



In charge

Students take control of Imperial's
new carbon capture pilot plant

 **CENTRE PAGES**



**MADAME LIU
YANDONG**
Chinese State
Councillor visits
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Professor
Richard Craster
on his first six
months as HoD
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BIG SPLASH
Staff member
to canoe the
length of the
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EDITOR'S CORNER

Open house

From tackling malaria to creating spray-on clothes – conveying the amazing **breadth of work that goes on at Imperial** to family and friends can be a tricky task. I often find the passion academics have for their work is best described in their own voices, which is why we created the Inside Story section of *Reporter* to help communicate this to the College community. On 11–12 May, members of the public will have the unique opportunity to see the thinking behind this section come to life at **Imperial's first public festival**. I'm looking forward to going along and finding out how Imperial scientists saved the **Leaning Tower of Pisa** from leaning too far and trying my hand at some robotic surgery – one of the many demonstrations being showcased throughout the festival. For a write-up and photos of the festival experience, keep your eyes peeled for the next issue of *Reporter*, published on 24 May. For more information visit: www.imperial.ac.uk/festival

EMILY ROSS-JOANNOU, EDITOR

Reporter is published every three weeks during term time in print and online. The next publication day is 24 May.
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Cover photograph: First year undergraduate, Sydney Smith (Chemical Engineering) checking a gauge in the carbon capture pilot plant.

Future of microsurgery unveiled

Sir Paul Nurse, President of the Royal Society, officially opened Imperial's newly refurbished Hamlyn Centre on 16 April. Guests were able to see the latest developments in robot assisted microsurgery – minimally invasive surgery with micro-scale imaging and manipulation – made possible by funding totalling £5 million from the Wolfson Foundation and the National Institute for Health Research (NIHR) underpinned by the Helen Hamlyn Trust endowment.

The Hamlyn Centre, which is split across three Imperial campuses – South Kensington, St Mary's and Northwick Park – has been refurbished with cutting edge new technologies and a pre-clinical imaging suite for clinical trials to enable clinicians and technicians to validate new surgical robots in the patient. The long-term hope is that the robots in the Hamlyn Centre will be integrated with imaging and sensing technologies to perform microsurgery, for example, on cancerous cells.

Janet Wolfson de Botton, Chairman of the Wolfson Foundation, said: "The Wolfson Foundation has a long tradition of funding excellence in science and technology and we are very pleased to support the



Hamlyn Centre in advancing robot assisted microsurgery."

Lord Darzi, Chair of the Institute and co-director of the Hamlyn Centre, said: "The new facilities will allow us to build on our unique strengths in research and clinical application of minimal invasive surgery."

Visit: www.imperial.ac.uk/roboticsurgery

Shortlisting success for Imperial teams

Imperial has received two nominations in the 2012 *Times Higher Education* Leadership and Management Awards.

Imperial staff in the Library have been short-listed for Outstanding Library Team, following a nomination by Scott Heath, ICU President. Debby Shorley, Director of Library Services, said: "We are simply thrilled about this news. We enjoy a great relationship with our students, so we are especially delighted that it was the students' union who nominated us for this award."

Commenting on why he nominated the team, Scott said: "This year the Library's campaign to see a fair deal from journal publishers has provided sector-wide savings which will benefit Imperial significantly. They have also shown a desire to provide the best service possible; they were one of the first libraries to offer 24-hour access during term time and trialled longer opening hours during the Easter break."



The Department of Medicine has been shortlisted in the Outstanding Departmental Administration Team category, in which the judges will look for evidence of excellent communication and service delivery based on the needs of students, academics and central administration.

Dr Matt Lee, Departmental Manager, who coordinated the entry said: "I am delighted that the excellence of the administration team has been deservedly recognised. Although located across six campuses, the team is unified in its focus to provide professional, high quality support to academics and students. The strength of the team has been instrumental in the outstanding departmental performance since its formation in January 2010."

The winners will be announced on 21 June.

—SIMON WATTS, COMMUNICATIONS AND DEVELOPMENT

Imperial College London

Imperial staff Olympics

From old-school sports days to Olympic-themed quizzes and fancy dress, this competition has something for everyone. To get involved, create a mixed team of 4–8 people, who can be from a number of departments. Each team will be allocated a country on registration.

Register your team at: <http://bit.ly/staffolympics>

8–11 May • South Kensington Campus



Imperial announces plans for new leadership



Imperial announced plans for new leadership arrangements which will separate the current responsibilities of the Rector, and create a new role of Provost on 30 April. The search for the first Provost of the College has begun and marks the beginning of the transition towards a leadership model that also includes the new position of President & Rector.

Imperial's Council, the governing body of the College, has agreed to change the current leadership structure for the College. The role of President & Rector will have oversight of all functions at Imperial, but will also place greater emphasis on Imperial's external affairs in the UK and overseas, focusing on building relationships with alumni, supporters, governments and industry. The Provost will be responsible for advancing and delivering the College's core academic mission – education, research and translation.

Explaining the reasons behind the decision to change the leadership model, the Chair of Imperial's Council,

Baroness Manningham-Buller, said: "Higher education is facing tough challenges. State funding for UK universities is reducing and universities across the wider world are competing with well-established institutions like ourselves for the best students and staff. We have to be imaginative and flexible, both to take advantage of the opportunities we have and to overcome the difficulties we face."

In line with the beginning of the search for a Provost, Sir Keith O'Nions has assumed the title of President & Rector. Commenting on the new approach, Sir Keith said: "This model is well established in many of the world's leading universities, most notably in the US. The President & Rector, as the College's leader, will promote Imperial's position as a global university, moving it into a different league in terms of development potential, and influence of higher education and research policy. The Provost will ensure the standard and quality of the academic programme is maintained and enhanced."

The post of Provost will report directly to the President & Rector, and together they will have responsibility for the strategic direction of the College. As a member of Council, Imperial's highest governing body, the Provost will also share responsibility for the wider governance of the College.

—SIMON WATTS, COMMUNICATIONS AND DEVELOPMENT

For more information about the role of Provost and how to apply visit: <http://bit.ly/INRT1U>

Chinese State Councillor visits Imperial

Chinese State Councillor Madame Liu Yandong paid a visit to Imperial on 15 April, where she learnt more about the College and its links with China, before taking a tour of the robotic surgery facilities in the College's Hamlyn Centre, part of the Institute of Global Health Innovation.

Madame Liu who, as a member of China's politburo, is the highest ranking female politician in China, was on a visit to Europe last month, taking in the UK, Belgium and Cyprus. She arrived at the College accompanied by Mr Liu Xiaoming, China's Ambassador to the UK, and senior Chinese ministers.



The delegation was met by Rector Sir Keith O'Nions, Dr Simon Buckle, Pro Rector (International Affairs), and Professor Guang-Zhong Yang, Director of the Hamlyn Centre.

The Rector said: "We are privileged to welcome Madame Liu to Imperial today. This visit also provides an opportunity to recall Imperial's strong relationship with

China, reflected both in numerous academic links and the significant contributions of Chinese staff and students to the Imperial community. It is a relationship we look forward to deepening in the future."

Following presentations on Imperial and its links with China and the College's approach to innovation, Madame Liu met Chinese staff and students based at the College before Professor Yang took her on a tour of the Hamlyn Centre.

Madame Liu's tour ended outside Imperial College Business School. Thanking the Rector for hosting her visit, she said: "It was a pleasure to visit Imperial and learn more about the College's work, as well as to hear more about its continuing relationship with China." The event follows a visit in February by the Chinese Ambassador.

—JOHN-PAUL JONES, COMMUNICATIONS AND DEVELOPMENT

See a slideshow of images from the visit: <http://bit.ly/diplomatictour>

in brief



Fifty-eight per cent of undergraduates took part, a rise of 13 per cent on last year, while 19 per cent of postgraduates voted, up 4 per cent on 2011. In all, 6,539 student voters took part in deciding the new Union sabbatical team and officers. A close race saw Paul Beaumont (Mathematics), triumph as Imperial College Union President. Visit: bit.ly/suresults2012

Union elections

This year the Imperial College Union sabbatical elections achieved the best ever turnout, propelling it to number one for participation among university student unions in England and Wales.

Space race school pupils head to NASA

On 28 March, 160 school pupils descended on Imperial for the UK finals of the Space Settlement Design Competition, to battle it out for their chance to head to NASA's Johnson Space Centre in Houston, Texas, for the international finals. The winning team was called Dougledyne-Flechtel, with their design featuring a settlement which moves across the surface of Mercury on caterpillar tracks, with a thick shell to protect it from solar flares.

