



Green sky thinking

The Eastside roof top experiment showing the way to better city living

... **CENTRE PAGES**



PARTICLE KNIGHTS

Highest honour for Higgs pioneers Kibble and Virdee

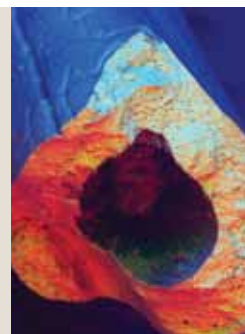
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COUNT DOWN

Postgrad students present three years' work in three minutes

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PICTURE PERFECT

Photo comp highlights incredible research in Medicine

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EDITOR'S CORNER

Street wise

Hailing from rural Yorkshire originally, it took me many years to adjust to [life in the capital](#). I now enjoy London and all it has to offer – yet there are certain problems that all city dwellers cannot escape from. The [detrimental health effects](#) of air pollution are a growing and ever-present worry (Kensington and Chelsea being the worst afflicted London borough), while the spectre of climate change is likely to lead to dangerously hot summer conditions in urban ‘heat islands’ in addition to severe water resource issues. These are some of the great problems of our age that will require a global effort to solve. But there are things we can do at a local level to [prepare ourselves](#). Imperial researchers are working with engineers, architects and town planners to design bespoke vegetation solutions that when implemented correctly can help keep cities [cooler, cleaner and more habitable](#) (centre pages). Maybe, just maybe, we can combine the best elements of rural Yorkshire and London town.

ANDREW CZYZEWSKI, EDITOR

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Imperial strengthens Korean ties

Imperial's Provost led a delegation to Korea in late May to develop scientific links and meet alumni.

The trip follows on from President Park Geun-hye's visit to Imperial in November 2013, when the College showcased UK science and led efforts to enhance research collaboration between the two nations.

Imperial's Provost Professor James Stirling, Dean of Natural Sciences Professor Maggie Dallman, quantum physicist Professor Myungshik Kim and plastic electronics pioneer Dr Ji-Seon Kim met with representatives from Korea's leading higher education, scientific and government institutions.

Professor Stirling and colleagues visited some of Korea's world-class universi-



ties and research institutes including POSTECH, KAIST and SNU, as well as the Seoul Science High School, and senior officials at the Blue House.

The tour culminated in the College's first major alumni event in Seoul, held at the British Embassy, where more than 50 Imperial graduates and guests gathered. Among the guests were nine offer-holding students planning to join the College later in 2014.

Professor Stirling said: "It was an honour to welcome President Park to Imperial last year, and it is a pleasure to see the College's relationship with South Korea flourish. I was very impressed by the quality of research and innovation taking place in Korea, with strong government support, and we are excited at the prospect of forging ever more collaborations with some of Korea's finest scientists."

—ANDREW SCHEUBER, COMMUNICATIONS AND PUBLIC AFFAIRS

Toumazou named 'European inventor of the year'



Professor Chris Toumazou has won Inventor of the Year (Research category) in the European Inventor Awards run by the European Patent Office (EPO).

The Regius Professor of Engineering, based in the Department of Electrical and Electronic Engineering, is the only UK inventor to receive an award this year.

Professor Toumazou has been recognised by the EPO for developing a device called the SNP Doctor. His invention uses small silicon microchips to identify genetic mutations that determine a person's predisposition to certain hereditary diseases. The portable, low-power device can analyse data on the spot rather than in a lab environment.

Professor Jeff Magee, Dean of the Faculty of Engineering, said: "The technologies that Chris has developed over the years not only have the ability to improve patient care, they are also important for the UK economy. His work is a perfect example of translating research into viable businesses that are helping to make the UK a leader in personalised healthcare."

Imperial's Provost Professor James Stirling added: "This award really underlines what Imperial researchers do best – taking world leading research and applying it to help solve global challenges. The whole College warmly congratulates Chris. This award is a brilliant acknowledgement of his hard work and his innovative spirit."

Watch a video about Prof Toumazou's work by the EPO: bit.ly/inventor14

Pledge to support trans staff

Imperial has made a public commitment to supporting transgender members of its community, in partnership with charity GIRES.

In a first for the Higher Education Sector, the Gender Identity Research and Education Society (GIREs) has endorsed the College's efforts to promote trans equality. This means that Imperial will be able to display the GIREs logo alongside those of Stonewall, Athena SWAN and the Two Ticks scheme to demonstrate its commitment to celebrating diversity and eliminating all forms of discrimination across the College.

GIREs is a charity which aims to improve the lives of trans people by changing attitudes, and challenging discrimination. Co-founder Bernard Reed OBE said: "As the first university to make public its partnership with GIREs, we hope that Imperial will set an important example to the rest of the HE sector."

GIREs delivered the College's annual Diversity Lecture on 25 June, entitled 'Gender variance from Dark Ages to Enlightenment', with GIREs Chair Celia Macleod sharing her personal story of transition whilst holding a senior NHS role.

One Imperial staff member with a transgendered background said: "I am very pleased to see the College making this public commitment to support its transgender staff. However more work is still needed to ensure that the message pervades all levels of the College."

—DEBORAH EVANSON, COMMUNICATIONS AND PUBLIC AFFAIRS

Royal honours for Kibble and Virdee

Two of Imperial's physicists, best known for predicting and finding the Higgs boson, have been knighted in this year's Queen's Birthday honours list.

Emeritus Professor Sir Tom Kibble, whose work led to the prediction of the mass-giving particle, and Professor Sir Tejinder (Jim) Virdee, who led on the design and construction of one of the detectors that found the Higgs Boson, have been recognised in the Queen's Birthday Honours list.

The Birthday Honours are bestowed by the Queen as part of the celebration of her official birthday. Philip Dilley – a member of Imperial's Council and Chairman of Arup Group – has also received a Knighthood.

Captain David Peter Henson, Corps of Royal Engineers, who is also studying for his MSc in Biomedical Engineering in the Department of Bioengineering, has received an MBE.

Imperial's Provost, Professor James Stirling, who is also a theoretical particle physicist, said: "I am delighted to hear that two of my longstanding friends and esteemed colleagues in the field of physics have been recognised with these great honours. The immense contributions that Tom and

Jim have made to physics are undeniable, but I take particular pleasure in congratulating them because I have first-hand experience from my own research of the profound influence that their visionary ideas have had."

Professor Tom Kibble is an eminent theoretical physicist whose pioneering work in the 1960s led to the mass-giving particle theory,

which has come to be known as the 'Higgs mechanism'.

Professor Sir Tom Kibble said: "I was very gratified by this public recognition of the work that for me has been a continual enjoyment.

My children were delighted, and are all keen to attend

the investiture.

An added bonus was to learn that the same honour was to be conferred on my friend and colleague Jim Virdee, whose work in designing, building and operating one of the huge detectors that found the Higgs boson I have long greatly admired."

Researchers at Imperial not only predicted the famous theory. They have also been central to the engineering of detectors built to find and verify the existence of the Higgs boson. Professor Virdee spearheaded the concept and design of the Compact Muon Solenoid (CMS) experiment, which is one of two of

"The immense contributions that Tom and Jim have made to physics are undeniable."



Professor Sir Tom Kibble



Professor Sir Tejinder Virdee

the main detectors of the Large Hadron Collider at CERN.

His knighthood also recognises his work campaigning for and promoting better science education in Africa and India.

