

Critical Mass

Researchers and students mobilise for a nuclear energy revival

... CENTRE PAGES



INNOVATION DESTINATION

Imperial launches new innovation hub at White City

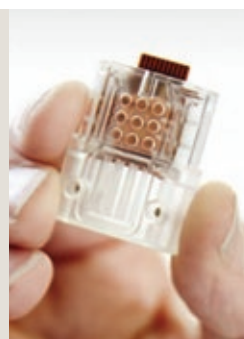
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GLOBAL REACH

The innovative Global MBA and the students benefiting

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RAPID RESULTS

Scientists develop an HIV test in a pen drive

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EDITOR'S CORNER

Powering ahead

As a society there are few more important and controversial topics than that of energy – and ensuring its **sustainable supply**. No doubt it will have been on the agenda for Imperial academics and students who travelled to Marrakech for the COP22 climate summit (right). Meanwhile, a new centre at Imperial's Business School is aiming to help investors make better decisions about energy infrastructure (page 4). Nuclear power adds another level of controversy to the debate, but there is something approaching a consensus now among experts that nuclear should form part of a **diverse energy portfolio** which includes wind, solar, carbon capture and other technologies (see bit.ly/hinkleyc). From a purely engineering perspective, I've always been fascinated by nuclear power – that we humans can harness the immense power of atomic bonds for peaceful gains. But it requires **tremendous expertise** to do it safely. Imperial has long been at the forefront of that effort, and aims to continue to play a role (centre pages).

ANDREW CZYZEWSKI, EDITOR

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The Queen opens the Francis Crick Institute

The Queen and The Duke of Edinburgh, accompanied by The Duke of York, opened the £650 million Francis Crick Institute in London this month.

The Crick is the biggest biomedical research institute under one roof in Europe and is investigating the fundamental biology underlying human health and disease. Imperial College London is one of its

founding partners, alongside the Medical Research Council (MRC), Cancer Research UK, Wellcome, UCL (University College London), and King's College London.

The Crick is bringing scientists together from across disciplines to tackle the pressing health concerns of the 21st century. At full capacity in 2017, it will be home to 1,250 researchers, including from Imperial, and a

further 250 support staff.

During their tour of the Crick, The Queen and The Duke of Edinburgh saw some of the state-of-the-art facilities for research. They spoke with Imperial's President, Professor Alice Gast, and representatives of the other founding partners.

Imperial's President Professor Alice Gast said: "The opening of The Francis Crick Institute confirms London's central place as a leader in medical research. It is an awe-inspiring space for brilliant science which will strengthen the fight against cancer, heart disease, infections and neurodegeneration.

"Imperial's strategy says that no university can realise the full benefits of its work by itself. We are proud to be a founding member and we look forward to building on our collective strengths to shape the future of biomedical research."

—LAURA GALLAGHER, COMMUNICATIONS AND PUBLIC AFFAIRS



Chief Executive and Director of the Francis Crick Institute, Sir Paul Nurse with The Queen

Climate mission in Morocco

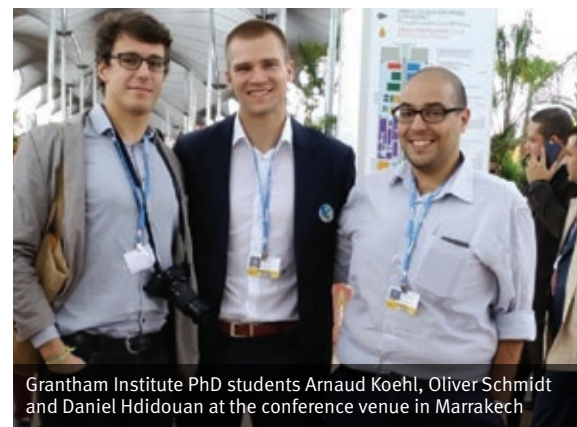
Representatives from Imperial travelled to Morocco last week to attend the United Nations climate change conference (COP22).

Staff, students and climate communicators engaged with international policymakers, learned about the negotiation process and talked about how research, innovation and finance can provide solutions to the climate change problem.

The Grantham Institute, together with Imperial College Business School, also organised an official side-event at the conference, to encourage discussion about how investment banks that target companies developing low-emission technologies, and other funding schemes will be needed to tackle climate change.

The Paris Agreement was drawn up at the COP21 conference in Paris in December 2015, where 197 nations agreed to limit global warming to 'well below two degrees' above pre-industrial temperatures, and to aim for a more ambitious limit of one and a half degrees.

As next steps, delegates at the COP22 conference will flesh out details of the concepts and principles agreed in Paris. Amongst these are provisions for adapting to climate change, financial contributions



Grantham Institute PhD students Arnaud Koehl, Oliver Schmidt and Daniel Hdidouan at the conference venue in Marrakech

from industrialised nations to those at risk from the effects, rules about tracking progress of mitigation, and the potential to use trading or market mechanisms to deliver its goals.

Grantham Institute Co-Director, Professor Joanna Haigh, said: "It was remarkable that 197 countries unanimously reached an agreement in Paris. A further achievement is that the treaty has legally entered into force within less than 12 months.

"Now, of course, the harder work begins in finding routes to achieve the stated objectives," said Professor Haigh.

—SIMON LEVEY, GRANTHAM INSTITUTE – CLIMATE CHANGE AND THE ENVIRONMENT

Imperial launches its new hub for innovation at White City

The I-HUB, Imperial's new translation and innovation hub, launched last month at the White City Campus.

Providing more than 185,000 square foot of new laboratory, incubator, accelerator and office space, the facility will enable the co-location of start-ups, entrepreneurs, and major corporations alongside Imperial's academic community.

A core aim of the 13-storey building will be to support the commercialisation and translation of research and innovation for the benefit of society.

Welcoming representatives from industry, partners and Hammersmith and Fulham Borough Council to the launch, Imperial's Vice President (Innovation), Professor David Gann, said: "We are delighted to be opening this new landmark hub for innovation, incubation and collaboration, reaffirming London's position at the forefront in applying leading-edge science. Businesses in the I-HUB will be focused on taking fantastic research ideas out into the market where they can have a direct positive impact for society."

The I-HUB is operated by Imperial College ThinkSpace, which provides high quality laboratory and office workspaces to companies at every stage of their growth, co-locating them with Imperial.

The building is the second to open at Imperial's White City Campus – a research and innovation centre that is in its initial stages of development. At the 25-acre site, researchers, businesses and higher education partners will co-locate to create value from ideas on a global scale.

The launch was followed by a two day Global Challenge Showcase at the I-HUB, with guests from industry and partner organisations invited to find out more about Imperial research and the new facility.

—JOHN-PAUL JONES, COMMUNICATIONS AND PUBLIC AFFAIRS



Climate change health risks probed

A new initiative has launched this month to understand the 'catastrophic risk to human health' caused by climate change.

Academics from 16 organisations including Imperial will establish a range of measures, for example tracking the spread of infectious diseases, deaths or illness resulting from heatwaves or droughts, and health problems caused by air pollution.

The initiative was announced on Monday at the United Nations climate change conference (COP22) taking place in Marrakech, Morocco.

Researchers Dr Kris Murray at the Grantham Institute and Professor Paolo Vineis at the School of Public Health are contributing.

Professor Sir Brian Hoskins, an eminent expert in meteorology and climate change and chair of the Grantham Institute – Climate Change and the Environment, at Imperial, said: "It is important to note that an average rise of two degrees Celsius will mean melting ice and permafrost in polar regions but also the hottest regions of the Earth warming to a climate not seen on Earth while humans have inhabited the planet.

"Populous coastal regions can expect to see more flooding with sea levels rising by perhaps half a meter, with all the problems that entails for health and sanitation. The weather will change for entire regions, leading to problems for people, agriculture and livelihoods that may be caused by, for example, heavier rain storms and increased water shortages."

—SIMON LEVEY, GRANTHAM INSTITUTE – CLIMATE CHANGE AND THE ENVIRONMENT



in brief

Creative Quarter 2016

Imperial students and researchers joined forces with musicians from the Royal Albert Hall to bring science to life on the streets of South Kensington. As part of Creative Quarter 2016, organised by Discover South Kensington, groups of 'science buskers' lined Exhibition Road to demonstrate the science of music and sound. Creative Quarter is an annual event in South Kensington which offers young people the chance to explore the latest developments in the creative industries and gives an overview of career paths in art, science, design, technology, music and drama.



Screen star in surgical sim

Alan Alda – the renowned actor, writer, director, and presenter – visited Imperial this month, meeting researchers and trying simulated surgery. Mr Alda is an enthusiastic supporter of science who has presented long-running science programmes on PBS and helped to found the Alan Alda Center for Communicating Science at Stony Brook University. He met several Imperial researchers during his visit, which was hosted by Imperial's President, Professor Alice Gast.