Watch a video of the event: <http://bit.ly/spacesettlement>

Pendry gains entry to exclusive society

Professor Sir John Pendry, Chair in Theoretical Solid State Physics (Physics), has been welcomed into the ranks of the American Academy of Arts and Sciences, alongside other new members, including US Secretary of State Hillary Clinton, philanthropist Melinda Gates and singer-songwriter Sir Paul McCartney. Professor Pendry, who has worked at the College since 1981, is a condensed matter theorist whose research has underpinned the development of an 'invisibility cloak'.

Second Big Science Pub Quiz

On 28 March, science reporters and press officers joined over 50 Imperial academics in a battle to be crowned champions of Imperial's second Big Science Pub Quiz – an event run by the Communications and Development Division. The winning team was headed by Dr Aldo Faisal (Bioengineering) and featured members from *Channel 4 News* and *Nature*.

To see pictures from the event and the full team scores, visit: <http://bit.ly/imperialpubquiz>



Six Imperial scientists join Fellowship of Royal Society

An evolutionary biologist, a pharmacologist and four physicists from Imperial joined the Fellowship of the Royal Society last month, as part of the 2012 election of 44 new Fellows.

They join the ranks of around 1,450 elite scientists recognised by the UK's national scientific academy for their contributions to science and are now permitted to use the letters FRS after their name. They bring the number of Royal Society Fellows at Imperial, or those with an on-going association with the College, to 73. The new Fellows are:

- **Professor Michele Dougherty** (Physics), a space physicist and Principal Investigator of the Cassini magnetometer instrument, which was launched onboard the Cassini-Huygens spacecraft in 1997.
- **Professor Russell Lande** (Life Sciences), a theoretical biologist who early in his career pioneered the use of genetics to study the evolution of continuous traits, such as height or weight, in natural populations.
- **Professor Chris Hull** (Physics), a theoretical physicist distinguished for his pioneering work on string theory, a concept that aims to unify all of the forces and particles of nature in a single quantum theory.
- **Professor Tejinder (Jim) Virdee** (Physics) who, for several years, led the team of thousands of international scientists that designed and built the Compact Muon Solenoid detector, one of the two main experiments at CERN's Large Hadron Collider, and one of the most complex scientific instruments ever built, weighing 14,000 tonnes and with a length of 30 metres and a diameter of 15 metres.
- **Emeritus Professor Timothy Williams** (NHLI), recognised for his contribution to the understanding of the mechanisms underlying inflammation. He was appointed Asthma UK Professor of Applied Pharmacology in 1988 and established the Leukocyte Biology Section at Imperial in 1998.
- Visiting **Professor Jeremy Burroughes** (Physics), one of the co-inventors of conjugated polymer electroluminescence, which allows light to be efficiently generated by passing electrical current through thin films of the plastic poly(p-phenylenevinylene).

—SIMON LEVEY, COMMUNICATIONS AND DEVELOPMENT

For the new Fellows' views on their awards visit:
<http://bit.ly/newfellows2012>

Prestigious painting restored to the College



A 130-year-old oil painting by Sir John Everett Millais, one of the founders of the Pre-Raphaelite movement, was hung in the drawing room of 170 Queen's Gate on 18 April.

The painting, known as *For the Squire*, previously owned by the late Lord Sherfield, a former Chairman of Imperial's Governing Body, has been loaned to Imperial for a year by Howard Morris, Emeritus Professor of Biological Chemistry, and his wife, Dr Maria Panico (both Life Sciences).

The couple bought the painting at an auction of the Forbes collection in Edinburgh last October. "For me it conjures up memories of the first errand you were sent on," said Professor Morris. "There is a real sense of responsibility and anticipation in the child's eyes," he added.

Professor Morris, who held the position of Head of the Department of Biochemistry (now part of Life Sciences), wanted to loan the painting to the College because of his family's affiliation with Imperial, as well as the connection to Lord Sherfield. "My wife and I agree that a painting of such quality shouldn't be kept in private – it's nice to be able to share it with a wider audience and allow them to enjoy it."

The painting has been hung next to *Lady in the Yellow Dress* by Sergei Arsenyevich Vinogradov. Lady Rita O'Nions, wife of Imperial's Rector, who saw the painting installed, said: "I have always favoured the *Lady in the Yellow Dress*, but now this one has arrived, I think I have a new favourite!"

—EMILY ROSS-JOANNOU, COMMUNICATIONS AND DEVELOPMENT



Two ticks for Imperial

The College officially received its 'two ticks' disability symbol at a presentation on 16 April.

The disability symbol is awarded by Jobcentre Plus to employers who have made a commitment to employ, keep and develop the abilities of staff with disabilities. Eligible organisations must meet five criteria, including interviewing all job applicants with a disability who meet a vacancy's minimum criteria, and making every effort to ensure employees who become disabled are able to stay in employment.

The presentation was attended by members of Imperial's Disability Action Committee who have helped lead improvements for College members with disabilities over the past two years.

Accepting the award from Jobcentre Plus representative Debby Huff, Louise Lindsay, Director of Human Resources, said: "We're delighted Imperial has received 'two ticks' disability status. This is an important recognition of the commitment by members of the staff and student body to supporting those with disabilities. There is more for us to do – but this is a great endorsement of the work to date."

Imperial will report to Jobcentre Plus on how it maintains this commitment. One new development is the introduction of a Staff Disability Officer, a post approved by the College's Equality and Diversity Committee, chaired by Edward Astle, Pro Rector (Enterprise).

—JOHN-PAUL JONES, COMMUNICATIONS AND DEVELOPMENT

media mentions

—SAM WONG, COMMUNICATIONS AND DEVELOPMENT



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THE GUARDIAN ▶ 29.3.2012

Grey matter



“That’s your fear and aggression centre,” says Professor Steve Gentleman (Medicine), as he removes a piece of brain tissue. “That’s the main event – personality, executive function, reason.” Professor Gentleman was watched by Guardian feature writer Zoe Williams, who visited the Parkinson’s UK Tissue Bank at Imperial to learn about how brains donated by volunteers are used in neuroscience research. Specimens in the brain bank are used to study not just Parkinson’s disease, but Alzheimer’s, multiple sclerosis and other disorders. “Pathology isn’t just weird people who keep things in the basement,” says Professor Gentleman. A film depicting a dissection at the brain bank is being shown at the Wellcome Collection’s new exhibition exploring how we treat the brain as an object. It runs until 17 June.

DAILY MAIL ▶ 31.3.2012

Sex change

Scientists in the UK are leading efforts to eradicate malaria by genetically engineering the mosquitoes that spread the disease. At Imperial, Professor Andrea Crisanti (Life Sciences) is working on disrupting the sex ratio in the malaria-carrying Anopheles mosquito, with funding from the Gates Foundation. “Our genetic modification consists of putting in a gene that codes for the PPO1 enzyme,” says Crisanti. This enzyme destroys the X chromosome during the production of sex cells, leaving only the male-determining Y chromosome active. Since only the females transmit malaria, the researchers hope the intervention will lead to a predominance of male mosquitoes.

THE OBSERVER ▶ 1.4.2012

Painting by numbers?

Can a computer create art? Dr Simon Colton (Computing), a researcher in computational creativity at Imperial, thinks so. He created a program called the Painting Fool to see if software could be taken seriously as a creative artist. Its work has been displayed in an exhibition in Paris, but Dr Colton says it isn’t a real artist yet. “People want to know artwork has been constructed with an intelligent thought process,” he says, “so



perhaps once the software produces pieces that are culturally valuable, that get people talking, and are not necessarily anything that I’m keen on aesthetically or conceptually, that would be a good indication of its independence from me.”

THE SUNDAY TELEGRAPH ▶ 1.4.2012

Waste not, want not

Leftover fat from plastic surgery is increasingly being saved from the incinerators by scientists who study the tissue for research on obesity, stem cell biology and other areas. “We don’t have any figures, but it’s a growth area and is driven by some very interesting developments,” says Professor Sian Harding (NHLI), one of the authors of a report on human tissue donation by the Nuffield Council on Bioethics. Many cosmetic patients are happy to consent, just as cancer patients are. “People who’ve had tumours removed are usually very happy to have cells grown out of those tumours that can then be tested for new drugs for cancer,” says Professor Harding.



awards and honours

ENGINEERING

Brainy proposal gets international support



Dr Paul Chadderton (Bioengineering) received a Young Investigator Award from the International Human Frontier Science Program Organisation in March 2012.