Professor Virdee said: "I was in my office in Geneva when I found out about the knighthood, which took me by surprise. It's really humbling and I'm truly honoured to be acknowledged in this way. Many brilliant scientists and engineers have worked tirelessly over two decades to make the discovery of a Higgs boson possible. I'll definitely be celebrating over a glass of champagne with my family and friends."

in brief

Canadian collaboration

Imperial is to intensify its education and research partnerships with the University of British Columbia (UBC), one of Canada's leading universities. Imperial and UBC signed a Memorandum of Understanding (MoU) on 26 June aiming to increase student and academic visits, cultural interchange and research collaboration between the two institutions. The MoU was signed by Imperial's Provost Professor James Stirling and UBC's Deputy Vice-Chancellor & Principal Professor Deborah Buszar.



At a reception following his tribute concert Sir Keith cut a special cake model of the Queen's Tower

Tribute to President Sir Keith

The Imperial community marked the forthcoming retirement of Sir Keith O'Nions as President with a concert on 23 June. Staff, students and friends of the College attended a musical tribute to Sir Keith and his wife Rita given by the Imperial College Symphony Orchestra and the Imperial College Choir. Reporter will look back at Imperial through the O'Nions years later this month.



Imperial Chair Baroness Eliza Manningham Buller is installed as a Lady of the Order of the Garter at the annual garter service at Windsor Castle on 16 June



New 27 acre sports ground for student activities

Imperial is nearing completion on the purchase of a major new sports ground.

The new site in Heston, located just over two miles from Imperial's existing Harlington sports ground, has grass space for five football and two rugby pitches as well as tennis and netball courts, cricket facilities and a shooting range.

It also has a wide range of indoor facilities for students to use, including a large theatre and activity space, squash and basketball courts and three bars, potentially providing wider benefit to non-sporting clubs and activities.

Neil Mosley, Head of Sport Imperial, said: "The Heston site represents an exciting opportunity for sport at Imperial. It will provide us with facilities that we don't currently have to support more diverse student activities, as well as larger and better quality pitches and courts less than 10 minutes' drive away from our Harlington sports ground."

Yas Edwards, Deputy President (Clubs & Societies) at Imperial College Union said:

"The Union welcomes the purchase of the new Heston sports grounds and is excited about the opportunities the new site will bring for sporting and non-sporting activities alike. We look forward to working actively with Sport Imperial to ensure the site offers the best in affordable and inclusive space for Imperial students."

The site, which is currently operated by British Airways for the airline's staff and members of the public, will be available to Imperial students from the autumn. With the purchase, staff currently working at the site will have their employment transferred to Imperial ahead of a wider consultation through which the College will consider the best structure for operating its sporting facilities in the future.

Review of student residential experience endorsed

The College has endorsed the findings and recommendations from a review of the student residential experience here at Imperial.

The review, which was commissioned by Vice Provost (Education) Professor Debra Humphris as part of the Education and Student Strategy, was tasked with looking at the residential experience for students living in Imperial accommodation with a particular focus on the experience of first year undergraduates and ways the quality of that experience can be improved.

The panel took evidence from students, wardens and accommodation staff as well as representatives from other universities to help them to assess best practice before presenting their findings to the College last month. The recommendations have been passed by the Provost's Board and an action plan drawn up.

Vice Provost (Education) Professor Debra Humphris said: "A lot of what we're taking forward is about

information and transparency, helping students take control of their decisions when it comes to their accommodation and residential experience.

"From improving the information we offer to prospective students, ensuring greater transparency on rent costs and with the amenities fund run by the Imperial College Union we're putting students firmly in control of shaping their own experience in halls."

As part of the review the College has also committed to investigate the feasibility of introducing a rent guarantor scheme for international students at the College who lack a UK-based guarantor when entering into accommodation contracts.

Marissa Lewis, Deputy President Welfare of ICU, who also sat on the review panel said: "We are pleased to see the review's recommendations endorsed on important areas like increased information and transparency as well as the continuation of vital pastoral and wellbeing support through the wardening system."

For more information on the review and its recommendations visit the Residential Experience Review site: bit.ly/resrev14

—JONATHAN NARCROSS, COMMUNICATIONS AND PUBLIC AFFAIRS

Milestone for new student accommodation

Imperial has celebrated the completion of structural building work at its new student halls with a topping out ceremony at the site in North Acton.

The development at One Victoria Road, due to open in October 2015, will eventually become home to 693 undergraduate students. The ceremony on Thursday 5 June celebrated the completion of the highest point of the building's structure with President & Rector Sir Keith O'Nions burying a yew tree sprig on top of the tallest tower to mark the occasion.

He said: "One Victoria Road is an important milestone in the development of accommodation for Imperial students. It builds on Imperial's presence in this part of the city, already established with our 25 acre Imperial West Campus, putting the College at the forefront of development in North West London."



Sir Keith O'Nions at the ceremony

In addition to the residential accommodation the site will also offer a range of communal spaces and facilities spread across the development's three buildings including a coffee shop, bar and common room as well as an onsite gym.

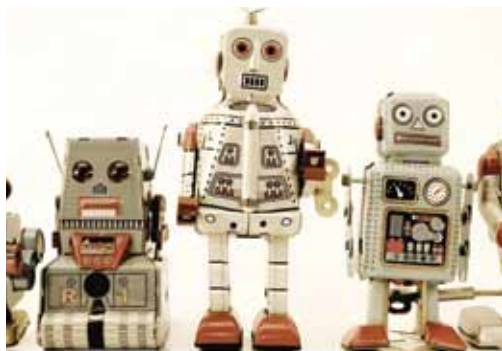
Marissa Lewis, Imperial College Union's Deputy President (Welfare), said: "Now that One Victoria Road is built we're going to be working closely with the College to make sure students are consulted on how the facilities and communal spaces on the site are developed."

—JONATHAN NARCROSS, COMMUNICATIONS AND PUBLIC AFFAIRS

media mentions



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Robot revolution on hold

THE TELEGRAPH ▶ 10.06.2014

A controversial scientist is facing criticism over claims that a computer passed a test for artificial intelligence. Professor Kevin Warwick called his recent experiment, in which a computer fooled humans in the Turing Test, an 'important landmark', but scientific opposition is gathering. Imperial's Professor Murray Shanahan (Computing) told *The Telegraph* that the five-minute conversation benchmark was 'taken out of context' from the Turing Test, and fell well short of a true experiment for AI, which should last for 'hours, if not days'. "It makes it seem like science fiction AI is nearly here, when in fact it's not and it's incredibly difficult," he said.

Camel culprits in MERS

REUTERS ▶ 04.06.2014

A Saudi man who became infected with and died of the new Middle East Respiratory Syndrome (MERS) virus contracted the disease from a camel in his own herd which was also sick, according to a study reported by *Reuters*. Imperial's Dr Jake Dunning (National Heart and Lung Institute), who was not directly involved in the study, said its findings added to a growing body of evidence that camels are a likely source of the outbreak. "It supports what we thought was going on – that MERS-CoV transmits from camels to humans ... rather than the other way around," he said.

triangle' in the South East for entrepreneurship in terms of access to finance, but found that some successful university spin-offs were actually not located in the South East but were nevertheless able to attract finance from there. That's one example of where the ecosystem isn't quite as location-based as we might admit, and may suggest that we need different mechanisms to stimulate a more virtual ecosystem rather than a physical location."

Long road to recovery

EMIRATES 24/7 ▶ 16.06.2014

Seven times Formula One racing champion Michael Schumacher, who suffered severe head injuries in a ski accident last year, has come out of a coma and was transferred to a Swiss medical centre. Professor Simone Di Giovanni (Medicine), an expert in restorative neuroscience at Imperial, said it was very difficult to predict recovery in people emerging from a coma. "That can range from someone who merely opens their eyes and may be able to respond to verbal input, to someone who opens their eyes and moves their hands in response to painful input, to someone who interacts with their environment fully and uses language and maybe can have a simple conversation," he told *Emirates 24/7*.