.....
Professor Roger Kneebone explains simulated surgery to Alan Alda

“No direction? Well that's just typical of universes these days. It needs to buck its ideas up or it will just drift on into heat death, just like that feckless, layabout universe next door. Get a haircut and get a job!”

READER DAVID LENG'S TONGUE-IN-CHEEK RESPONSE TO RESEARCH SUGGESTING THE UNIVERSE HAS NO DIRECTION: bit.ly/uni-res

Risk and reward

A new centre that will help businesses to make better green investment decisions launched this month.

The Centre for Climate Finance & Investment at Imperial College Business School will work with companies to manage the risks and financial opportunities posed by climate change – for example in choosing to invest in technologies that help stabilize the climate, whilst providing a good return on investment.

Dr Charles Donovan, Head of the Centre for Climate Finance and Investment, said: “Climate change has already created major political and technological changes that are disrupting a number of business sectors. Adapting intelligently to these changes is not just about the environmental agenda for companies, it’s about how they survive and thrive amidst a climate of risk. The new research centre will help businesses avoid the serious impact of climate change, whilst raising the prospects for global economic growth.”

The work of the centre will be divided into three main themes: tools for financing climate-ready infrastructure; routes to sourcing clean energy investing (new forms of investing and the barriers to business growth); and managing firms in carbon-constrained economies (financial returns on sustainable business management and the impact of carbon pricing.)

Find out how climate change is affecting businesses in this animation: bit.ly/climate-risk

—LAURA SINGLETON, COMMUNICATIONS AND PUBLIC AFFAIRS

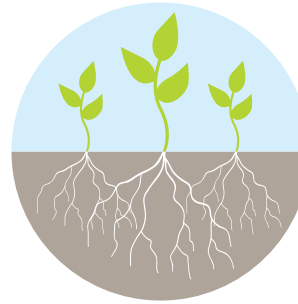


New bond to support Imperial’s growth

Imperial has agreed to issue bonds for £200 million through private placement to support major capital projects.

The agreement, which was signed on 17 November, will allow Imperial to draw down funds to support part of a £600 million programme of growth and diversification at Imperial’s South Kensington and White City campuses.

The funds will be repaid at an average fixed rate of 2.46% to a range of UK and North American investors with maturities varying between 33 and 40 years. Lloyds Bank acted as the sole placement agent for the transaction.



Muir Sanderson, Chief Financial Officer, said: “Strengthening and diversifying our revenues is a key part of the College’s strategy. This successful bond shows a shared belief in Imperial’s long-term vision. The initial offering was four

times oversubscribed, enabling Imperial to increase the transaction to £200m.

This is a mark of recognition for Imperial’s academic and financial strength.

“This support from the investment community will help us to deliver our ambition for growth and maintain our position at the forefront of education, research and innovation.”

—DEBORAH EVANSON AND ANDREW SCHEUBER, COMMUNICATIONS AND PUBLIC AFFAIRS

Consultation launches for new Learning and Teaching Strategy

Imperial has launched a consultation, open to all staff and students, on the development of a new College-wide Learning and Teaching Strategy.

The development of the new Learning and Teaching Strategy is being led by Professor Simone Buitendijk, Imperial’s Vice-Provost for Education. It aims to bring modern and fresh approaches to the educational experience of students across Imperial. From evidence-based teaching methods through to new approaches to assessment and feedback, the new Strategy will be key to delivering excellence and innovation in education.

One of Professor Buitendijk’s first priorities is to provide the opportunity for all staff and students to feed in, with a College-wide consultation taking place during Autumn Term 2016.

Professor Buitendijk said: “Imperial aims to take big steps towards new ways of educating – and it needs to be a joint effort with our community. The development of the new Learning and Teaching Strategy will require the participation and insights of everyone across College engaged with supporting and delivering learning and teaching.”

The College is working closely with



Professor Buitendijk with Luke McCrone

Imperial College Union on the development of the new strategy, including Nas Andriopoulos (President), Luke McCrone (Deputy President for Education), and the network of student academic representatives.

Luke said: “I’m really pleased to be working with Simone and with colleagues in the union on the development of the new strategy. We have a lot of ideas about how we can improve the learning experience of students at Imperial, but we’re really keen to make sure that all students have a say.”

After the consultation closes, the key themes emerging will be reviewed and the Strategy will then be developed, with the aim of launching the new Learning and Teaching Strategy in Summer 2017.

Watch a video about the consultation here: bit.ly/teach-strat

—ELIZABETH NIXON, COMMUNICATIONS AND PUBLIC AFFAIRS

media mentions

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Why the Higher Education and Research Bill must be amended

GUARDIAN ▶ 18.10.2016

Writing in the *Guardian*, Professor Stephen Curry (Life Sciences) argues that the 2016 Higher Education and Research Bill that is currently before parliament represents massive constitutional change that will undermine the autonomy and vigour of Britain's universities and its research base. "As it stands the bill envisages far-reaching changes to the organisation of universities and research. It establishes the Teaching Excellence Framework (TEF), an assessment exercise based heavily on a variety of simple metrics with questionable relationships to teaching quality; it lowers the threshold that private providers must meet to become degree-awarding universities; and it

will create a super-research council – UK Research and Innovation (UKRI) – led by a powerful chair and chief executive to oversee the near-totality of publicly funded research in the UK. Never before in the history of British science have so few individuals been responsible for so much spending. This bill is a direct threat to the autonomy of our existing institutions and needs to be amended to ensure adequate consultation and proper parliamentary scrutiny. It's not too late. You can help to amend the bill by contacting your MP to express your concerns (bit.ly/vital-science)."

Rigid testing delays dementia diagnosis

THE TIMES ▶ 09.11.2016

Dementia patients face serious delays in diagnosis because of needless barriers put up by specialist clinics, a study has suggested. Some memory clinics demand that older patients are all tested for syphilis before they will assess them for dementia as part of unjustifiably complex and restrictive access criteria. Dr Benedict Hayhoe (School of Public Health) who carried out the study, told the *Times*: "We're talking about multiple appointments with GPs with patients who are already forgetful; there's an obvious problem there."

Forget the start-up garage myth. We need golden triangles and super clusters

WORLD ECONOMIC FORUM ▶ 03.11.2016

Writing on the World Economic Forum website, Professor David Gann, Imperial's Vice President (Innovation) and Mark Dodgson attempt to dispel the myth that technology start-ups typically begin in a humble garage. "It is clusters that bring together start-ups, established corporates, specialist and aligned businesses, and, very importantly, research-intensive universities. Such is the intensity of world-class universities, tech-savvy consumers, start-ups, availability of finance and culture, that London can more fairly be described as a 'supercluster', or cluster of clusters. Universities, historically the quiet heart of clusters, are playing a more active and assertive role. Imperial Incubator has seen scores of spin-outs connected to Imperial College agglomerate and grow on campus. In less than a decade – from the basement rather than a garage of an academic building – Imperial Incubator firms have attracted more than \$1 billion in investment."



awards and honours



ENGINEERING

Fired-up

Professor Bill Lee, an expert in ceramics and glass from the Department of Materials, has become the first non-US president of the American Ceramic Society (ACerS) in its 118 year history. Professor Lee has worked

extensively on producing next-generation materials capable of operating in extreme conditions, such as severe thermal and radioactive environments and was formerly Director of the Centre for Nuclear Engineering (see pages 8-9). Professor Lee's appointment is the latest in a long string of achievements, including being awarded a Fellowship of the Royal Academy of Engineering and being appointed Deputy Chair for the Government Committee on Radioactive Waste Management (CoRWM). Last year he appeared as an expert on ceramics on BBC2's The Great Pottery Throwdown.



NATURAL SCIENCES

Research reach-out

Dr Jessica Wade has been recognised for both her outstanding research in her field and also the work she does in encouraging others to study physics. She was announced as this year's winner of the Institute of Physics' (IOP) Bell Burnell award on 9 November at an awards ceremony at IOP's offices in London, where the four finalists were first invited to talk about their research and outreach work. Dr Wade (inset, left) is currently a researcher in the Centre for Plastic Electronics at Imperial and senior outreach officer at King's College London.

COLLEGE

Driving change

Dr Simon Philbin received the Franklin B. W. Woodbury Special Service Award from the American Society for Engineering Management (ASEM) at the recent ASEM International Annual Conference held in Charlotte, North Carolina, USA. The award is for his contributions as the International Director of ASEM. Dr Philbin is Director of Imperial's Programme Management Office (PMO), which provides support for the management and administration of collaborative research programmes and commercial projects delivered in support of academic-driven initiatives across the College.