Dr Chadderton and his team will investigate brain activity in mouse models to understand in more detail the underlying principles behind working memory

– verbal and non-verbal activity, such as reasoning and comprehension. This could ultimately lead to a greater understanding of human brain function.

MEDICINE

Professional fellowships

Professor Justin Stebbing (Surgery and Cancer) and Dr David Sharp (Medicine) are among eight scientists in the UK to have been awarded National Institute for Health Research (NIHR) professorial fellowships. The awards, which aim to support translational research, will give five years of funding for Professor Stebbing’s work on personalised cancer treatments and Dr Sharp’s work on traumatic brain injury.

ENGINEERING

Henry Edward Armstrong medal

Dr Vivian Onyebuchi Ikem (MSc Chemical Engineering and Chemical Technology 2005, PhD 2010) was awarded the Henry Edward Armstrong Memorial Trust medal by the Deputy Rector, Stephen



Richardson, at an event on 30 March 2012. Vivian was recognised for her PhD research developing highly porous, permeable and mechanically sound materials, via a technique called emulsion templating, for use as filters in oil wells.

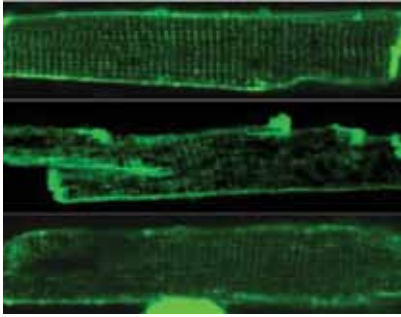
GRANTHAM INSTITUTE

City and Guilds Fellowship



Professor Sir Brian Hoskins, Director of Grantham Institute for Climate

Change, was awarded the Fellowship of the City and Guilds of London Institute for his outstanding contribution to the understanding of the effects of manmade climate change and its impact on the environment, at a ceremony which took place on 21 February.



Heart failure's effects in cells can be reversed with a rest

Structural changes in heart muscle cells after heart failure can be reversed by allowing the heart to rest, according to findings from a study in rats published in early April in the *European Journal of Heart Failure*.

The research, which was led by Imperial scientists, shows that the condition's effects on heart muscle cells are not permanent, as has generally been thought. The discovery could open the door to new treatment strategies.

Heart failure means that the heart muscle is too weak or stiff to pump blood as effectively as it needs to, and it is commonly the result of a heart attack.

Patients with advanced heart failure are sometimes fitted with a left ventricle assist device (LVAD). The LVAD is a small pump that boosts the function of the heart and reduces strain on the left ventricle, the biggest chamber of the heart, which pumps blood around the body's main circulation.

In 2006, researchers led by Professor Magdi Yacoub (NHLI) showed that resting the heart using an LVAD fitted for a limited time can help the heart muscle to recover.

The new study looked at the changes that occur in heart muscle cells during heart failure in rats, and whether 'unloading' the heart can reverse these changes.

"This is the first demonstration that this important form of remodelling of heart muscle cells induced by heart failure is reversible," said Michael Ibrahim (NHLI). "If we can discover the molecular mechanisms for these changes, it might be possible to induce recovery without a serious procedure like having an LVAD implanted."

—SAM WONG, COMMUNICATIONS AND DEVELOPMENT

Care for premature babies has improved in England

Neonatal services in England have improved since they were reformed to increase cooperation between hospitals in 2003, according to a new study published on 4 April in the *British Medical Journal* and led by researchers at Imperial.

After a Department of Health review, neonatal services were organised into managed clinical networks so that clusters of hospitals providing different levels of specialist care could work in collaboration. This restructuring aimed to increase the proportion of premature babies born in a specialist care unit and reduce the number of acute (within 24 hours of birth) postnatal transfers from one hospital to another.

The researchers looked at 294 maternity and neonatal

units in England, Wales and Northern Ireland between 1998 and 2000 and 146 neonatal units in England between 2009 and 2010, covering the births of 6,441 babies born at 27–28 weeks of gestation.

Between the two time periods, the proportion of babies delivered at specialist care centres increased, as did the proportion of premature babies that survived to 28 days.

However, half of premature babies are still delivered in non-specialist units, and the proportion of babies transferred between hospitals within 24 hours has increased from seven per cent to 12 per cent.

Professor Neena Modi (Medicine), who led the research, said: "The rate of preterm birth is increasing worldwide, and



extremely premature babies need highly specialised neonatal intensive care immediately after they are born. Our findings show that considerably more babies are being born in environments where they get the best care compared with 10 years ago, but there's still a lot of room for improvement. In particular we are worried by the continued separation of twins and triplets, the evidence of insufficient cot capacity, and poor coordination between neonatal and maternity services".

—ADAPTED FROM A NEWS RELEASE ISSUED BY THE BRITISH MEDICAL JOURNAL

The time is ripe for Salmonella



The ripeness of fruit could determine how food-poisoning bacteria grow on them, according to research presented by Imperial researchers at the Society for General Microbiology's spring conference in Dublin on 26 March. Their work could lead to new strategies to improve food safety, bringing many health and economic benefits.

A wide range of fresh produce has been linked to outbreaks of *Escherichia coli* and *Salmonella enterica*, including melons, jalapeño and serrano peppers, basil, lettuce, horseradish, sprouts and tomatoes.

The researchers, led by Professor Gad Frankel (Life Sciences), are looking at how these bacterial pathogens latch onto fruits and vegetables and establish themselves in the first place. They have discovered that strains of *Salmonella* behave differently when attached to ripe and unripe tomatoes.

"Bacteria that attach to ripe tomatoes produce an extensive network of filaments, which is not seen when they attach to the surface of unripe tomatoes. This could affect how they are maintained on the surface," explained Professor Frankel. "We are not completely sure yet why this happens; it might be due to the surface properties of the tomatoes or alternatively the expression of ripening hormones."

Although fresh fruits and vegetables are recognised as important vehicles that transmit harmful bacteria, they are still important components of a healthy and balanced diet.

"By and large, raw fruits and vegetables are safe to eat and provide numerous health benefits. By working out the reasons behind sporadic outbreaks of infections, we can control these better and help maintain consumer confidence. By improving food safety we would also see important economic and health benefits," Professor Frankel said.

—SIMON LEVEY, COMMUNICATIONS AND DEVELOPMENT

“By improving food safety we would also see important economic and health benefits”

Plants may absorb more carbon dioxide than previously thought

The capacity of terrestrial ecosystems to absorb carbon dioxide emissions from human activity may be greater than previously thought, according to a new study involving Imperial and University of York scientists, which was published in March in *Nature Climate Change*. The authors say these results improve our ability to predict the magnitude of climate change before it happens.



The scientists were investigating how changes in temperature and atmospheric carbon dioxide levels, such as those predicted under the effects of global climate change, affect soil respiration and a plant's rate of growth, photosynthesis and respiration.

"These results improve our ability to predict the magnitude of climate change before it happens"

The research addresses a key question in environmental science about whether an increase in global temperatures will cause an increase or a decrease in the ability of ecosystems to absorb carbon dioxide from the atmosphere. The results of the study suggest that with the help of plants, the Earth's terrestrial ecosystems may well have more capacity to buffer against 'runaway' climate change than previously thought.

The scientists grew plants in sealed experimental cabinets, provid-

ing them with soil, light, water, and a controlled atmosphere that mimicked possible future temperatures

and levels of atmospheric carbon dioxide. Over several months they measured how well the plants absorb carbon dioxide under these changing environmental conditions.

Research author Dr Alex Milcu (Life Sciences) said: "We are really improving our understanding of how plants react to global environmental changes, but a discrepancy exists between our results, those from 'open' unsealed experiments, and data from the best computer simulations. Right now, the best way to improve these simulations is through more experimental work to understand the way that carbon cycles between soil, vegetation and the atmosphere."

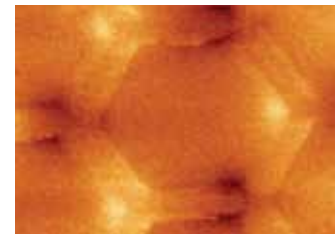
—SIMON LEVEY, COMMUNICATIONS AND DEVELOPMENT

Honeycombs of magnets for new gadgets

Imperial scientists have taken an important step forward in developing a new material using nano-sized magnets that could ultimately lead to new types of electronic devices, with greater processing capacity than is currently feasible. This is according to a study published on 30 March in the journal *Science*.