Building an ecosystem

THE ECONOMIST ▶ 10.06.2014

Entrepreneurial Britain is beginning to flourish as policy changes and increased investment in the UK's innovation ecosystem take root. An innovation ecosystem refers to the combination of factors for innovation that function together in a symbiotic relationship, Professor Mike Wright (Business School) explains in the *Economist*. "We looked at the notion that there's a 'golden

awards and honours

ENGINEERING High society

The Department of Electrical and Electronic Engineering's student society (EESoc) has been named Club, Society or Project of the Year at the Imperial College Union Awards 2014. It was recognised for its wide provision of events and activities including hack-a-thons, a black tie Christmas dinner for 200 people, a revue show, an engineering careers fair, industrial talks, and a trip to the world's largest international computer expo.



ENGINEERING Fine art

Imperial is to house a portrait of eminent polymer scientist Professor Dame Julia Higgins, it was announced last week. The portrait, painted by prominent artist Tess Barnes, will be the first of an Imperial woman to be hung at the College. The historic occasion was marked with a reception held on Monday 16 June, where Provost Professor James Stirling formally unveiled the portrait.

MEDICINE

Life changing work recognised

Professor Alan Fenwick OBE, Director of the Schistosomiasis Control Initiative, has been honoured with the Mike Fisher Memorial Award for 2014. The award is given annually by the Windward Islands Research & Education Foundation, which is based at St. George's University in Grenada, West Indies. The award honours outstanding individual contributions to global science and scientific achievement that has had an impact on the lives of people.



NATURAL SCIENCES

Geometry guru in major new award

Professor Sir Simon Donaldson (Mathematics) is one of five winners of a major new mathematics prize, co-funded by Facebook founder Mark Zuckerberg. Professor Donaldson, was recognised for his work in differential geometry, which uses calculus to study curved spaces. His research area has applications for a wide range of fields, from shape recognition to fundamental physics.

Climate change favouring fair butterflies and dragonflies

Butterflies and dragonflies with lighter colours are out-competing darker-coloured insects in the face of climate change.

In a new study, scientists from Imperial, Philipps-University Marburg and the University of Copenhagen have shown that as the climate warms across Europe, communities of butterflies and dragonflies consist of more lighter coloured species. Darker coloured species are retreating northwards to cooler areas, but lighter coloured species are also moving their geographical range north as Europe gets warmer.

Study co-author Professor Carsten Rahbek (Life Sciences) said: “For two of the major groups of insects, we have now demonstrated a direct link between climate and insect colour, which impact their geographical distribution.”

Dark-coloured insects are able to absorb more sunlight than light-coloured insects, in order to increase their body temperature, and are more likely to be found in cooler climates. In contrast, insects in hotter climates need to protect themselves against overheating.

Light-coloured insects are more likely to be found in hotter climates as they can reflect the light to prevent overheating their body and be active for longer periods of time.

To identify whether colour lightness was correlated to temperature, the scientists combined digital image analysis, which scanned and measured colour values of butterfly and dragonfly wings and bodies, with distributional data which mapped where in Europe the species are found.

Among 366 butterfly species and 107 dragonfly species there was a clear pattern of light-coloured insects dominating the warmer south of Europe and darker insects dominating the cooler north.

“We have demonstrated that the effects of climate change on where species live are not something of the future, but that nature and its ecosystems are changing as we speak,” Professor Rahbek concluded.

—GAIL WILSON, COMMUNICATIONS AND PUBLIC AFFAIRS



Light-coloured insects reflect light to prevent overheating



Grey squirrels are twice as heavy as red ones and outcompete them for food

Grey squirrel invasions rely on genetic diversity

The ability of founder populations of grey squirrels to invade new environments depends on their genetic diversity, according to a new genotyping study of grey squirrels sampled from Italy and the UK.

The international team of scientists from Imperial and the Zoological Society of London compared 12 DNA markers from grey squirrels (*Sciurus carolinensis*) in Piedmont in Northern Italy with the same markers from squirrel populations in Northern Ireland, Northumberland and East Anglia.

After correlating genetic diversity against size of founding populations, the scientists have shown that if the number of squirrels in a founding group is low, then their genetic diversity is reduced, which in turn reduces their ability to invade new environments.

The small size of founding populations in Italy means that the spread of grey squirrels there has, until recently, been slow. But genetically distinct populations have now expanded to the point of merging, which would increase diversity and accelerate their ability to invade new environments.

Lead researcher Dr Lisa Signorile (Life Sciences) said: “Italian grey squirrels are edging closer to the northern border and are perilously close to crossing the Alps. If the Italian populations interbreed, they will increase in genetic diversity, which will increase their chances of invading the rest of Europe. To stop the spread, we need to understand what makes some populations such successful invaders. Our new study, which is the first to specifically examine grey squirrel population genetics at a large scale, helps us uncover some of those reasons.”

—GAIL WILSON, COMMUNICATIONS AND PUBLIC AFFAIRS



Invasion force

Grey squirrels are an invasive species introduced from North America. Twice as heavy as red squirrels they outcompete for food and spread the deadly parapoxvirus, decimating native populations. They also create problems for British forests by debarking trees, such as Garry Oaks, which take hundreds of years to cultivate and flourish.

While greys are common throughout most of the UK and Ireland, on mainland Europe they are currently only found in Italy, where they mostly exist in discrete, but slowly

expanding, populations. Several of the grey squirrel introductions have been well documented, making it possible to correlate their spread today against the size of their original founding populations. For example, one of today's Italian populations has spread from a deliberate introduction in 1948 by diplomat Giuseppe Casimiro Simonis Vallario. He took a shine to the 'exotic' animals while in Washington DC for meetings following the end of World War Two and brought back just four squirrels, which he released in the park near his Turin villa.

New method aims to topple malarial mosquito population

Scientists have modified mosquitoes to produce sperm that will only create males, pioneering a fresh approach to eradicating malaria.

The new method distorts the sex ratio of *Anopheles gambiae* mosquitoes, the main transmitters of the malaria parasite, so that the female mosquitoes that bite and pass the disease to humans are no longer produced.

“This new approach could ultimately lead to a cheap and effective way to eliminate malaria from entire regions.”

Lead researcher Dr Nikolai Windbichler (Life Sciences) said: “What is most promising about our results is that they are self-sustaining. Once modified mosquitoes are introduced, males will start to produce mainly sons, and their sons will do the same, so essentially the mosquitoes carry out the work for us.”

In the first laboratory tests, the method created a fully fertile mosquito strain that produced 95 per cent male offspring. The hope is that if this could be replicated in the wild, this would ultimately cause the

malaria-carrying mosquito population to crash.

Since 2000, increased prevention and control measures have reduced global malaria mortality rates by 42 per cent, but the disease remains a prevalent killer especially in vulnerable sub-Saharan African regions.

Co-author Dr Roberto Galizi (Life Sciences) said: “The research is still in its early days, but I am really hopeful that this new approach could ultimately lead to a cheap and effective way to eliminate malaria from entire regions. Our goal is to enable people to live freely without the threat of this deadly disease.”

—GAIL WILSON, COMMUNICATIONS AND PUBLIC AFFAIRS



QUICK FACTS

30–150 eggs

A female mosquito can lay 30–150 eggs every 2–3 days. Human blood is needed to nourish those eggs.