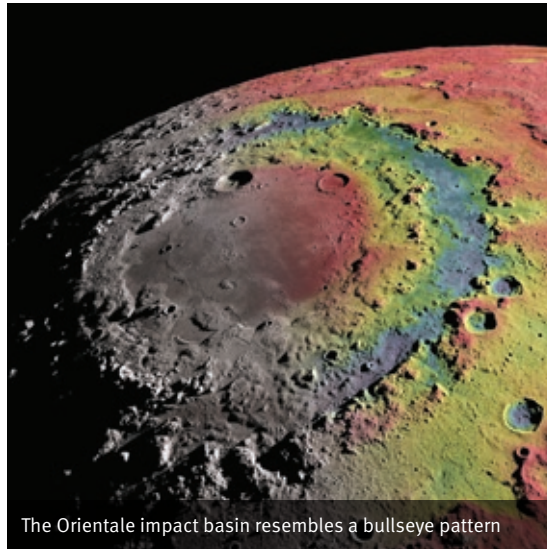
Deep impact

Scientists have simulated the conditions that formed a huge bullseye-shaped crater on the Moon, called **Orientele**.

The **Orientele** impact basin is located on the Moon's south western region, or the left-hand edge as seen from Earth. It is made up of concentric rings that resemble a bullseye pattern. At over 900 kilometres across and with an age of approximately 3.8 billion years, **Orientele** is one of the largest and best preserved example of what scientists call a multi-ring basin – observed on many of the rocky and icy worlds in our solar system.

The team was able to show with their computer simulation that following the impact of the asteroid, the deep crater that was initially created quickly collapsed. This caused material on the surface and around the outside to flow inward, covering up the exposed rock from the Moon's interior and generating huge concentric faults outside the crater that cut through the entire crust from the surface to 50 kilometres in depth.

Study co-author Dr Gareth Collins (Earth Science and Engineering) said: "Next time there's a full Moon, take a moment to look at it and see if you can spot **Orientele** on its surface. Imagine the moments after



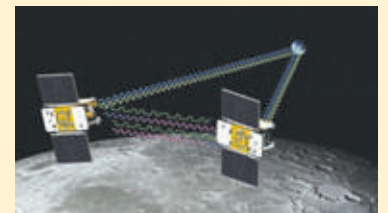
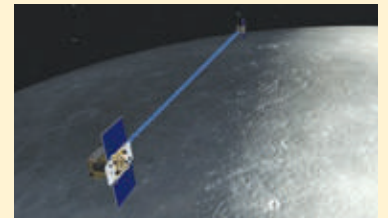
The **Orientele** impact basin resembles a bullseye pattern

the asteroid impact that created it. It was a world-changing event that in a matter of minutes generated a huge pool of melted rock inside the crater and enormous fault scarps that were several times taller than Grand Canyon."

"Our model is helping us to see how its distinctive concentric rings were formed, which is really exciting because we now have a much clearer idea of the size of the asteroid that formed this crater and we can now use this information to infer how multi-ring basins on other worlds may have come into being."

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS

— 64km —
estimated length of the asteroid that made the basin



Moon mapping

The researchers used data gathered by NASA's Gravity Recovery and Interior Laboratory (GRAIL) mission. Completed in 2012, the mission consisted of two spacecraft orbiting the Moon. Instruments on board measured changes in gravity caused by different features, such as mountains and craters. These changes in gravity caused the spacecraft to move slightly toward and away from each other as they circled the Moon. An instrument aboard each spacecraft measured the changes in their relative velocity precisely, and scientists translated this information into a high-resolution map of the Moon's gravitational field – including over the **Orientele** basin.

Asteroid impacts could create niches for life

Scientists studying the ancient **Chicxulub** crater have shown how large asteroid impacts deform rocks in a way that may produce habitats for early life.

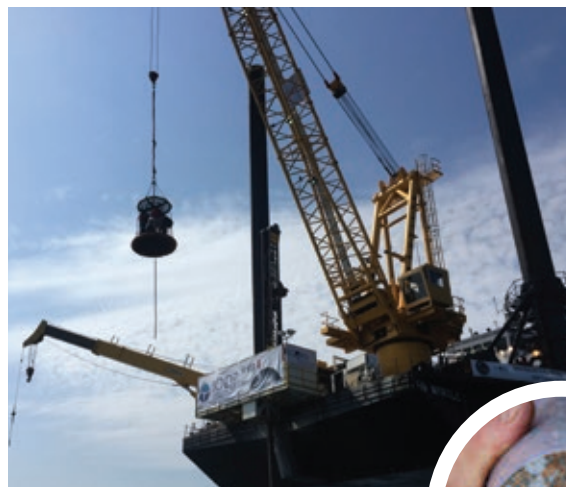
Around 65 million years ago a massive asteroid crashed into the Gulf of Mexico causing an impact so huge that the blast and subsequent knock-on effects wiped out around 75 per cent of all life on Earth, including most of the dinosaurs. This is known as the **Chicxulub** impact.

In April and May 2016, an international team of scientists undertook an offshore expedition and drilled into part of the **Chicxulub** impact crater. Their mission was to retrieve samples from the rocky inner ridges of the crater – known as the 'peak ring'

– drilling 506 to 1335 metres below the modern day sea floor to understand more about the ancient cataclysmic event.

Now, the researchers have carried out the first analysis of the core samples. They found that the impact deformed the peak ring rocks in such a way that it made them more porous, and less dense, than any models had previously predicted.

Porous rocks provide niches for simple organisms to take hold, and there would also be nutrients available in the pores, from circulating water that would have



been heated inside the Earth's crust. Early Earth was constantly bombarded by asteroids, and the team have inferred that this bombardment must have also created other rocks with

similar physical properties. This may partly explain how life took hold on Earth.

Lead author Professor Joanna Morgan (Earth Science and Engineering) said: "It is hard to believe that the same forces that destroyed the dinosaurs may have also played a part, much earlier on in Earth's history, in providing the first refuges for early life on the planet.

We are hoping that further analyses of the core samples will provide more insights into how life can exist in these subterranean environments."

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS



HIV test via pen drive

Scientists have developed a USB device which can test for HIV in under 30 minutes – offering patients throughout the world new ways to monitor their own treatment.

The disposable test, created by scientists at Imperial and DNA Electronics, uses a drop of blood to detect HIV, and then creates an electrical signal that can be read by a computer, laptop or handheld device.

Current tests to detect the amount of virus take at least three days, often longer, and involve sending a blood sample to a laboratory. In many parts of the world, particularly those with the highest number of HIV infections, such testing does not exist at all.

Also viral levels cannot be detected by routine HIV tests, which is important, as study co-author Dr Graham Cooke (Medicine) explains: “HIV treatment has dramatically improved over the last 20 years – to the point that many diagnosed with the infection now have a normal life expectancy.

“However, monitoring viral load is crucial to the success of HIV treatment. At the moment, testing often requires costly and complex equipment that can take a couple of days to produce a result. We have taken the job done by this equipment, which is the size of a large photocopier, and shrunk it down to a USB chip.”

Dr Cooke added that this technology, although in the early stages, could allow patients to regularly monitor their virus levels

in much the same way that people with diabetes check their blood sugar levels.

The technology could be particularly powerful in remote regions in sub-Saharan Africa, which may not have easy

access to testing facilities. Finding out quickly if a patient, particularly a baby, is infected with the virus is crucial to their long term health and survival.

The team are also investigating whether the device can be used to test for other viruses such as hepatitis.

—KATE WIGHTON, COMMUNICATIONS AND PUBLIC AFFAIRS

“Monitoring viral load is crucial to the success of HIV treatment.”

991 → 95% → 20.8 minutes

blood samples were tested

were accurate

average time to produce a result



Why pints spill but straws don't: researchers uncover the science of spilling

New research shows that it is not only the size, but the shape of a tube that determines whether a liquid will spill out of it when tipped over.

Glasses of liquid, when turned horizontally, inevitably spill. This is not necessarily the case however with very thin straws, which, when turned on their sides, can retain liquid in them.

This simple relationship was thought to be based purely on the size of the tube opening, but by investigating more closely, a team of researchers have determined that this rule of thumb doesn't always hold true.

The shape of the tube turns out to be important too, and if it is squashed enough – forming an elliptical shape – then no matter how thin the straw is the liquid will always spill out.

This new understanding has practical applications in technologies that have liquids present on small scales - such as biomedical diagnostics, oil recovery and inkjet printing – where choosing the right tube shape could be as important as its size.

The calculations – which took over seven years – were carried out by Professor Andrew Parry (Mathematics), alongside colleagues in Oxford and Spain.

He said: “If your pint glass falls over, tragedy has struck and you know you're going to spill your beer. But conversely that doesn't necessarily happen if you suck your beer into a straw and turn that horizontally. In that case common experience tells us that if the straw is thin enough the liquid stays in. Now, we have discovered that it should be possible to create minute straw shapes that would mean that any liquid spills, or empties out of the tube, no matter how thin it is.”

