

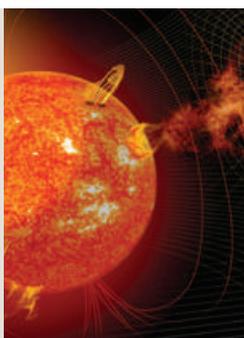


# Battling Superbugs

The Imperial researchers taking on the antimicrobial resistance threat ... ❖ CENTRE PAGES



**CLASS APART**  
Jane Saffell  
wins National  
Teaching  
Fellowship  
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**FLARE UP**  
Predicting  
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**THE WELTON WAY**  
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plots a course  
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EDITOR'S CORNER

## United front

You could be forgiven for thinking that *Reporter* has gone all horror science fiction judging by this issue's cover. In fact, those 'alien' creatures with tentacles, commonly known as carbapenem-resistant enterobacteriaceae (CRE), are uncomfortably close to home and an unwelcome guest at many hospitals in London. CRE is just one of many emergent **bacterial strains** that pose such a grave risk that the UK's Chief Medical Officer and former Imperial Professor Dame Sally Davies called for them to be ranked alongside terrorism on a list of **threats to the nation**. As with all grand societal challenges, such as climate change and healthy ageing, the solution has to involve a **concerted effort** from both the public at large and experts from diverse fields of study, which is the idea behind Imperial's Antimicrobial Research Collaborative (ARC; Centre Pages). Having delved into the issue, I for one will never again take for granted the antibiotic medication that my friends, family and I have relied upon throughout our lives.

ANDREW CZYZEWSKI, EDITOR

Reporter is published every three weeks during term time in print and online. Contact Andrew Czyzewski:

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# Imperial robotics experts launch London Tech Week

Robotics experts from Imperial demonstrated some of the world's most advanced aerial robots to help launch London Tech Week.

The event, held on 15 June at London's iconic Shard building, saw technologists, entrepreneurs and investors gather to celebrate the capital's technology sector. Guests heard from a number

of tech experts and saw demonstrations of Imperial's drones that are putting London at the forefront of aerial robotics technology.

Dr Mirko Kovac, Director of the Aerial Robotics Lab at Imperial (below), said: "Drones get a bad press but they can improve our lives and be of immense benefit to society. That's why I talk about

'drones for humanity'.

"Aerial robots can help us to monitor pollution, protect wildlife and assist in search and rescue operations. At Imperial we are working on autonomous construction and repair with swarms of aerial robots for future cities."

The event was a chance to meet others in the technology sector keen to discover how Imperial's drone technology could be applied in the real world.

"There was a lot of interest in the drones from industry," said Talib Alhinai, a postgraduate researcher in aerial construction. "There's so much potential for them to contribute to smart city innovation. It's great to see the possibilities with everyone, from start-ups all the way up to the big corporations, looking to develop tech and spur innovation in the city."

—JON NARCROSS AND ANDREW SCHEUBER, COMMUNICATIONS AND PUBLIC AFFAIRS



## National recognition for Imperial lecturer

The Higher Education Academy (HEA) has awarded a National Teaching Fellowship to Dr Jane Saffell, a Senior Lecturer in the Faculty of Medicine and the Academic Lead for Postgraduate Education across the Faculty.

The HEA's National Teaching Fellowship Scheme, now in its 15th year, celebrates outstanding achievement in learning and teaching in higher education. Recipients become part of a community of nearly 700 National Teaching Fellows representing more than 40 discipline areas from institutions across the country.

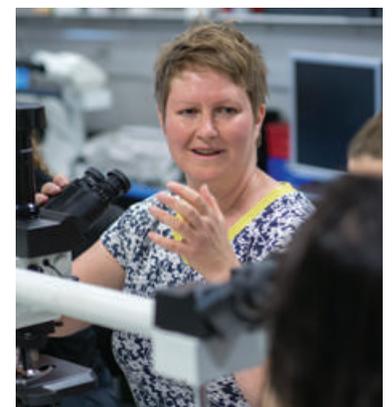
The award recognises Dr Saffell's contribution to biomedical education and her work to create inclusive academic communities,

that mesh teaching and learning with research and scholarship.

She said: "I felt enormously honoured to have been the College's nominee for the fellowship. Finding out that I'd won was a bonus – and the award opens up several research and development opportunities that would be difficult to fund otherwise.

Dr Saffell will receive the prize at a celebration event in October at Liverpool Cathedral. The fellowship includes a cash prize to support professional development or fund education research projects, programmes or initiatives.

Professor Debra Humphris, Imperial's Vice Provost (Education) said: "Jane Saffell is an outstanding example of a



transformative academic and I was delighted to endorse her for this fellowship. Her innovation, reach and impact are recognised within her discipline area at national and international level."

—JON NARCROSS, COMMUNICATIONS AND PUBLIC AFFAIRS

## Engineering Medicines Lab launches

A new collaboration is aiming to speed up and economise drug discovery with the development of more flexible manufacturing systems.

Imperial and the global healthcare company GlaxoSmithKline (GSK) are establishing the Engineered Medicines Laboratory (EML). The EML is taking a new approach to the development of medicines, where researchers from a range of scientific fields including life sciences, physical sciences, engineering and medicine will work side-by-side on projects.

Currently, most manufacturing processes are built when a drug has been fully tested and developed, meaning that any alterations to process can be time consuming and costly.

The researchers at the EML aim to develop a flexible manufacturing system that can produce multiple drug designs concurrently. The advantage of this is that manufacturing can be more closely aligned with the research stage, which could make drug development more cost effective, leading to therapies being cheaper and more widely available for patients.

This could, for example, see mini-manufacturing plants producing new prototype therapies for testing, which could significantly speed up the product development process and make drugs cheaper and more readily available.

Imperial's Provost James Stirling said: "In the twenty-first Century, some of the greatest advances in healthcare will be at the intersection between medicine and engineering and that is why the establishment of the EML is so exciting and timely. Already work has begun on two ground breaking projects that aim to discover new drug therapies for cancer and inflammation.

The societal benefit could be particularly important for those in developing countries who historically have not always had the best access to treatments."

—COLIN SMITH,  
COMMUNICATIONS  
AND PUBLIC AFFAIRS



## Milestone for aspiring leaders

Participants on Imperial's sector-leading development course for disabled staff came together on 27 May to celebrate their success and discuss the projects they had undertaken as part of the programme.

Imperial's Calibre programme, now in its third year, provides leadership development support for disabled staff, and has been designed to address the distinct and often subtle barriers disabled staff face in the workplace.

As in previous years, this year's cohort of Imperial staff were joined on the programme by staff from other higher education institutions. Participants attended sessions built around the social model of disability, which sees disability as created by barriers in society.

Dr Geoffrey Nelson (Materials) was a participant on Calibre. As his personal project on the programme, he put together a proposal to establish a Fellowship specifically for disabled academics.

Dr Nelson said: "The Calibre programme provided us with a way of thinking about disability in a different way and giving us a framework to drive forward change in our institution, demonstrating that we – along with our employer, share responsibility for removing barriers for disabled people."

—DEBORAH EVANSON AND ELIZABETH NIXON, COMMUNICATIONS AND PUBLIC AFFAIRS

Staff who are interested in taking part in the programme next year should contact Leyla Okhai, Equality and Diversity Manager: [l.okhai@imperial.ac.uk](mailto:l.okhai@imperial.ac.uk)

### in brief

#### On the rise

The Business School has risen up the latest Financial Times rankings to become the best business school in the UK for its MSc Finance programme. The 2015 Financial Times Master in Finance rankings, published today, place Imperial College Business School at 11th place in the world, climbing five places from its previous 16th position in 2014. The Business School was also ranked 10th place overall in the European rankings.

#### Student science scribes scoop national prize

Two Imperial-run publications have won awards at the Association of British Science Writers' Awards 2015. *Broadsheet*, the magazine of the Royal College of Science Union, edited by Ben Stockton, won the IOP Student Science category; meanwhile, *I, Science*, edited by Jennifer Toes and Iona Twaddell, was named as the runner-up in the same category.

#### Mastering business and climate

Future business leaders will be equipped with the skills to tackle the business challenges caused by climate change, through a new Masters course. The MSc in Climate Change, Management & Finance, developed by the Business School and the Grantham Institute, aims to open the doors to a wide range of careers, in areas including carbon finance, risk management, sustainability consulting, the energy industry, Government and green technology.



“Gabor saw the great link between life science and engineering... I feel privileged to have inherited that scientific spirit.”

REGIUS PROFESSOR CHRIS TOUMAZOU SPEAKS AT THE 2015 GABOR LECTURE ABOUT THE POTENTIAL OF SEMICONDUCTOR TECHNOLOGY TO REPLICATE BIOLOGY. TO WATCH VISIT: [BIT.LY/GABOR-15](http://bit.ly/gabor-15)



## Prestigious professorship for female engineer

National Women in Engineering Day got off to an auspicious start on 23 June, with the announcement of the Shell/Royal Academy of Engineering (RAE) Research Chair for Professor Mary Ryan.

Professor Ryan leads Shell's programme for Materials and Corrosion at the Department of Materials. The programme was set up to help industry develop new ways to manage and protect equipment by understanding the behaviour of materials. Finding ways to reduce corrosion is a serious challenge for industry, estimated to cost the global economy upwards of \$2.2 trillion annually.

Professor Ryan, whose new chair is for Interfacial Nanoscience for Engineering Systems, said: "It is a huge honour to be awarded this prestigious Chair. We will continue to work on using nanotechnology techniques to develop new protective materials such as smart antimicrobial coatings. These respond to changes in the surrounding environment to provide effective, environmentally friendly alternatives to conventional treatments."

Congratulating Professor Ryan on her "exciting appointment" Professor Jeff Magee, Dean of the Faculty of Engineering, said: "This research chair reflects Imperial's priorities in developing multidisciplinary research and in fostering collaborations with other organisations."

Professor Dame Ann Dowling, President of the RAE, added: "I am delighted that we are able to announce this important new research chair appointment on National Women in Engineering Day. Professor Ryan's work on advanced materials and corrosion is a crucial area for collaborative development between academia and industry and I am delighted that Shell is co-sponsoring the appointment."

—NATASHA MARTINEAU, COMMUNICATIONS AND PUBLIC AFFAIRS

## Mums and dads ape their mothers' parenting style, suggests study

Mothers' and fathers' parenting behaviour is more likely to resemble their own mothers' than their fathers', according to Imperial researchers.

