



# Smart living

The Energy Futures Lab's vision for more efficient shops, cars and communities  **CENTRE PAGES**



**WORLDS COLLIDE**  
Scientist turned  
MBA student Dr  
Peter Varnai on  
changing tack  
PAGE 10



**SUPERMASSIVE**  
The incredible  
force that  
holds galaxies  
together  
PAGE 11



**AFRICAN  
OUTREACH**  
Postgrads  
taking practical  
science to  
Ghana  
PAGE 12



## EDITOR'S CORNER

## Yes, we can!

President Barack Obama put **climate change centre stage** in his recent inauguration speech and State of the Union address. Echoing the words of his chief science advisor Dr John Holdren, who addressed the College last December, he spoke of the threat of **more extreme weather patterns** if we do nothing. But there was also a positive note – that “we can make meaningful progress on this issue while driving strong economic growth”. That’s exactly what the Energy Futures Laboratory (EFL) has been doing since it was established in 2005. It works towards the ultimate goal of achieving a **secure and sustainable energy supply** for the future by funding research across the College grounded in sound economic policy. In this issue of *Reporter* we explore three areas where the EFL is delivering practical and feasible solutions to save energy: the supermarkets where we buy our food, the cars we use to get around and the communities we live in (page 8). **Change is coming** faster than you think.

ANDREW CZYZEWSKI, ACTING EDITOR

*Reporter* is published every three weeks during term time in print and online. The next publication day is 21 March. Contact Andrew Czyzewski: [reporter@imperial.ac.uk](mailto:reporter@imperial.ac.uk)

## New student halls set for W3

Plans to develop a new undergraduate hall of residence in North Acton – named W3 after the area’s postcode – have been announced.

The College Council has agreed plans to purchase and develop the new halls, with work expected to start in May this year and completion scheduled for summer 2015.

The new development will provide 724 additional *en suite* bed spaces, assisting the College to meet its target of guaranteeing accommodation for every first year student in the future. Other devel-

opments include the renovation and expansion of Wilson House in Paddington, due to reopen in September 2013 with 393 bed spaces, up from 273.

Plans for W3 include a student lounge and coffee shop, restaurant and bar, gymnasium, newsagent and print shop, cinema room and study centre. The travel time by tube to the South Kensington Campus is around 30 minutes and to Imperial

West around 10 minutes.

Chief Operations Officer, Simon Harding-Roots, said: “This development presents a great opportunity to provide a large portion of the College’s accommodation requirement, delivering excellent value for money and affordable rents for our students. It is one element in our ongoing strategy, to ensure a range of accommodation options catering for the different budgets and preferences of students.”

“The quality and design of this development will be outstanding”

## Outstanding medical leaders recognised

Two esteemed medics have been awarded Fellowships by the Faculty of Medicine in recognition of outstanding achievements in clinical medicine, academic leadership and medical technology.



Professor Patrick Maxwell, Regius Professor of Physics and Head of the School of Clinical Medicine at the University of Cambridge, and Professor Freddy Boey, Deputy President and Provost of Nanyang Technological University (NTU) in Singapore, were awarded the Fellowships by Professor Dermot Kelleher, Principal of the Faculty of Medicine, at an event on 12 February.

At the ceremony, Professor Boey delivered a guest lecture, offering insights into how NTU, a relatively young university, has achieved academic and research excellence, highlighting the university’s collaboration with Imperial to establish the Lee Kong Chian School of Medicine. He also reflected on his own research interests, which are

focused on developing novel medical devices and biomaterials.

Professor Kelleher thanked Professor Boey (pictured left) adding: “LKCMedicine is not only a once in a lifetime opportunity to create a new medical school, but also offers the chance to build a strong and sustainable partnership between two world class universities.”

Professor Maxwell (pictured right) has authored over 200 research papers, making a series of important discoveries in the control of genes by oxygen. He has won a number of accolades for his work, including the Royal College of Physicians Goulstonian Lectureship in 2001 and the Renal Association’s Martin Lockwood Award in 2000, and currently holds a prestigious Wellcome Trust Senior Investigator award.

—LUCY HANDFORD, COMMUNICATIONS AND DEVELOPMENT

IMPERIAL COLLEGE IMPERIAL MEDICALS

★★★★★

“AN EXPLOSIVE CLASH, THRILLING ENTERTAINMENT AND REAL EDGE-OF-YOUR-SEAT ACTION!”

**VARSITY VENGEANCE**  
13.03.13

**LUCKY FOR WHO?**

**GET YOUR TICKETS ONLINE AT:**  
[WWW.IMPERIAL.AC.UK/SPORTS/VARSITY](http://WWW.IMPERIAL.AC.UK/SPORTS/VARSITY)  
f /SPORTIMPERIAL

JPR WILLIAMS CUP RUGBY MATCH KICK OFF 19.30  
AT THE STOOP STADIUM, TWICKENHAM

Imperial College London imperial college union sportImperial

# Rare Regius for Engineering

The College has been awarded a prestigious Regius professorship, recognising the highest standard of research and teaching in the Faculty of Engineering.

Announced on 29 January, the honour was granted by the Queen as part of her 60th anniversary celebrations. Eleven other universities in the UK also received the rare privilege of using the Regius title, awarded only twice in the past century.

The title, which does not come with any funding, recognises the work of the Faculty of Engineering and its many technological breakthroughs, such as the invention of holography (see Awards and Honours, page 5).

Imperial will confer the title of Regius Professor on Professor Chris Toumazou (Electrical and Electronic Engineering). Among his many achievements, Professor Toumazou developed one of the world's first cochlear implants to enable deaf people to hear. He has also created a digital plaster, which can monitor a patient's vital signs remotely and a handheld device that can analyse DNA to determine if a patient is allergic to specific types of medication.

Sir Keith O'Nions, President & Rector, said: "This honour is a tribute to our academics – the backbone of



Imperial will confer the Regius Professorship on Professor Chris Toumazou (Electrical and Electronic Engineering).

Imperial – and their world-leading research that has helped and will continue to help to improve our lives."

When universities were invited to apply, six new Regius Professorships had been planned. However, the 12 winning submissions were judged by the panel to have been of exceptionally high quality and Ministers and the Queen agreed that 12 professorships should be awarded.

David Willetts, Minister for Universities and Science, stated: "I was incredibly impressed by the quality and range of the applications received and I am delighted that 12 new Regius professorships are to be created."

## New centre to tackle diseases that affect billions

Imperial is to be a partner in an innovative new research collaboration that aims to control, and in some cases eliminate, neglected tropical diseases by 2020.

The London Centre for Neglected Tropical Disease (NTD) Research – a partnership between Imperial, the London School of Hygiene and Tropical Medicine and the Natural History Museum – was announced at an event held on 30 January.

It builds on an earlier commitment by pharmaceutical companies and development organisations to combat neglected tropical diseases which affect the lives of over two billion people across the globe.

The Centre will investigate the control, mapping and diagnosis of four of the most common NTD infections – hookworms, roundworms, whipworms (collectively known as soil-transmitted helminths) and schistosomiasis.

Core funding will come from the Bill and Melinda Gates Foundation and GlaxoSmithKline, and the centre will, in turn, support the work of organisations including Sightsavers and the International Trachoma Initiative.

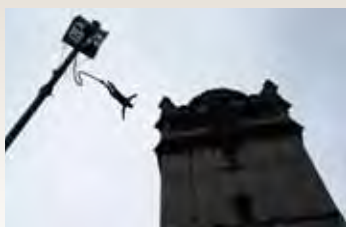
The Centre's Director, Professor Sir Roy Anderson (Public Health), said: "The considerable amount of support and donations which have been made to control and eliminate NTDs have thrown up a number of important research questions which need to be answered if we are to meet the 2020 target. The Centre's mission is to answer these key questions, thereby helping to ensure that investments are used in the most effective way and will have the maximum positive impact."

As well as building the research evidence base, the Centre will provide technical advice and support to countries looking to develop and implement their own government-led control programmes. This expertise will be provided by the Partnership for Child Development and the Schistosomiasis Control Initiative, both based at the College.

—FRANCIS PEEL, SCHOOL OF PUBLIC HEALTH



### in brief



and staff bravely bungee jumping from a crane on the Queen's Lawn (see page 13). That was followed by other RAG activities at the College including a bake sale, musical acts on the Queen's Lawn, a masquerade ball, a cinema night and 'cartoon collect' – where teams dressed as their favourite cartoon characters in a challenge to collect donations. Money raised will go to international development charity Concern Universal, Breast Cancer Campaign and Richard House, a children's hospice in Newham.