Many modern data storage devices rely on the ability to manipulate the properties of tiny individual magnetic sections, but their overall design is limited by the way these magnetic 'domains' interact when they are close together.

Now, researchers have demonstrated that a honeycomb pattern of nano-sized magnets introduces competition between neighbouring magnets, and reduces the problems caused by these interactions by two-thirds. They have shown that large arrays of these nanomagnets can be used to store computable information. The



arrays can then be read by measuring their electrical resistance.

"Electronics manufacturers are trying all the time to squeeze more data into the same

devices, or the same data into a tinier space for handheld devices like smart phones and mobile computers," said research author Dr Will Branford (Physics). "However, the innate interaction between magnets has, so far, limited what they can do. In some new types of memory, manufacturers try to avoid the limitations of magnetism by avoiding using magnets altogether, however, our philosophy is to harness the magnetic interactions, making them work in our favour."

—SIMON LEVEY, COMMUNICATIONS AND DEVELOPMENT

Gene can turn flu into a killer



A genetic finding could help explain why influenza becomes a life-threatening disease in some people while it has only mild effects in

others. New research, which involved Imperial scientists and was published in the journal *Nature* on 26 April, has identified for the first time a human gene that influences how we respond to influenza infection.

The researchers found that people who carry a particular variant of a gene called IFITM3, which encodes a protein of the same name, are significantly more likely to be hospitalised when they fall ill with influenza than those who carry other variants. This gene plays a critical role in protecting the body against infection with influenza and a rare version of it appears to make people more susceptible to severe forms of the disease. IFITM3 is an important protein that pro-

tections cells against virus infection and is thought to play a critical role in the immune system's response against such viruses as H1N1 pandemic influenza, commonly known as swine flu. When the protein is present in large quantities, the spread of the virus in lungs is hindered, but if the protein is defective or absent, the virus can spread more easily, causing severe disease.

"This new discovery is the first clue from our detailed study of the devastating effects of flu in hospitalised patients", said the study's co-author, Professor Peter Openshaw (NHLI), pictured. "It vindicates our conviction that there is something unusual about these patients."

—ADAPTED FROM A NEWS RELEASE ISSUED BY THE WELLCOME TRUST SANGER INSTITUTE



Plant power

On 18 April, Imperial unveiled its new £2 million carbon capture pilot plant – the most sophisticated facility of its kind in the world for training the next generation of engineers to enter industry. The Director of the pilot plant project, Dr Daryl Williams (Chemical Engineering), takes *Reporter's* Colin Smith on a guided tour before undergraduates take over the running of the facility on a day-to-day basis.

People walking along the walkway on the South Kensington Campus over the past two years cannot have failed to notice the general buzz of building activity going on behind the hoardings in the Department of Chemical Engineering. Dr Daryl Williams, a senior lecturer in the Department, has been in the thick of it, collaborating with building managers, construction experts, engineers and Imperial staff to bring to fruition the new pilot plant – a four-storey facility, rising up through the Department's core. The pilot plant is part of a larger refurbishment in the Department – the ChemEng Discovery Space – a £9 million pound investment that also includes new teaching labs, research labs, offices and learning spaces.

The College has been working closely with industry on this project, and the power and automation technology company ABB in particular, to ensure that students get the most realistic experience of working in a chemical engineering plant. The plant features a wide variety of advanced control and instrumentation technology, so that students are trained to work with a range of different industrial plant systems and technologies.

Hands-on

"Engineering education needs to retain a hands-on element, especially as more and more academic material goes online," explains Daryl enthusiastically, as he leads me through one of the newly finished teaching labs and into the bowels of the plant on the ground floor.

"It's pretty amazing that students who are 18 or 19 will be able to come in here and learn how to operate this £2 million plant as part of their studies," he adds, gesturing towards the plant machinery as we walk in. As I take in the full view, I begin to realise just how unique the learning experience for students will be.

It looks like something out of *Dr Who*, complete with flashing green and red lights, lots of buttons and big computer servers huddling up against the walls. In the centre of the room is a tangle of impressive-looking machinery and towering stainless steel pipes. I ask Daryl to explain the purpose of all this equipment.

"It demonstrates how coal or gas-fired power plants could capture harmful CO₂ emissions before they reach the atmosphere," he says.

Mock crisis

Our tour and conversation is suddenly interrupted by an announcement booming over a loudspeaker: "There is an emergency! Please wait for further instructions".

A piercing klaxon sounds and an orange light begins to flash. We hurry away from the noise, up another level and into the control room – the plant's nerve centre – where students are involved in a training scenario; a mock crisis in the plant.

The big screens, desks and computer terminals are reconfiguring into emergency mode as we walk into the room. "It's like something out of a *Star Trek* movie," enthuses Daryl, pointing to the desks and computers that are rising up so that the students can monitor their terminals from a standing position."

"Years of industry research suggest that in an emergency situation people work best when they are standing up," Daryl explains.

The student team prevents a virtual spill from happening in one of the pipes in the pilot plant and the mock crisis is averted.

Pictured clockwise: students in mock crisis mode in the control room; Daryl inspecting a sensor and the glass viewing portal through which you can see CO₂ absorption.



Career-ready

Second year chemical engineering undergraduate George Spence-Jones is part of the demonstration team in the pilot plant. George tells me he wants to be a process systems engineer when he graduates, designing chemical plants like the one we are in. He says the pilot plant is already providing valuable insights into his future career.

“As part of our studies, we carried out an inspection of the pilot plant and one of the major things that I’ve learnt is that there may be a number of unforeseen challenges that come up during the construction phase that may impact on the design,” explains George. “For instance, we had to update the pilot plant’s schematics because we discovered discrepancies between the designs and the actual layout of the plant, due to space constraints. Apparently, this happens all the time when plants are being built. It felt good to be involved in tasks that I might actually do in my career.”

The opening of this plant could not have come at a better time for Imperial undergraduates. In April, the government announced a £1 billion initiative to develop carbon capture and storage technology, through a competition to design the first workable carbon capture plant for gas-fired power stations. The project has the potential to create 10,000 jobs in industry, and researchers from Imperial’s Energy Future’s Lab will be involved in the underpinning research that will help to make the government’s vision a reality. It strikes me that graduates like George could be at the forefront of this new UK industry.

“Absolutely,” agrees Daryl. “The pilot plant gives our students a headstart because they’ll be learning all the latest technologies and processes behind carbon capture, long before the first plants are built for industry.”

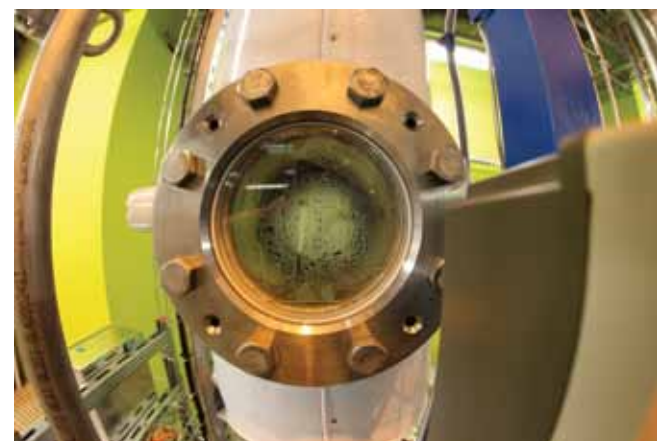
Future vision

In the future, we may be able to mitigate the impact of industrial-scale power plants on the climate, by capturing CO₂ using similar technology to that used in this pilot plant. A vast network of pipes could pump the extracted gas into depleted oil and gas reservoirs under the North Sea, where it would be safely stored for millions of years.

At Imperial’s plant, the process works by separating 1.2 tonnes of CO₂ per day from other emissions. As this plant is a training facility, the CO₂ is simply separated from the other gases and then mixed in again as part of a continuous demonstration cycle, rather than being pumped underground.