Previous studies have established that warm and supportive parenting is associated with academic achievement, psychosocial development and emotional stability, while harsh parenting is associated with child aggression and conduct problems. But the extent to which parenting quality is transmitted from one generation to the next is unclear.

The new study, funded by the Wellcome Trust, is one of only a few to address this question by observing parents' behaviour directly, looking at both positive and negative aspects of parenting in both mothers and fathers.

Researchers filmed



146 mothers and 146 fathers interacting with their young children, and used questionnaires to record their perceptions of the quality of parenting they received.

Parents whose mothers showed more affection showed more positive parenting behaviour with their own children, while those whose mothers were more controlling showed more negative parenting behaviour. The parenting behaviour of their fathers was not associated with how parents interacted with their children.

Study author Dr Paul Ramchandani (Medicine) said: "Parenting plays a fundamental role in children's development, affecting health, social and educational outcomes in later life, so it's of utmost importance to society that we have a greater understanding of the complex issue of parenting behaviour."

—SAM WONG, COMMUNICATIONS AND PUBLIC AFFAIRS

## Animal facility welcomes school group

A group of pupils from Westminster Academy took a tour of an Imperial animal facility in June organised in partnership with Understanding Animal Research.

The sixteen and seventeen year-olds were taken on a tour of the facility by animal research technicians. They saw how mice and rabbits are housed and looked after at Imperial, and heard how scientists work with the animals that are used in medical research.

The visit came about as part of Imperial's commitment to openness, underlined last year when the College signed up for the Concordat on Openness in Animal Research.

The visitors heard from Helen Goyal,



Facility Manager, and Bruna Delfini Animal Technician, about their everyday care for research animals.

In the rabbit room, Bruna explained: "We have to give them lots of water. You can see these rabbits are big animals and they drink a lot. The rabbits are kept in floor pens instead of cages so they have more room to explore and move around."

She then demonstrated how staff handle the rabbits to keep them safe and calm, and answered questions about what types of experiments the rabbits were used in and how they are similar to humans.

The tour was combined with a practical lesson, coordinated by the College's Outreach team and led by Dr Rebecca Holloway (NHLI), where the pupils worked with Daphnia – tiny freshwater animals often called water fleas – to measure the effect of caffeine or alcohol on heart rate.

Pupil Gabriella, who plans to study biochemistry at university, said of the day: "I've heard a lot about animal research and I think it's an important ethical issue. Until we can find an alternative I think it is still needed before treatments can go into humans."

—KERRY NOBLE AND THOMAS ANGUS, COMMUNICATIONS AND PUBLIC AFFAIRS

# media mentions



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## London tech on the rise

CITY AM ▶ 19.06.2015

Writing in *City AM*, Professor David Gann, Vice-President (Development and Innovation), discusses the challenges and opportunities for the capital's technology sector: "London beats New York for finance, Boston for universities, and has the world's most exciting arts scene. But it's tech innovation that has the greatest potential to drive London's future growth. If we can bring together London's inventors, entrepreneurs, investors, academics and creatives on a grander scale, our enterprise and technology capabilities could soon surpass San Francisco's. But we have real challenges ahead: unlocking capital, sustaining talent pipelines and management capabilities, delivering smart infrastructure and helping startups to scale up."

## Dino fact or dino fantasy?

THE TIMES ▶ 16.06.2015

The latest Jurassic Park film is breaking records at the box office, but does the science stand up? *The Times* consulted the experts. In the film, the reptilian DNA has been partly retrieved from a mosquito that bit a mosasaurus. However, as palaeontology research fellow Dr Susannah Maidment (Earth Science and Engineering), pithily points out: "The mosasaurus is a big sea reptile. Was it a scuba-diving mosquito?"

## Hypochondriacs need therapy

THE DAILY TELEGRAPH ▶ 15.06.2015

The notion that hypochondria might be a recognisable, treatable condition is one vigorously championed by Peter Tyrer (Medicine), Professor of Community Psychiatry, *The Daily Telegraph* writes. Approximately 1 in 100 people suffer from 'pathological health anxiety' and fall into two main groups: 'chronic somatisers' who express their psychological distress through physical complaints, and those who focus their fears on one illness in particular – usually cancer. In the largest study of its kind almost 500 patients with hypochondriasis were allocated to having either cognitive behavioural therapy

(CBT) or 'standard care'. The results are most encouraging with 'substantial improvement' in those receiving CBT. "We have had dozens of letters describing how their lives have been turned around," Professor Tyrer says.

## Investors waking up to sleep sensors

THE INDEPENDENT ▶ 21.06.2015

There's nothing quite like a good night's sleep. Doctors have always known it – and now big business is waking up to the fact, *The Independent* reports. Most sleep sensors on the market only track movement, with some also monitoring heart rate. Now health researchers at Imperial are working with engineering colleagues on a wearable brain activity monitor that can fit into the ear. Mary Morrell (Medicine), a Professor of Sleep and Respiratory Physiology, is optimistic about the popularity of the current generation of sleep sensors. "There has been an increase in people coming forward with sleep problems because of greater awareness and I think sleep sensors have been a part of that," she said.



## awards and honours

### BUSINESS SCHOOL

#### Business students and staff excel

A team of Business School students has won a competition that tested the skills and knowledge acquired during their MBA programme. The team of five,

consisting of Henry Quiroz, Pavika Tanveerakasm, Sandeep Kumar, Pakaporn Thongyai NA Ayuttaya and Mario Abdisa (pictured below, L-R) beat MBA students from business schools across Europe to win a 5,000 euro prize in the SDA Bocconi International Finance Competition. Meanwhile, a team of academics from the Business School has been chosen by the Health Foundation to be part of its Efficiency Research Programme.

Marisa Miraldo, Associate Professor in Health Economics and Carol Propper, Chair in Economics, will look at different factors that influence the take-up of innovative cancer treatments in the UK.

### NATURAL SCIENCES

#### Bright future ahead

Postdoctoral researcher Hannah Nissan (Physics) has received a Fulbright-Lloyds of London Award – one of the most prestigious and selective scholarship programmes operating world-wide. Hannah has been selected to work jointly with scientists at Columbia University and the Red Cross Red Crescent Climate Centre to develop climate change projections for disaster risk reduction in Africa.

### MEDICINE

#### Medal for pioneering surgeon

The Imperial surgeon who performed the first heart and lung transplant in Britain, and pioneered a life-saving technique for babies with heart vessel problems, has won the prestigious Lister Medal from the Royal College of Surgeons. Professor Sir Magdi Yacoub (National Heart and Lung Institute) said: "I am honoured to receive this award and hope that it will inspire other surgeons to become involved in research. In order for medicine to progress, we need surgeons to be at the forefront of research, working alongside academics."



# Uncovering the great mystery of matter

Particles called antineutrinos been observed shape-shifting at the T2K experiment in Japan – reports an international team including researchers from the Department of Physics.

It is an important step in an experiment that could unravel one of the greatest mysteries of physics – namely why the universe and all the matter in it exists (see right).

Neutrinos have the smallest mass of any known particle, created when cosmic rays from the Sun hit the Earth's atmosphere and in nuclear reactions. They come in three types, or 'flavours,' – the electron neutrino, the muon neutrino and tau neutrino – and are believed to oscillate between these types as they travel.

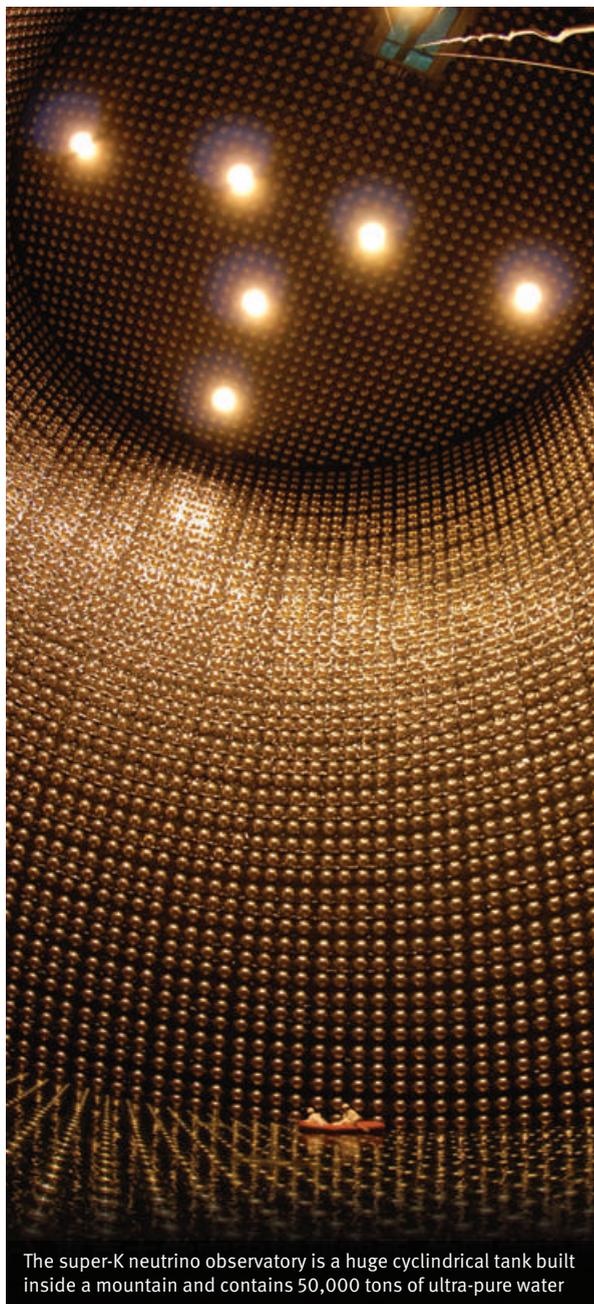
To explore these oscillations, the T2K experiment fires beams of neutrinos from the J-PARC laboratory on the eastern coast of Japan and collects them at the Super-Kamiokande detector, 295 km away in the North West.

The team have so far observed all the different ways in which all the neutrino flavours can oscillate. Now in the latest series of runs they have captured muon antineutrinos oscillating into tau antineutrinos – in a manner very similar to their matter counterparts.

T2K researcher Dr Morgan Wascko (Physics) said: "I would say that we set the trap with the neutrino results, especially the electron neutrino appearance, and this recent muon antineutrino result is our first go at using the trap."