247 million

Approximate number of cases of malaria each year

3.3 billion

Number of people that live in areas where malaria is a constant threat



Gender bending

In normal reproduction, half of the sperm bear the X chromosome and will produce female offspring, and the other half bear the Y chromosome and produce male offspring. The enzyme that the researchers used works by cutting the DNA of the X chromosome during production of sperm, so that almost no functioning sperm carry the female X chromosome. As a result the offspring of the genetically modified mosquitoes was almost exclusively male. It took the researchers six years to produce an effective variant of the enzyme.



Pre-term babies are more likely to experience cognitive problems

Study points to root of cognition problem in premature babies

Cognitive problems that can develop in babies born prematurely may be linked to how the so-called ‘rich club’ area of the brain develops.

The rich club is a set of regional hubs in the brain that are densely connected and enable different parts of the brain to communicate efficiently with one another. It is a common feature in all mammal brains.

In a new study scientists from Imperial and King’s College London used magnetic resonance imaging to look at how the brain developed in 63 pre-term and full-term babies in the UK.

Their research reveals for the first time that the rich club structure is present from 30 weeks into the gestation period of pregnancy, and that it continues to develop its connections with the rest of the brain during the time leading up to full-term birth at around 39 weeks. The team believe that it may provide a fundamental structure for the emergence of complex neurological functions.

In pre-term babies, the researchers found that though rich club organisation remains intact, there are significant disruptions in the communication pathways interlinking the hubs, called the cortical-subcortical and short distance corticocortical connections.

“Our research is another piece in the jigsaw puzzle that is helping us to understand in more detail why some babies develop cognitive problems.”

This discovery may help explain why pre-term babies are more likely to go on to experience cognitive problems such as autism and attention deficit disorder.

Co-author Professor Daniel Rueckert (Computing) said: “We think that this densely connected rich club organisation helps different parts of the brain to communicate with one another. Our

study is helping us to see that any disruption to its development may impact later on in the growth of more complex brain functions. Although more work needs to be done, our research is another piece in the jigsaw puzzle that is helping us to understand in more detail why some babies develop cognitive

problems.”

The next step will see the team creating a comprehensive map of babies’ brains as part of the Developing Human Connectome Project, which is funded by the European Research Council.

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS

Urban revival



The Eastside green roof has sensors embedded, which feed data to the cloud where it can be accessed wirelessly



The green roof has three 4 x 3m plots with different vegetation combinations

An Imperial-led, EU-wide project is helping cities adapt to the challenges of climate change using bespoke vegetation solutions

Last month, scientists from the UK's Met Office warned a London Assembly committee that dangerous heat waves could become the norm in coming decades and urged the capital to make adequate infrastructure preparations. Unfortunately that's just one of a number of challenges faced by expanding global megacities like London – including loss of biodiversity; air, water and noise pollution; droughts; floods and so-called 'urban creep' (a green area double the size of Hyde Park is paved over every year in London).

In a global era where more people are now living in urban than rural areas, part of the solution is

actually to bridge that divide and bring tailored vegetation solutions to the heart of cities. That's the focus of a Europe-wide, Imperial-led project launched in 2012 called the Blue Green Dream (BGD) – itself part of the wider EU Climate-KIC (Knowledge and Innovation Community) initiative.

In harmony

It turns out that when properly integrated with surrounding buildings and existing water works ('blue' infrastructure), vegetation solutions such as green roofs, living walls and rain gardens ('green' infrastructure) can help mitigate many of the problems listed above and make our cities cooler, healthier and more habitable (see box opposite page).

"It's all about a smart approach to what we already have," says Dr Karl Smith (Civil and Environmental Engineering), BGD Project Manager. "We're asking what services does

vegetation provide naturally – in essence for free – and how can we harness those services not only for humankind's advantage but to the advantage of the environment."

In addition to lead partner Imperial, the BGD draws together 16 other academic institutes, NGOs, multinational companies and SMEs – including Delft University of Technology, Technical University of Berlin, École des Ponts ParisTech (ENPC), Sainsbury's, Veolia Environnement and AECOM to name a few.

To date there are 15 sites either in operation or development in Europe that are showcasing BGD solutions. Flagship projects include The Blue Green Wave at ENPC in Paris – a huge undulating green roof that filters and reuses water and Tempelhof Airport (Berlin), where water siphoned from the runway is stored and filtered in green infrastructure.

“It's all about a smart approach to what we already have.”

The Imperial dream

Imperial is now launching its own projects at various sites across the College and the rest of London — starting with an experimental green-roof on Eastside hall of residence, South Kensington Campus, which was finished in April this year. Funded by Climate-KIC, the College's Estates Division and the Department of Civil and Environmental Engineering it involved getting six tonnes of soil substrate, vegetation and equipment lifted up to the Eastside rooftop with a mobile crane (the lifts and stairs weren't an option for safety reasons).

Primarily the experiment is designed to test the effectiveness of greenroofs in terms of reducing temperature and managing rainwater runoff — a particular issue in London, as project manager Karl explains.

“When you have heavy rainfall on big concrete surfaces such as roofs or pavements, what happens is the water runs off into the drains, filling up our old Victorian sewers — which weren't designed to handle the flash floods we're increasingly seeing with climate change. Mixing with raw sewage, the runoff then spills over into the Thames and even out into the street in some cases. That's why the authorities are planning to build a £4.6 billion Thames Tideway Tunnel — the 'super sewer'. But we think we can tackle this issue far more cheaply with greenroofs and rain gardens that act to retain stormwater.”

The role of monitoring and logging the effectiveness of the Eastside green roof falls to PhD students Xi Liu and Srdjan Stankovic (both Civil and Environmental Engineering). They've embedded a series of sensors among the plots that automatically feed back data on weather conditions, temperature run-off volumes and soil moisture levels. Samples of the green roof run-off water are also being tested in the lab for levels of potential pollutants including nitrates, organics and metals.

A vision for the future

The BGD was first dreamt up by Professor Cedo Maksimovic (Civil and Environmental Engineering) who now spends much of his time meeting with city majors, town planners,

architects and other professionals around the world to persuade them to adopt aspects of BGD philosophy into their projects.

“I was walking to work through Hyde Park one morning — as I've done for 20 years now — and I saw the vegetation there dying. As a water engineer, I just thought there must be a better way to integrate green areas with urban water infrastructure. By coincidence that day there was a call for proposals from Climate-KIC and I felt it was an opportunity not to be missed.

“From there it has progressed beyond my most optimistic expectations and dreams — the reason being because the idea is simple but nobody has put it together in a consistent way using both common sense and basic science.”

Cedo is now setting up 'BGD nodes' in cities around Europe (initially London, Berlin, Paris, Rotterdam) to continue the vision once the project concludes next year. The nodes will provide a focal point for engineers, planners, architects and decision makers and act as a catalyst for creating spin-out companies specialising in aspects of BGD technology.

But Cedo's vision extends further afield — to Asia, Africa, Latin America and the Middle East. He has recently worked with Grant Associates — the team responsible for the iconic 'Gardens By the Bay' in Singapore — to create a large new residential

development in the City State that will incorporate BGD Solutions as central to their design.

Implemented extensively over entire city areas such as Singapore, Cedo thinks that Blue Green solutions can lower temperature by a crucial few degrees and reduce a city's running costs by around 30% — cutting water, food, heating and cooling bills.

“We have a slogan which is a fun play on Hamlet — 'To BGD or not to BGD, that is no longer the question'. “This *must* happen to ensure our cities will be habitable in the future!”

“There must be a better way to integrate green areas with urban water infrastructure.”