I ask Daryl to show me how the CO₂ is separated. We leave the control room and head back into the pilot plant to a glass viewing portal in the piping to watch the CO₂ extraction taking place. The CO₂ gas mixture bubbles up an ‘absorber column’. It is collected by a water-based solution containing the chemical monoethanolamine (MEA), which is trickling down the column in the opposite direction. At the base of the column, the CO₂-rich MEA is pumped to an adjacent ‘stripper column’, which heats the MEA, so that the CO₂ can be collected and reused again in the demonstration.

As we wander around the plant, Daryl points out some of the other features including video surveillance cameras and more than 250 sensors, some wireless and others that are powered by excess energy generated by the plant. Together, they form a network that relays information in real time to students, so that they can monitor anything from temperature to liquid pressure. The plant also features a wide variety of advanced control and instrumentation technology, so that the



students who train here will be equipped to work with a range of different plant systems and technologies.

Another novel feature is that students can use their iPhones and iPads to access information from the sensors, video equipment and computers, so they don’t have to be in the control room to run the plant.

“In the near future, engineers will be able to use technology like iPads to work offsite to solve problems and monitor situations. We want our students to benefit from that experience before they even set foot in a real plant,” says Daryl.

As my tour with Daryl ends, I ask him how it felt to see the students finally in the plant. “It feels like all the hard work that everyone has put into the project over the last two years is justified, now that the students are taking control of the pilot plant. When you see students quickly learning how to operate a plant in a crisis, or understanding in more detail the challenges involved in constructing such a complex structure like this, it underlines just how capable our undergraduates are. If this is the future of chemical engineering, we are in safe hands,” he adds.

—COLIN SMITH, COMMUNICATIONS AND DEVELOPMENT

To hear a podcast on the carbon capture pilot plant visit: <http://bit.ly/carbonpodcast>

“It looks like something out of a *Star Trek* movie!”



Finding the right formula

Reporter meets Professor Richard Craster, Head of the Department of Mathematics, who first started at the College as a maths undergraduate in 1986, to find out how he has found his first six months in post and his plans for the Department.

What are your aims for the Department?

I think they are the aims of any Head of Department, which is to have world class research and high quality teaching within the Department. In addition I want to there to be more of an emphasis on transferable skills for students, as well as try to build a greater sense of community within the Department. No matter what the external factors are, with financial constraints and other worries, internally we need to focus on it being a really great place to work.

How are you going to go about achieving that?

I want to put on more events both for staff and students, and for the Department to be more socially proactive. There are the challenges of being a city centre campus to overcome, with some people living far away and so many other nearby distractions, but we want to give staff and students a reason to hang around the Department a bit more often. It can be something as simple as pastries and coffee at Wednesday afternoon meetings, although I'm under no illusions we're going to turn the Huxley Building in to a party palace!

What advice would you have for any early-career scientists?

Everyone always assumes that if you've had a 'successful' scientific career, then it must have been planned, and that you became a professor as a result of a series of mapped out steps taken since you were sixteen. But in my experience, it doesn't work like that. I got into science, and maths in particular, because I found the subjects easy and fascinating. And so I think for so long as postdocs find the work challenging, fun and exciting, they should follow that path and it could eventually lead to a career. In my case it was a filtering process, rather than some pre-planned deterministic path.

What are you excited about in the Department?

Since October we have made several new appointments. It is exciting to see a place grow. By strengthening research areas, such as mathematical biology, dynamical systems and mathematical finance, it's becoming an even more interesting place in which to work. It's also good to see people successfully winning research grants. Even though the headline message from research funders is that money is limited, the Department is winning grants at every panel meeting and a steady stream of successful Fellowships. I'm personally excited that we have won funding from the Engineering and Physical Sciences Research Council for a research project on which I'm a co-investigator with Dr Greg Pavliotis and Professor Andrew Parry from this Department. It aims to predict how waves reflect off designed structured surfaces and how they change when they encounter a micro-patterned surface. We all have really different backgrounds and the funding will force us to work together in new ways.

How has the College changed since you first joined?

I was an undergraduate between 1986 and 1989 and then returned as an EPSRC Advanced Fellow and a lecturer in 1998, so really I've seen it in two incarnations. The first time around, Imperial was part of the University of London and the College was primarily based on the South Kensington Campus. Whilst its physical space hasn't grown since then, the number of people has. Then, there were only 70 undergraduates in my year, whereas now there are 200 students in each year. Today, as an academic, there are many more pressures than there used to be – you must be a fantastic teacher, administrator and bring in grant income, as well as do top-quality research: which is actually hard to do well and to do simultaneously. The public perception of an academic loafing around with lots of spare time is very wide of the mark!

What continues to excite you about maths?

As a child I always thought it almost magical that maths coupled with physics could explain such seemingly simple, but real, things like rockets, projectiles and orbiting planets, and that you can use it to predict how they would move. That magical feeling about getting equations to interpret or explain real processes has never gone away.

—SIMON LEVEY, COMMUNICATIONS AND DEVELOPMENT

“That magical feeling about getting equations to interpret or explain real processes has never gone away”

inside*

story

mini profile

Bob MacCallum

Reporter spoke to Dr Bob MacCallum (Life Sciences) about mosquitoes, databases and his work in Professor George Christophides' lab.



How did you get into bioinformatics?

Until a few years ago, my dad was a computer science lecturer, so computers have always been in my blood. However, being the usual rebellious child, I decided not to pursue computing and did a biology degree instead! Later on during my PhD at UCL, I discovered bioinformatics – the application of computer science and information technology to biology and medicine. I've been involved in computational biology ever since.

What is VectorBase?

I've been at Imperial since 2005 working for VectorBase – a consortium involving the University of Notre Dame, Harvard, the European Bioinformatics Institute and the University of Crete – tasked with building a website and database of genome sequence, gene expression, and population data for different species of mosquitoes and other insect vectors of disease. A vector is an organism responsible for transmitting infections from host to host.

How did the project begin?

The project is funded by the US government and arose in the aftermath of 9/11 when homeland security was high on the agenda. It is hoped that an improved understanding of vector borne diseases will help defend against their potential weaponisation, improve conditions in developing countries, and mitigate the effects of global warming as vector populations move into new areas.

Who's the database for?

VectorBase is a portal for worldwide insect vector research. We gather microarray (the technology used to do gene expression profiling) data from the community into one web-based resource. Biologists with no computational training can see how a specific gene is switched on and off (or regulated up and down), with respect to different biological events and processes. Our latest development, published in *BMC Genomics*, is a map of gene expression in the malaria mosquito.

—EMILY ROSS-JOANNOU, COMMUNICATIONS AND DEVELOPMENT

For more information see: www.vectorbase.org

Reaching out to business

Professor Tom Welton, Head of the Department of Chemistry, reports on his experience of being invited to the Imperial Business Partners dinner and discussion on 13 March.

“The Business Partners are a group of companies that have decided that they want to deepen their relationships with the College. These are AWE, BP, BT, GE, Ineos, National Grid, Rolls-Royce, Shell and Syngenta. Dow Chemical, which makes products in the chemical, advanced materials, agrosiences and plastics fields, were guests for the evening. Professor Julia Buckingham, Pro Rector (Education and Academic Affairs), led the evening's first discussion on the world of £9,000 p.a. fees soon to be upon us, and what its consequences may be. Later, we had a second discussion on broader government policy for science and technology funding led by Lord Robert Winston, Professor of Science and Society (Humanities), who either has a remarkable ability to eat and speak at the same time, or doesn't mind the taste of a cold dinner.

The real stars of the evening were the 20 or so teenagers, who had come to show us Imperial's Reach Out Labo-



Dr Ellis Armstrong of BP with students in the Reach Out Lab

ratory in action. These young people were from schools in disadvantaged areas from all over London. They were fantastic. You couldn't hope to meet people more enthusiastic about doing science. They each grabbed different guests to show us what they were doing and to tell us why the Reach Out Lab is so important to them. If you believe, as I do, that the foundations of Imperial's success are its students, then I am happy to report that, should they choose Imperial for their degree, the College has a bright future to look forward to.”

www.imperial.ac.uk/imperialbusinesspartners

“You couldn't hope to meet people more enthusiastic about doing science”



SCIENCE FROM SCRATCH

Algorithms

explained by Douglas Heaven, MSc Science Communication

An algorithm is a recipe. When following a recipe for a chocolate fudge cake, for example, we carry out an ordered series of actions that takes a set of ingredients – flour, sugar, eggs, chocolate – and produces a cake. The recipe specifies which actions to perform and the order in which to do them. In mathematics and computer science, an algorithm relates a set of inputs to an output in much the same way that a cake recipe relates the ingredients to a cake. Some algorithms have become standard tools for common tasks such as sorting, or finding the best routes between locations. Algorithms have also been around for a lot longer than computers: Euclid's algorithm for finding the largest positive whole number that divides two others, for example, was recorded in 300 BC. More recently, 'rogue algorithms' have been blamed for the stock market crash. But blaming an algorithm is like blaming a recipe – the responsibility lies with whoever requested a cake when a brownie was wanted instead.