In the future, the team would ideally like to see differences between neutrino and antineutrino oscillations, pointing the way to new physics and possibly an explanation of the matter- antimatter divide. "We want the weird stuff," said Dr Asher Kaboth (Physics), a post-doctoral researcher.

—HAYLEY DUNNING, COMMUNICATIONS AND PUBLIC AFFAIRS



The super-K neutrino observatory is a huge cylindrical tank built inside a mountain and contains 50,000 tons of ultra-pure water



## Evil twins

Every type of particle that exists in the universe has an elusive and rarely encountered antimatter counterpart, which is identical in almost every respect but with an opposite charge. Antimatter particles only appear fleetingly in our universe under special conditions before they are rapidly annihilated by their matter counterparts creating a flash of light. Yet physicists predict that during the Big Bang equal amounts of matter and antimatter should have been created, leaving a conundrum as to why matter vastly predominates over antimatter. Researchers have long searched for subtle differences in the way matter and antimatter behave that might explain why one survived at the expense of the other. Some physicists believe clues may lie in an unusual and ghostly particle called a neutrino and its antimatter counterpart the antineutrino.

“The real quarry is our electron antineutrino search, for which will have first results this summer. We'll need to run for several more years to get a significant result.”

Dr Morgan Wascko, International Co-Spokesperson of T2K and Imperial physicist

## The power of wrinkles

Engineers have developed an ultra-thin 'crumpled' membrane to filter liquids and gases, with the potential to cut energy consumption in industry.

Membranes are selectively permeable barriers used for a range of processes, from removing salt from sea water in desalination plants, to filtering the blood

of kidney patients in dialysis machines.

However, many industries use evaporation and distillation techniques rather than membranes, because membranes can be costly to scale up.

Now, Imperial researchers have developed a prototype membrane that has the potential to be used widely across industry. It contains nanoscale 'crumples' which provide an increased surface area for filtering substances whilst maintaining strength under extreme pressures.

Ultimately, the researchers believe that their prototype membrane could be used to improve

or completely replace industrial processes that process organic solvents, which currently rely on evaporation and distillation techniques. Approximately 30 per cent of the world's energy is currently used by industry, with a substantial fraction of that being used in evaporation and distillation processes.

Group lead Professor Andrew Livingston (Chemical Engineering) said: "These membranes could be useful for industries ranging from pharmaceutical companies to oil refining. The energy and environmental benefits could be massive."

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS

## Heads-up on solar storms

**Large magnetic storms from the Sun, which affect technologies such as GPS and utility grids, could soon be predicted more than 24 hours in advance.**

Coronal mass ejections (CMEs) are eruptions of gas and magnetised material from the Sun that have the potential to wreak havoc on satellites and Earth-bound technologies.

However, not every mass ejection from the Sun that travels past the Earth causes this much disturbance; the power depends on the orientation of magnetic fields within the mass ejection. Currently, satellites can only tell the orientation of a mass ejection's magnetic field with any certainty when it is relatively close to the Earth, giving just 30-60 minutes' notice – not enough time to mitigate the impacts on utility grids and systems operating on GPS.

Now, a new measurement and modelling tool could give more than 24 hours' notice. It takes a closer look at where mass ejections originate from on the Sun and makes use of a range of observatories to track and

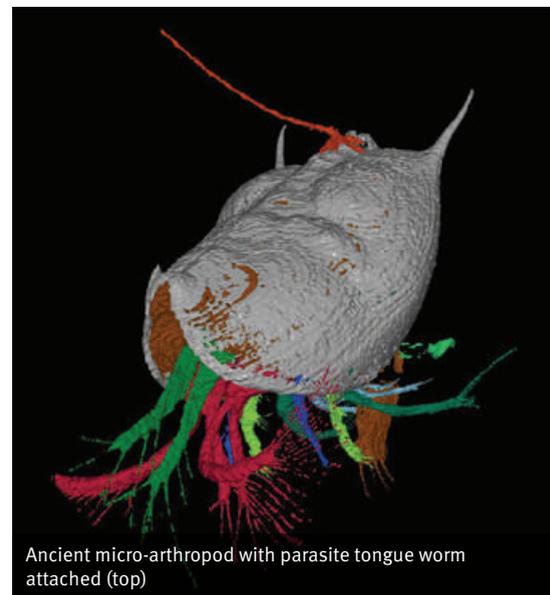
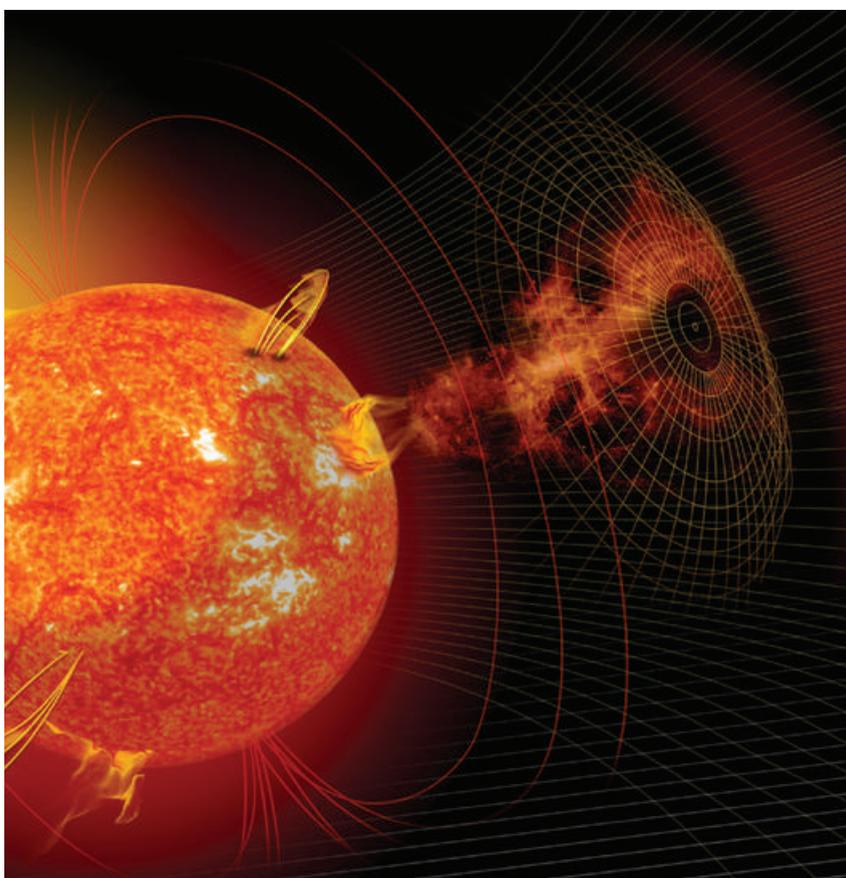
model their evolution. Details of the technique have been revealed by a team led by Dr Neel Savani, Visiting Researcher in the Department of Physics and a space scientist at NASA's Goddard Space Flight Center.

"As we become more entwined with technology, disruption from large space weather events affects our daily lives more and more," said Dr Savani. "Breaking through that 24 hour barrier to prediction is crucial for dealing efficiently with any potential problems before they arise."

Dr Savani and colleagues have tested the model on eight previous mass ejections, with the results showing great promise at improving the current forecasting system for large Earth-directed Solar storms. If further testing at NASA supports these initial results, the system could soon be used by NOAA in the US and the Met Office in the UK for geomagnetic storm predictions.

—HAYLEY DUNNING, COMMUNICATIONS AND PUBLIC AFFAIRS

Watch a NASA video of major solar eruption that occurred 7 January 2014 here: [bit.ly/solar-erupt](http://bit.ly/solar-erupt)



Ancient micro-arthropod with parasite tongue worm attached (top)

## Fossilized parasite caught in the act

**Researchers have found a 425-million-year-old parasite attached to the outside of an ancient sea creature – preserved for eternity in stone.**

Because these 'tongue worm' parasites are related to modern lung-dwelling parasites, it fills in an important missing evolutionary step. Today more than 140 species of tongue worm exist that live internally in the respiratory systems of vertebrates, including humans – entering the host when they are eaten.

Tongue worms are entirely soft-bodied, meaning ancient ones do not usually preserve well as fossils. The latest find came from rocks in Herefordshire dated at 425-million years old – before the evolution of vertebrates.

The new fossil shows a host, in this case a species of ostracod (a group of micro-arthropods related to crabs, spiders and insects), surrounded by several tongue worms attached to various parts of the body.

The parasites were identified as a new species, and named *Invavita piratica*, which means an 'ancient intruder' and 'piracy', referring to their parasitic lifestyle in the sea.

The team that made the discovery was led by the University of Leicester and included Dr Mark Sutton from the Department of Earth Sciences and Engineering, who created a 3D model of the fossil.

"Fossils like this can genuinely cast light on things that would be otherwise fundamentally unknowable," said Dr Sutton. "Before this, we knew these parasites must have done something else before moving into vertebrates, but it was all just guesses. We now have a much better idea of the evolutionary pathway this parasite took from external to internal."

—HAYLEY DUNNING, COMMUNICATIONS AND PUBLIC AFFAIRS

# Leading the fightback

## The new Imperial collaboration taking on the growing superbug threat

It's very difficult to imagine life before the era of antibiotics. Aggressive infections such as tuberculosis, pneumonia and whooping cough were common killers – and it was not unheard of for minor wounds and burns to become infected and prove fatal.

That all changed with the discovery of penicillin by Sir Alexander Fleming at St Mary's Hospital in 1928 and its subsequent therapeutic development in the early 1940s involving another Imperial scientist, Sir Ernst Chain.

The ensuing decades brought the development of a raft of highly effective new antibiotics, and in 1969 US Surgeon General, William Stewart, boldly told Congress it was time to 'close the books on infectious diseases'.

Yet, just as Fleming had presciently warned, bacterial strains began to emerge that had acquired resistance to these very antibiotics.

The lack of new drug development in the 1980s and 1990s, coupled with an explosion in the use of existing antibiotics in both humans and farm animals has hugely escalated the resistance problem – to the point where some experts now believe we are entering a 'post-antibiotics era'.

In 2014 a UK government review estimated that failing to tackle antimicrobial resistance (AMR) would result in at least 10 million extra deaths a year by 2050 (more than the number of people who currently die from cancer), and Prime Minister David Cameron promised to make the issue a national priority.