The Blue Green Wave in Paris, one of the project's flagship sites



Power plants: the case for green infrastructure

Cooling — In cities, concrete structures absorb solar radiation and retain heat during the day, slowly emitting it at night, starting the process again each day. It leads to the so-called 'urban heat island effect' where cities are often several degrees warmer than their surroundings. On top of climate change, it means some stifling conditions to come. Installations like tree lines, living walls and green roofs can mitigate this effect as they facilitate evaporative, endothermic cooling. That can also save on air conditioning costs for buildings.

Water management — Cities struggle to cope with flash floods of the sort we are likely to see more of with climate change resulting in problematic runoff (see main text). Greenroofs, rain gardens and swales can help in the most basic fashion by holding onto large quantities of water. More engineered solutions can also store water for subsequent reuse in a closed loop system.

Air and water filtration — Plants extract CO₂ from the air for use in photosynthesis. There are also some species that can capture, degrade, or eliminate pollutants and heavy metals from the air, soil and water.

Noise dampening — Tall concrete structures can create an amphitheatre effect amplifying sounds from traffic; vegetation can help disperse those sound waves which is particularly important in eliminating noise in residential areas.

Aesthetics — It might seem common sense that being surrounded by nature is good for the soul, but scientific studies have proven that green spaces have beneficial effects on mental health and even lower the risk of heart disease and stroke.

Food — Cities are net importers of food, but compact farming solutions such as hydroponics and aquaponics can help them to become more self-sufficient food producers.

Biodiversity — Greenroofs not only bring their own constituent plant species to urban areas but enhance biodiversity indirectly by attracting millions of new bees and other pollinators.

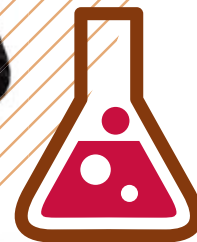
To find out more about Blue Green solutions visit: bgd.org.uk

THREE YEARS IN THREE MINUTES



11 STUDENTS

4 JUDGES



Aliyah Kovner, MSc student in Science Media Production, attends the College's first postgraduate research showcase with a particular emphasis on brevity

Imperial is a scientific institution well aware of the importance of public engagement and communication – indeed, it was the first in Europe to establish a masters courses in science communication way back in 1991.

However, the necessity of the skill goes beyond specialists, extending to all researchers whose inventions and advancements have the potential to affect the world at large. Turning that philosophy into a fun challenge, the Graduate School hosted its first Three Minute Thesis competition this month.

The event saw 11 PhD candidates from diverse fields delivering summaries of their thesis and its relevance to society – all in three minutes or under. The day's winner advanced to the UK semi-final, to be held at the University of York in July.

The atmosphere was dramatic for the participants, who faced instant disqualification if their talk went overtime. The alerting sound was the sonorous bang of a gong, demonstrated in the opening few minutes to set the stage theatrically. Host Dr Stephen Webster, Director of the Science Communication Unit,

explained the strict rules of the competition, which limited contestants to one static PowerPoint slide and forbade any non-speaking forms of presentation.

Impressively, all the contestants finished in time. While the judges deliberated, the audience and competitors shared coffee and snacks. As anxious as they might have been to know the results, the participants were united in their respect for the competition's message.

"You can be the best scientist in the world, but if you can't tell anyone about it, what's the point in doing the science in the first place, right?" said Tomasz Kostrzewski (Life Sciences), whose PhD focuses on gene activity in 'Natural Killer' white blood cells.

Department of Physics contestant James Semple gave an animated talk on creating cheaper electronics through adhesion lithography, and discussed the difficulty of sticking to the allotted time. "I had it around 3:20, 3:30 for a long time, and even at that stage it's really difficult to cut stuff out," he said. As for whether he was fazed by the threat of the gong, James said, "I was a bit nervous beforehand, I think that's always natural, but I'm really happy that when I was doing it, I just enjoyed it." Stephen, who was able to enjoy his tea and muffin with less stress than the eleven students, was pleased with their performances.



“You can be the best scientist in the world, but if you can't tell anyone about it, what's the point in doing the science in the first place.”

"All the talks were very different, and showed that there's no one correct way to communicate science," he said. "You need to just ask yourself some questions, think about the style you're comfortable with and kind of follow your heart."

Finally, the winners were announced, with Anna Cocking (National Heart and Lung Institute) coming in first place (pictured above, right). Her research into cell-to-cell contact through the protein E-cadherin and its impact on tumour progression was distilled eloquently in a talk entitled, 'To stick, or not to stick'. Second place went to Sam Cooper (Materials), who discussed using tomography imaging to find the ideal micro structure for fuel cells. Hikmatali Shariff (Physics), placed third for the Star Wars tinged summary of his work on statistical analysis of supernovae to discover the equation state for dark energy.

Director of the Graduate School Sue Gibson closed the event, remarking, "I think the future is very bright for science communication. As Imperial deepens its commitment to training articulate young scientists, this was only one of many opportunities for keen students to challenge themselves."

Until then, good luck to Miss Cocking in York.

—ALIYAH KOVNER FOR COMMUNICATIONS AND PUBLIC AFFAIRS

inside*

story

mini profile

Dr Eva-Maria Graefe

Junior Research Fellow Eva-Maria Graefe (Mathematics) has just been recognised for her inventive work modelling ‘leaky’ quantum systems with a L’Oréal-UNESCO Women In Science Fellowship complete with £15,000 in research funding.



Tell us about the recent L’Oréal win

The awards emphasise application of science and as I am a theoretical scientist, I was quite shocked to be among eight shortlisted from nearly 300 other fantastic female scientists. To then go on to actually win a fellowship with three other very high calibre women was an incredible honour.

Why do you think this award is important?

I still feel like there are not enough female scientists as role models. Progressing my career is not only important for me, it’s important that my nine month-old daughter has a role model in science to look up to. As a percentage, there are still relatively few female professors and then when you look at keynote speakers at conferences it’s even less. I think we need to make female scientists, in all their varieties, more visible.

Can you tell us a little bit about your research?

Quantum mechanics seeks to understand the microscopic world of atoms, electrons, and all these tiny particles, which have strange and very different laws of nature than what we experience on a daily basis. For example if you shrink down an apple it doesn’t behave the way you expect – if it hits a wall, there is a probability that instead of bouncing back it will go straight through the wall. A lot of modern technology – mobile phones and transistors – for example is based on this. In recent years scientists have realised that if you engineer little holes in these walls or boundaries you can change the dynamics of the quantum system – which is the focus of my work. At this stage I’m not sure whether it will lead to useful applications but as a colleague said the other day: ‘I do know that we will not have applications without foundational research’.

—GAIL WILSON, COMMUNICATIONS AND PUBLIC AFFAIRS



Visual treat

Through the course of their work our staff and students routinely encounters some quite amazing sights that are inspiring, moving or just unusual.

The Department of Medicine recently sought to tap into this rich seam with an image competition attracting some 38 entries.

Dr Matt Lee, Programme Director & Departmental Manager, who helped coordinate the competition, said: “It provides an opportunity to highlight some of the amazing images the top class researchers in the Department produce during their studies. The winning entries combined interesting scientific stories with really powerful images which are a great way to project the work undertaken in the Department.”

1. ‘Bone Fracture’ by Duncan Bassett, Graham Williams (overall winner)

Electron micrograph showing the fractured surface of a tibia following a destructive 3-point bend test. “In order to improve the perception of depth we combined three different views of the fracture coloured red, green and blue respectively,” Duncan says. “The process allows the detailed and complex surface structure to be appreciated and helps us to understand the mechanisms underlying different types of fracture.”