### New heights

RAG Week at Imperial got off to a flying start on Monday 11 February with students

### Earth League meets

Imperial welcomed the inaugural meeting of Earth League, a voluntary alliance of scientists addressing earth science and sustainability challenges, on 7 February. This international group of prominent scientists from world class research institutions will work together to respond to some of the most pressing issues faced by humankind, as a consequence of climate change, depletion of natural resources, land degradation and water scarcity.

### Flu research resumes

Research into artificial strains of H5N1 influenza or 'bird flu' will resume after being put on hold in January 2012 for a year over worries about safety. Professor Wendy Barclay (Medicine) is a signatory of a letter to *Nature* announcing the resumption and explaining why such research is in the public interest.

“We really are made of dust, everything that we see around us has been inside a star – dust and gas are the components of everything.”

VISITING RESEARCHER DR BRIAN MAY (PHYSICS) AND LEAD GUITARIST OF THE BAND QUEEN WHO HAS RECENTLY CO-AUTHORED A PAPER BASED ON HIS PHD RESEARCH (SEE PAGE 6).



## Car sharing scheme launched

A new car sharing scheme will launch next month giving staff and students at the College access to pay-as-you-go, low emission vehicles parked on South Kensington Campus.

Imperial College Car Club has been established in conjunction with Hertz On Demand as part of the College's ongoing commitment to lower its carbon footprint.

"It should reduce our reliance on taxis and personal vehicles used for business trips between campuses, thereby lowering emissions," said Kevin Cope, Head of Building Operations (Facilities and Property Management).

"Membership is free and will also be available to staff and students, including our 300 clubs and societies, for private use outside working hours, providing a convenient and

cost-effective alternative to traditional car use," he added.

Initially, there will be three vehicles available – two fuel-efficient Alfa Romeo MiTo petrol cars and an all-electric Mitsubishi i-MiEV (pictured above).

Hourly rates are £4.50 per hour for the electric vehicle and £7.50 for the petrol cars, with a 20 per cent reduction for staff when travelling for business purposes.

Cars can be booked online or over the phone up to six months in advance or immediately, if available, and are accessed using wireless radio frequency identification key fobs, issued to members when they enrol.

—SAM TRACEY, FOR COMMUNICATIONS AND DEVELOPMENT

To register for membership visit: [www.hertzdemand.co.uk](http://www.hertzdemand.co.uk) quoting promotion code 1102

## Imperial-Tsinghua workshop tackles healthcare challenges



Research group leaders from Tsinghua University in China and their College counterparts came together at Imperial at the end of January to identify tools and technologies to tackle current healthcare challenges.

The Imperial-Tsinghua Translational Molecular Research Workshop ran for three days from 21–24 January during which 30 researchers – 15 from each university – shared aspects of their work with one another.

"This multidisciplinary workshop is an example of our commitment to forging strong and effective scientific links with the wider world in general and with Tsinghua University in particular," said

workshop attendee Dr Wing-Chau Tung (Chemistry), Project Manager at the Institute of Chemical Biology.

Over the course of the workshop the researchers identified current healthcare challenges in the UK and China and potential technological solutions with which to tackle them, based on research at their respective universities. They also discussed potential collaborations that might accelerate the translation process.

"By bringing together the research portfolios of both institutions in this way, we multiply the opportunities for further development of our world class research," added Dr Tung.

The workshop was funded by the Engineering and Physical Sciences Research Council's international research collaborations funding scheme, and a return visit to Tsinghua University for the Imperial academics is currently being organised.

## Indian alumni spearhead new scholarship foundation

Indian alumni have joined forces with the College to launch a programme of new PhD scholarships for Indian postgraduates.

The College and its Indian supporters association, the Imperial College India Foundation, established the scholarships in January during the President & Rector's visit to India.

The scholarships are aimed at academically outstanding Indian students who have not already

completed a degree at a higher education institution outside India, and will focus on supporting those in financial need.

For entry in 2013, the College invites applications for study in the Faculty of Engineering and Business School.

President & Rector, Sir Keith O'Nions, said: "Imperial is proud to have an association with India and Indian higher education institutions which goes back many

decades. The generosity of our Indian alumni, in supporting gifted postgraduates through these new scholarships, helps us build on this for the future."

Imperial alumnus Cyrus Mistry, Chairman of Tata Sons, who also sits on the board of the Imperial College India Foundation, said:

"Talented leaders in science, technology and business will have an essential role to play in India's future. As Imperial College alumni,

we are delighted we can support some of these future leaders by giving them the opportunity to study at our *alma mater* and benefit from the same educational experience and opportunities we enjoyed."

—JOHN-PAUL JONES, COMMUNICATIONS AND DEVELOPMENT

The deadline for scholarship applications is 29 March 2013 and more information is available at: <http://bit.ly/TAe82o>

# media mentions

—COLIN SMITH, COMMUNICATIONS AND DEVELOPMENT



✉ **JOIN OUR MAILING LIST**  
for regular news alerts: [www.imperial.ac.uk/media/jointsignup](http://www.imperial.ac.uk/media/jointsignup)

## High speed to recovery?

THE GUARDIAN ▶ 29.01.2013



With the government announcing the route for the next generation of high speed rail (HS2), we are now in a good position

to debate the £26 billion scheme, says transport expert Emeritus Professor Stephen Glaister (Civil and Environmental Engineering). Writing in *The Guardian*, he questioned whether this investment will be money well spent. “The nation needs more infrastructure – in particular transport infrastructure – to meet the needs of a rapidly growing population and economic recovery,” Professor Glaister said. “We must spend the desperately limited public funds on those projects with the best return. While HS2 may score highly in terms of political and personal legacy, it will not help the tens of millions of ordinary travellers for whom it is an irrelevance.”

## Rust: an unlikely super material

NEW SCIENTIST ▶ 29.01.2013

Humble flakes of rust might be the answer to one of the most intractable problems plaguing solar power – the night, reported *New Scientist*. Rust or iron oxide is non-toxic, dirt cheap and abundant, and can be used to store excess energy through its ability to split water and create hydrogen fuel. Other resources, currently used in solar panel technology, such as rare earth metals, aren’t just expensive and toxic but also difficult to obtain. That is not a problem for iron oxide. “Nobody controls rust,” commented Dr Klaus Hellgardt (Chemical Engineering).

## The key to business success

REUTERS ▶ 21.01.2013

British employees care passionately about business success but lack the support to achieve it, according to a recent report. “Motivated and engaged employees are at the heart of business success, and there’s no time when this is more true than in tough economic conditions,” commented Professor Nelson Phillips (Business School) to *Reuters*. “Yet, it’s just at this moment that employee motivation and engagement drops as their employers lack the resources to support and reward them, while constant cost-cutting and pressure undermines morale and enthusiasm,” he added. “The key to turning things

around is to focus on improving and developing working practices and efficient communication.”

## Houdini virus hoodwinked

NEW SCIENTIST ▶ 15.01.2013

Scientists may have found a way to block the ‘Houdini’ of the virus world from its means of escape, which could lead to new treatments. Herpes – the family of viruses that includes strains that cause genital warts, glandular fever and, in some cases, blindness and birth defects – is able to wriggle free of the body’s defences, reactivating after lying dormant for long periods. Scientists have developed a drug that inhibits the enzymes the virus uses to free itself – stopping it from escaping. “It’s neat that they got such a potent effect,” commented Dr Robert White (Medicine) in *New Scientist*, but he added that more work is needed to investigate possible side-effects.

## awards and honours

### OUTREACH Star mentor



Dr Annalisa Alexander (Outreach) has received a Star Award from the

Brightside Trust for 10 years of commitment to outreach and mentoring at a ceremony in London on 17 January. Several other College mentors and mentees were also nominated and shortlisted. The Brightside Trust

is an education charity that connects people from disadvantaged backgrounds with online mentors who can help them develop skills and confidence, and explore their further and higher education and employment options.

### ENGINEERING AND NATURAL SCIENCES Trio of Wolfson awards

Professors James Moore (Bioengineering) and Darren Crowdy (Mathematics) and Dr Abhijeet Ghosh (Computing) have won prestigious Wolfson Research Merit Awards. The awards recognised 25 scientists of outstanding achievement and potential based at universities in the UK, and are jointly funded by the Wolfson Foundation and the Department for Business, Innovation and Skills.



Dennis Gabor and his cathode ray oscillograph in Berlin, 1927.