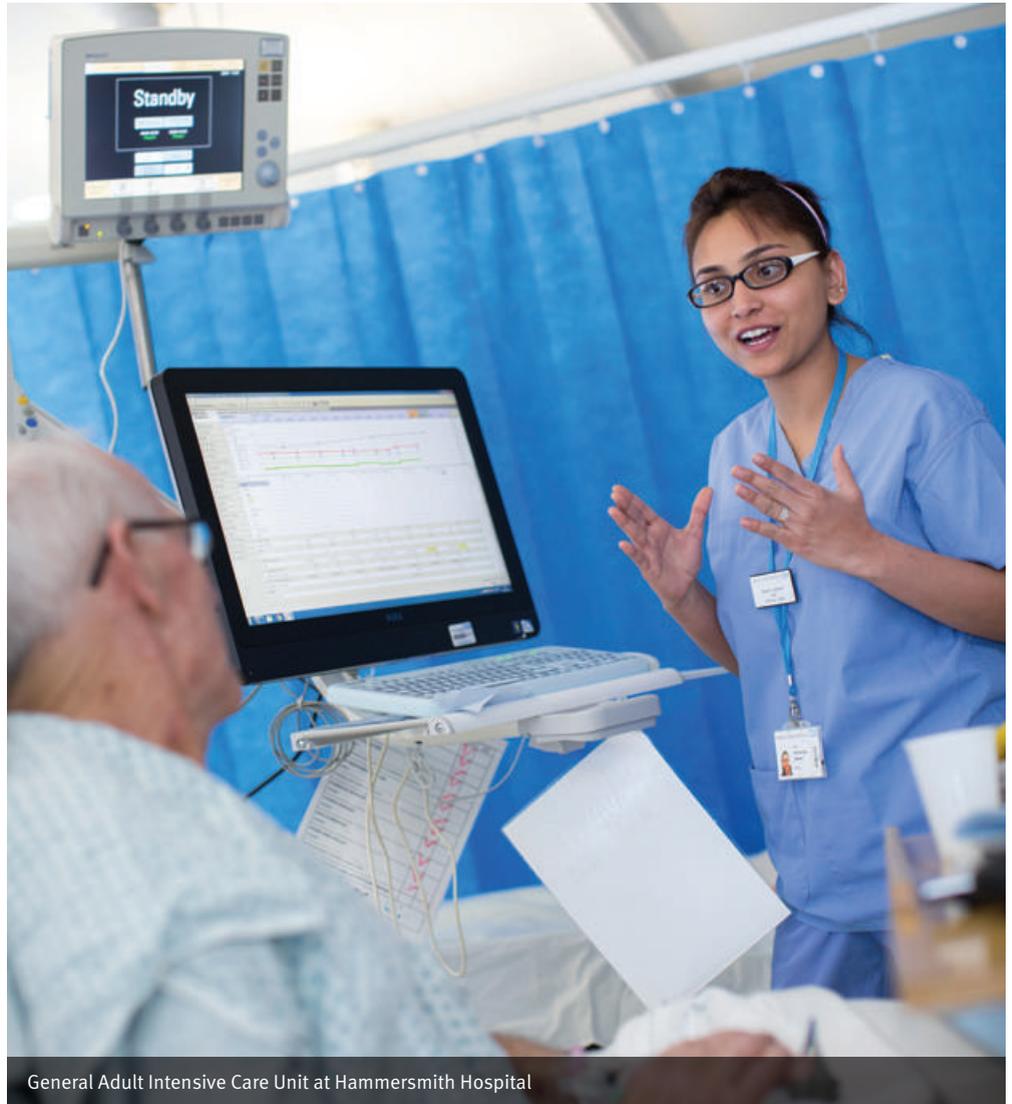
### On many fronts

Imperial plans to play just as pivotal a role in the fight back against antimicrobial resistance as it did in the development of the first antibiotics.

The new Antimicrobial Research Collaborative (ARC) is a network of researchers, clinicians and healthcare professionals from Imperial's four faculties, Imperial College Healthcare NHS Trust, and industry who have joined forces to address the global threat of AMR.

ARC is led by Professor Alison Holmes (pictured right), Professor of Infectious Diseases in the Department of Medicine and Director of Infection Prevention and Control for the Trust. "The rapid spread of AMR is a serious global public health issue," she says. "ARC will tackle this problem by adopting a collaborative approach across a broad range of disciplines."

This will encompass structural biology right through to health policy initiatives and employ the latest techniques including big data, microelectronics



General Adult Intensive Care Unit at Hammersmith Hospital

“If we don't address this, infections which were once easily treatable will become fatal.”

Professor Alison Holmes



and synthetic biology. The end goal will be the same though: to translate research for the benefit of patients as quickly as possible.

"This is not just about the treatment of infections here and now, for you and me – it's also for the next generation," Alison adds. "It is vitally important not just from a healthcare perspective but also from a societal perspective."

Reporter spoke with some of those working as part of the ARC.

### Empowering doctors

ARC collaborator Dr Luke Moore is a Registrar in Infectious Diseases at Imperial College Healthcare NHS Trust and Clinical Research Fellow in the Department of Medicine, working in Alison Holmes' group. Luke practiced as a medical doctor for ten years, trying out different areas of medicine including cardiology. But after witnessing the AMR threat first hand was galvanised to play a part in the remedy.

“Ninety-five per cent of my clinical work involves complex antibiotic choices, because the bugs have become resistant to the most commonly used drugs,” he says. “Outbreaks are common, especially in London. Right now, we’ve been dealing with a strain that is resistant to every single drug bar one, called colistin, which was developed in the 1960s but largely abandoned because it can have a significant impact on kidney function. But our backs are against the wall; it’s a last resort.”

Luke and others believe the first step is to address one of the root causes of the problem which has led us to this position – an explosion in antibiotic use, often with the ‘blunt instrument’ of broad spectrum antibiotics.

“We know about Darwinian pressure, we know how bugs become resistant; yet still, up to half of all antibiotics prescribed are inappropriate. So every other time a doctor puts pen to paper, it may not have the desired outcome and will likely exacerbate resistance.”

Luke is working with computing experts to develop ‘machine learning’ decision-support tools for hospital doctors who routinely prescribe antibiotics. Delivered on ipads and mobile phones, the applications use available information on the patient and their infection – but crucially also pull in data from the cloud on similar patients in the locality. This means the app is constantly updating with data from the latest outbreaks and is able to ‘learn’ from this when advising the doctor.

The app is currently being trialled in hospitals and Luke and the team hope to develop and roll out a version for GPs at some point in the future.

### Rapid diagnosis

Prescribing tools have the potential to become even more powerful when coupled with rapid diagnosis of the underlying infection. For several years, Regius Professor Christofer Toumazou (Bioengineering) and his team has been developing microchip technology that directly translates DNA code into digital information for various patient healthcare applications. However, he soon saw the potential of the technology to reveal the identity of culprit bacteria responsible for infections, just as forensics identifies a perpetrator.

This is particularly important in the management of bloodstream infections and sepsis – a major worldwide killer. When sepsis is suspected, clinicians urgently need to know the type of infection before administering the appropriate type of antibiotics. However, this usually requires remote laboratory analysis which can take days to complete, by which time, the patient’s condition can become much worse. With little information doctors often prescribe inappropriate antibiotics, to the detriment of the patients and potentially fuelling the resistance problem.

“My son has relied on renal dialysis for many years now, so I am quite familiar with the acute hospital environmental – and frankly it is primitive with respect to adoption of the latest technologies,”



Regius Professor Toumazou’s microchip technology directly translates bacterial DNA code into digital information

says Chris. “Only recently he had a potential infection scare in hospital, which luckily turned out to be negative, but it was agonising waiting for the blood cultures to be analysed. Fortunately though, we have a better way, and we believe it will be in the clinic very soon.”

Chris’ prototype device looks like a slightly larger USB pen drive, and works in a similar fashion, taking samples at one end and uploading the data to a laptop at the other, allowing identification of the infection in as little as a couple of hours instead of days.

### The next generation

Whilst better use of existing drugs will help to curb the resistance problem, many experts believe that in the long-term we will ultimately need an entirely new repertoire of treatments. Many researchers in the ARC are working on just that.

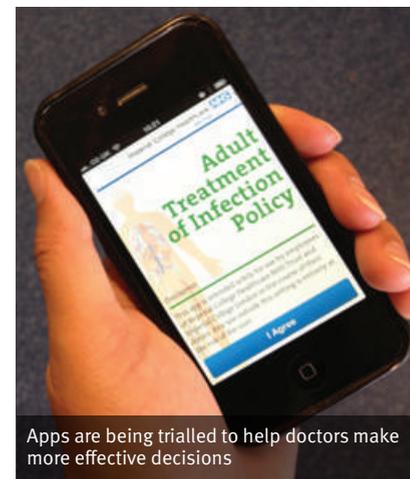
One group is attempting to use the power of synthetic biology – where cells are genetically reprogrammed as production factories – to explore the possibilities of manufacturing new antibiotics.

ARC collaborator Dr Tom Ellis (Bioengineering), explains that the first step in this ambitious project is to establish what he refers to as ‘warfare system’, where yeast cells are reprogrammed to produce penicillin, then grown in the presence of a bacterial cocktail.

“These synthetic yeast cells will only grow if they can produce sufficient yields of penicillin. So we will set up an array of 1,000 little tubes and add new bits of DNA that we suspect may give an advantage – for example by increasing or controlling the amount of penicillin production.”

Once this system is established they can start to design entirely new antibiotic structures, and select for those that appear to be effective against resistant bacterial strains, using their yeast cultures for confirmation.

“Because many enzymes that produce antibiotics tend to be modular themselves, it really lends itself to the synthetic biology approach, where we can experiment with different combinations. Ultimately we could have a system that sifts through billions of combinations – we call it the broth of possibilities!”



Apps are being trialled to help doctors make more effective decisions

“Up to half of all antibiotics prescribed are inappropriate.”