2. ‘Two Brains’ by Henrietta Bowden-Jones (runner up)

Portrait of Tim, a man with Parkinson’s Disease who agreed to be photographed in front of at the

entrance to the South Kensington Campus. “It was an emotional moment for both of us, as Tim’s illness had progressed and his gait had worsened,” says Henrietta. “After posing for the image for some time he struggled to get walking again. I felt the enormity of the brain in the background of the image symbolised the weight of his illness and of other patients suffering from brain diseases.”

3. ‘Cluster’ by Oduaghanju Okoturo-Evans, Robert Edwards and Dr John Cupitt (runner up)

Shows a toxicity ‘heat map’ of carbon nanotubes to cells cultures. Blocks of colour represent groups of proteins which change together when exposed to the nanotubes. “This represents a lot of data and is very hard to understand...this visualisation helped us to locate significant changes in protein abundance,” the team said.

4. ‘Night of the Living Glia’ by Amy Birch and Alex Renziehausen (runner up)

A confocal microscope image of brain cells from a mouse model of Alzheimer’s disease. Stained with florescent markers it shows astrocytes (pink) and microglia (red) surrounding an amyloid plaque (green), forming a protective ‘glial scar’ that prevents healthy tissue from being damaged. “As an avid horror fan, this picture reminded me of a horde of zombies surrounding a group of innocent humans, ready to eat them, hence the title,” says Amy. “Although in this case the amyloid is not innocent as it is thought to play an important role in the progression of AD,” says Amy.


INVENTOR'S CORNER

Bumper harvest

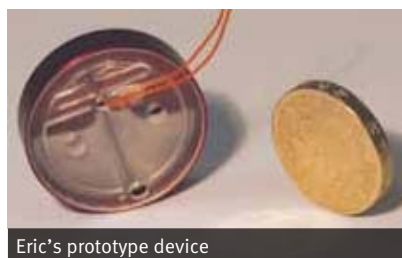
Eric Yeatman (Electrical and Electronic Engineering), Professor of Microengineering, has invented a series of devices to harvest energy to power small-scale electronics.

Why do this?

There is a growing trend in society for using wireless sensors to capture all sorts of data – from wearable sensors for health and fitness to environmental sensors for pollution monitoring. The question is how to power them all – you don't want to have to be regularly replacing thousands of batteries. We began to look into ways to make these sensors energy self-sufficient. We chose to work with motion because it is ubiquitous, even if just as vibrations from passing vehicles for example.

How does your device harvest this energy?

We are using the piezoelectric effect – which is seen in a special class of materials that generate charge when put under mechanical strain. Our recent design has a piezoelectric beam with a magnet on its end. Another magnet is attached to a rotating inertial mass. As the device moves, the rotating mass plucks at the piezoelectric beam, which generates a current as it bends.



Eric's prototype device

What is the main challenge?

You don't always make energy when you need it, and vice-versa, so balancing generation and consumption can be a challenge. You need something like an energy dam: something that will gather energy as it is harvested and release it as a steady stream. Because we're working at a small scale we can use a simple rechargeable battery for this.

How do you see your device being used?

An initial use for this would be wearable sensors or wristwatches – they move a lot making them ideal for energy harvesting. Eventually, we would like to see them used in medical implants such as pacemakers.

—DAVID BARRETO-IAN, IMPERIAL INNOVATIONS

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



Big idea gets big prize

Rapid analysis technology developed at Imperial for a range of clinical and environmental applications has scooped the top prize at the Climate-KIC UK's Big Idea Bootcamp, securing €20,000 and entry into Stage 1 of the UK Accelerator programme.

AnywhereHPLC was originally set up by postdoctoral researchers Duncan Casey and Ali Salehi-Reyhani (both Chemistry) when they were PhD students and is being commercialised by Imperial Innovations. The core

technology is a handheld, disposable device which connects to a smart phone, allowing scientists to analyse a range of samples from groundwater to blood for instant results – removing the need to transport samples back to laboratories.

"The specific application we're looking at now is testing for aflatoxin in the import/export of spices and crops. Globally \$1.3 billion is lost annually due to aflatoxin contamination and if we can test crops closer to the field then we can prevent contaminated crops from entering the supply chain in the first place," Ali says.



'Bruise trousers' help to detect sporting injuries

All top athletes pick up injuries in the course of training and competition which can impact performance and recovery. However, paralysed athletes aren't always aware of their own injuries – particularly internal ones – meaning that they may go untreated.

Now a group of students at Imperial have developed 'bruise trousers' that contain strips of pressure-reactive film that leave a coloured magenta stain, which increases in intensity reflecting the strength of the impact.

The idea came after a talk given by paralympian skier Talan Skeels-Piggins at the College.

Team member Lucy Jung says:

"We were really inspired by what Talan had to say about competing in sport and it was great to hear about his experiences. Offhandedly, he remarked about not being able to feel his injuries after competing in high impact sporting events and it prompted us to look more into this area. We found that many sports people often don't realise that they've injured themselves because they can't feel anything, which could have serious health implications."

Lucy worked to develop the technology with fellow team members Elena Dieckmann, Dan Garrett and Ming Kong – all taking the Innovation Design Engineering and Global Innovation Design course, run jointly by Imperial and the Royal College of Art. The project was done as part of the Rio Tinto Sports Innovation project, which challenges engineering students to design and build Paralympic sporting equipment.

As part of their laboratory validation they put their trouser material onto animal bone samples placing them in a device called a droptower and applying different loads, thereby simulating the impacts that sportspeople would feel during a game. This enabled the team to develop a chart to determine the severity of impacts and gauge the level of medical assistance required.

The trousers could be used by people in a range of sports including sit ski, wheelchair basketball and motor racing, the team says.

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS

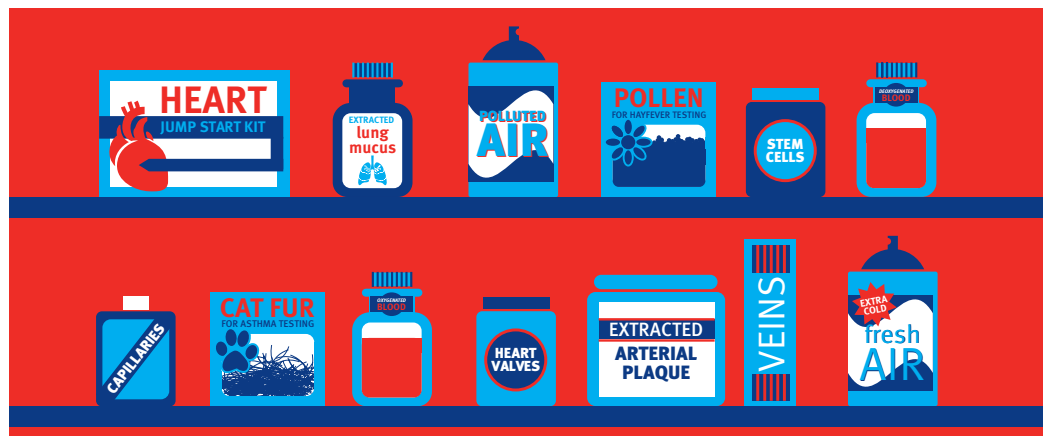
"Many sports people often don't realise that they've injured themselves because they can't feel anything."

Retail therapy

This month researchers from the National Heart and Lung Institute, artists and designers are collaborating on a science engagement project called The Heart and Lung Repair Shop, funded by the Wellcome Trust. The shop is located in an empty retail unit in Hammersmith's King's Mall Shopping Centre, bringing science engagement to the local community.

The design has been inspired by a mechanical repair shop and features a workshop bench where scientists will do mini experiments and dissections. The main installation is a heart and lung machine which the audience will be able to pump and inflate themselves.