### ENGINEERING Holography invention recognised by IEEE

A prestigious Institute of Electrical and Electronics Engineers (IEEE) ‘milestone plaque’ will be installed at the College to commemorate the invention of holography by Professor Dennis Gabor. The plaque will be positioned outside the

Electrical Engineering Building and a dedication event is being organised by the Department and the IEEE to coincide with the College’s annual Gabor Lecture.

### ENGINEERING Siemens medal for student

Undergraduate student Salil Gokhale (Electrical and Electronic Engineering) has been awarded the Sir William Siemens Medal. The medal is given by the global engineering firm Siemens to first year students who have achieved exceptional exam results, performed well in projects and presentations and shown vision in a set essay on technology trends. Salil will also embark on a paid internship with the company.



## Lunar library could unlock origins of life

Understanding how life evolved in our solar system will be the focus of new research at Imperial, which will examine the chemistry of meteorites that have crashed into the Moon's surface.

Working in collaboration with Birkbeck, University of London and UCL, the aim is to understand in more detail the organic chemistry inside rock fragments on the Moon, which are like a 'lunar library' of geological information spanning billions of years.

Professor Mark Sephton (Earth Science and Engineering) said: "We think meteorites created massive blows on the surface of planets, ejecting rocks that spurted back out into space, eventually crashing into other planets and moons, and delivering organic ingredients that may have been taking part in the creation of life. By studying the Moon, which may contain an almost pristine record of the events, we hope to learn more about this process."

"We think meteorites created massive blows on the surface of planets"

The first phase of the project will take place in the organic geochemistry lab at South Kensington Campus. Here, researchers will place organic compounds in similar mineral mixtures as found on the Moon during the Apollo missions, and expose them to heat and radiation, to see what types of moon rocks are the most protective.

In the next stage, they will analyse meteorites from the Moon that have landed on Earth and subject them to the same laboratory experiments.

Ultimately, the team hopes to provide evidence to support future unmanned missions to the Moon to investigate meteorites that are likely to contain this organic chemistry.

Professor Sephton added: "It is quite ironic that such a cold and lifeless world may contain valuable information that could help us understand how life took root in our solar system. There is so much of the Moon and its contents that have yet to be explored."

—COLIN SMITH, COMMUNICATIONS AND DEVELOPMENT

## Shedding light on zodiac dust

A new study has accurately determined the source of the zodiac dust which is responsible for the phenomenon of the zodiacal light or 'false dawn' that has intrigued scientists and thinkers since the Middle Ages.

The work is by Emeritus Professor Michael Rowan-Robinson (Physics), formerly head of the Astrophysics Group, and Visiting Researcher Dr Brian May (Physics), who in 2007 completed the PhD he abandoned to become Queen's lead guitarist.

They conclude that 70 per cent of the dust that is found between the Sun and Mars comes from comets, 22 per cent from asteroids, and around seven and a half per cent from outside the solar system – dust from interstellar space.

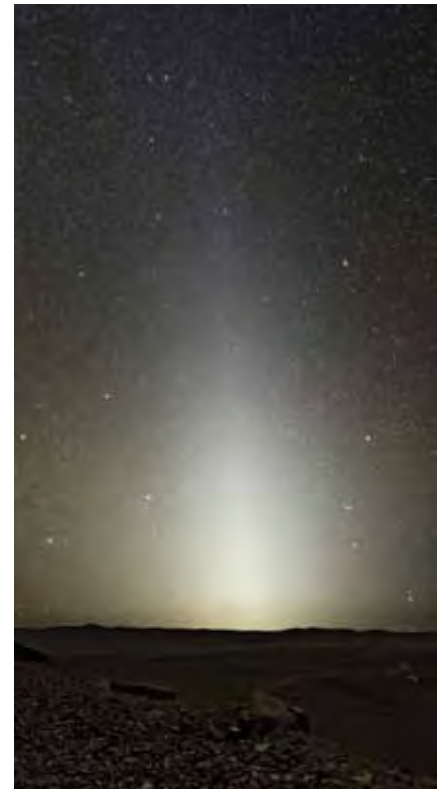
The zodiacal dust cloud, asteroid belt and cometary cloud make up the Sun's debris disk. Similar debris disks have been observed around many nearby stars. Understanding the composition of the zodiacal dust will contribute to a better picture of how the Sun's debris disk evolves with time.

"Despite the higher proportion of interstellar material that we have estimated arriving at the inner solar system, we think only around one per cent of the zodiacal dust arriving at the Earth would be from an interstellar source," concluded Professor Rowan-Robinson. "These particles would then mostly burn up in the Earth's atmosphere, but it's nice to think a tiny fraction of the dust we sweep up from our floors might come from interstellar space."

“It's nice to think a tiny fraction of the dust we sweep up from our floors might come from interstellar space”

The work is an extension of Dr May's PhD research, which was supervised by Professor Rowan-Robinson. In his blog in December 2012, when the research was accepted for publication, Dr May wrote: "It's something close to my heart, because I wanted to publish this part of the research in the 1970s but was dissuaded."

—MIKE JONES, COMMUNICATIONS AND DEVELOPMENT



### Why do we see a false dawn?

Zodiac dust comprises tiny particles that have fallen from the trail of a comet, broken off from a collision between asteroids, or travelled from beyond our solar system. They reflect light from the Sun creating zodiacal light, visible from dark clear sites after dusk or before sunrise as a faint glow along the zodiac – the path along which the Sun orbits the Milky Way (every 226 million years or so). Eventually most of the dust is destroyed as it is falls into the Sun, but the constant creation of new dust from the three sources replenishes it.

## Tourist snaps could aid whale shark conservation

Holidaymakers' photos could help scientists track the movements of giant endangered whale sharks living in the waters of the Indian Ocean.

A new study, led by postgraduate research student Tim Davies (Ecology and Evolution), is the first to show that these publicly sourced photographs are suitable for use in conservation work.

Tourists who scuba dive and snorkel in the Maldives frequently take underwater pictures of the spectacular and docile whale shark, often called the world's largest fish. Conservationists have long hoped to use this photographic resource to help them trace the sharks' life histories, relationships and geographic distribution, although the value of these amateur snapshots has never been properly measured.



In their latest study, the team compared results using tourist images from websites such as Flickr and YouTube, with results based on surveys by marine researchers specifically aiming to track the sharks.

In order for a shark to be clearly identified, any photograph must capture the distinctive pattern of spots located directly behind the gills. This unique mark-

ing serves as a 'fingerprint', which can then be scanned with a computer programme to tell the animals apart.

The study found that individual whale sharks could be successfully identified in 85 per cent of amateur pictures, surprisingly close to the 100 per cent identification possible in photographs taken by researchers.

Although they are widely thought to be rare, the

“We will be able to build up our understanding of the Maldives population”



conservation status of the whale shark has remained uncertain. Tim Davies added: “Hopefully, as more data come in from tourists over the years and from further across the archipelago, we will be able to build up our understanding of the Maldives population and monitor its status closely.”

—GILEAD AMIT, COMMUNICATIONS AND DEVELOPMENT

## Discovery heralds 'industrial revolution' in biology

A team from the Centre for Synthetic Biology and Innovation has found a new way to rapidly establish microscopic biological 'factories' that could perform a range of useful technological functions.

This could lead to better drug delivery for patients, enhancements in the way that minerals are mined from deep underground and advances in the production of biofuels.

At present, microscopic biological factories can be made to perform some of these general functions, but the process to set them up is slow and protracted.

First, scientists re-engineer sections of DNA and insert them into cells, usually bacterial, to make a working prototype factory. They must then observe how the DNA operates in practice within the cell. If it functions as intended, the scientists then store the specifications of this DNA 'part' in a catalogue.

The researchers have now devised a much quicker method that allows them to predict how a DNA structure will function without going through the entire validation process in the cell itself. The team say this could lead to vast new libraries of 'off-the-shelf' components that could be used to build more sophisticated biological factories.

Professor Paul Freemont (Molecular Biosciences), principal co-investigator, said: “Before the industrial revolution most items were made by hand, which meant that they were slower to manufacture, more expensive to produce and limited in number. We are at a similar juncture in synthetic biology, having to test and build each part from scratch, which is a long and slow process. We demonstrate in our study a new method that could help to rapidly scale up the production and testing of biological parts.”

—COLIN SMITH, COMMUNICATIONS AND DEVELOPMENT



### What is synthetic biology?

As with any rapidly moving field of science, it's difficult to precisely define synthetic biology. But there is general agreement that it involves using engineering principles to **modify the building blocks of biology** in order to create new functions or 'devices' that don't already exist in nature. Of course, scientists have been reading and manipulating the DNA code of organisms for a few decades now – generally taking useful features from one organism, and adding them to another. The classic example is the **genetic modification of yeast** to produce human insulin for diabetics. More recently though, new advances have enabled scientists to make **new sequences of DNA** from scratch. When you combine that ability with knowledge of chemical pathways in cells and computer models, you can start to design **cell factories** that do new things – like produce biofuels or excrete the precursors of medical drugs.