Dr Luke Moore, ARC collaborator

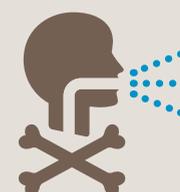
### FUTURE THREAT: WHAT AMR WOULD MEAN FOR US



£95 million

Amount spent on antibiotic research in past 5 years

That’s just 1% of total UK public research funding



Infections that were once treatable could become fatal



10 million

extra deaths a year by 2050

UK government review, 2014

# The Welton way

**Professor Tom Welton became Dean of the Faculty of Natural Sciences in January, following 22 years of Imperial service.**

One of the first public appearances Tom made as Dean came on 17 February, as he walked barefoot across burning embers at 500°C on the Queen's Lawn in aid of RAG Week. It might have been unconventional behaviour for a Dean, but perhaps less so for a larger-than-life character such as Tom.

"They offered me the bungee jump at first, but since I have artificial hips I was concerned about becoming uncoupled and making a mess on the pavement," he says with trade-mark humour. "I'd seen a firewalk done on TV and was feeling fine about it... right up until the point when they started making the fire in front of me."

The point of the undertaking – aside from the obvious good cause – was to put an approachable, human face to his tenure and to the administrative side of the Faculty, which can still be seen as somewhat mystifying to those outside the 'Blue Cube' of the Faculty Building, he says.

It also fits with the enabling role Tom sees himself playing – whether that's helping students achieve their education ambitions, staff to meet their career expectations or departments work towards their strategic objectives.

## Accidental ascendency

Growing up in London with a burgeoning interest in science, Tom says Imperial loomed large in his consciousness – but that it would have been 'completely unimaginable' for that boy to become Dean.

After studying Chemistry at Sussex University, he joined Imperial's Chemistry Department in 1993, rising to Senior Lecturer in 2000, then Professor in 2004.

Tom's research is focussed on studying the separate processes



involved in chemical reactions. It calls on a particular type of thinking that Tom speculates may have helped him when it came to the management side of things.

"I always say that I've got the efficiency of the bone idle! I'm just able to see easier ways of doing things – whether it's how we run the lab or how we administer exams. In the early days I'd reluctantly volunteer for some task, then eventually I got asked to do bigger things."

Tom took on the role of Exams Officer, then Director of Undergraduate Studies before going on to lead the Department from 2007 to 2014. As Head of the Department of Chemistry Tom instituted a series of changes, perhaps most notably working with Dr Tricia Hunt to earn the Department Imperial's first ever gold Athena SWAN award for promoting gender equality.

When the role of Dean came up, Tom saw it as an opportunity to 'write some of these things on a larger canvas'. In the past four months Tom has visited many of the varied research facilities that make up the Faculty,

from the mosquito insectory in Life Sciences to the high-powered lasers of Physics.

With government-funded research facing an uncertain future, Tom is working closely with Development to identify a broader cross-section of potential funding sources that encompass alumni, philanthropic donors and foundations.

"That doesn't mean that the palaeontologists, for example, must start doing something that's industrially relevant. But it does mean helping people to find those alternative sources so that they can carry on doing the things that they are passionate about doing."

## Building the future

Tom has always been invested in the careers of students and early stage researchers. One of the things he would like to see is for every student to have the opportunity to work a paid internship.

This partly stems from his concern about what he sees as widening inequality in society and the competitive graduate jobs market. He points to initial analysis by the College suggesting that students from low income backgrounds at Imperial are more likely to be unemployed six months after graduating than their College peers, adjusting for degree results.

"These are students that have successfully navigated the academic rigours of Imperial, yet still lack something, perhaps social capital or confidence, and therefore get left behind. We have to do something about that."

So does the boy who rose from a council estate to become a top professor and scientific leader have any advice for those embarking on a career in academic science?

"Yes it is difficult, yes it is competitive but many of the most rewarding things are. I will do everything I can possibly do to help you, be your coach, but ultimately you have to do it because you want it."

“I’ve got the efficiency of the bone idle! I’m just able to see easier ways of doing things.”



# inside\*

## story

### mini profile

## Dale Wigley



Professor Dale Wigley FRS recently joined Imperial from Cancer Research UK to

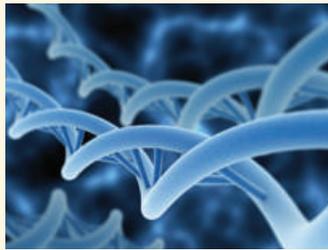
form the new Structural Biology Section within the Department of Medicine, alongside Professors Paul Freemont and Xiaodong Zhang

### What's it like being back in the higher education environment?

Moving from a research institute with such a defined focus to a multidisciplinary university will allow me to broaden my research horizons. The creation of the Section of Structural Biology should promote synergistic interactions leading to advances in our understanding of diseases with potential for new drug discovery avenues – something that I find very exciting.

### Have you always been captured by the exquisite structures found in biology?

For me, seeing is believing. Structural biology allows us to visualise molecules to understand the chemistry of their action. I get a buzz from knowing that when we determine the molecular structure of a protein we can be sure that we are the first human beings to ever see that detail and the insight that brings.



Watson, Crick and Wilkins elucidated the structure of DNA over 60 years ago — are we still unravelling this mighty molecule?

At that time, they had no idea of the molecular complexity required to replicate and repair DNA; even today we are still discovering new protein players in these processes. Each human cell has two metres of DNA – an awfully large amount of information to replicate each time the cell divides and to keep in good shape against an onslaught of chemical and mechanical damage.

### What are you most excited about with regards to the new phase of your research work here?

When I first began my research group in Oxford in the early 1990s, I was working on bacterial DNA replication and repair as a target for novel antibiotic discovery. In subsequent years I got involved in these processes to understand their role in cancer. Moving to Imperial has allowed me to return to antibiotic development – which has become an even more significant medical issue in the intervening years (see centre pages).



## Engineering showcase

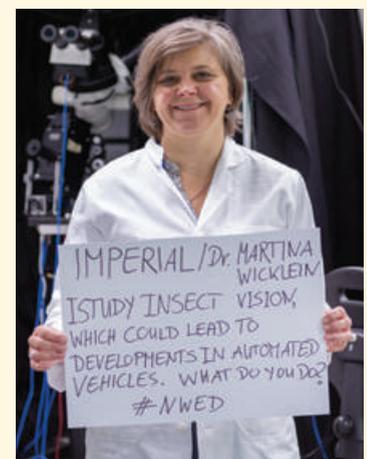
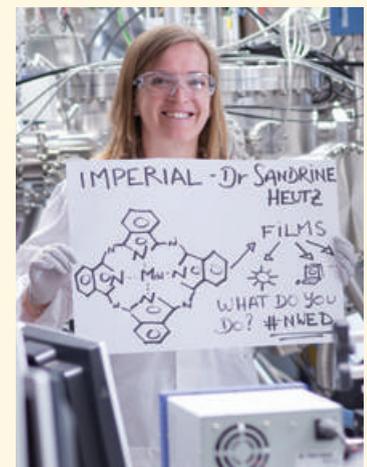
Schools, universities and workplaces across the country marked National Women in Engineering Day on 23 June, to raise the profile and celebrate the achievements of women in engineering.

The Day was set up by the Women's Engineering Society to mark its 95th anniversary. The aim is to showcase the great engineering careers that are available.

As part of the lead up to the event, the College's professional photographer took photos of a cross-section of female engineers in the Faculty of Engineering, holding a placard that answers the question: "what do you do?" then posted them on Twitter as part of Imperial's #NWED campaign. Undergraduate and postgraduate students, and academics at all levels, then contributed their own pictures of themselves to celebrate the work that they are doing in engineering.

Dr Martina Wicklein (Bioengineering), who took part said: "This campaign is a really simple and effective way to stand up and show our community and the world what we are doing in engineering. I investigate how insect vision could help us to make better controls for autonomous vehicles and I want budding engineers to know that work we do is so diverse and exciting. I am looking forward to seeing the other posts to learn more about what my colleagues are working on."

See more pictures from National Women in Engineering Day here: [bit.ly/IMP-NWED](http://bit.ly/IMP-NWED)



(Top-bottom) Dr Angela Goode showcases Materials' Titan microscope; Dr Sandrine Heutz in the lab where she works in thin film technology for electronic and solar devices; Dr Martina Wicklein in the insect vision lab

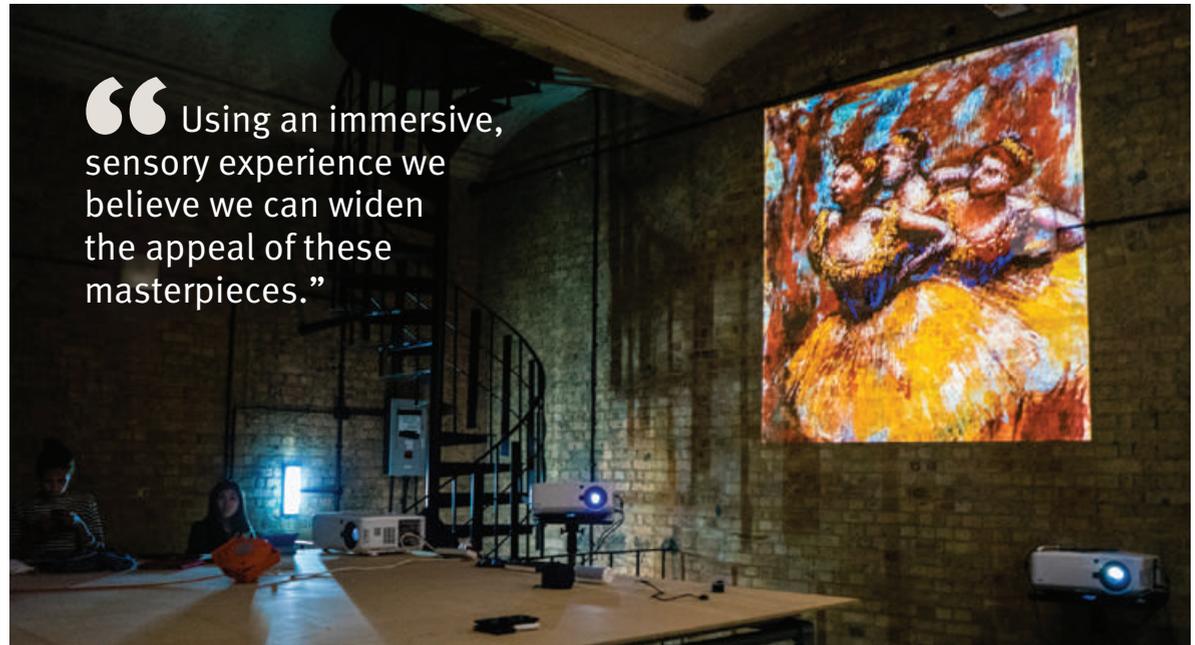
## Modernizing masterpieces

Many people find traditional art galleries stuffy affairs, and the masterpieces they contain mystifying and inaccessible. That's according to a team of MBA students from the Business School which is developing a more immersive viewing experience.