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

Student blogger Aislinn on hitting the books:

“Sleeping – I’ll be the first to admit I’ve overdosed on this one this Easter. Yesterday I woke up at 15.00 and the day before, I fell asleep in the middle of revising.



But no more! I got up at a respectable hour this morning (10.00, don’t you dare judge me) and got some solid work done after some gentle nudging by my dad. Do I regret my hours of staying up late and sleeping all day?

Not at all. But I made a promise to myself to get back into serious study mode for at least the last two weeks of the holidays, a goal I set at the beginning of the break.”

www.imperial.ac.uk/campus_life/studentblogs

blog
SPOT

Could you survive on just £1 a day?

Between 6–10 May, Alexandra Weldon, Advocacy and Relations Manager (Public Health) at the Schistosomiasis Control Initiative (SCI), has taken on the challenge to live off just £1 per day for food, reflecting the experiences of the 1.4 billion people currently living in extreme poverty around the world. Alix explains why she is taking part in the annual Live Below the Line fundraising initiative.

“One of SCI’s dedicated supporters, a student at the University of Liverpool called Aled Roberts, took part in the initiative last year and contacted us to let us know what he was doing. I had never heard of Live Below the Line, which was in its second year in



2011, but thought the idea was simple and brilliant, and offered an incredible opportunity for the SCI to increase its reach and educate people about

the relationship between extreme poverty and neglected tropical diseases. These diseases cause malnutrition and stunted growth, prevent children from going to school and parents from going to work, thereby taking away any chance families have of lifting themselves out of poverty. Aled said the worst thing about the challenge was the boredom and it was months before he could face eating

boiled rice again, but my greatest fear is five days with no caffeine! So far, the SCI’s Director, Professor Alan Fenwick, Dr Michael French (Public Health) and

“My greatest fear is five days with no caffeine!”

I have signed up to participate, as well as a number of students including Imperial College Union President, Scott Heath. Anyone interested in joining the challenge (you can do it anytime up to 30 June when the website will cease to accept donations), feel free to drop me a line: a.weldon@imperial.ac.uk.”

Sponsor the Imperial team:
<http://bit.ly/belowthelineimperial>

Planet under pressure

Last month Georgina Mace, Professor of Conservation Science (Life Sciences), addressed scientists and policy makers at the three-day Planet Under Pressure conference, as they decided their key priorities for next year’s UN international climate summit, the Rio+20 in Rio de Janeiro, Brazil. Reporter caught up with her ahead of the conference

What do you think the planet will look like in 100 years?

It depends on what decisions we make about how to manage landscapes and the oceans. We do know, though, that the earth will be much altered. We will have been through a period of maximum population size with all the implications that has for land use, and the loss of natural ecosystems and wild species. And because

climate change will continue to have a big impact on some ecosystems and areas of the world, this will have had major consequences on polar areas, and many low-lying coastal areas could be flooded due to sea level rise.

What effect do you think negative stories about the future of the planet has on people’s behaviour?

There is a serious problem that short term concerns – about economic growth, poverty reduction and employment – will eclipse the need for actions to be taken now that secure prosperity and equity for the future. This is a difficult communication task, but there is no doubt that over decades, as

opposed to years, the success of actions taken today need to be measured in terms other than monetary growth.

What commitments would you like to see coming out of the Rio+20?

Firstly, we need to see some joined-up planning for the environment at all scales from local to global. This means that separate short-term plans for agriculture, water, energy, biodiversity and infrastructure need to be moved to integrated long-term plans for a sustainable future. Secondly, we need measures of success that are based on overall benefits to societies and correlated with the amount of environmental degradation it causes,

“We need to see some joined-up planning for the environment at all scales from local to global!”



and not only on measures of production and consumption (otherwise known as Gross Domestic Product, or GDP) that is. Thirdly we need better governance and decision-making for the environment. These are large but interconnected challenges that are widely agreed to be necessary. The science is clear, it is simply a case of finding ways for politicians to act.

—SIMON LEVEY, COMMUNICATIONS AND DEVELOPMENT

For the full interview see:
<http://bit.ly/planetunderpressure>



INVENTOR'S CORNER

Bio-inspiration

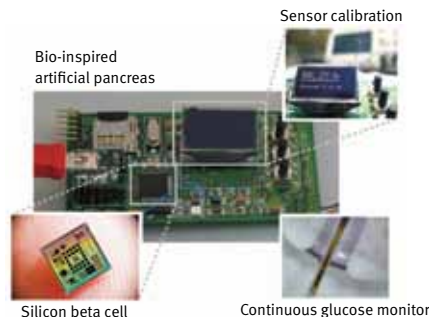
Dr Pantelis Georgiou is a lecturer in the Department of Electrical and Electronic Engineering, whose research involves the application of microelectronic technology to create novel medical devices. He has developed a Wellcome Trust-funded bio-inspired artificial pancreas, which aims to improve the treatment of patients suffering from Type 1 diabetes

Why have you developed this device?

Type 1 diabetes is an autoimmune disease, in which the beta cells in your pancreas (the cells responsible for sensing your blood glucose and releasing the insulin) get destroyed. Traditional insulin injections solve the problem in the short term, but patients still end up having large glycaemic variability, meaning their blood sugar still fluctuates throughout the day – a leading cause of secondary complications like blindness, heart disease and nerve damage. The bio-inspired artificial pancreas can control the blood sugar continuously throughout the day, helping to constrain glycaemic variability and the resulting medical difficulties.

How does it work?

The artificial pancreas is worn externally and combines a continuous glucose monitor that reads your blood sugar, and an insulin pump that infuses the insulin into the body. The innova-



Dr Georgiou's artificial pancreas comprises an innovative bio-inspired microchip which replicates the body's cells

tive aspect of this is the biologically-inspired microchip which connects the two; we've been able to replicate the beta cells using integrated circuits on a silicon micro-chip. With this we can deliver insulin profiles that would be as expected in a healthy pancreas.

How will you develop this technology?

We've validated this technology through a patient simulator and were able to regulate the patient's blood glucose within target levels 93% of the time. This allowed us to begin human clinical trials, which are currently underway at St Mary's Campus. The next step is to develop this into a larger scale study that will take this from the clinic to the home.

—KAILEY NOLAN, IMPERIAL INNOVATIONS

Visit: www.imperialinnovations.co.uk

course review



By course attendee Dr Karl Smith, Research Associate (Civil and Environmental Engineering)

Presentations for interviews: practice and feedback

1 Why did you go on the course?

Delivering presentations is increasingly becoming a standard part of job interviews. My research contract is nearing its end, so I'm currently immersed in the job application and interview process. My key aspiration was that this course would help to maximise my recruitment prospects.

2 What did you learn?

I received some very constructive feedback on how I could address the weaker aspects of my presentation approach and delivery. Watching and, moreover, critiquing the other attendees' practice presentations gave me a strong grasp of what should engage an assessment panel.

3 What element of the course did you find the most helpful?

A crucial element was that each presentation was filmed. Consequently, we could watch video playbacks of our performances: this gave us a revealing insight into our individual tics, some of which were shown to be alarmingly distracting. I wouldn't hesitate to recommend this course to fellow postdocs pursuing gainful future employment.

Visit the website for more information on the course: <http://bit.ly/practiceandfeedback>

Tackling the Thames

This month, Martin Lodemore, Patient and Public Liaison Officer (Medicine), is attempting to canoe the length of the Thames in an inflatable canoe in memory of his nephew Tom, who died from sudden unexpected death in epilepsy (SUDEP), aged 27. In the UK, 1,000 young people die each year from epilepsy and around half of these are due to SUDEP. Martin reports on his challenge:

"I was trying to think of something different that I might be able to do in Tom's memory. Initially, I thought of rowing the Thames, but with the estuary, an inflatable canoe sounded more

sensible and more stable. I'm starting on 5 May from Thames Head in Gloucestershire and hopefully finishing the 215-mile journey by 20 May at Southend-on-Sea in Essex, I'll be camping where I can or finding accommodation. Family, friends and colleagues are planning to swim, walk, run or cycle sections with me on the Thames Path. Training has been tough: weekday evenings, I focus on fitness using an exercise bike, weights and even the Wii; weekends are largely spent getting in the canoe and trying to build up my stamina and strength. In my role at Imperial, working with the national Diabetes Research



Network, I travel across England, so it's been hard to keep up the weekday training. I'm looking forward to getting started on the challenge!"