# Energy smart

Providing a secure and sustainable energy supply is one of the key issues facing the UK today. Finding innovative solutions to this challenge will involve academics working with local authorities, businesses and governments. The Energy Futures Lab (EFL) is addressing this challenge head on, supporting energy research across the College that is helping to make our shops, homes, transport, and communities more energy efficient and sustainable.

**The Sainsbury's store in Hythe, Kent, looks like any other large supermarket. A steady stream of shoppers traipse through the aisles, examining groceries, picking through the range of clothing and homeware and pausing at the fresh food counters. Yet, unbeknown to them, their weekly shop takes place in a unique store where researchers from Imperial test their energy-saving ideas.**

Behind the scenes of the store an energy management system monitors the National Grid and, at peak times, activates the store's biofuel generator, which uses waste oil from food processing plants, hot food counters and out-of-date stock to power the supermarket. When the demand for power from the grid is high, the store's heating, lighting and ventilation systems also switch into power saving mode. When the sun shines brightly, its lights automatically dim.

The supermarket has separate power meters for different parts of the shop, so that the bakery counter can measure its energy efficiency against the hot food counter, for example. Professor Nilay Shah (Chemical Engineering), Director of the Centre for Process Systems Engineering, uses information from them to calibrate his computer models of how the store functions.

"Even just knowing that energy use is being monitored can focus people's minds on reducing it," he says.

Sainsbury's believes that its store managers cut energy use by an average of 17 per cent once they have been made aware of the possibility. The technologies being tested

are now being implemented in other stores across the country.

In the future, Nilay envisages shops where customers can choose their frozen goods using a touch screen to select the packets of frozen peas and oven chips they desire. When they reach the checkout with their fresh produce, the frozen items will have been selected mechanically from within the freezers and be packed ready for them to collect. This could prevent energy being wasted from cold air escaping from the freezers.

Nilay is also interested in other interfaces between supermarkets and consumers, particularly the trends towards online grocery shopping. At present, some supermarkets meet online orders by sending employees to pick up items within the store as though they were the customer. He is modelling how much money they would save if the online orders were met instead from warehouses, which would be far more energy efficient.

Professor Nigel Brandon (Earth Science and Engineering), Director of the EFL, says: "The UK has set itself very ambitious targets to deliver an 80 per cent cut in emissions by 2050. It is quite clear that we are not going to do that without really transformational changes in how we provide and deliver energy services. The work that Imperial is doing with companies such as Sainsbury's is a really important part of that picture."

Those energy saving initiatives at Sainsbury's might be squandered if shoppers are not also encouraged to change their behaviour, for example by switching to more sustainable modes of transport when making trips to the supermarket.

## Cleaner transport

Transport is vital for economic growth and quality of life; yet the uncomfortable truth is that in 2011 it accounted for 26 per cent of carbon dioxide emissions in the UK, as well as producing noxious gases and particulates that damage human health.

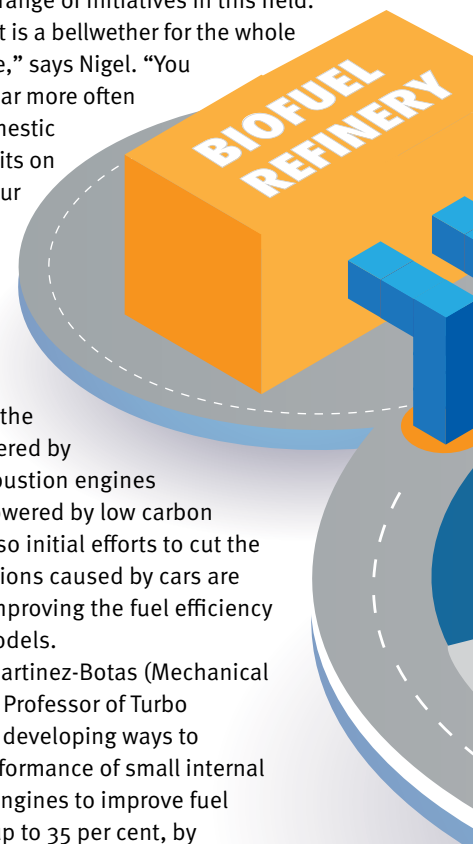
Researchers from the EFL are currently working on a range of initiatives in this field.

"Transport is a bellwether for the whole energy debate," says Nigel. "You replace your car more often than your domestic boiler and it sits on the road or your drive outside your home, telling people who you are."

It could take decades to replace all the vehicles powered by internal combustion engines with those powered by low carbon alternatives, so initial efforts to cut the carbon emissions caused by cars are focused on improving the fuel efficiency of existing models.

Ricardo Martinez-Botas (Mechanical Engineering), Professor of Turbo Machinery, is developing ways to boost the performance of small internal combustion engines to improve fuel economy by up to 35 per cent, by minimising losses through friction and heat transfer. In theory these engines should retain the power and feel of the bigger engines available today.

**"The UK has set itself very ambitious targets to deliver an 80 per cent cut in emissions by 2050. We are not going to do that without really transformational changes"**





With colleagues, Ricardo has patented a system that uses exhaust gases to propel a high performance turbine that is coupled to a high speed electrical generator, thereby making use of energy that would otherwise go to waste.

“In the short to medium term, this technology is affordable and acceptable. As it is not completely new, manufacturers and buyers tend to be more comfortable with it,” he says.

Dr Gregory Offer (Mechanical Engineering), EPSRC Research Fellow, thinks that plug-in hybrid combustion engine and electric vehicles will eventually become as commonplace in car showrooms as flatscreen displays are in electrical stores. Unfortunately, the batteries that help to power these cars are still not fully understood.

Part of the problem is that the performance of batteries can be adversely affected when placed in the hot and bumpy environment of a car, compared with strict lab conditions. So researchers at the College have built a new battery test rig that enables them to simulate real world driving, which might point to ways to improve battery range, safety and lifespan.

Of course, drivers and the supermarket chains they visit do not exist in isolation. Researchers across the College are looking at ways of making whole communities more intelligent with the way that they use energy.

### Smarter communities

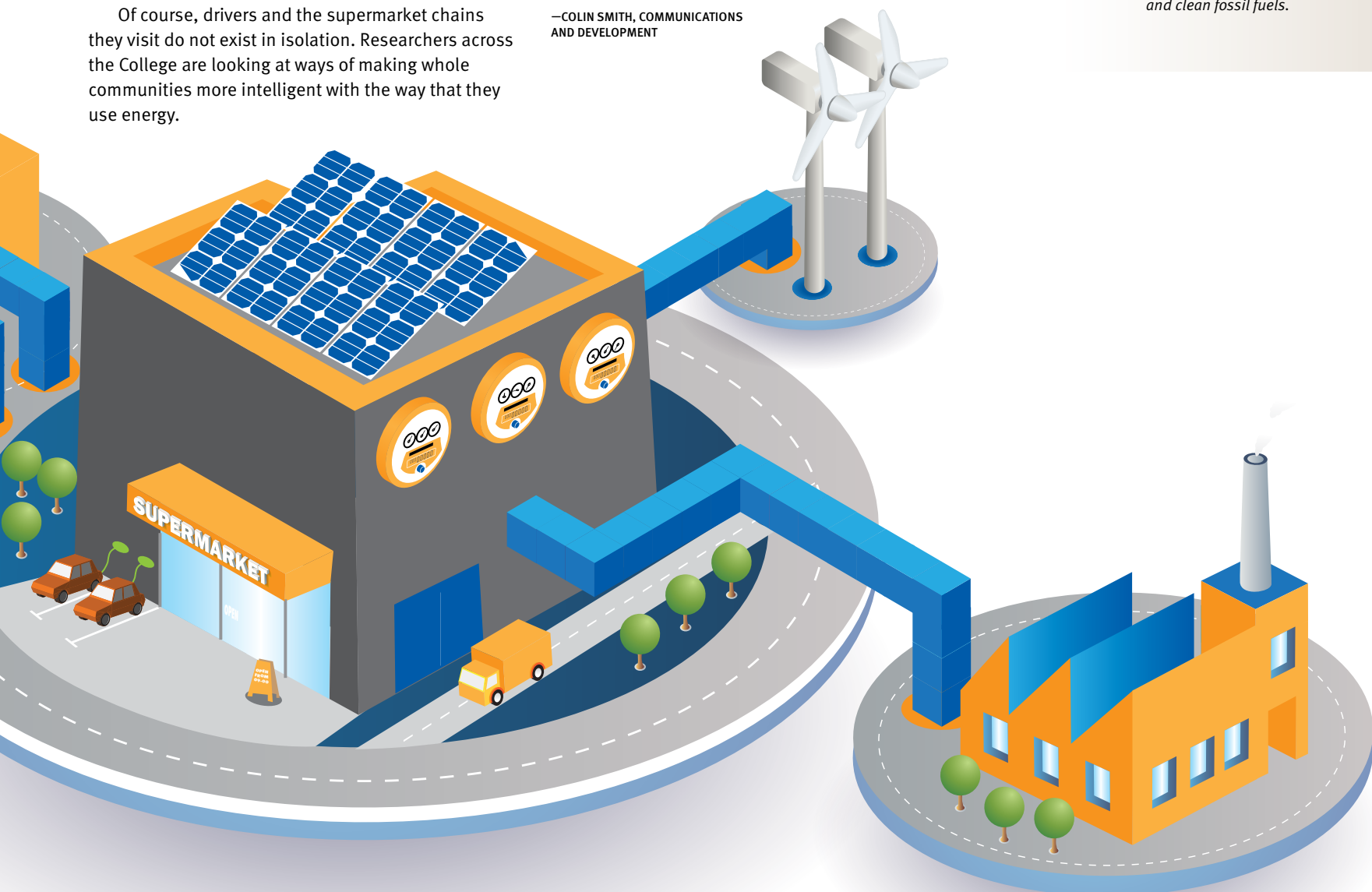
Nilay is building computer models of what he calls smart communities. He examines what life would be like if a community comprising, say a hospital, a school, offices, shops and homes, united to form a trading agreement that ‘smoothed’ demand for power, placing less reliance on polluting coal-fired power stations. Some organisations may be able to tolerate temporary reductions in the power supplied during periods of high demand – a brick-built school, for example, might easily cope if the heating were switched off for half an hour, but a hospital might not.