SensArt takes high resolution digitized copies of artworks and projects them onto iconic buildings as part of intimate pop-up events that include an educational aspect detailing the artist and work.

"We wanted to break away from the passive museum-going experience," said Nino Oniani, who is a member of the team that also includes Jason O'Malley, Abu Mohammed, Olia Sardarova and Salman Haq. "Using music, voiceover and storytelling as well as creating the right ambience, we aim to give our audience a 360-degree sensory experience. In this way, we believe we can widen the appeal of these masterpieces."

For the launch event, SensArt collaborated with two students at the Royal College of Art, JooHyun



“Using an immersive, sensory experience we believe we can widen the appeal of these masterpieces.”

Ryu and Hangil Song, for a pop-up event on the work of Edgar Degas inside Imperial's iconic Queen's Tower.

In attendance was Business School Dean Professor G. "Anand" Anandalingam, who commented: "I was truly very impressed by the show; the texture of the brick walls on the Queen's Tower truly gave a three-dimensional effect to the Degas paintings, and brought them to life better than I have ever seen before."

Following their inaugural pop-up, SensArt has plans to exhibit in rural Europe and the Middle East, with the hope of



bringing art to those who can't – or won't – go to more conventional spaces. They are also hoping to digitally exhibit private art

collections not currently accessible to the general public and explore new technologies such as 3D Holographic projection.



blog  
SPOT

## Student blogger Em: Mindful Medicine

At the end of last term a small group of us put on a Mental Health Awareness Week, led by the School of Medicine Students' Union (ICSMSU) Student Welfare Officer.

On the Monday evening there was an Introduction to Mindfulness session. It's a useful technique to have in a busy, stressful environment, and I've started trying to practise it from time to time.

On the Tuesday there was a 'Mind Matters' session organised by PsychSoc focusing on mental illness and the General Medical Council (GMC) – it looked at fact and fiction about fitness to practice for those with a mental health condition.

The main event was on the Thursday – a speech by Ahmed Hankir aka 'The Wounded Healer'. He is a psychiatrist who himself suffers from a mental health condition. Any explanation I could give would not be able to sum up his talk – suffice to say I was inspired to the point that I was almost in tears and completely in awe by the time he'd finished. Some medical schools have his lecture on their syllabus – hopefully soon ICSM will too; it is something that I think every medical student should hear.

More from Em and our other student bloggers:  
[www.imperial.ac.uk/utills/sites/studentblogs/](http://www.imperial.ac.uk/utills/sites/studentblogs/)

# Homeless lizards welcomed into Silwood

Common lizards and slow worms are being relocated from a nearby building site to Imperial's Silwood Park Campus.

Both species are protected in the UK under the Wildlife and Countryside Act, and new building sites must be surveyed for them. They were found on a building site near Silwood Park, and as their habitat was under threat, it was decided to find a new home for them. Approximately 50 creatures are expected to be moved.

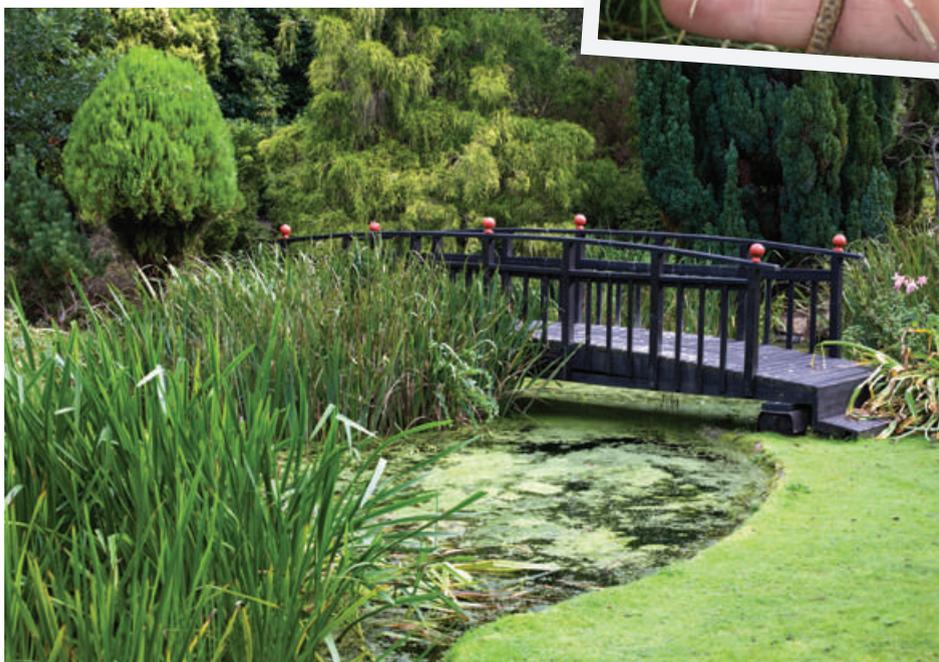
The rural Silwood Park Campus, in Berkshire, is home to much of Imperial's research and teaching in ecology, evolution and conservation, and this – together with its abundant habitat – makes it an ideal place to release the homeless reptiles. Deputy Head of the Department of Life Sciences Professor Vincent Savolainen said the release may also form a part of future student projects.

“We encourage wildlife on campus and there are plenty of sites available. The grounds host several ongoing long-term experiments investigating big questions in ecology using local wildlife,” he said. “However, there haven't been any surveys of reptiles on campus for a long time, so this relocation project could provide a good opportunity for students to monitor how the population changes in the coming years.”

Slow worms and common lizards both need habitats that have a good selection of

prey and a variety of vegetation, so they can hide when necessary in thick undergrowth but also bask in open patches of sunlight. They hibernate in the winter, requiring a deep or well-covered area, such as a pile of wood.

Despite been called worms and having the appearance of snakes, slow worms are actually lizards, albeit legless ones, as identified by their ability to blink their eyelids and re-grow their tails. Common lizards are also slightly odd reptiles, giving birth to live young instead of laying eggs like most of their relatives.



## Licence to Thrill

Imperial students and staff celebrated the end of term in style on Saturday at this year's Imperial College Union Summer Ball.

The Summer Ball, which this year took on a 007 theme, saw activities ranging from a funfair to a silent disco taking over Imperial's South Kensington Campus.

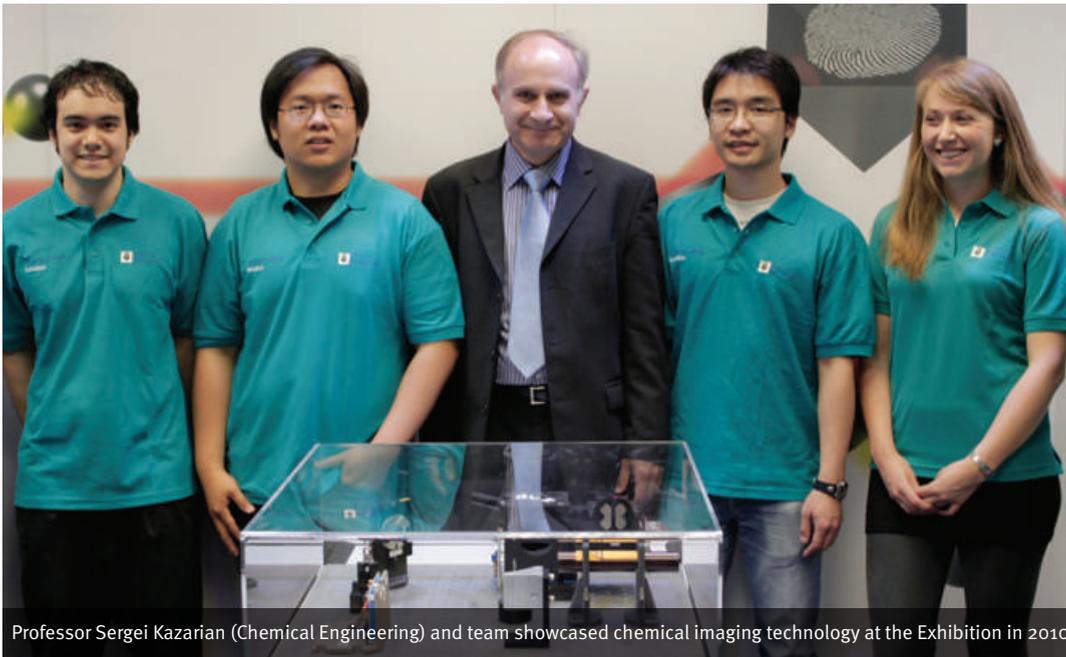
This year's Ball was the largest yet with over 1,500 guests enjoying the attractions as well as the musical acts including this year's headliner, MOBO Award winning rapper Professor Green.

The evening ended with a bang as the annual firework display lit up the skies over South Kensington before guests moved on to Imperial College Union's afterparty. Here the party continued until the early hours when the 'Survivor's Photo' captured the last of the action as the sun began to rise.

—JON NARCROSS, COMMUNICATIONS AND PUBLIC AFFAIRS

See more photos from the Ball here:  
[bit.ly/union-ball](http://bit.ly/union-ball)

# Science in the Sun: A royal appointment for Imperial research teams



Professor Sergei Kazarian (Chemical Engineering) and team showcased chemical imaging technology at the Exhibition in 2010

At the end of June Imperial returned to the Royal Society's Summer Science Exhibition, where the most exciting new science and technology in the UK was on show. Across four stands visitors raced cells with lasers, photographed the calorie content of their lunch, tested their skills in uncovering the next elusive physics particle, and even attempting to hold a conversation with a robot in a noisy tube station.

Amongst the Imperial delegation was David Klug, showcasing new techniques to study

single cells and Arttu Rajantie, searching for the illusive magnetic monopole. They were joined by the Hamlyn Centre team with new apps and wearable sensors to transform healthcare, and Patrick Naylor's Communication and Signal Processing group, attempting to improve how machines hear (see sneak peek, right).

With hands-on experiments, panel discussions and family activities, all completely free of charge, there were plenty of reasons to head down and enjoy the week-long celebration of science.



