hannes Guhl, Physics
 Dr Krishma Halai, NHLI
 Mr Richard Halligan, Catering Services
 Dr Alison Hardy, Research Office
 Dr David Harris-Birtill, Surgery & Cancer
 Miss Alison Harrod, Surgery & Cancer
 Dr Christoph Hellmann, Materials
 Dr Henrik Hesse, Aeronautics
 Dr Stefan Holzer, Faculty of Medicine Centre
 Dr Frank Hughes, EEE
 Mr Asif Hussain, Bioengineering
 Mr Rozh Jalil, Surgery & Cancer
 Miss Claire Jones, College Headquarters
 Miss Siana Jones, NHLI (5 years)
 Dr Shiva Keihaninejad, Business School
 Mr Andre Keller, Mechanical Engineering
 Mrs Sarah Kelly, Surgery & Cancer
 Miss Skye Kelly-Barrett, NHLI
 Dr Kiang Kho, Physics
 Miss Sana Kidwai, Faculty of Medicine Centre
 Dr James Kinsey-Jones, Medicine
 Professor Ralph Knoell, NHLI
 Miss Helena Kopecka, Registry (5 years)
 Dr Sacheen Kumar, Surgery & Cancer
 Dr Elise Laird, Faculty of Natural Sciences (7 years)
 Dr Anders Lervik, Chemistry
 Dr Korina Li, Medicine
 Dr Cong Liu, Chemical Engineering
 Mr Stephen Logan, Physics
 Dr Nicolas Lorient, Computing
 Ms Dayna Lynch, Finance
 Dr Johann Malawana, Surgery & Cancer
 Miss Stephanie Marchese, Surgery & Cancer
 Dr Stephen Marley, Medicine (19 years)
 Dr Ruth Martinez Casado, Chemistry
 Dr Stephen McAdoo, Medicine
 Dr John McDaid, Medicine (11 years)
 Miss Daniella McManamon, Estates Division
 Dr Eve Miguel, Public Health
 Mrs Vesela Mills, Accommodation
 Dr Miriam Miranda Fernandez, Materials
 Ms Karen Mortell, Faculty of Medicine Centre
 Dr Jaita Mukherjee, Faculty of Medicine Centre
 Ms Kay Neale, Surgery & Cancer (6 years)
 Mr Bang Nong, Faculty of Medicine Centre
 Miss Marinda Oosthuizen, Public Health

Im Kampe Otte, Public Health
 Dr Giuseppe Pasqualetti, Medicine
 Dr Pit Pillatsch, EEE
 Dr Elena Pizzo, Business School
 Dr Simon Read, Bioengineering
 Miss Eleanor Reast, Centre for Environmental Policy
 Mr Khalil Rhazaoui, Faculty of Engineering
 Dr Carmen Rodriguez Maldonado, Chemistry
 Dr Thomas Sanctuary, NHLI
 Dr Stephan Schmidt, Aeronautics
 Mr Mark Scott, Life Sciences
 Dr Umang Shah, Chemical Engineering
 Miss Helen Sigoura, Faculty of Medicine Centre (13 years)
 Dr Sarah Skoff, Physics
 Mrs Rebecca Sleaf-Ireland, Development
 Dr Antonia Solomon, NHLI
 Mr Jayesh Soobhujhun, Catering Services
 Dr Kumuthan Sriskandarajah, Surgery & Cancer
 Mrs Margaret Stevens, Surgery & Cancer (6 years)
 Dr Ruth Tarzi, Medicine (9 years)
 Dr Samuel Taub, Materials
 Ms Ilana Taub, Centre for Environmental Policy
 Mr Andres Tello Gracia, Finance (6 years)
 Ms Sini Timonen, Surgery & Cancer
 Dr Antonio Tralbalza, Medicine
 Ms Tara Vernhes, Centre for Environmental Policy
 Miss Sarah Waechter, Faculty of Natural Sciences
 Dr Rachel Walls, HR
 Dr Ling Weng, Medicine (10 years)
 Dr Alexander White, Mathematics
 Mr Alex Whitworth, Estates Division
 Dr James Wilgeroth, Physics
 Dr Matthias Willbold, ESE
 Miss Sian Williams, The Grantham Institute
 Dr Steven Wolf, Centre for Environmental Policy
 Dr Ling Wong, Chemical Engineering
 Ms Gwen Young, Surgery & Cancer (13 years)
 Ms Fahriya Zandari, NHLI
 Dr Ze Zhang, EEE

This data is supplied by HR and covers staff leaving the College during the period 25 Feb – 7 April. This data was correct at the time of going to press. For Moving In, visit the online supplement at www.imperial.ac.uk/reporter

✉ Please send your images and/or comments about new starters, leavers and retirees to the Editor at reporter@imperial.ac.uk

The Editor reserves the right to edit or amend these as necessary.