Nigel adds: “It is really important that communities work together to find ways to improve how they use energy. After all, there is no use making fuel-efficient, low emission hybrid electric vehicles if the electrical energy they use comes from a heavily polluting coal-fired power plant. That is why Imperial researchers are working with government, industry and our partners here and abroad to develop integrated solutions that will help to make our energy future both secure and sustainable.”

—COLIN SMITH, COMMUNICATIONS AND DEVELOPMENT



*This story draws on the recently published EFL Research Overviews written by alumnus Alison Goddard (Physics 1993, Science Communication 1994), novelist and former Economist journalist, along with academics across the Faculty of Engineering and the EFL. The Research Overviews focus on five of the EFL's key research areas: low carbon transport, policy and innovation, sustainable power generation, energy infrastructure and clean fossil fuels.*





## Changing tack

Chemical biologist turned MBA student Peter Varnai suggests that scientists could benefit from business training to build research teams and translate discoveries.

In the wake of the financial crash of 2008, many scientists have found themselves working in an environment of squeezed budgets in which they must increasingly make the case that their research adds value to the wider economy.

The upshot is that science and business need to intersect more frequently than they ever have before – at the level of institutions and also individuals.

Dr Peter Varnai, a chemical biologist, enrolled on the prestigious MBA course at the Business School at the start of this academic year. Previously

a Wellcome Trust Research Fellow at Cambridge, Peter took up a position as a senior lecturer at the University of Sussex in 2007. His research sought to understand how the physical structure of biomolecules relates to their function, with the aim of designing new drugs. He also founded and directed an MSc programme in chemical biology at Sussex. So why this switch when Peter's star was very much still on the rise?

"I think that the ambition I had as a young scientist to constantly push the boundaries was tempered slightly in the academic setting. I figured

that I had another 25 years to go in my career, and I wanted that time to be the most effective and worthwhile it could be. I talked to friends who had done MBAs, and they said that this is a year for you to think about what values you represent as a person and how you can most efficiently deliver on them."

Since Peter plans to remain involved in some way in science – a career which was a "childhood dream come true" – Imperial College Business School seemed like the perfect fit. Sitting inside a world class science and technology university, the Business School has built a reputation for delivering ground-breaking research and teaching, specialising in innovation and entrepreneurship.

"Imperial gives you that kind of crossover between science and business that I was looking for. There is still this perception among some scientists that business and application are dirty. The truth is business knowledge actually helps you understand why people invest in science, and why some scientific discoveries make it big and others completely disappear."

In the event that he decides to return to full-time research and teaching, Peter believes the MBA will have given him the ability to make better decisions.

"I think I could lead a research group that is more efficient, knowing my leadership capabilities and how to approach people who have difficulty in voicing their own thoughts better. We learn a lot about how to tap into other people's motivations."

The one year MBA course is intense with a busy schedule, especially for Peter who commutes in from his home in Brighton most days and admits to sleeping much less now. But he particularly enjoys the practical projects which emphasise working through problems in a team.

"It is part of the process – there is no hierarchy here, we are in a team and you realise the only way your team will follow your advice,

and not somebody else's suggestion, is by using your reasoning but also your charm."

Some of the contemporary course projects that Peter's team has worked on so far include devising a model to predict medal counts in the Olympic Games and the ethics of 'price gouging' when doing business in cities hit by storms and other natural disasters.

The diversity of students enrolled on the MBA programme is also an enriching factor when

“Business knowledge helps you understand why some scientific discoveries make it big and others completely disappear”

it comes to swapping ideas and exploiting different ways of thinking.

"Some students come from dynasties of entrepreneurs in India and have already established

five companies despite being 10 years younger than you! Others have a finance background, where they led big teams with important responsibilities, and others like me have made a complete change. We inspire each other."

Peter is now embarking on a five-month MBA project as part of the Innovation, Entrepreneurship and Design programme. He has decided to explore mobile and remote health, specifically devising business models that encourage primary healthcare providers to adopt new technology platforms.

"The projects we do as part of the MBA can serve as a stepping stone. The Business School has a strong alumni network, so we meet a number of successful business people who come back and try to help us. Hopefully we will give back as well, once we are out in the wild!"

Perhaps Imperial will soon be contributing more names to the list of renowned scientists turned business people that includes genome decoder Craig Venter, private sector space explorer Elon Musk and software sage Mike Lynch.

—ANDREW CZYZEWSKI,  
COMMUNICATIONS AND DEVELOPMENT

# inside\*

## story

### mini profile

## Emily Mayhew

Dr Emily Mayhew (Centre for Co-curricular Studies) is a historian who teaches a history of medicine module to fourth year medical students and works with Imperial Outreach. She wrote her PhD thesis at Imperial on the development of modern plastic surgery in World War II, which in 2005 became a book – *The Reconstruction of Warriors* – then a BBC documentary.

**I understand you're working on a new book about the First World War, how did that come about?**

I wanted to write a sort of prequel but I found that most of the official medical reports from the Great War were disposed of in the 1920s. So I realised I would have to work

from personal testimony and private collections of documents, diaries and letters. The story that emerged was how medicine was pushed forward, so that you started to treat people as close to the front line as possible and as soon as they were wounded. Key to that were the stretcher bearers who were, for the first time, given basic first aid training.

**So they were unsung heroes in some ways?**

Yes. The stretcher bearers were uneducated and rarely



kept diaries so testimonies came from medical officers. It's a history that has very nearly evaporated. I have this slightly weird thing, where I'm in my office working and I sense they're watching. I feel a very strong sense of responsibility, because I'm really the first person telling their story. Ironically, we actually brought them to life in a play that came to the Great Hall as an outreach event.

“I'm really the first person telling this story”

**How did that go?**

It was a huge learning curve.

This was the first

time a professional theatre company had done anything at the College, but everyone was extremely helpful. More than two thirds of the kids that came had never been to a theatre production, yet they were gripped and really got it. I hadn't fully understood the power of drama and the history of medicine as an introduction to medicine itself.

For the full interview visit: <http://bit.ly/TAe82o>



## Active imagination

Third year undergraduate student Oskar Weigl (Electrical and Electronic Engineering) is pictured above at the opening of the new Imagination Technologies Laboratory on 5 February. Behind Oskar is a display panel, originally from an advertisement screen at Piccadilly Circus, which his team obtained through London Hackspace and reverse-engineered by developing their own hardware and software to show images and animations.