## A sneak peek...

Dr Patrick Naylor from the Department of Electrical and Electronic Engineering showcased audio and acoustic signal processing research.

"Signal processing research for audio and acoustics aims to improve human-human and human-machine voice communication by reducing the effects of ambient noise and reverberation. Humans do this effortlessly whereas machine 'hearing' still struggles in the real world."

"Using microphone arrays and beam forming methods we exploit 3D spatial information in sound. At the Summer Exhibition the public will gain first-hand experience of acoustic zoom, immersive acoustic simulation, and hopefully have some fun testing whether a robot can understand their voice in various acoustic scenarios."

*The Summer Science exhibition runs until 5 July 2015. Read more at: [sse.royalsociety.org](http://sse.royalsociety.org)*

## obituaries

### AUBREY SILBERSTON



**Aubrey Silberston, former Professor of Economics at Imperial, died on 24 March**

**2015 aged 93. Professor Dorothy Griffiths pays tribute to her former colleague.**

Aubrey came to Imperial in 1978 as the first Professor of Economics at the College, where he helped

found the Department of Social and Economic Studies – which later become part of the Business School.

Educated at the London School of Economics and the University of Cambridge, Aubrey served in the Royal Fusiliers in the war before going onto academic posts at Cambridge, Oxford and then Imperial.

His most important work at Imperial was the two reports he wrote in late 1980s for

the Department of Trade and Industry on the implications of international polices affecting clothing and textiles for the UK economy.

Aubrey provided great service to the College. He introduced economics as a subject and helped build the Department of Social and Economic Studies, then went on to become Head of the Humanities Department.

Following his retirement from the College in 1987, Aubrey

remained active and took on roles such as Vice President of the Royal Economic Society (1992), Governor of the National Institute of Economic and Social Research (1996-) and Council of Experts, Intellectual Property Institute (1996-). He was honoured with a CBE in 1987.

Aubrey was not only a fine scholar he was also a great teacher and he is remembered with great fondness by peers and students alike.

## Welcome new starters

Mr Erju Abdurahman, Catering Services  
 Mr Dickie Acharya, Security Services  
 Miss Catherine Acheampong, Accommodation  
 Miss Sun Ahn, Accommodation  
 Mr Adebayo Akinwale, Accommodation  
 Miss Jummy Alabi, Accommodation  
 Mr James Aram, Computing  
 Mr Ayotunde Ayoade, Catering Services  
 Ms Aminat Balogun, Accommodation  
 Miss Selina Bannoo, Medicine  
 Miss Eleanor Baugh, Accommodation  
 Mr Daniel Beatrup, Student Recruitment & Outreach  
 Miss Huneisha Beckford, Accommodation  
 Miss Halima Begum, Bioengineering  
 Dr Arnaud Beth, Physics  
 Miss Shantice Blaize, HR  
 Miss Emily Brady, Accommodation  
 Mr Andrew Brockman, Life Sciences  
 Mr Paul Buckley, ICU  
 Miss Laura Burgess, Public Health  
 Miss Harriette Burt, Accommodation  
 Mr Gianluca Campanella, Public Health  
 Dr Ioana-Cristina Carlson, Computing  
 Mr William Carney, Accommodation  
 Mr Paul Carter, Security Services  
 Dr Jonathon Carthy, Medicine  
 Dr Hoyjung Cha, Chemistry  
 Mr Yiqiang Chen, Materials  
 Mr Max Chen, Medicine  
 Mr Tiberiu Chis, Computing  
 Dr Martin Cohn, Public Health  
 Dr Simon Cork, Medicine  
 Miss Emma Cornwell, Medicine  
 Mr Massimiliano Cosso, Medicine  
 Miss Cassandra Curriters, Accommodation  
 Miss Mary Daramola, Accommodation  
 Mr Jonathan Davison, Chemistry  
 Dr Gregory De Boer, Aeronautics  
 Dr Katia De Filippo, NHLI  
 Mr Nicola De Laurentis, Mechanical Engineering  
 Ms Alexandra De Sousa, Faculty of Medicine Centre  
 Dr Laura del Nido Varo, Public Health  
 Miss Jessica Delannoy, Accommodation  
 Miss Veena Dhulipala, Physics  
 Miss Benite Dibateza, Accommodation  
 Dr Marc Dionne, Life Sciences  
 Mrs Maria Dlugosch, Faculty of Medicine Centre  
 Dr Ruijiao Dong, Chemical Engineering

Miss Anne Dooley, Accommodation  
 Mr Laurence Doyle, Chemistry  
 Miss Victoria Durojaiye, Accommodation  
 Miss Jordun Egan, Accommodation  
 Miss Sarah Elattar, Accommodation  
 Dr Marina Evangelou, Mathematics  
 Miss Mariam Fanous, Medicine  
 Miss Alice Ferns, Communications and Public Affairs  
 Miss Rebecca Firth, Business School  
 Miss Sarah Fynn, Accommodation  
 Dr Nicholas Fyson, Life Sciences  
 Dr David Gaboriau, NHLI  
 Miss Lauren Gibson, Accommodation  
 Mr Kaan Giray, Accommodation  
 Mr Stefan Goniszewski, Materials  
 Miss Niamh Gordon, Accommodation  
 Miss Gagandeep Grover, Surgery & Cancer  
 Mr Johan Guegan, Mechanical Engineering  
 Ms Salema Gulbahar Clemenceau, Development  
 Miss Katalin Hajdu, Accommodation  
 Mr Philip Hamilton, Physics  
 Miss Elin Harding, Accommodation  
 Mr Eddie Hartrick, Health and Safety  
 Miss Josephine Hogg, Accommodation  
 Mr Sam Holt, Accommodation  
 Dr Kate Honeyford, Public Health  
 Ms Bianca Howard, Civil and Environmental Engineering  
 Miss Cynthia Hu, Chemistry  
 Dr Anja Jochmann, NHLI  
 Mr Chavez Johnson, Accommodation  
 Miss Mica Jones, Bioengineering  
 Dr Miland Joshi, NHLI  
 Mr Simon Julliard, College Headquarters  
 Dr Nisha Kanda, Medicine  
 Ms Sally Kao, Civil and Environmental Engineering  
 Dr Gwilherm Kerherve, Materials  
 Mrs Emily Kinchin, NHLI  
 Mr Alexander Kirby, Materials  
 Miss Paula Kjellen, Accommodation  
 Miss Kasia Kmiecowski, Faculty of Natural Sciences  
 Mr Christopher Kyriacou, Sport and Leisure  
 Mr Frederick Lamptey, Accommodation  
 Miss Elena Liber, Accommodation  
 Miss Leah Liddell, Accommodation  
 Dr Bo Lindberg, Life Sciences  
 Ms Sarah Marcus, Communications and Public Affairs  
 Miss Bryony Markwick, NHLI  
 Miss Holly Matthews, Life Sciences  
 Dr Johanna Maziar, Public Health  
 Ms Felicity McGrath, Faculty of Natural Sciences  
 Ms Fiona McLean, Public Health  
 Miss Siobhan McMahon, Life Sciences

Ms Louise Menard, Registry  
 Ms Saba Mirza, Institute of Global Health  
 Mr Abdikarim Mohamed, Accommodation  
 Mr Noman Mohammed, Accommodation  
 Mr Pierre Murray, Accommodation  
 Mr Steve Nalvandian, ICT  
 Mr Michael Nowak, Accommodation  
 Mr Liam O'Farrell, Accommodation  
 Miss Anne Ogunbiyi, Accommodation  
 Miss Oluwadamilola Olaolorun, Accommodation  
 Miss Tamara O'Neill, Accommodation  
 Miss Esther Oroge, Accommodation  
 Mr Guled Osman, Life Sciences  
 Miss Amrita Padan, Accommodation  
 Miss Julia Panascia, Accommodation  
 Dr Chrysanthi Papoutsis, Medicine  
 Ms Elisa Pardoe, Public Health  
 Dr Bernardo Parente Coutinho Fernandes Toninho, Computing  
 Mr Arun Patel, Accommodation  
 Mr Hassan Patel, Computing  
 Miss Jonquil Peck, Faculty of Medicine Centre  
 Mr Iskren Peev, Accommodation  
 Mr Karl Phillips, Accommodation  
 Mrs Audrey Plaquin-Chan, Health and Safety  
 Ms Zara Qadir, ESE  
 Dr Jennifer Quint, NHLI  
 Ms Yasmeen Rafiq, Computing  
 Dr Farhat Rasul, Public Health  
 Mrs Ranjit Rayat, Public Health  
 Mrs Isabel Caldas, Medicine  
 Dr Sadie Reed, Surgery & Cancer  
 Mrs Chris Richley, Mathematics  
 Miss Ruby Robinson, Accommodation  
 Miss Emily Rodgers, Accommodation  
 Mr Duane Rodney, Campus Services  
 Mr Kieran Rothnie, NHLI  
 Miss Soraya Rusmaully, Public Health  
 Mr Matthias Saba, Physics  
 Dr Alceste Scalas, Computing  
 Mr James Schofield, EEE  
 Mr Maik Schroder, Medicine  
 Miss Kate Shotayo, Accommodation  
 Miss Navneet Sian, Surgery & Cancer  
 Mr Baldeep Singh, Faculty of Medicine Centre  
 Miss Yaxsaana Sivanathan, Accommodation  
 Dr Nathalie Krzyppek, Physics  
 Miss Olivia Sleet, Careers  
 Ms Magdalena Sliwiska, Medicine  
 Ms Mandeep Sokhi, Business School  
 Mr Marco Sorbona, Materials  
 Dr Laurent Soucasse, ESE  
 Dr Mark Steadman, Design Engineering

Mrs Marjory Stewart, Education Office  
 Mr Nathan Sweeney, Medicine  
 Mr Matthew Sweeting, Registry  
 Mrs Mica Tolosa-Wright, NHLI  
 Miss Elizabeth Ugbeikwu, Accommodation  
 Dr Antonio Vallejo-Vaz, Public Health  
 Dr Laura Vanderbloemen, Public Health  
 Dr Mathieu Vanderstraete, Life Sciences  
 Miss Fern Whyte, Faculty of Medicine Centre  
 Miss Liz Worsley, NHLI  
 Dr Changkun Xia, Chemistry  
 Ms Lilian Yakawa, Accommodation  
 Miss Angela Yiu, Surgery & Cancer  
 Mr Giovanni Zaninotto, Surgery & Cancer  
 Dr Sophie Zemenides, Chemical Engineering  
 Dr Yi Zhou, Aeronautics  
 Mr Guangyu Zhou, EEE