—HAYLEY DUNNING, COMMUNICATIONS AND PUBLIC AFFAIRS



Critical Mass

As the UK gears up for a new wave of nuclear energy infrastructure, Imperial is consolidating its expertise in research, training and consultancy

In September, the UK Government gave the green light to build a new nuclear power plant at Hinkley Point in Somerset. It will be the first such nuclear plant in the UK for 20 years and will be built by French energy company EDF, with investment from China General Nuclear.

With all the controversy surrounding that decision, it's easy to forget that the UK was a trailblazer in the early days of civil nuclear technology – the Calder Hall power plant in Cumbria was the world's first commercial nuclear power station, connecting to the national grid on 27 August 1956.

Imperial too played its role in the nascent industry, hosting one of only a few small-scale research reactors in the UK at the Silwood Park Campus, using it to prepare undergraduates for work in the sector and also to carry out research. Completed in 1963, the reactor shut down in 2012 and is currently being decommissioned – making it one of longest running research reactors in the world.

With global commitments to curb climate change, nuclear is back in the spotlight as a low-carbon, base-load power source, and Imperial is once again aiming to play a key supporting role – this time through the cross-departmental, cross-faculty Centre for Nuclear Engineering (CNE).

New wave

Formed in 2008, the CNE coordinates nuclear research from all areas of the College; administers undergraduate and postgraduate degrees; creates dialogue with industry; and even gets involved in outreach and online learning initiatives.

“The really exciting thing about nuclear is that it's such a huge field, such a collection of activities, and there's something for everyone,” says CNE Director Dr Mike Bluck (Mechanical Engineering).

“It's about bringing people in; as nuclear

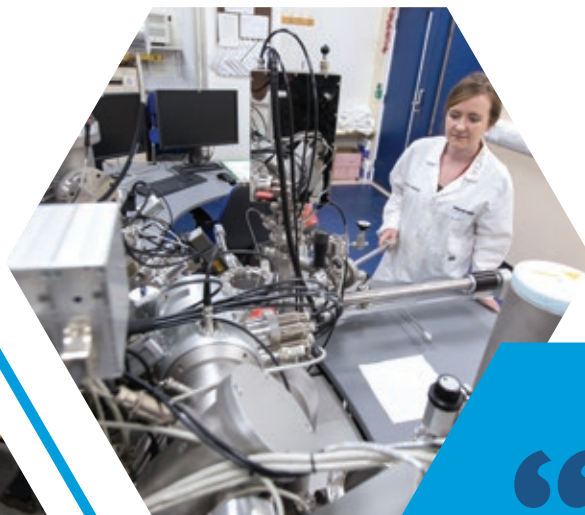
grows, there'll be more and more opportunities for those who'd never thought of doing it. I honestly believe there's not a single area of the College that couldn't contribute in some way.

I recently had a conversation with Rolls Royce about their plans for making civil reactors and it cropped up that they need to do seismic assessments. Well we have people who do that at Imperial – using satellites for example. That's a new connection that's been made. In other areas it might involve using synthetic microorganisms to extract waste.”

Research at the CNE looks at five principal areas covering the entire end-to-end nuclear cycle: the manufacturing of the fuel itself; designing, operating and maintaining nuclear reactors; managing spent fuel and waste; investigating long-term repositories for the most toxic waste; and finally nuclear policy, security and regulation.

Some of that research is fundamental, exploratory science, as Imperial has been doing in this area for more than 50 years – while other research is reactive to the contemporary needs of industry in this fast changing field.

“It's an exciting time right now,” says Mike. “For many years the work has been focused on maintaining and extending the life of current reactors – crucial, interesting work, but perhaps not always so aspirational and inspiring. But we're now in a position where new build is actually happening. There's tremendous opportunity to work on future designs.”



Above, a CDT student examines nuclear isotopes in a time-of-flight mass spectrometry (TOFMS) machine. Left, examining materials using an electron microscope

“The really exciting thing about nuclear is that it's such a huge field, such a collection of activities.”



Director of the Centre for Nuclear Engineering Dr Mike Bluck with graduate students from the Centre for Doctoral Training in Nuclear Energy

PhD student Dimitri Pletzer (right) and Professor Bill Lee visited Fukushima last year to see the clean-up operations. Dimitri's project focuses on developing glass composite material wastefoms from Fukushima.



Collaboration

The College, alongside Bangor University, this month signed a memorandum of understanding with Hitachi-GE to collaborate on research into Advanced Boiling Water Reactors. The Japanese-US conglomerate is planning to build new nuclear power plants in Anglesey, North Wales and Oldbury in Gloucestershire.

Looking further to the future, Mike is particularly enthused at the possibility of working with long-term Imperial partner Rolls Royce on its plans to build small modular nuclear reactors (SMRs). These are essentially miniature versions of full scale reactors like Hinkley, but crucially they can be built almost entirely in factories, then transported by road or rail to site – making them more cost effective.

“The intention is to build reactors on a production line; it’s what’s known as an investable model,” Mike explains. “You need around £20 billion to build a full-scale, one-off reactor and it’s difficult to persuade investors, as Hinkley has shown. But people are more willing to invest one or two billion [pounds] for the design and production infrastructure for

a fleet of small modular reactors. That’s routine. It’s the same risk and outlay as is if you decide to build a new jet engine design.”

The small modular reactor concept also plays into ambitions for a more distributed ‘smart-grid’ that is responsive to the needs of communities (see issue 296 of Reporter). But clearly if we are ever going to see mini nuclear reactors in our towns and cities, there will need to be a collective journey with the public in terms of understanding and acceptance – something Mike and the whole CNE team are only too aware of.

“We do a lot of outreach work, for example at Imperial Festival, Cambridge Science Festival and public lectures to create discussion and we’re trying to grow that even more. History has shown that if you’re going to pursue nuclear, you have to open about it.”



Training future generations

“What’s unique about nuclear is that it’s a very long-term proposition, and so a lot of what we are looking at is 60 years hence,” says Dr Mike Bluck, Director of the Centre for Nuclear Engineering (CNE).

For that reason, it’s vitally important not just to train the next generation of engineers, scientists and policy-makers, but several generations ahead. Imperial has long had an undergraduate nuclear engineering offering and some postgraduate opportunities, but the Centre for Doctoral Training (CDT) in Nuclear Energy offers something uniquely tailored to today’s graduate students. Launched in 2014, it is a collaboration between Imperial, the University of Cambridge and the Open University, core-funded by the Engineering and Physical Sciences Research Council (EPSRC).

Aimed at attracting a diverse spread of applications, the programme begins with a full-time year of study towards an MRes in Nuclear Energy at Imperial to give a solid foundation in the topic. This is followed by a PhD research project at one of the academic partners, often with industrial placements. Crucially for a field where collaboration is implicit, the programme encourages cohort-building activities, such as trips to research reactors in Romania and Norway, the opportunity to organise an international conference, and receive media, public engagement and entrepreneurship training.

PhD candidate Sophie Morrison said: “The most beneficial aspect of the CDT is the cohort building that takes place over the years. Students come from such a variety of backgrounds and use their individual knowledge and experiences to ensure a level of consistency amongst the graduates – something which will prove vital in the face of the skills gap within the nuclear industry.”

For graduates with aspirations to work in the field, but who are unable to undertake the CDT programme, there is a five week massively open online course (MOOCs) in nuclear energy. Delivered by Open University, it is open to anyone and features Imperial academics Dr Mark Wenman and Professor Bill Nuttall explaining aspects of nuclear power – such as its history, reactor physics, safety culture and accidents and the economics of new build.

Many CDT students also get involved in outreach activities, sometimes to school children, for example at Imperial Festival. So in a way they’re also preparing the way for the subsequent generations of engineers and scientists – some of whom, like them, may find the nuclear an exciting, flourishing career prospect.

Education Insights: Global reach

In the first in a series of articles looking at Imperial's innovative educators and their students, *Reporter* speaks with Dr David Lefevre from Imperial College Business School



Some people see virtual education as an easy way of offering cut-price education, but not Dr David Lefevre. As the man who created Imperial's first online degree programme, the Global MBA, he is clearly passionate about the benefits of this approach.

He says: "The Global MBA has been a great success. Students on the course are the most satisfied in the Business School, and Business School students are already some of the most satisfied at Imperial."

The obvious benefit of a virtual degree is that students do not have to be on campus, or even in the same country, as the university (see box, right). Global MBA pupils visit South Kensington just twice over their two-year part-time course, once at the start of their first year and again at the start of their second.

"Our students are people who couldn't study at Imperial in the traditional way because of their time-commitments or their location," David explains. "And these are exactly the kind of student Imperial needs to have influence in business."