### ► SCIENCE FROM SCRATCH

As explained by Christopher Clarke, MSc Science Communication

## How big is a super-massive black hole?

Black holes are deeply mysterious objects that exist throughout the universe: giant plugholes in space that drag in and consume anything that strays too close. Their enormous gravitational pull means that even light cannot escape making 'black hole' a pretty good description all round.

The key to a black hole's immense power lies in its mass. Our Sun for example weighs the same as 332,946 Earths, giving it enough gravity to keep our whole solar system in place around it. Imagine then the gravitational pull of something 100 times the mass of our Sun? What about one thousand times? One billion? This is the sort of gravity that keeps whole galaxies in place.

Until recently, the largest black holes observed were the supermassive black holes, weighing in at a minimum of 100,000 times the mass of our Sun.

Supermassive black holes are thought to have originated in the early universe, growing larger over the millennia by sucking in matter or merging with other black holes. These giants reside at the centre of galaxies and are surrounded by enormous discs of gas and dust that burn with luminous ferocity. There's even one at the centre our own galaxy, the Milky Way.

Now, however, a new class of Titan has emerged. Right at the centre of a number of galaxies that crowd together to form large clusters scientists have discovered black holes that are over 10 billion times the mass of our own sun. These have been imaginatively christened the 'ultramassive black holes' by astronomers and are without a doubt the most massive objects ever observed by mankind.

Will astronomers soon be reporting on 'über-, hyper-, or mega-massive black holes'? Only time will tell.

IMPERIAL STUDENTS SHARE THEIR EXPERIENCES OF LIFE AT THE COLLEGE ON THE STUDENT BLOGGERS WEBSITE.



### Student blogger Liam on competing at BUCS:

blog SPOT

Mud, mud, glorious mud... was the story of last weekend for me. I went away with the Cross Country and Athletics and Triathlon College clubs to the BUCS XC Championships (2 Feb). This was probably the biggest and toughest race of the year for everyone in the clubs and I was definitely psyched up for it. In typical British cross country fashion the course was more like a 7.5km river of mud. However, Imperial ran well with our Men's A team taking 6th place overall. I came 153rd out of well over 400 runners in the B race, a result I'm chuffed with for now but will be hoping to improve on next year!

[www.imperial.ac.uk/campus\\_life/studentblogs](http://www.imperial.ac.uk/campus_life/studentblogs)

## Heart of the matter

Dr Sayan Sen (National Heart and Lung Institute) was recently awarded the College's Henry Edward Armstrong Memorial Trust Medal which recognises outstanding PhD research that has clear potential in industrial applications. Sayan explains his work, which is already helping to diagnose and treat patients with coronary artery disease (CAD).

"CAD is one of the leading causes of ill health and mortality worldwide. Patients often complain of chest pain, which is caused by a narrowing of the arteries that supply blood to the heart. This can be treated with stents to open up the vessels, but patients often have disease in more than one artery and figuring out which is responsible for the chest pain can be difficult. At present, clinicians use wires with pressure sensors at the tip to spot any decrease in blood flow. However, this requires the patients to take potent drugs in order to get adequate measurements, adding time and cost to the procedure as well as causing uncomfortable side effects. I have developed a new way to assess CAD without the need for these drugs, by performing analysis during a specific period in the cardiac cycle.

Over the past two years we've taken this

"I have developed a new way to assess CAD without the need for drugs"

technique from concept to bedside and it's now available for clinicians to use

in practice. It has been recognised at the TCT 2012 cardiology conference and in a top cardiology journal as one of the most important innovations in this field in recent years. I am honoured to receive the Armstrong Medal and would

like to thank Dr Justin Davies, Professor Jamil Mayet, Professor Alun Hughes and Professor Darrel Francis (all NHLI) for their support during my studies."



## Lightyear foundation brings practical science to schools in Ghana

In October 2012 PhD students Naomi Nickerson and Adam Billing (both Physics) travelled to Accra, Ghana, with 16 other volunteers from the Lightyear Foundation, an organisation bringing practical science to schools there. Naomi reports on their involvement, which was coordinated by Dr Simon Foster (Outreach).

"How do you change someone's life using an old plastic bottle and a handful of dirt? Seems tricky, but when I was given the opportunity to travel to Ghana with the Lightyear Foundation as a science teacher, this is exactly what I found myself doing.

Lightyear is a quickly growing charity that aims to empower and enthuse science students and teachers in Ghana,

by demonstrating how learning can be made practical and fun without the need for expensive lab equipment – or even any lab equipment at all!

Despite being far better off than many of her war-torn and corrupt West African neighbours, Ghana remains one of the world's poorest countries. Schools are rarely more than an empty room with

a blackboard and experiments are generally unheard of.

But with our bag of (very) cheap tricks we travelled the country showing pupils how they could demonstrate lensing with a bag of water, aerodynamics with a ball and

string, or filtration with rocks, dirt and a plastic bottle.

I was not new to science communication, and have plenty of



experience explaining and demonstrating to children in the UK, but I have never found it as challenging or rewarding as in Ghana, where creativity and improvisation are constantly needed.

Last year was the first year Imperial students were

involved, and as more and more schools in Ghana are asking us to visit them, we need even more people to take part in 2013."

For more information about the Lightyear Foundation visit: [www.lightyearfoundation.org](http://www.lightyearfoundation.org)



## INVENTOR'S CORNER

# Every last drop

Oil refineries take crude oil from drilling pipelines and extract its useful constituent parts – gas, petrol, aircraft fuel and engine oil – using a series of heating and cooling steps. Professor Sandro Macchietto and PhD student Francesco Coletti (both Chemical Engineering) have devised a way to increase the efficiency of this complex process. They formed Imperial spin-out company Hexxcell, based on their technology, in July 2012.

### What have you developed?

Key to the invention is novel software models and a test rig to simulate aspects of refining. When heat exchange steps occur in oil refineries, you are left with oil deposits that are hard to remove and create considerable heat wastage. In order to study these effects, Hexxcell co-founder Emeritus Professor Geoffrey Hewitt (Chemical Engineering) created an advanced experimental rig that measures some of the properties of oil in heat exchangers. We use the data the rig produces to estimate what's going to happen during operations and, combined with our computer simulations, predict refinery inefficiencies up to 15 months ahead. This, in turn, helps us to optimise the design of heat exchangers and heat recovery systems.

### How is this different from current methods?

At present, plant operators can get simple projections based on



assumptions from previous models but accurate, long-term predictions, like ours, are basically unheard of. Now our experimental rig allows us to take measurements at near industrial conditions, a difficult task in oil refineries that work at very high temperatures and pressure.

### What are the benefits of this technology?

Oil refineries consume around eight per cent of the world's oil resources just to run themselves, making them responsible for two to three per cent of global CO<sub>2</sub> emissions. So there is a big incentive for trying to increase energy recovery in these systems. Systems produced with our techniques could achieve efficiency gains of up to 15 per cent, meaning energy sources last longer and waste is reduced. It should also lead to lower prices for consumers.

—KAILEY NOLAN, IMPERIAL INNOVATIONS

## course review



By course attendee Dr Caroline Clewley,  
Senior Teaching Fellow (Physics)

## Postgraduate Certificate in University Learning and Teaching

### Why did you go on the course?

My job is entirely focused on all the different forms of undergraduate teaching – I don't do any physics research anymore – so I felt it would be important to get to grips with the educational theory behind everyday practice, and gain a qualification in the process. I also believe the Department gains significantly from having 'experts' in the field of educational theory who can play a key role in improving teaching practice overall.

### What did you learn?

The PGCert course encourages you to reflect upon your own teaching practice. It was extremely useful, as it forced me to stop and think about what I was doing and why, and consider whether my teaching methods were simply based on tradition or actually the best choice for the task.

### How has it been helpful in your role?

It's opened my eyes to a whole new field that directly influences my everyday job. My teaching is now much more informed and I hope to be able to say my students are gaining from it! Additionally, it has sparked my interest in educational research, and I have since decided to take a postgraduate diploma and a Master's degree in education. This will help me bring the latest educational theory into practice into our Department.

For anyone interested in taking the PGCert ULT there will be a briefing on 26 February at 13.00–14.00 in SALC 1 or visit: [www.imperial.ac.uk/edudev](http://www.imperial.ac.uk/edudev)



## On the threshold

Divisional Operations Manager Tom Pearson (Communications and Development) is pictured bungee jumping for the Rector's Scholarship Fund as part of RAG week, for which he raised a total of £633 at the time of going to press.

"It was the first time I'd ever done a bungee jump and I wanted to show my support for the students of Imperial, who have impressed me ever since I joined the College. The jump was terrifying on the way up and exhilarating on the way down. I'm just glad that I was not tempted to eat any of the RAG week doughnuts before I took the plunge!"