## Farewell moving on

Mr Alireza Ahrabian, EEE  
 Miss Samia Akthar, NHLI  
 Dr Emma Arbabzadah, Physics  
 Dr Magdalena Bak-Maier, HR (7 years)  
 Dr Nina Biscoe, Strategic Planning (6 years)  
 Dr Kevin Blighe, Surgery & Cancer  
 Dr Rachael Boddy, Physics  
 Dr Anna Bonne, Development  
 Mr Peter Botto, Catering Services  
 Miss Eileen Boyce, Chemistry (9 years)  
 Mr Shane Cadogan, Chemical Engineering  
 Mr Arturo Casini, Life Sciences  
 Dr Megha Chadha, Physics  
 Ms Rebecca Church, Medicine  
 Mr Dean Clifton, Security Services (12 years)  
 Mrs Tracy Connelly, Faculty of Medicine Centre  
 Mr Jez Cope, Library  
 Mr Jonathan Cottam, Sport and Leisure  
 Mr Jason Coyne, ESE  
 Ms Emma Critchley, Grantham Institute  
 Dr Andrew Davies, Business School  
 Dr Rachel Davis, Surgery & Cancer  
 Mrs Veronica De Araujo, Medicine (6 years)  
 Dr Florent Deledalle, Physics  
 Mr Chris Dolan, Faculty of Medicine Centre (6 years)  
 Dr Lucie Duluc, Medicine  
 Mr Gareth Duxbury, Business School  
 Dr Christoph Engl, Life Sciences  
 Mr Federico Fabbri, Public Health (5 years)  
 Mr Joao Farinha Garcao Nunes, Surgery & Cancer  
 Mr Alexandros Floros, NHLI

Dr Ville Friman, Life Sciences (Silwood Park)  
 Mrs Karyn Georges, Centre for Environmental Policy  
 Mr Ben Godsall, Life Sciences (Silwood Park)  
 Miss Daphne Guilmard, Public Health  
 Dr Satindra Gungah, EEE  
 Mr Redha Haddad, Sport and Leisure  
 Mr Cai Heath, Public Health  
 Dr Anna Herasimtschuk, Medicine (7 years)  
 Mr Nicholas Ho, Life Sciences  
 Miss Catherine Holden, Clinical Science  
 Dr Rebecca Holloway, NHLI (5 years)  
 Miss Rebecca Holmes, Surgery & Cancer  
 Dr Maxime Huvet, Life Sciences (6 years)  
 Dr Javier Igea de Castro, Life Sciences (Silwood Park)  
 Ms Vera Janev, Faculty of Medicine Centre  
 Dr Tahereh Kamalati-Buluwela, Public Health  
 Miss Emilie Karafilakis, Public Health  
 Professor Dermot Kelleher, College Headquarters  
 Dr Sabah Khan, Public Health  
 Mr Dimitrios Kontopoulos, Life Sciences (Silwood Park)  
 Dr Siva Krishnadasan, Chemistry  
 Ms Kirsten Kruls, Catering Services  
 Miss Ira Ktena, Computing  
 Mr Seth Kugblenu, Security Services (12 years)  
 Mr Juan Kuntz Nussio, Mathematics  
 Dr Jessica Le Ven, Surgery & Cancer  
 Dr Jonas Lexow, Surgery & Cancer  
 Dr Zhe Li, Chemistry  
 Mr Lucas Lieber, Life Sciences  
 Miss Anna Lisowska, Mathematics (6 years)  
 Dr Yiyuan Liu, Medicine  
 Miss Sandra Lock, Medicine (8 years)  
 Dr Ylenia Lombardo, Surgery & Cancer  
 Dr Karim Maghlaoui, Life Sciences (20 years)  
 Miss Erin McAlistier, Medicine  
 Mr Terence McConnell, Security Services (10 years)  
 Ms Julie McQueen, Surgery & Cancer  
 Dr Mohamed Mohamed, Mechanical Engineering  
 Mr Marco Mol, Life Sciences  
 Dr Rebecca Nadal, Faculty of Natural Sciences (6 years)  
 Miss Sibel Narin, Surgery & Cancer  
 Mrs Farbin Nessa, Library  
 Dr Rexford Newbould, Medicine  
 Dr Hafid Omar, Medicine (12 years)

Mr Jon Onativia, EEE  
 Dr Gennaro Pagano, Medicine  
 Dr Jose Palacios Fabrega, NHLI  
 Dr David Palomas Dona, Chemistry  
 Dr Chrysanthi Papoutsis, Medicine  
 Dr James Pearson, EEE  
 Dr Daniel Perea Menendez, Clinical Science  
 Dr Daniel Perkins, Life Sciences (Silwood Park)  
 Dr Filippo Prisci, Life Sciences (5 years)  
 Mr Karthik Ravichandran, Bioengineering  
 Mr Guy Reynolds, Library  
 Dr Ursula Rodgers, NHLI  
 Dr Anindita Roy, Medicine  
 Dr Milagros Ruiz, Public Health  
 Dr Delwen Samuel, Faculty of Medicine Centre  
 Mr Jorrit Schafer, Life Sciences  
 Dr Dilshan Silva, Computing  
 Dr Gareth Smith, Computing (5 years)  
 Miss Najwa Soussi, NHLI  
 Ms Linda Stoner, Business School  
 Mr Martin Summersgill, Estates Division  
 Dr Namrata Syngal, Public Health  
 Mrs Jia Tian, ICT  
 Mr Chui Tsang, Bioengineering  
 Miss Helen Vaughan, Careers  
 Mr Rudolf von Grot, Civil and Environmental Engineering  
 Mr William Watson, Faculty of Engineering  
 Mrs Ann Watson, NHLI  
 Dr Silene Wavre, NHLI (6 years)  
 Miss Katie Webb, Business School  
 Dr Thomas Weissensteiner, Life Sciences  
 Miss Claire Westgate, HR (9 years)  
 Ms Anna Wheeler, NHLI  
 Mrs Althea Wroblewska, Finance (8 years)  
 Dr William Wu, Business School  
 Miss Maria Xenou, Medicine  
 Mr Alexander Yacoub, Sport and Leisure

## retirement

Mrs Carol Greenslade, HR

This data is supplied by HR and covers staff joining the College during the period 23 May 2015 – 24 June 2015. This data was correct at the time of going to press.

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

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

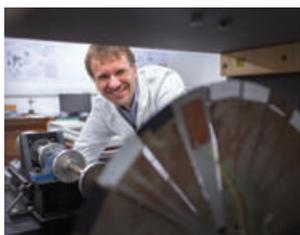


30 JUNE – 5 JULY

## Imperial at the Royal Society Summer Science Exhibition

Imperial returns to the Royal Society's Summer Science Exhibition, where the UK's most exciting new science and technology will be on show. Across four exhibits featuring Imperial research,

visitors will be uncovering research to improve how robots hear, racing cells with lasers, photographing the calorie content of their lunch, and testing their skills in uncovering the next Higgs boson of particle physics.



ONLINE

## Catch up on any events you missed!

We have uploaded all the live streams produced from the various lectures and talks over this past academic year to a single page on the College website. Whether it's Arttu Rajantie explaining what quantum fields can tell us about

the early universe, Norbert Hoffmann debating the lessons in smart systems and data science, or Jon Lloyd discussing the effects of vegetation loss on climate change – you can watch all these again via the link – [bit.ly/implectures14-15](http://bit.ly/implectures14-15)

## take note

### College Car Club

Staff are reminded that the College's Car Club provides students and staff with access to a fleet of cars conveniently parked on campus. The service can be used for business or leisure purposes and provides a more sustainable alternative to private vehicles or taxis. Membership of the service is free and use of the cars is charged at an hourly rate.

Find out how to join:  
[bit.ly/car-club](http://bit.ly/car-club)



2 JULY 17.30  
**Innovation in healthcare**

Professor Lord Darzi of Denham discusses his research in global health policy and innovation.



7 JULY 09.00  
**Farmer's Market**

The market offers a range of fresh produce from fruit and veg to fresh fish and meat. Also available are a range of cakes, breads and takeaway lunch bites. It will continue each Tuesday throughout the summer at South Kensington Campus.

9 JULY 17.30  
**SCI Open Evening**

The Schistosomiasis Control Initiative (SCI) is hosting its annual open house event which will explore the work it is doing to tackle neglected tropical diseases.

10 JULY 14.00  
**Bugs! Day**

Head to Silwood Park and enter the world of dragonflies, spiders, and beetles with demos and talks from Imperial's Grand Challenges in Ecosystems and the Environment group.

3–5 JULY 09.00  
**Bioersivity hackathon**

Join the Imperial Bioersivity Team for their first Hackathon to tackle the most pressing problems in the biotech sector with new creative solutions.

4 JULY 17.15  
**Is time travel possible?**

Join Alan Heavens, professor of cosmology at the Royal Albert Hall for a journey into the science behind the Back to the Future films.



16 JULY 08.30  
**Sowerby eHealth Symposium**

Join the Institute of Global Health Innovation at the Royal Geographical Society for a conference to explore the benefits to patients from data sharing.

19 JULY 09.00  
**Race for Life 2015**

Staff are invited to join the Active Lifestyles team for this year's Race for Life event in Hyde Park. Participants can run, jog or walk either 5K or 10K with friends and colleagues. The event aims to raise awareness of breast cancer and promote active lifestyles. Register and find out more here: [bit.ly/IMP-RFL](http://bit.ly/IMP-RFL)



25 JULY 12.00  
**Silfest 2015**

The small independent music festival held every summer at Silwood Park, Imperial College's campus in Berkshire returns for 2015 with a full line up of bands and DJs.



SUPPORT STAFF

# VILLAGE FETE

**Tuesday 28 July 2015**

16.00–21.00, Queen's Lawn

Hog roast,  
 croquet, cream teas,  
 cider, Morris Men & more!

**PRIZES FOR COSTUMES!**

**REGISTER YOUR PLACE!**

FREE food, drink and entertainment for everyone registered before  
**Friday 17 July:**  
[bit.ly/villagefete15](http://bit.ly/villagefete15)

## Stay in the loop

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