To set up the programme, existing MBA course content had to be digitised – a massive undertaking but one that brings additional benefits. "We ran a pilot project last year for undergraduate engineering students. This allowed us to deliver online modules in topics such as economics, accounting and entrepreneurship to our campus based students, something that was previously impossible due to timetable clashes across departments."

In addition, the capability built to support the Global MBA is now being expanded into Imperial's partnership with edX, a non-profit organisation that offers free online education from some of the world's best universities. Imperial's first offering via edX is a series of courses designed to prepare students to pursue a full MBA.

The easy part is actually having the vision, says David, who notes that the technology is also constantly evolving and opening up possibilities. The challenging part, he asserts, relates to organisational change.

"Switching to online teaching and learning means that everyone involved has to do their job in a slightly different way."

He explains that online learning forces teachers to approach lessons differently: "To deliver online courses our academic staff need to adopt a team approach, often working together with an instructional designer, teaching assistant and media specialists who develop the online courseware."

Dr Lefevre says the whole process has taken around a decade but his motivation is clear: "We hope to use technology to enhance the learning experience of all students. For example, on a typical course students spend 80 per cent of their study time outside the classroom. This can be a very isolating experience but when students log in to our online environment they have access to help, support and a sense of community."

STUDENT PROFILE

Khilona Radia Global Online MBA 2016–17

Khilona is a businesswoman based in Cape Town, South Africa. She previously lived in London for around 10 years and had long harboured ambitions to undertake an MBA in the capital. However, she moved back to her native South Africa to set up a company focused on social healthcare innovations.

"I was already running a start-up, a real life MBA if you will, but I needed more – something different, something unique that would give me the edge. Imperial College fitted the bill with its strong research, innovation and entrepreneurship focus."

For Khilona the benefits of the Global MBA are clear and tangible: "What I enjoy the most is that it's almost an instantaneous application. So I might learn about corporate finance and valuation, and I'll almost immediately practice it in the real world. And in that sense, your learning becomes far deeper, beyond just the written and theoretical components, you really absorb it."

She extols the user-friendly, technology driven approach of the platform, where she can see if tutors are online and communicate with them almost immediately.

And as a mother of three children, Khilona also finds that the Global MBA programme suits her busy lifestyle.

"I can sit in the car park while I'm waiting for my kids to finish some extracurricular activity and I can work through a session. It ticks all the boxes really – it works with my start-up, it works with my personal life – it just works!"

"It's almost an instantaneous application. So I might learn about corporate finance and valuation, and I'll almost immediately practice it in the real world."



inside*

story

mini profile

Chris Hankin

Professor Chris Hankin is Director of Imperial's Institute for Security Science and Technology and was recently asked to serve on an advisory panel considering the implications of Brexit on the UK's cyber infrastructure



Tell us about the new role?

I investigated new European Union legislation, which comes into force in 2018. It is aiming to make companies more open and accountable when data breaches occur. I also investigated the rules around the right for users to be forgotten. This is where users have a right to have their data removed from search engines if they can demonstrate that leaving the data there can cause them undue stress. The EU are also aiming to introduce legislation to more severely punish companies that breach data protection rules and I was also looking at the implications for the UK. I also looked at the implications of Brexit on innovation in the UK's higher education sector. In particular, we looked at the potential implications of the loss of Horizon 2020 funding on UK science.

Is London a special case in terms of its needs around cyber-security?

I think London is potentially a special case because it is one of the main financial capitals in the world. Cyber security

and the financial sector is something we at the Institute are very keen to build some activity around. It is an area that is very attractive to serious organised crime, but one could also imagine that it could be a primary target of attack from nation states, if they wanted to undermine the UK economy

How is the cyber threat changing on a nation-state level?

There are many benefits to digitising the services that we rely on, such as train networks and our energy generation and distribution systems. It makes them more flexible and responsive, and smarter. It also makes them vulnerable to cyber-attacks. Many countries are taking an interest in these systems and are developing tools to compromise them. They are seeing cyber as another weapon in their armoury.

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS



Football, fun and robots: Imperial scientists pitch up at QPR

Who's got the best lung capacity in White City? Do sports drinks really contain electrolytes? Why is it important to exercise your heart? A team of Imperial staff and students held an interactive stand to explore these questions and examine the science behind sport at a QPR vs. Reading match last month.

As work progresses on Imperial's new White City Campus, staff and students are making efforts to build links with the local community and share the wonder of science, engineering, medicine and business. On 15 October members of the College's community took up positions in the fan zone of QPR's home turf at Loftus Road, just down the road from the White City Campus.

The team from Imperial was captained by Priya Pallan, the College's recently appointed Community Engagement Officer for White City. Priya explains: "We came to the QPR match to engage football fans with interactive experiments that explore the connections between science and sport. More than 230 fans took part and it was great to see people of all ages having fun and discovering something new."

Hosting the event was Justin Stone, Multi Sports Manager, from the QPR Community Trust: "We were delighted to have our neighbours from Imperial make such a buzz at our fan zone. The aim of the zone is to give families the opportunity to turn a football match into a family day out. It's a great way for us to interact with club supporters of all ages."

Imperial's vision for the new White City Campus is to be a long-term partner of the local community. The College will be opening up a dedicated community engagement hub in 2017, and is running a series of interactive activities across the local area. Priya said: "We would love to hear your thoughts and ideas on how we can best interact with the local community, and suggestions for future events."

Priya can be contacted at whitecity.community@imperial.ac.uk

—JOHN-PAUL JONES, COMMUNICATIONS AND PUBLIC AFFAIRS

"We came to the QPR match to engage football fans with interactive experiments that explore the connections between science and sport."

Meet London's most innovative international student

Design engineer Luca Alessandrini beat hundreds of other entries from 49 countries to take home the £10,000 prize at the International Student Innovation Awards.

Luca's project, a violin which is made from a mixture of spider silk and resin, was developed during his MSc in Innovation Design Engineering, run jointly between the Royal College of Art (RCA) and Imperial's Dyson School of Design Engineering.

When the violin is played, the spider silk vibrates the instrument's casing, emitting a sound which can be customised by tweaking the exact blend of the material. The combination of silk and resin produces a unique tone which can be altered by blending different quantities of the raw materials.

Devised by London & Partners, the Mayor's official promotional company,



the International Student Innovation Awards was set up to highlight the work of the city's international students.

Luca, originally from Urbino, Italy, said: "Studying in London has been one of the best experiences in my life and this incredible initiative will allow me to bring my project closer to reality."

"I have spent two years working full time with 38 people from 14 different countries and I couldn't imagine a more supportive and stimulating environment than this city."

Entries from Imperial students made up eight of the fifteen projects in the final – and two of these projects won second and third place at last night's competition.

Second place went to Kitty Liao from the Dyson School of Design Engineering, and Abellona U from the Department of Surgery and Cancer. The pair have developed a vaccine delivery system which could potentially help to save lives around the world.

Third place went to Elena Dieckmann from the Dyson School of Design Engineering,



who has used recycled waste chicken feathers to create building materials, such as water repellent paint, thermal insulation and a range of consumer goods including tooth brushes.

—JON NARCORSS, COMMUNICATIONS AND PUBLIC AFFAIRS

Papal prize



A former Imperial student who developed a neonatal incubator made from cardboard has won a prestigious international competition at the Vatican.

Malav Sanghavi, who recently completed an MSc in

Innovation Design Engineering at Imperial, was selected as one of two winners at the Vatican Youth Symposium earlier this week.

The Vatican Youth Symposium was hosted by the Pontifical Academy of Sciences (PAS) in collaboration with the UN's Sustainable Development Solutions Network (SDSN) and its Youth Initiative.

It brought together 50 young innovators from across the globe in the search for solutions to achieve social inclusion, economic prosperity and environmental sustainability across the world as part of the UN's Sustainable Development Goals.

—JON NARCORSS, COMMUNICATIONS AND PUBLIC AFFAIRS

Malav's cardboard incubator, LifeCradle, (formerly known as LifeBox), is intended for use in the developing world



Imperial students crowned iGEM Champions

An Imperial team has been crowned winners of an international student prize for synthetic biology at a special Jamboree event in Boston, USA on 31 October 2016.

The team took the grand prize and five major prizes at the International Genetically Engineered Machine (iGEM) competition, beating over 295 other undergraduate teams from universities all over the world.

The team's synthetic biology project, Ecolibrium, is focused on developing a framework for engineering 'co-cultures' – different types of cells grown together. Co-culturing allows co-operation between bacteria for purposes such as engineering the human microbiome or the biosynthesis of metabolites.