To support Martin's challenge or follow his progress visit: www.tacklingthethamesfortom.co.uk

obituaries



CHRISTOPHER WASTELL

Professor Christopher Wastell, who held a Chair of Surgery at Charing Cross and Westminster Medical School, died on 18 January 2012. Julia Anderson (Surgery and Cancer) shares her memories of her colleague:

“Professor Wastell was born on 13 October 1932. He qualified from Guy’s Hospital and was appointed to the Chair in Surgery at Westminster when

the first Professor of Surgery at Westminster Medical School, Harold Ellis, retired in 1989. He had already held a personal chair conferred by Westminster Medical School, since 1981.

Chris was an outstanding gastrointestinal surgeon. He built the Academic Surgical Unit at Chelsea and Westminster, securing charity and industrial funding to support it. He was an excellent teacher – to undergraduates and postgraduates – many Doctor of Medicine (MD) and Master of Surgery (MS) students owed their subsequent careers to Chris.

Chris was a great supporter of the hospital (both Westminster and subsequently Chelsea and Westminster), continuing after retirement in 1997.

He was avidly interested in sailing and supported the student’s sailing club for many years; in retirement he sailed the Atlantic and continued sailing after suffering a stroke from which he made a determined and remarkable recovery.

Chris was a keen gardener with a large garden and a beautiful lawn, and an allotment producing wonderful vegetables.

He leaves his wife, Margaret and their three children – Giles, Jackie and Viv – and five grandchildren.”

To share your memories of Chris visit: www.imperial.ac.uk/reporter

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 June to 14 June. The data is supplied by HR and is correct at the time of going to press.

20 years

- Mrs Jennifer Eastwood, Administration, Environmental Policy
- Dr Djordje Brujic, Research Fellow, Mechanical Engineering

30 years

- Emeritus Professor Mary Ritter, Medicine and CEO of Climate-KIC

SPOTLIGHT



Jennifer Eastwood, Administrator (Centre for Environmental Policy)
20 years

Jennifer Eastwood joined Imperial in 1983 but was forced into early retirement due to ill health. She re-joined the College in 1991. “I bumped into Sir Eric Ash, the Rector at the time, who told me I didn’t look ill enough! He gave me the confidence to come back to work after a difficult time,” she explains. This month she celebrates 20 years of continuous service.

Jennifer’s background in modern languages has been well-used in the various roles she has had at the College. These include editing research submissions and journal articles, organising events and, on one occasion, persuading Polish border guards to grant Imperial researchers access to ‘the Black Triangle’, one of the world’s most polluted areas at the intersection of Poland, Germany and the Czech Republic.

She says: “My main priority has been to provide support for some of Imperial’s many weird and wonderful researchers, although my husband [College Secretary, Dr Rodney Eastwood, who retired recently] claims that running Imperial was a doddle compared to dealing with me!”

Nuclear safety



Professor Kamran Nikbin, Professor of Structural Integrity (Mechanical Engineering) discusses the role Imperial’s Structural Integrity Centre, sponsored by EDF Energy, has in advancing safety issues in the nuclear industry. Structural integrity covers a wide range of failure assessment of structures and the related material response to stresses and failure mechanisms.

“Since the Fukushima incident, which was triggered by an earthquake and tsunami in Japan in March 2011, issues about nuclear energy and worries about operational safety have once again come to the fore. It is clear that dealing with safety is paramount in the nuclear industry, as the political, social and media scrutiny always influences the governmental decision makers, who have a duty to balance public concerns with the need to guarantee energy production.

The UK was one of the early pioneers of civil nuclear build and chose advanced gas cooled reactor design, which operates at high temperatures and where aggressive conditions, such as oxidation and corrosion, dramatically

reduce safety. As a result, the UK nuclear industry embarked on a pragmatic approach to develop advanced safety codes to ensure that nuclear plants would run safely for an extended lifetime without endangering the public.

Since the 1970s, Imperial has been a major contributor in the field of nuclear energy research. At present, the College is an international leader in the research and development of novel concepts and safety methodologies in fracture mechanics. In 2008, Imperial established a Structural Integrity Centre in the Department of Mechanical Engineering. At the Centre, a number of processes, including advanced testing for materials characterisation, virtual testing and life prediction meth-

odologies, are being developed by an expert team that is supported by students. The fundamental research carried out at Imperial filters through to new design and international safety codes, which are continually being developed, improved and validated. The Centre leads the international field in extending the boundaries for predicting safe life in a nuclear industry. We believe that the best way to establish a comprehensive approach to nuclear safety is to develop and apply fundamental concepts of structural integrity using multidisciplinary techniques.”

For more information visit: www.imperial.ac.uk/mestructuralintegrity

Welcome new starters

Ms Sokina Begum, Estates Division

Dr Anca Belme, ESE

Dr Pawel Bembnowicz, Computing

Mr Edward Bennett, Catering Services

Miss Georgia Bergson, Communications and Development

Mr James Birch, Life Sciences

Ms Rowena Boddington, Business School

Miss Sarah Broady, Library

Miss Lucy Brown, Surgery and Cancer

Dr Elaine Burns, Surgery and Cancer

Miss Joanna Chamiola, Accommodation

Mr Oliver Coen, Library

Dr Matthew Cook, Medicine

Ms Justyna Czyzewska-Khan, Medicine

Ms Veronica Daniel, Medicine

Mr Martin Dansey, Bioengineering

Dr Siobhan Darrington, Faculty of Medicine

Mr Joao De Jesus Reis Lagarto, Physics

Mrs Susan Diggines, NHLI

Mr Hendrik Faber, Physics

Dr Adriano Festa, EEE

Mr Luke Fleet, Materials

Dr Joseph Footitt, NHLI

Dr Mathieu Fortier, NHLI

Mr Jun Hu, Civil and Environmental Engineering

Miss Farhana Hussain, NHLI

Ms Laurel Issen, Medicine

Miss Claire Jones, Legal Services

Miss Wendy Jules, Library

Dr Dalia Kasperaviciute, Clinical Sciences

Dr Zhe Li, Chemistry

Dr Yu Lien, Physics

Ms Laura Monje Garcia, Clinical Sciences

Mrs Joanne Murphy, Faculty of Medicine

Dr Sobiya Nadaraja, NHLI

Dr Silvia Panico, Life Sciences

Dr Dimitrios Pavlidis, ESE

Miss Lisa Pomfrett, Registry

Miss Sophie Price, Materials

Dr Ayesha Rehman, Physics

Dr Claudia Schonborn, Public Health

Ms Tayjal Tailor, Faculty of Engineering

Mr Michael White, Public Health

Ms Celine Yan, Medicine

Farewell moving on

Mr Feras Al Jayoose, NHLI

Mr Joan Alabort Medina, Computing

Dr Laura Alcazar Fuoli, Medicine

Dr Paul Aljabar, Computing (8 years)

Ms Nadia Baillie, Legal Services

Mr Alan Bane, Catering Services

Miss Naomi Bateman, Medicine

Miss Helen Blake, Medicine

Dr Agnieszka Brandt, Life Sciences

Dr Andrew Brent, Medicine

Dr Ana-Maria Calcagno Pizarelli, Medicine

Dr Cristina Canova, NHLI

Dr Antoine Chamballu, Physics

Ms Flora Christofi, NHLI

Miss Kirsty-Lee Collins, Medicine

Miss Sian Cousins, Medicine

Dr Rosenildo da Costa, Chemistry

Dr Pasquale D'Angelo, Chemistry

Miss Raygana Davids, Faculty of Natural Sciences

Miss Lara Davidson, Medicine

Ms Saloni Dosani, Medicine

Ms Kelly Dunagan, Life Sciences

Dr Robert Eckersley, Clinical Sciences (12 years)

Ms Rosie Evans, Medicine

Dr Andreas Fidjeland, Computing (6 years)

Dr Diego Fontaneto, Life Sciences

Dr Peter Gammon, Materials

Miss Shreena Ghelani, Medicine

Dr Emma Green, Life Sciences (5 years)