## obituaries



### VICTOR MOONEY

**Victor Mooney, former catering manager, died on 27 December aged 89 years, after a short illness. Alumnus Gordon Green (Metallurgy, 1957), who befriended Victor whilst he was studying at the College, pays tribute.**

'Mooney', as he was known to generations of students and staff, was catering manager of the College from 1953–85, supervising around 80 members of catering staff. In the early 1950s, he was involved in modernising the kitchens, bars and refectories and brought vitality to his administration when it was badly needed. His personality and humour was recognised by all, as was his desire to get value for money. On one occasion, believing the price of wine from a supplier to be too high, he shipped barrels direct from Borie-Manoux in Bordeaux and had his staff do the bottling. The result was a "much better wine" sold at lower cost to happy students, staff and visitors. When handling the occasional complaint about food he always said that if he was given "a serious budget" he could provide "a serious meal". He made a point of attending all functions to ensure that his organisation was well executed. Students held him in high regard and, uniquely, he was a member of the Chaps, Links and 22 College clubs. On his retirement in 1987, the College awarded him an Associateship of Imperial College for his services.

To watch an interview with Victor from the video archive visit: <http://bit.ly/Tgjobr>

long  
service

Staff featured in this column have given many years of service to the College. Staff listed below celebrate anniversaries during the period 1 January–1 February. The data is supplied by HR and is correct at the time of going to press.

### 20 years

- Vikki Meredith, Chef, Catering Services
- Dr Mahmoud Ardakani, Research Officer, Department of Materials
- Laura Bailey, HR Systems Manager, Human Resources Division
- Professor Anthony Barrett, Head of Synthesis, Department of Chemistry
- Dr Bamber Blackman, Reader in the Mechanics of Materials, Department of Mechanical Engineering
- Dr Anton de Paiva, Deputy Safety Director and Biorisk Manager, Health and Safety Services
- Professor David Edgerton, Hans Rausing Chair, Centre for History of Science, Technology and Medicine
- William Gorman, Security Officer, Security Services
- John Harrington, Electrician, Estates Division
- Professor Howard Johnson, Shell Chair in Petroleum Geology, Department of Earth Science and Engineering
- Martin Kenton, Administration Officer, Faculty of Medicine Centre
- Bachir Taouti, Conference Coordinator, Conference Office

### 30 years

- Terence Payne, Ventilation/Refrigeration, Estates Division
- Dr Kleoniki Gounaris, Senior Lecturer and Director of Postgraduate Studies, Division of Cell and Molecular Biology, Department of Life Sciences
- Professor Sandro Macchietto, Professor of Process Systems Engineering, Department of Chemical Engineering
- Dr Fusun Nadiri, Computer Facilities Manager and Deputy Examination Officer, Department of Mechanical Engineering
- Anne Reynolds, Pavilion Supervisor, Sport and Leisure Services
- Paul Woodward, Technician, Department of Mechanical Engineering

### 40 years

- Professor Jeffrey Kramer, Professor of Distributed Computing, Department of Computing

# The future of digital money

Many of us now manage our finances online and a few tech-savvy early adopters have started paying for things like their morning coffee using mobile and touchless systems. Professor David Gann, Head of Innovation and Entrepreneurship at the Business School, explains how this system of 'digital money' could ultimately have a transformative effect on society.

### How do you see digital money evolving?

Charge cards will probably become more common as we see the use of near-field communication chips allowing payments to be made by swiping past card readers – a bit like using the Oyster card. Mobile phones and devices will increasingly be used in a similar way. But I think the wider implications will be in the ways that money flows within and between businesses. There are likely to be many innovations to smooth the flow of money to find faster, cheaper and more secure ways of transacting.

### What upcoming projects and research are you working on in relation to digital money?

We are trying to understand how systems such as mobile payments could help individuals and communities develop their own businesses and solutions with micro-finance – what's called 'inclusive innovation'. We are also interested in how digital money might ease the ways in which cities operate – this is one of the questions in our Digital City Exchange research project. Finally, we are interested in the security and identity issues relating to digital money and exchange using the internet.

### How will digital money impact globally?

A project to encourage people to use digital money in Kenya has contributed to bringing more people into the formal economy, providing the means to develop businesses, creating jobs and growth. The global impact is likely to be profound in the next 10–20 years, as more



transactions take place online. We're exploring these issues, asking questions about transparency of money flows, implications for business, individuals, institutions and government.

David is also Director of the Digital Economy Lab, a cross-faculty interdisciplinary initiative focused on digital technology and business: <http://bit.ly/bnOvP3>