Congratulating the team, Imperial's Provost James Stirling said: "This is a wonderful achievement, and the iGEM team should be incredibly proud. Our students fought off very strong competition from around the world, and our repeated success in this competition demonstrates the excellence of our students: not only do they excel in their core disciplines, but they are also able to develop their innovative ideas and showcase their talent."

—JON NARCORSS, COMMUNICATIONS AND PUBLIC AFFAIRS



Communicating science through sculpture

A sculpture of Dolly the Sheep has been placed in Imperial’s Central Library, to commemorate twenty years since Dolly the sheep was cloned from mammary cells. The sculpture, which was made by students on Imperial’s MSc in Science Communication, invites viewers to reflect on what Dolly has meant to the world and to them.

Dolly (5 July 1996 – 14 February 2003) was a female domestic sheep, and the first mammal cloned from an adult cell. She was cloned by Ian Wilmut, Keith Campbell and colleagues at the Roslin Institute, part of the University of Edinburgh, Scotland.

Made on a papier mâché base, the sculpture is finished with a collage of media responses to Dolly. On her legs are found copies of the original research papers, while on her body are news pieces,



comments and cartoons that appeared throughout her life.

The sculpture was made as coursework for the MSc Science Communication by Ellyw Evans, Zoe Ohman, and Joanna Wolstenholme, who said: ‘Creating

a model of Dolly took us on quite a journey – from sourcing newspaper articles at the British Library, through visiting her



taxidermy remains at the National Museum of Scotland, to spending hours perfecting our papier mâché technique at Imperial’s art studio. We hope our results invite people to share their memories of Dolly’s legacy 20 years on.”

Roberto Trotta, Director of the Centre for Languages, Culture and Communication, said: “This piece is a great example of how contextualising ground-breaking, important science in its broader social and scientific setting helps in understanding its meaning and impact. And it demonstrates science communication at its best: engaging, provocative, and fun.”

Imperial Lights

A week long video projection was held earlier this month to promote the work of the College’s Centre for Languages, Culture and Communication (CLCC)

The Imperial Lights projection on the front of the Central Library displayed a creative graphic video which explored the range of opportunities and activities that take place within the CLCC as well as the Graduate School, the Equality, Diversity and Inclusion Centre, the Learning and Development Centre and the Educational Development Unit.

The 23-minute long animation was projected forty metres and 3000 pixels wide across the library’s façade.

The home of humanities at Imperial, the CLCC includes the Science Communication Unit and the Imperial Horizons programme as well as night classes and language courses open to staff, students and members of the public.

The CLCC aims to provide breadth to the study of science, engineering and medicine at the College, engaging students in a range of humanities subjects. It offers over 80 different courses through the Horizons programme



in topics as diverse as music technology and crime and justice as well as a range of language courses.

Dr Roberto Trotta, Director of the Centre for Languages, Culture and Communication, said: “The idea was to make more visible the great work that goes on in the centre and do it in a creative way for the whole of the Imperial community to see.

“In choosing a light projection we wanted

to add some excitement to the building’s façade to better represent the creative things that happen inside it.”

Imperial Lights is one of a number of new or expanded initiatives from the CLCC this year including new evening classes, a project pairing up Imperial and LSE students to look at global challenges and their new research seminar series that launches this week.

Watch a video here: bit.ly/Imperial-Lights

long
service

Staff featured in this column have given many years of service to the College. Staff listed celebrate anniversaries during the period 1 October–31 October. The data are supplied by HR and correct at the time of going to press.

30 years

- Professor Desmond Johnston, Vice Dean (Education) for the Faculty of Medicine
- Professor Paul Kelly, Professor of Software Technology, Computing
- Emeritus Professor Walter Murgatroyd, Emeritus Professor, Materials
- Professor Richard Thompson, Consul for the Faculty of Natural Sciences, Physics

40 years

- Dr Michael Barrett, Senior Lecturer, Head of Learning Resources, Faculty of Medicine Centre
- Emeritus Professor Christopher Isham, Distinguished Research Fellow, Physics
- Meilin Sancho, Technician, Physics
- Professor James Roy Taylor, Professor of Ultrafast Physics and Technology, Physics

50 years

- Emeritus Professor Andre Balogh, Distinguished Research Fellow, Physics
- Dr Michael De Freitas, Distinguished Research Fellow, Civil and Environmental Engineering
- Professor David Gosman, Distinguished Research Fellow, Mechanical Engineering
- Professor John Monhemius, Senior Research Fellow, Earth Science and Engineering
- Professor Rees Rawlings, Visiting Professor, Materials
- Dr David Widdowson, Honorary Senior Research Fellow, Chemistry

SPOTLIGHT

Meilin Sancho, Technician, Physics

40 years



It was quite a change in direction coming to Imperial from art school; yet the search for signs of quarks in high energy physics experiments also demanded keen observation and a steady drawing hand (I worked as part of a scanning and measuring team on Bubble Chamber experiment films from SLAC and CERN).

The College's diversity was a bonus, after all, I was born and bred in Trinidad and felt at home. In 1984, I was privileged to spend some weeks

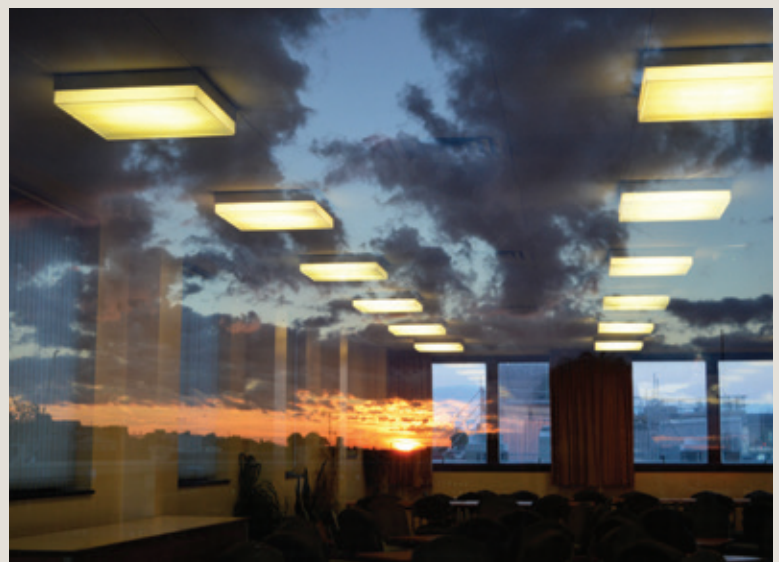
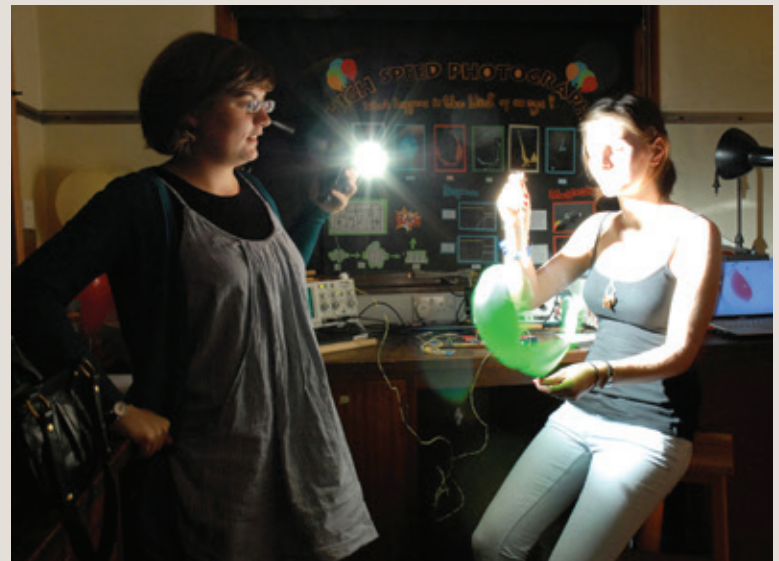
at CERN experiencing big science on an international scale – with all the delights of Geneva and Swiss chocolate.

In the late eighties and I moved on to departmental photography when I attended day release in general photography plus science and technical photography. My circle of contacts widened to the entire department as did my activities from portraits to experimental projects. I have absorbed much by osmosis and curiosity.

Some of the highlights include the College's centenary in 2007 and being instrumental in bringing music back to its original starting point in our Blackett Common room. Our student population has exploded through the years and so has the reputation of the College. I am grateful for the drive towards more awareness and care in working conditions.

I must mention a few people: my first and exemplary manager Pat Hurst; Sir Tom Kibble, whose brilliance shone quietly and who took time to laugh at my jokes; and Danny Segal, a fine human being and a wonderful musician who once sang the original French version of 'Autumn Leaves' to his own guitar accompaniment.

In their lifetimes they have enriched our lives. There are many remarkable, admirable Imperial people who have been friends and supportive colleagues for decades. I am truly proud to be a part of Imperial.