IMPERIAL FESTIVAL

★ FRI 9 – SAT 10 MAY ✦ FREE + OPEN TO THE PUBLIC ★

Explore the unexpected side of science

With demonstrations, talks, music, dance and more, don't miss the chance to explore Imperial's ground breaking research at the third Imperial Festival. Materials, microbes, maths and medicine; explore Imperial's ground-breaking research with a packed schedule of activities, talks and performances for all ages.

This event is free and open to all, so bring your colleagues, families and friends to take part in hands-on science demonstrations, peek behind the scenes of Imperial's most exciting labs, and enjoy music, dance and comedy.



ImperialFestival #impfest

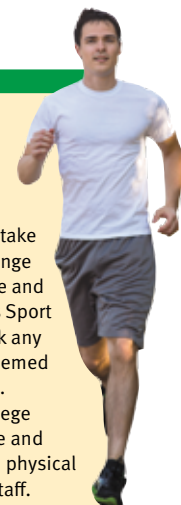
www.imperial.ac.uk/festival

take note

Race 5K ... in any way!

Staff and students are invited to take part in the 'One Big Thing' challenge on 16 May, organised by UKactive and British Universities and Colleges Sport (BUCS). The Hyde Park race is '5k any way' – it could be fancy-dress themed runs, walking, jogging or cycling. The event is part of Imperial College Union's 'Stress Less' programme and will be held annually to promote physical activity amongst students and staff.

For more info visit: bit.ly/1k2sUKb sending entries to h.blanford@imperial.ac.uk



MEET THE READER



Stefan Piatek, (NHLI) Research Postgraduate and Imperial Bike User Group Representative

What are you doing in the picture?
I'm having a delightful read at a whole day cycle event, which I helped organise as a part of my role in the Bike Users Group, which has been set up to make cycling better for anyone who cycles to and around Imperial (staff, students and visitors). Visit union.ic.ac.uk/bike to find out more.

What would you do if you were editor of Reporter for a day?
I think I would try to do a section on bike repair; we've set up a bike workshop on campus which is free for anyone to use, and dedicated workshop times but I think a set of easy instructions would help a lot.

Who would be your cover star?
I'd like to suggest Geraldine Coy and all those in security involved in the bike auction. They really help us out a lot in marking and removing bikes which are then sold on for charity and to improve cycling at Imperial. In fact bikes have been labelled this week and will be auctioned on 13 May.

Want to be the next reader featured in Reporter? Send in a picture of yourself to: reporter@imperial.ac.uk



30 APRIL ▶ PUBLIC TALK

Should you believe anything you see and interact with online?

Cyberspace powers our technology, our infrastructure and increasingly influences our lives. However, the more that society relies on online interactions, the more we need to be aware of potential security issues such as

making our private data public. In his inaugural lecture, Professor Michael Huth (Computing) discusses how advances in automated reasoning are helping establish how we can trust that our online interactions are safe.

Interact with Imperial events online and Tweet along with @ImperialSpark using the hashtag #onlinesafety

21 APRIL ▶ CONFERENCE

Imagining the future of medicine

The Royal Albert Hall hosts a celebration of future medicine and healthcare, with comedian Dara Ó Briain and guests including TEDMED curator Jay Walker and Imperial researchers Professor Chris Toumazou (Bioengineering) and Mr Mark Wilson (Surgery & Cancer).

28 APRIL ▶ SEMINAR

Using genomic data to understand bacterial evolution

Dr Angela Brueggemann, University of Oxford, delivers a seminar about the evolution of Streptococcus pneumonia, which causes pneumonia and meningitis worldwide.

30 APRIL ▶ SEMINAR

Science, surgery, sports and rehabilitation

Seminar for surgeons, engineers, physiotherapists and scientists covering this interdisciplinary research area, chaired by Professor Molly Stevens (Bioengineering).

2 MAY ▶ SOCIAL

The Bigger Bang Reloaded

Graduate School's annual live chemistry show with experiments performed by Hal Sosabowski, University of Brighton, who appears on BBC television programmes Ministry of Mayhem and Rocket Science.

Stay in the loop

✉ Visit www.imperial.ac.uk/events for more details about these events and others. To sign up for regular updates about Imperial events please email: events@imperial.ac.uk