The products in the shop are an impression of what might be sold if a heart and lung repair shop really did exist, for example, cans of fresh air, bottles of oxygenated blood and preserved stem cells. Rather than being for sale, the items'



labels will provide snippets of information to incite conversations between the scientists and the audience.

"It's about bringing together scientists and the community and enabling them to have conversations, share perspectives and connect. The scientists will be really interested to hear what the audience think about their research and hopefully the audience will be really inter-

ested to hear about the medical research happening on their doorstep," says Ellen Dowell, Public Engagement Officer from the NHLI.

—LAUREN HOSKIN-PARR, FOR COMMUNICATIONS AND PUBLIC AFFAIRS

The Shop will be open 11.00–17.00 every day July 7–20. Some workshops and talks are ticketed:

for more info visit:
imperial.ac.uk/heartandlungrepairshop

Student blogger Isobel on: **Finishing**

I have *finally* reached the end of the academic year here at Imperial and it feels *amazing*. Upon finishing I went pretty much directly from the exam room to the Union for a much deserved post-exam drink... then some retail therapy, despite the ridiculous crowds on Oxford Street! It has been the most stressful, difficult and amazing year of my life so far. Despite the ups and downs and challenges I have faced this year, I wouldn't have wanted anything different. Can't wait to move in to my new house in September and get stuck in to second year!

Have great summers lovelies
xxx



Show time

Visitors to the College were recently invited to interact with a prototype radio that changes tune according to the listener's mood as part of an exhibition in the main entrance to the South Kensington Campus.

The Imperial Show 2014, which ran from Monday 30 June to Thursday 3 July, was supported by Imperial Innovations and showcased 46 working prototype designs developed by students as part of the Innovation Design Engineering course – run jointly by Imperial and the Royal College of Art.

Another technology that visitors interacted with is a prototype material that could enable those with prosthetic limbs to feel the sensation of touch (pictured above). The patented material would cover a prosthetic arm, relaying sensory information to the wearer's brain so that they could, for example, feel another person's touch via their prosthetics for the first time.

Those with an eye for design could also investigate an electronic pen, pad and virtual reality goggles that enable the user to sketch and alter their drawings in 3D.



MSc student John McCormac and Dr William Knottenbelt try out the 'WhatPlant' identification app in Kensington Gardens, developed as part of an MSc group project

Celebrating outstanding student support

Thirty members of staff will receive the 2014 annual President & Rector's Awards for Excellence – recognising outstanding contributions in teaching, pastoral care, research supervision and supporting the student experience.

Dr John Gibbons (Mathematics) was awarded a Medal for Excellence in Pastoral Care, recognising his contribution as a postgraduate tutor for over a decade. He said: "Looking after the progression and welfare of postgraduates is intrinsically rewarding. Many of them have since gone on to become mathematical colleagues, here or elsewhere."

Dr William Knottenbelt (Computing) was recognised with a Medal for Outstanding Contribution to Teaching Excellence, for his pioneering work to involve industry in student projects. He said: "Computing Science can be a challenging subject to teach especially on account of its rapid and continuous

evolution. I believe there's a lot of benefit to be had from collaborations between industry and academia and I'd like to thank all our industrial partners who have helped to challenge and inspire generations of our students."

Professor Miriam Moffatt (NHLI) received a medal for Excellence in Research Supervision. She said: "Being involved in the training and education of the next generation of doctoral scientists and clinical academics is one of the greatest pleasures of working in academia."

The awardees were nominated by staff and students across the College, with winners decided by a selection panel chaired by Vice Provost (Education) Professor Debra Humphris.

Professor Humphris said: "An outstanding education requires outstanding staff. That excellence occurs on a day-to-day basis, often quietly and behind the scenes. That's why opportunities like this, when we acknowledge the immense contributions of some of our most committed colleagues, are so valuable."

—DEBORAH EVANSON, COMMUNICATIONS AND PUBLIC AFFAIRS

Awards teaching excellence

- Dr Helal Ahmed (Graduate School)
- Dr Tristan Allwood (Computing)
- Dr Michael Bearpark (Chemistry)
- Dr Susan Hodgson (Public Health)
- Mr Martin Holloway (Bioengineering)
- Dr Philippa Mason (Earth Science Engineering)
- Dr Paul Mitcheson (Electrical and Electronic Engineering)
- Dr Darryl Overby (Bioengineering)
- Dr Maarten van Reeuwijk (Civil and Environmental Engineering)
- Dr Duncan Rogers (NHLI)
- Professor Henry Rzepa (Chemistry)
- Dr Paul Strutton (Surgery and Cancer)
- Dr Mike Tristem (Life Sciences)
- Mr Peter Wren (School of Professional Development)
- Dr Andrew Wynn (Aeronautics)

Medals for teaching excellence

- Dr William Knottenbelt (Computing)
- Professor Mary Morrell (NHLI)

Awards for pastoral care

- Dr Chris Braddock (Chemistry)
- Dr Caroline Hargreaves (Graduate School)

Medals for pastoral care

- Dr John Gibbons (Mathematics)
- Dr Ruediger Woscholski (Chemistry)

Awards for research supervision

- Professor Ahmed Elghazouli (Civil and Environmental Engineering)
- Professor Danilo Mandic (Electrical and Electronic Engineering)
- Professor Peter Weinberg (Bioengineering)

Medals for research supervision

- Professor Clare Lloyd (NHLI)
- Professor Miriam Moffatt (NHLI)

Awards for supporting the student experience

- Mr Vic Boddy (Electrical and Electronic Engineering)
- Dr Alison Cambrey (Faculty of Medicine)
- Dr Amani El-Kholy (Computing)

Medals for supporting the student experience

- Mr Ian Gillett (Health and Safety Services)
- Dr Maria Toro-Troconis (Faculty of Medicine)

long
service

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

20 years

- Lorraine Lawrence, Senior Technician in Histology, NHLI

30 years

- Linda Casey, Editorial Coordinator/BMT Liaison Officer, Medicine

40 years

- Professor Richard Vinter, Professor, Electrical and Electronic Engineering
- Judith Barritt, Secretary and MSc Cluster Administrator, Civil and Environmental Engineering
- Lynne Cox, Director, Research Office
- David Hayes, Maintenance Supervisor, Finance Division
- Shashikant Patel, Payroll Manager, Finance Division

Welcome

new starters

Ms Tomike Adenekan, Finance
 Mr Reza Akhavan, Computing
 Miss Jummy Alabi, Accommodation
 Mrs Charmian Alvares, Faculty of Natural Sciences
 Miss Marie Anderson, EYEC
 Miss Pearl Anteh, Accommodation
 Dr Andres Arce, Life Sciences
 Miss Natalie Attafua, Accommodation
 Miss Talia Augustine, Accommodation
 Miss Mariam Balogun, Accommodation
 Miss Olukorede Balogun, Accommodation
 Dr Jose Bermudez Menendez, Chemical Engineering
 Mr David Boadu, Accommodation
 Mrs Tania Bozinovska, ICT
 Miss Bethany Britton, Materials
 Dr Gillian Brydson Young, Life Sciences
 Miss Tamara Carboo, Accommodation
 Miss Holly Cartwright, Accommodation
 Mr Niall Casey, ICT
 Mr Marco Castelli, Medicine
 Dr Andrea Cavallaro, Materials
 Miss Chipo Chitakunye, Accommodation
 Miss Athina Christou, Accommodation
 Ms Demi Corr, Accommodation
 Mr Richard Daws, Medicine
 Dr Paul Dawson, Surgery and Cancer
 Dr Matias De Vas, Medicine
 Mr Ciaran Deasy, Accommodation
 Dr Ziyun Ding, Bioengineering
 Miss Anne Dooley, Accommodation
 Miss Stephanie Fadahunsi, Faculty of Natural Sciences
 Miss Shalini Fernando, Accommodation
 Miss Kirsty Fletcher, Accommodation
 Mr Oliver Foss, Accommodation
 Mrs Felicia Frost, Public Health
 Dr Andres Garcia Trengo, Chemistry
 Miss Lydia Garmon-Jones, Accommodation
 Ms Mana Golsorkhi, Medicine
 Miss Anne-Marie Gray, Accommodation
 Dr Roya Haghighat-Khah, Life Sciences
 Miss Louisa Hepworth, Accommodation
 Dr Katerina Hnatkova, NHLI
 Miss Josephine Hogg, Accommodation
 Mr Sam Holt, Accommodation
 Mr Paul Hughes, ICT
 Mr Sodrud Hussain, Business School
 Miss Tina Johnson, Public Health
 Dr Janice Kenney, ESE