Mr Khilan Gudka, Computing

Dr David Hastie, Public Health

Miss Bianca Hinds-Walters, Medicine

Dr Kai Ishihara, Mathematics

Dr Deanpen Japrun, Chemistry

Miss Karishma Jivraj, Medicine

Dr Ioannis Kaparias, Civil and Environmental Engineering

Mr Martin Keats, Medicine

Dr Olga Kotik-Kogan, Life Sciences (6 years)

Dr Wenjun Li, Computing

Mr Jens Loebbermann, NHLI

Mrs Gemma Loebenberg, Medicine

Ms Kaatje Lomme, Medicine

Mr Steven Lovegrove, Computing

Dr Kate Maclaran, Surgery and Cancer

Mr Richard Matthewman, ESE

Mrs Antoinette McNulty, Medicine

Miss Jozella Mearhart, Medicine (5 years)

Dr Katarina Miljkovic, ESE

Dr Gemma Molyneux, Surgery and Cancer

Miss Michela Moraldo, NHLI

Mr William Morgan, Medicine

Dr Angela Mortier, Physics

Mr Richard Munday, Medicine

Dr Jair Munoz Bugarin, Faculty of Engineering

Mr Miguel Munoz Zuniga, Chemical Engineering

Miss Jessica Nagar, Medicine

Dr Miguel Navarro-Cia, Physics

Mrs Samantha Newton, Registry (5 years)

Ms Lorraine O'Connell, Medicine

Ms Karen Ofosu-Orchard, Life Sciences

Mrs Sandra O'Sullivan, Medicine (10 years)

Dr Yannis Pappas, Public Health

Dr Elli Peltoketo, Surgery and Cancer (9 years)

Professor John Pepper, NHLI (21 years)

Dr Ole Peters, Grantham Institute

Miss Elena Phoka, Mathematics

Mr Stephen Quirke, ICT (7 years)

Mr Rajendra Rai, Surgery and Cancer (14 years)

Mrs Sabeena Rashied, Surgery and Cancer (8 years)

Mrs Rachel Rathbone, Clinical Sciences (9 years)

Dr Licia Ray, Physics

Mr James Roberts, Life Sciences

Ms Ester Romeri, Public Health

Mr Shantanu Rout, Surgery and Cancer

Mr Reuben Rowe, Computing

Mr Philip Shanahan, Library (10 years)

Mr Richard Sheppard, Chemistry

Dr Nicholas Silver, NHLI

Ms Lipei Song, Surgery and Cancer

Dr Diego Soto Sanchez, EEE

Ms Julie Swales, Medicine

Mr Said Tarabi, Medicine

Mr Tri Tat, Surgery and Cancer

Dr Frauke Thrun, Chemistry

Mr Richard Tromans, Faculty of Medicine

Mr Sofor Uddin, Finance

Mr Raphael Underwood, Medicine

Miss Maria Urjanheimo, Medicine

Dr Pinar Uysal Onganer, Surgery and Cancer (5 years)

Mr Povilas Uzdavinys, Life Sciences

Dr Thomas Wall, Physics

Mr Alexander Warren, Computing

Miss Charlotte Watson, Medicine

Dr Robert Wicks, Physics

Dr Ghaseem Yadegarfar, Public Health

retirements

Mrs Doris Abeysekera, Mathematics (34 years)

Professor Dorian Haskard, NHLI (21 years)

Professor David Potts, Civil and Environmental Engineering (32 years)

Professor Charles Pusey, Medicine (30 years)

Professor Brian Spratt, Public Health (11 years)

This data is supplied by HR and covers the period 12–31 March. 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

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

Double Paralympic champion trains at Imperial

British paralympian swimmer Ellie Simmonds (pictured right with Neil Mosley, Assistant Director of Commercial Services), was at South Kensington Campus on 27 March to train in the swimming pool at Imperial's *Ethos* sports centre during a trip to London. "Ellie had used the pool before and decided to come back for a training session," explained Neil. "She was really engaging and focused on 2012. She signed a few pictures and swimming hats for students and promised to win us a gold medal in July," he added. Ellie, who is based in Swansea, was the first athlete to set a world record at the new Olympic Aquatics Centre in March.



Speak out

Story ideas?

We welcome contributions from across the College. The next publication day is 24 May. *Reporter* is published every three weeks during term time in print and online at www.imperial.ac.uk/reporter. Contact Emily Ross-Joannou: reporter@imperial.ac.uk ☎ +44 (0)20 7594 6715



22 MAY ▶ PUBLIC LECTURE

Brains, trains and automobiles: an eventful journey

Professor Stephen Gentleman (Medicine), a neuropathologist at the UK's largest brain bank dedicated to Parkinson's disease, studies the human brain at post mortem to provide unique insights into the pathological processes that

underlie traumatic brain injury and common neurodegenerative disorders, such as Alzheimer's and Parkinson's. In his inaugural lecture, he describes how traumatic brain injury can initiate early Alzheimer's-type changes in the brain, and explains why the early protective responses to injury, if they persist, can eventually become harmful.



23 MAY ▶ PUBLIC LECTURE

The art of surgery: encounters and connections

In this personal perspective on the relationship between surgery and education, Professor Roger Kneebone (Surgery and Cancer), creator of the pop-up operating theatre for surgical education,

explores how this emerging field offers a bridge between the worlds of science, technology, art, humanities and performance. He argues that integrating these elements is key to developing the skilled, compassionate clinicians by whom we would all wish to be looked after if the need arose. Roger's inaugural lecture will highlight some unexpected connections and convey his passion for his field.

take note

Shape the vision for Imperial West

The College Research Committee is seeking staff views on how to take advantage of the opportunities presented by the new Imperial West site, close to the Hammersmith Campus, to develop academic activities. Imperial West will be a mixed use development incorporating research and teaching space.



Send your suggestions for the site's academic use to pr@imperial.ac.uk by 8 May.

9 MAY ▶ SEMINAR

Energy carriers from biomass

Professor Johannes Lercher, Technische Universität München



15 MAY ▶ PUBLIC LECTURE

Plastic electronics: the coming revolution

Professor Donal Bradley (Physics)

16 MAY ▶ SEMINAR

Tail-anchored membrane proteins: better late than never?

Professor Stephen High, University of Manchester

16 MAY ▶ SEMINAR

Catalysis: a part of the solution for future energy production

Professor Ib Chorkendorff, Technical University of Denmark

17 MAY ▶ MUSIC

Lunchtime concert

Chloë Hanslip, violin, and Charles Owen, piano

17 MAY ▶ SEMINAR

Science themes in the literature of Italo Calvino

Dr Stephen Webster (Humanities)

23 MAY ▶ SEMINAR

Block co-polymers in ionic fluids: structures, properties and applications

Professor Timothy Lodge, University of Minnesota

24 MAY ▶ MUSIC

Lunchtime concert

Jessica Chan, piano

24 MAY ▶ PUBLIC LECTURE

The molecular world: the rise and fall of viscosity

Professor Velisa Vesovic (Earth Science and Engineering)

MEET THE READER



Dr Manel Torres, Academic Visitor (Chemical Engineering)

What are you doing in the picture?

I am in the V&A café. I find this place relaxing and inspiring. I come here sometimes to think and sometimes to talk, particularly when I have visitors from overseas companies.

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

I would devote a small section to materials research here at the College. I'm sure there would always be something interesting to talk about, from fashion to biomaterials. I would also launch an edition of Reporter that people could read on their tablets and smartphones.

Who would be your cover star?

It would have to be Lady Gaga, wearing the 'Chemist Tailor's' dress we made for her in the Department of Chemical Engineering out of Fabrican's spray-on fabric. Her stylist contacted us in February and commissioned it but I'm still waiting to see a photo of it!

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

11-12 MAY ▶ FESTIVAL

Imperial Festival

A celebration of Imperial research and culture

14 MAY ▶ PUBLIC LECTURE

Optogenetics and other tools for the analysis of neural circuits

Professor Ed Boyden, MIT

15 MAY ▶ MUSIC

Lunchtime concert

Gordon Fergus-Thompson, piano

PHOTO EXPO

This two-metre high sculpture of milk teeth, now being exhibited at the Science Museum, results from a collaboration between stem cell biologist Professor Sara Rankin (NHLI) and artist Gina Czarnecki. The exhibition will be at the Science Museum until 28 June.



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