## Welcome new starters

Dr Carmen Aceijas, Faculty of Natural Sciences

Ms Blerine Ahmetaj, NHLI

Dr Diego Alonso Alvarez, Physics

Mr Steve Annett, Physics

Dr Omar Bacarreza Nogales, Aeronautics

Dr Fouad Ballout, EEE

Mr Guillermo Barinaga, Medicine

Dr Emilio Barocio Espejo, EEE

Ms Rebekka Bauer, Life Sciences

Dr Quentin Bazot, Medicine

Mr Christian Bedford, Library

Ms Ligia Bernardeli, Catering

Mr David Birch, Computing

Miss Honor Bixby, Public Health

Mr Michael Bodnarchuk, Mechanical Engineering

Miss Josephine Bourner, Medicine

Ms Angela Bowen, Communications and Development

Mr John Brennan, Medicine

Dr Ornella Cappellari, Medicine

Mr Damian Cerase, Faculty of Medicine

Dr Elena Chekmeneva, Public Health

Professor Peter Cherepanov, Medicine

Ms Valentina Cisnetto, Life Sciences

Ms Paola Cognigni, Clinical Sciences

Mr Rafal Czapiewski, Surgery and Cancer

Dr Imogen Davies, Surgery and Cancer

Mr William Dodt, Medicine

Dr Luigi Dolcetti, Medicine

Mr Simon Dufal, Chemical Engineering

Dr Charlotte Durkin, Medicine

Miss Victoria Edwards, Medicine

Ms Mona El-Khatib, Public Health

Mr Richard Garfield, Estates

Dr Jane Gregory, Environmental Policy

Dr Jelena Grujic, Mathematics

Mr Fernando Guadalupe Santos Lins Brandao, Physics

Ms Rebecca Halil, Catering

Mr David Harris-Birtill, Surgery and Cancer

Mr Sijin He, Computing

Professor David Heyes, Mechanical Engineering

Miss Martha Hill-Cousins, Medicine

Dr Kate Holden-Dye, Medicine

Mr Denis Hyka, Catering

Mr Michael Inkpen, Chemistry

Dr Chase Kantor, Medicine

Mr Omar Katamish, Aeronautics

Mr Patrick Kelly, EEE

Miss Philippa Kennedy, Life Sciences

Mr Mohan Khadka, Catering

Miss Gillian Kinnear, NHLI

Miss Siu-Teing Ko, Bioengineering

Dr Alessandra Lanfrancotti, NHLI

Mr John MacDonald, ESE

Dr Paola Mapelli, Surgery and Cancer

Dr Alice Marmugi, Medicine

Miss Samantha Martin, Bioengineering

Dr Stephen Matthews, Computing

Mr Martin McMahon, Finance

Ms Evgenia Mehleri, Chemical Engineering

Professor David Miles, Business School

Mr Borislav Milijas, Faculty of Medicine

Mr Jordan Muscatello, Chemical Engineering

Mr Jim Myers, Medicine

Miss Melinda Nemeth, Public Health

Mr Pariwarta Nepal, Catering

Dr Freddy Oropeza Palacio, Materials

Miss Ceri Owen, Reactor Centre

Dr Mark Oxborrow, Materials

Dr Enrica Papi, Surgery and Cancer

Ms Mariann Pentek, Catering

Mrs Catherine Pereira, NHLI

Mr Rajika Perera, Life Sciences

Miss Julija Petrovska, Catering

Miss Julita Poswiata, Catering

Miss Marina Quinlan, Clinical Sciences

Dr Killian Quinn, Medicine

Miss Aneta Rapacz, NHLI

Miss Eleanor Reast, Environmental Policy

Dr Robert Richardson, Chemistry

Mr Artyom Romanov, Mechanical Engineering

Mr Yassine Saidat, Catering

Dr Matthew Schneemilch, Chemistry

Mr Mahdi Sharifzadeh, Chemical Engineering

Mr Alan Smith, Registry

Dr Kieron South, Medicine

Dr Roberta Spaccapelo, Life Sciences

Ms Kaylene Steenkamp, Clinical Sciences

Ms Katie Stripe, NHLI

Dr Dilveer Sually, Medicine

Miss Mohana Suppiah, Surgery and Cancer

Ms Lavander Tembo, Medicine

Dr Panagiotis Theodorakis, Chemical Engineering

Ms Dora Tomor, Catering

Dr Tina Toni, Life Sciences

Dr Matthias Van Ginneken, ESE

Miss Neeta Vekaria, Faculty of Medicine

Dr Gudrun Weis, NHLI

Mr Edward Wilde, Communications and Development

Dr Sarah Williams, NHLI

Dr Zhihua Xie, Chemical Engineering

Mr Jason Yarrow, Careers Advisory Service

## Farewell moving on

Miss Nessa Adams, Medicine

Mr David Alonso Chacon, NHLI

Dr Jeroen Bergmann, Surgery and Cancer

Dr Carlo Bertolli, Computing

Dr Damien Bigourd, Physics

Mr James Bone, Environmental Policy

Dr Edward Burgin, Chemistry

Miss Lucy Chamberlin, Environmental Policy

Mr Ming Chan (7 years), ICT

Ms Ling-Jun Chen, Medicine

Mr John Darby, Life Sciences

Dr Maurice Darding, Medicine

Dr Peter Draber, Medicine

Mrs Helena Draberova, Medicine

Dr Lydia Eccersley, Medicine

Dr Robert Fagan (7 years), Life Sciences

Dr Nicolas George, Chemistry

Dr Timothy Ham, Medicine

Dr Boumediene Hamzi, Mathematics

Dr Jiang Han, Civil and Environmental Engineering

Mr Paul Harrop, Civil and Environmental Engineering

Mr Torsten Hartwig, Medicine

Mr Menashe Hazan, Aeronautics

Dr Ulrike Hillemann-Delaney (6 years), International Office

Dr Nicholas Hine, Materials

Miss Louise Hirst, Physics

Mrs Liz Howard, College Headquarters

Dr Thilanga Iddamaloda, Medicine

Dr Rivka Isaacson, Life Sciences

Mr Dominic Jackson, ICT

Mr Martin Keats, Medicine

Dr Svyatoslav Kondrat, Chemistry

Dr Nitya Krishnan (5 years), Medicine

Miss Ewelina Krysztofinska, Life Sciences

Mr Sebastian Kupka, Medicine

Dr Elodie Lafont, Medicine

Mr Karl Lawrence, NHLI

Dr Xinzhong Li (9 years), Clinical Sciences

Dr Marta Llarena, Medicine

Dr Patrick Mallia, NHLI

Miss Giorgia Marchioro, Imperial College Union

Dr Kelly Morrison, Physics

Miss Vicky Nicholson (11 years), Business School

Miss Lauren Pae, Public Health

Dr Paul Parham (7 years), Grantham Institute

Mr Luca Pesaresi, Mechanical Engineering

Dr Sally Power (19 years), Life Sciences

Mrs Remya Prasannan, Medicine

Miss Silvia Prieske, Medicine

Miss Nathalie Reichmann, Medicine

Dr Eva Rieser, Medicine

Dr Mark Robinson, Medicine

Dr Marianne Ruperti, Medicine

Ms Aida Sarr Daboh, Medicine

Dr Yorifumi Sato, Medicine

Dr Alexandra Sevko, Medicine

Dr Timothy Simpson, Life Sciences

Dr Anand Singh, Surgery and Cancer

Miss Kellie Smith, Catering

Ms Julie Storr, Global Health Innovation

Dr Daniel Stuckey, NHLI

Mr Adam Szczepanski, Public Health

Miss Lucia Taraborrelli, Medicine

Dr Maximilien Vanleene (5 years), Bioengineering

Dr Anupama Vydyanath, NHLI

Professor Catherine Williamson (15 years), Surgery and Cancer

This data is supplied by HR and covers the period 11 January–4 February. This data was correct at the time of going to press.

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

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



13 MARCH ▶ PUBLIC LECTURE

### Tom Kibble: breaking symmetries, breaking ground and the new boson

The announcement by CERN in 2012 of the discovery of a new particle that they believe to be the Higgs boson was a scientific sensation.

The elusive Higgs boson is believed to convey mass to the fundamental particles that form the building blocks of the universe. As the experiments at CERN suggest, we are on the threshold of exciting new discoveries in fundamental physics. Nobel laureate Professor Steven Weinberg of the University of Texas at Austin presents a special particle physics lecture to celebrate Professor Tom Kibble's (Physics) 80th birthday.



21 MARCH ▶ PUBLIC LECTURE

### From antibodies to bicycles

In recent years there has been a revolution in the pharmaceutical industry with therapeutic antibodies displacing small molecule drugs as blockbuster pharmaceuticals. In the 2013 Kohn

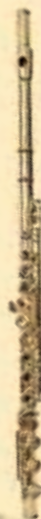
Award Lecture, one of the pioneers responsible for this change, Professor Sir Gregory Winter of the University of Cambridge, explains how this revolution started and where it is going. After the talk, enter the frontier science of synthetic biology and explore how it may change our future at the Imperial Fringe.

## take note

### Symphony Orchestra to play top venue

Imperial College Symphony Orchestra will perform at the prestigious Cadogan Hall, home of the Royal Philharmonic Orchestra, on March 2 at 19.30. They will play Rachmaninov's The Bells, Smetana's Vltava, and Dvořák's Cello Concerto with cellist Laura van der Heijden, BBC Young Musician of the Year.

Tickets available at:  
<http://bit.ly/XBg46B>



27 FEBRUARY ▶ PUBLIC LECTURE

### Nature, nurture or neither? What we do not know about genetics

Professor Steve Jones, UCL



28 FEBRUARY ▶ MUSIC

### Lunchtime concert

London Bridge Ensemble

28 FEBRUARY ▶ PUBLIC LECTURE

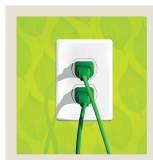
### The Academic Health Science Centre: from concept to reality?

Professor Jamil Mayet (NHLI)

28 FEBRUARY ▶ PUBLIC LECTURE

### How to make an electricity business sustainable

Professor Richard Green (Business School)



7 MARCH ▶ MUSIC

### Lunchtime concert

Charles Owen (piano)



13 MARCH ▶ SOCIAL

### Varsity rugby

Imperial College vs Imperial Medicals

14 MARCH ▶ PUBLIC LECTURE

### Metals in medicine: diagnostic and therapeutic agents

Professor Ramon Vilar (Chemistry)

14 MARCH ▶ PUBLIC LECTURE

### Breaking into your brain

Dr Aldo Faisal (Bioengineering)

18 MARCH ▶ PUBLIC LECTURE

### Imperial Business Insights

Marianne Fallon, Head of Corporate Affairs, KPMG



21 MARCH ▶ PUBLIC LECTURE

### Life as we know it

Interactive demonstrations at the Imperial Fringe

27 FEBRUARY ▶ SEMINAR

### Research showcase

Mechanical Engineering talks and presentations

27 FEBRUARY ▶ PUBLIC LECTURE

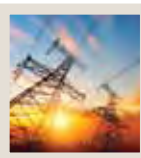
### Cardiac surgery in the recession

Professor Thanos Athanasiou (Surgery and Cancer)

27 FEBRUARY ▶ SEMINAR

### Delivering the smart grid

Dr Alex Rogers, University of Southampton



27 FEBRUARY ▶ PUBLIC LECTURE

### Altered states: what happens when we tell stories about science

Imperial and LSE Literary Festival event

## MEET THE READER



### Professor Peter Kohl, Chair in Cardiac Biophysics and Systems Biology, NHLI

#### What are you doing in the picture?

I'm heading into the Magdi Yacoub Institute Heart Science Centre which hosts and supports my research group at Harefield. We have been given freshly refurbished space to conduct translational research – allowing us to move from molecular-level insight to things that are relevant to patients.

#### What would you do if you were editor of Reporter for a day?

A day wouldn't be enough! If I could set down a policy, it would continue the good work of the print magazine and resist the temptation to go entirely online. I think it's an incredibly useful source of information and allows one to browse and see what is happening across the entire breadth of activities at the College.

#### Who would be your cover star?

It would be interesting to explore the role of project managers; people who coordinate large, focused research efforts and who straddle that boundary between what one would traditionally regard as administrative and content-related work. I think they are among the unsung heroes, mine certainly.

## Stay in the loop

✉ Visit [www.imperial.ac.uk/events](http://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](mailto:events@imperial.ac.uk)