Two of Meilin's photographs. Above, experimenting with high-speed photography on an undergraduate project. Below, an abstract shot from the Physics terrace looking into the Blackett Common Room

Welcome

new starters

Dr Yoshiaki Abe, Aeronautics
 Dr Pedro Aceves Sanchez, Mathematics
 Mr Alexandros Adam, ESE
 Ms Anisha Ahmed, Library
 Miss Anum Akhtar, Business School
 Ms Yukie Akune, Medicine
 Mr Saleh Alatabi, Physics
 Mrs Semiha Alma, Advancement
 Dr Fatin Altuhafi, Materials
 Dr Maryam Anwar, Institute of Clinical Sciences
 Mr Rory Baggott, Physics
 Dr Edward Bailey, Chemical Engineering
 Mr Ilias Bamis, Chemistry
 Mr Joseph Barrit, Life Sciences
 Mr Luke Bevan, Grantham Institute
 Mr Moshel Biton, ESE
 Miss Emma Blyth, Faculty of Medicine Centre
 Miss Hazel Blythe, Surgery & Cancer
 Dr Jacopo Bono, Bioengineering
 Mr Francesco Borghesan, Chemical Engineering
 Ms Laura Bouche, Life Sciences
 Miss Claire Burgess, Materials
 Mr Paolo Cadinu, Bioengineering
 Professor Jeff Cash, Mathematics
 Dr Margherita Castronovo, Bioengineering
 Dr Ayhan Celik, Chemistry
 Dr Juan Cerrolaza Martinez, Computing
 Dr Jason Chang, Bioengineering
 Mr Lloyd Charles, Security Services
 Dr Dongwan Choi, Computing
 Dr Lorenzo Cirri, Surgery & Cancer
 Mr Izaak Coleman, Computing
 Miss Claudia Contini, Chemistry
 Ms Carolina Contreras Quintanilla, Chemical Engineering
 Dr Christopher Corbishley, Enterprise
 Dr Joseph Cotter, Physics
 Mr Steven Cousins, Business School
 Mr Michael Crone, Medicine
 Mr Samuel Cryer, Chemistry
 Mr Keith Davies, Mechanical Engineering
 Mr Alexander de Giorgio, Surgery & Cancer
 Mr Francois de Luca, Chemical Engineering
 Dr Alexandre De Zotti, Mathematics
 Ms Alison Dexter, Enterprise
 Miss Kanika Dharmayat, Public Health
 Miss Aikaterini Diamanti, Chemical Engineering
 Dr Ruth Dobson, Medicine
 Dr Beverly Donaldson, Medicine
 Dr Dawn Doran, Surgery & Cancer
 Miss Tinuke Durotolu, Public Health
 Mr Merlin Fair, NHLI
 Miss Lavender Fan, Surgery & Cancer
 Dr Sara Fontanella, Medicine
 Dr Matteo Fumagalli, Life Sciences (Silwood Park)
 Mr Ivan Garcia Kerdan, Chemical Engineering
 Mr Spyros Giannelos, EEE
 Miss Cher Goey, Chemical Engineering
 Mrs Sayuri Gong, ICT
 Dr Sakina Gooljar, Medicine

Mr Peter Gordon, ESE
 Dr Susannah Gray, Faculty of Medicine Centre
 Mr Joshua Green, Chemistry
 Dr Karen Grewal, Surgery & Cancer
 Miss Florence Gschwend, Chemical Engineering
 Miss Ana Guedan Paredes, NHLI
 Dr Bakul Gupta, Materials
 Dr Arash Hamzehloo, Mechanical Engineering
 Miss Chiara Heal, Advancement
 Dr Marta Hojka, Life Sciences
 Dr Ruien Hu, Chemical Engineering
 Dr Kang Huang, Chemical Engineering
 Mrs Shahhura Hussain, Finance
 Mr Christopher Hutcheson, Sport and Leisure
 Dr Jennie Hutton, Chemistry
 Dr Eleni Ioannou, Mechanical Engineering
 Mrs Josephine Ireneo Mendoza, Medicine
 Mr Kuldip Jaj, Faculty of Medicine Centre
 Ms Marija Jevtovic, Finance
 Ms Bethan Johnson, Life Sciences
 Mr Charalambos Kallepitis, Materials
 Dr Andreas Kampitsis, ESE
 Mr Kaiser Karamdad, Chemistry
 Miss Roya Karimnia, Public Health
 Dr Aditya Karnik, Chemical Engineering
 Mr Daniel Kelly, Computing
 Dr Faaizah Khan, Life Sciences
 Miss Maryam Khan, Medicine
 Dr Min Kim, NHLI
 Dr Rebecca Kordas, Life Sciences (Silwood Park)
 Dr Lobna Kouser, NHLI
 Mr Juan Kuntz Nussio, Chemistry
 Mr Chaipat Lapinee, Chemistry
 Dr Maria Lathouri, ESE
 Ms Jo Leask, Business School
 Mr Yong Li, Mechanical Engineering
 Dr Kartik Logishetty, Surgery & Cancer
 Miss Lizzie Lomer, NHLI
 Ms Romy Lorenz, Medicine
 Mr Edmund Lovell, Physics
 Ms Maria Lucey, Medicine
 Mr Fabio Luporini, ESE
 Mr David Mack, Physics
 Miss Sanja Maglajlija, EYEC
 Mr Daniel Malko, Chemistry
 Miss Naila Mannan, Medicine
 Ms Katie Martin-Fagg, ICT
 Dr Alba Matas Adams, Materials
 Mr Ruairi McEvoy, Business School
 Dr Ryan Meade, Public Health
 Mr Nitish Mital, EEE
 Miss Syafrina Mohd Sharif, Centre for Environmental Policy
 Dr Zahra Mohri, Bioengineering
 Miss Nazma Mojid, Estates Division
 Mrs Luisa Mouta Faria de Lima Doria, Surgery & Cancer
 Mr Julian Mutz, Public Health
 Miss Dianna Nguyen, Chemistry
 Miss Jennifer Ofoedu, NHLI
 Mrs Natalia Okele, Faculty of Natural Sciences
 Mr Brian O'Neil, Security Services
 Mr Afzal Patel, ICT
 Dr Lucy Penfold, Institute of Clinical Sciences
 Dr Ana Pestana Gomes, Institute of Clinical Sciences

Dr Paolo Piazza, Medicine
 Mrs Livia Pierotti, Centre for Environmental Policy
 Ms Vanessa Powell, Medicine
 Dr Katarzyna Procyk, Medicine
 Ms Yasel Quintero Lares, Mechanical Engineering
 Miss Priscilla Rajakumar, Bioengineering
 Dr Emma Ransome, Life Sciences (Silwood Park)
 Miss Mary Raymer, Centre for Environmental Policy
 Mr Ahsan Raza, Finance
 Ms Lucie Richards, Design Engineering
 Mr Amerigo Salemme, Catering Services
 Mr Philip Sandwell, Grantham Institute
 Dr Nina Sanghani, NHLI
 Ms Ruth Saunders, Business School
 Mr Daniel Schade, Physics
 Dr Sonke Schmidt, Computing
 Miss Juliette Scull, Centre for Environmental Policy
 Mr Giovanni Serra, Security Services
 Dr Jose Serrano Contreras, Surgery & Cancer
 Dr Louise Shelley, Faculty of Medicine Centre
 Ms Bryony Simmons, Medicine
 Dr Sabrina Simoncelli, Physics
 Dr Stacey Skaalure, Materials
 Mr Robert Smith, ICU
 Professor Rod Smith, Mechanical Engineering
 Mr Jakub Sobiecki, Public Health
 Miss Lauren Stevens, Faculty of Engineering
 Ms Lorna Suckling, Bioengineering
 Ms Georgina Tennant, Computing
 Ms Cristina Termenon Casado, School of Professional Development
 Ms Romina Tocci, Surgery & Cancer
 Mrs Thilagavathy Toman, Surgery & Cancer
 Dr Vivian Tong, Materials
 Mx Melinda Toumazos, Public Health
 Miss Foteini Tzakoniati, Chemistry
 Dr Claire Villette, Civil and Environmental Engineering
 Dr Aaron Vincent, Physics
 Mr Matthew Watts, Life Sciences (Silwood Park)
 Dr Shoshana Weider, Faculty of Engineering
 Ms Maria Weinert, Medicine
 Dr Nathan Welch, Chemical Engineering
 Miss Ruth White, Surgery & Cancer
 Mr Matthew Wilkins, Business School
 Mr Aaron Williams, NHLI
 Mr Mark Woodbridge, Medicine
 Mr Menglong Ye, Computing
 Mr Kailun Zheng, Mechanical Engineering

This data is supplied by HR and covers staff joining the College during the period 21 October – 21 November 2016. This data was correct at the time of going to press. For Moving On, visit the online supplement at www.imperial.ac.uk/reporter

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

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

Farewell

moving on

Mrs Tawiah Adekunle, HR (10 years)
 Dr Mian Ahmad, Surgery & Cancer
 Dr Folake Akinduro, Life Sciences
 Mr Justin Alsing, Physics
 Dr Nadav Amdursky, Materials
 Dr Uma Anand, Medicine (6 years)
 Dr Bani Anvari, Civil and Environmental Engineering
 Dr Mubarik Arshad, Surgery & Cancer
 Miss Josephine Backhouse, Faculty of Medicine Centre
 Mr Roberto Banfi, Catering Services
 Dr Claudia Battistelli, EEE
 Mr James Birch, Life Sciences
 Miss Carina Blythe, Faculty of Medicine Centre (9 years)
 Dr Guido Bolognesi, Chemistry
 Miss Marielle Bouqu Coast, Medicine
 Mr George Bowie, Estates Division
 Miss Katharine Buckle, Faculty of Natural Sciences
 Mrs Julia Byrne, Business School (5 years)
 Mr Ben Champion, Faculty of Medicine Centre
 Dr Subhojit Chakraborty, Bioengineering
 Dr Shu Chen, Materials (5 years)
 Miss Lisa Collins, Sport and Leisure
 Dr Alethea Cope, Medicine (5 years)
 Dr Robert Currie, Physics
 Ms Kirstie Cuthbert, Faculty of Engineering
 Mrs Christelle Dalle, Catering Services
 Mr Frederik Dieleman, Physics
 Dr Ying Fan, EEE
 Dr Ildar Farkhatdinov, Bioengineering
 Miss Laura Fellows, ICU
 Dr Frederic Francois, EEE
 Dr Michael French, Public Health (9 years)
 Dr Benedicte Galmiche, Mechanical Engineering
 Ms Amber Gibney, Medicine
 Miss Simren Gill, Medicine
 Dr Benjamin Goislard De Monsabert, Bioengineering
 Mr Alastair Gregory, Mathematics
 Dr Nabil Hajji, Medicine
 Miss Charlotte Harvey, Life Sciences
 Dr Harini Hewa Dewage, ESE
 Dr Ashleigh Howes, NHLI
 Miss Yvette Ighorue, Medicine
 Dr Marilia Ioannou, Medicine
 Dr Michiyo Iwami, Medicine
 Miss Mishell Jachero Bustos, Catering Services
 Dr Philip Jedrzejewski, Chemical Engineering
 Miss India Jordan, ICU
 Dr Sebastian Kaltwang, Computing
 Emeritus Professor Barry Kay, NHLI (12 years)
 Mr Alexander Kirby, Materials
 Mr Kostas Konstantinidis, ICT
 Dr Everett Kropf, Mathematics
 Mr Nicolas Kyllilis, Bioengineering
 Miss Katie Lamb, Medicine
 Mrs Jennifer Landmann, Public Health
 Dr Maria Lathouri, ESE
 Miss Rositsa Lecheva, Catering Services (6 years)
 Dr Yufei Liu, EEE

Dr Victoria Lopez Morales, Computing
 Dr Ifung Lu, Surgery & Cancer
 Mr David Malatinszky, Life Sciences
 Ms Sujita Mall, NHLI
 Dr Stefan Matthies, Chemistry
 Ms Eilis McCarthy, Central Secretariat
 Dr John McGinley, Mechanical Engineering
 Dr Andrew McKinley, Chemistry (5 years)
 Miss Feryal Mehraban Pour Behbahani, Computing
 Dr Yulia Melnikova, ESE
 Dr Marija Milojevic Jevric, Computing
 Ms Ania Mirkowska, Business School (9 years)
 Dr Isabel Moraes, Life Sciences (6 years)
 Dr Jordan Muscatello, Chemical Engineering
 Mr Chris Natt, Design Engineering
 Dr Peter Norsworthy, Medicine (24 years)
 Miss Linda Ogunbiyi, Finance
 Mr Christopher O'Sullivan, Residential Services
 Mr Melvyn Patmore, Physics (5 years)
 Dr Sarah Perkins, Faculty of Medicine Centre (7 years)
 Dr Sebastian Pike, Chemistry
 Mr Morgan Pinfold, Estates Division
 Dr Sebastian Potter, Public Health
 Dr Christos Rossios, NHLI (6 years)
 Dr Kevin Rue-Albrecht, Medicine
 Dr Milagros Ruiz, Public Health
 Dr Sadia Saeed, Public Health (5 years)
 Dr William Scott, Public Health
 Dr Rachel Shaw, Surgery & Cancer
 Mr Jamie Silman, Catering Services
 Dr Daniel Skodlerack, Mathematics
 Dr Laura-Jane Smith, NHLI
 Emeritus Professor Rodney Sobey, Civil and Environmental Engineering
 Dr Aggeliki Spentzou, Medicine
 Dr Mark Steedman, Institute of Global Health
 Mr Keith Tarnowski, Mechanical Engineering
 Dr Grigoris Tsolkas, Bioengineering
 Mr Sergio Velez-Moss, Reactor Centre (27 years)
 Dr Ignacio Villar Garcia, Materials
 Dr Dominic Walker, Library
 Dr Edward White, Chemistry
 Mrs Daisy Wiley, Surgery & Cancer
 Dr Tobias Witting, Physics (7 years)
 Dr C Peng Wong, Public Health
 Mr David Yeo, ICT
 Dr May Yong, Computing
 Dr Nada Yousif, Medicine (6 years)

Retirement

Mr Derek Parker, Estates Division (14 years)
 Mr David Winstanley, EEE (19 years)



08 DECEMBER, 17.00

Imperial Fringe: All around the world

Take a festive trip of discovery around the globe to meet scientists and adventurers working amongst rainforests, in deserts, up mountains and at the North Pole. The latest Imperial Fringe brings together scientific adventurers from the world's most exotic locations. From polar

explorers and rainforest ecologists, to volcano climbers and junior doctors helping remote mountainous villages in Nepal, find out how far (literally) science and engineering can take you as we present their stories and treasures gathered from the field. Register in advance and exchange your tickets on the night for free Christmas treats from around the world.



08 DECEMBER, 17.30

A metallic journey through human history

Arsenic in drinking water. Lead in the atmosphere. Uranium leaking from nuclear waste. A little too much of some trace elements in the environment can have fundamental effects on human and environmental health. However too little of others can have equally disastrous consequences, leading to issues

such as malnutrition in large areas of the developing world. In his inaugural lecture, Dominik Weiss will discuss a career investigating the past and present movement of trace elements around our environment. This will include work to explain how valuable metals for our health are taken up by rice plants.

take note

Accessibility information available online

Detailed accessibility information, including detail on entering and navigating buildings, is now available for seven College campuses. The information on the South Kensington Campus includes extra details about lecture theatres, seminars, meeting rooms and teaching areas. Staff are encouraged to share the link when organising events or inviting visitors, such as prospective students or job applicants, to the College.

Find out more:
bit.ly/access-online



24 NOVEMBER, 19.00

Wasted works: a conversation

Join Professor Sara Rankin in conversation with artist Gina Czarnecki about science-art collaborations including the Tooth Palace.



30 NOVEMBER, 17.30

New drugs for old diseases

Explore new treatments for traditional ailments such as malaria, the common cold, and a greasy hedgehog at the inaugural lecture of Professor Ed Tate.



06 DECEMBER, 18.00

Renewable Gas: The lowest cost pathway to decarbonising heat?

This year's Sustainable Gas Research Annual Lecture will be given by David Parkin the Director of Safety and Network Strategy at National Grid.

07 DECEMBER, 17.30

The Bionic Man

Explore the potential to interface the human nervous system with robotic limbs at the inaugural lecture of Professor Dario Farina.



08 DECEMBER, 18.15

Bio-inspired flying robots for future cities

This year's Children's Christmas Lecture take a journey towards a future smart city that could see friendly flying robots moving autonomously alongside their human neighbours.



08 DECEMBER, 18.30

A new Antarctica: The technological exploration of Earth's last wilderness

Professor Martin Siegert explains how technology is changing how we view Antarctica, from a lifeless continent, to one shaping our global environment.



13–15 DECEMBER, 09.00

The IET and Synbicite Engineering Biology Conference

Imperial's Synthetic Biology, Engineering Biology Industrial Accelerator and the IET host a conference on synthetic biology for manufacturing.

14 DECEMBER, 15.00

Intrusion detection in critical infrastructure

A joint seminar between the Institute for Security Science & Technology and the Department of Mathematics Statistics Section to look at the signs for the next Stuxnet cyber attack.



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