Dr Eunjung Kim, Materials
 Miss Kirstin Knight, Accommodation
 Mr Jeremy Lamont, Accommodation
 Mr Frederick Lamptey, Accommodation
 Mrs Jennifer Landmann, Faculty of Medicine
 Mr Christoph Lamdorfer, Physics
 Dr Emma Lawrence, Public Health
 Miss Meera Maheswaran, Accommodation
 Mr Sean Markus, Aeronautics
 Mr Luis Martinez Montblanch, Chemistry
 Dr Linda McDonald, Medicine
 Miss Emilia Michael, Accommodation
 Mr Sean Markus, Aeronautics
 Mr Luis Martinez Montblanch, Chemistry
 Dr Linda McDonald, Medicine
 Miss Emilia Michael, Accommodation
 Miss Kelly Mills, Development
 Mr Marco Mol, Life Sciences
 Mr Pierre Murray, Accommodation
 Dr Elham Nabavi, Surgery and Cancer
 Mr George Nolan, Accommodation
 Dr John O'Donoghue, Public Health
 Miss Linda Ogunbiyi, Accommodation
 Miss Oluwadamilola Olaolun, Accommodation
 Miss Victoria Oroge, Accommodation
 Miss Tola Oshitelu, Medicine
 Miss Sing Pang, Accommodation
 Dr Alexandros Pechlivanis, Surgery and Cancer
 Miss Dinithi Perera, Public Health
 Dr Nicholas Phillips, Chemistry
 Mr Karl Phillips, Accommodation
 Dr Valentin Poirier, Chemistry
 Dr Balaji Purushothaman, Chemistry
 Dr Susarla Raghuram, Physics
 Dr Nisha Ranganathan, Medicine
 Miss Laura Raphael, Accommodation
 Miss Brenda Rosales, Surgery and Cancer
 Dr Sara Rosas Martins, Life Sciences
 Miss Meenal Selvaratnam, Accommodation
 Mr Sahil Shah, Accommodation
 Mr Petar Sofev, Accommodation
 Miss Helen Vaughan, Careers Service
 Miss Shauna Walker, Accommodation
 Miss Jemma Whelan, Accommodation
 Dr Edward White, Chemistry
 Mr Dean Woodhouse, Imperial College Union
 Mr Geoffrey Wu, Surgery and Cancer

Farewell

moving on

Dr Mustafa Bayazit, Chemistry
 Dr Ute Cappel, Chemistry
 Dr Maria Carreras Romeo, Chemistry
 Mr Thomas Chau, Computing

Mrs Alison Cigari (6 years), Registry
 Dr Roxana Danger Mercaderes, Public Health
 Ms Abigail Deamer, Public Health
 Ms Jenny Evans (10 years), Library
 Miss Cherelle Fairbairn, Human Resources
 Mrs Margaret Gibbs (13 years), Library
 Mrs Lisa Grass, NHLI
 Miss Kerry Hillier, Medicine
 Dr Ellen James, Medicine
 Dr Annabelle Jayaraman, NHLI
 Dr Saurabh Johri (5 years), Public Health
 Dr Rodrigo Liberal Fernandes, Life Sciences
 Dr Suki Mistry (7 years), Medicine
 Dr Olive Murphy (7 years), EEE
 Miss Pauline Osseo-Asare, EYEC
 Miss Gill Peacock, Medicine
 Mr Matthew Percy, Medicine
 Mr Richard Pett, Aeronautics
 Miss Denise Phillips, EYEC
 Dr Fatemeh Pishbin, Materials
 Dr Narges Rashidi, Life Sciences
 Miss Chloe Richardson, Imperial College Union
 Miss Holly Robens, EEE
 Miss Marjory Rollo (14 years), College Headquarters
 Dr Dora Romaguera-Bosch (6 years), Public Health
 Ms Sarah Rosenberg-Wohl, Public Health
 Dr Sushmita Roy Nawathe, Surgery and Cancer
 Miss Vera Schroeder, Materials
 Mrs Lisa Sharpe, Surgery and Cancer
 Mr Daniel Silk, Life Sciences
 Dr Dimitrios Stampoulis, Medicine
 Mr Hendrik Utzat, Chemistry
 Miss Meriel Vaal, Medicine
 Miss Rebecca Vanderkar, Human Resources
 Dr Xinxin Wang (10 years), Faculty of Engineering
 Mr Mark Woodbridge (6 years), Life Sciences
 Dr Jessica Yu, Medicine
 Dr Ming Zhao, Chemical Engineering

This data is supplied by HR and covers staff leaving the College during the period 3 June – 27 June. This data was correct at the time of going to press.

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

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



9 JULY ▶ DEBATE

The future of shale gas in the UK

Shale gas and fracking have become contentious subjects, hailed by some as a lower carbon alternative to coal, criticised by others for their potential environmental impact. This Energy Futures Lab debate, chaired by director Professor Tim Green,

will cover the future of shale gas in the UK, and the technological, economic, political and environmental challenges facing fracking. Speakers include Professor Geoff Maitland (Chemical Engineering), Francis Egan, CEO of Cuadrilla Resources, Dr Jim Marshall, Policy Adviser at Water UK and Dr Nick Riley, Director of Carboniferous Ltd.



7-20 JULY ▶ EXHIBITION

The Heart & Lung Repair Shop

This summer an empty retail unit in Hammersmith's Kings Mall will be temporarily transformed by the NHLI into a pop-up shop for the creative and curious. Visitors of all ages can discover how the heart and lungs are far more complex than any car engine, central heating

boiler or air conditioning system, and learn about what it takes to repair them. The shop will feature bioengineered organs, broken hearts that can heal themselves and amazing ways to stop cells from ageing, providing a glimpse into the future of science and medicine (see page 13).



1-6 JULY ▶ EXTERNAL

Royal Society Summer Science Exhibition

Come and support Imperial researchers presenting exhibits at this annual display of UK science and technology, free and open to all on 1-6 July. Interact with demonstrators online using the #summerscience hashtag.

Set controls for the heart of the sun

Physicists showcase how lasers are recreating the sun's core to explore nuclear fusion. Interact with Arthur Turrell (Physics) on Twitter @arthurturrell.

Smart wing design

Learn about the aerodynamics of flow control and wing design. Interact with Dr Kevin Gouder (Aeronautics) on Twitter @aeflowcontrol.

Brain networks

Discover how the brain changes when affected by severe and traumatic injuries. Interact with Professor David Sharp (Medicine) on Twitter @Neurosharp.

Higgs boson

Find out how Imperial's researchers have helped in the quest to find the Higgs boson. Interact with Dr Paul Dauncey (Physics) on Twitter @HiggsBosonRS14.

Catch a comet

Learn about the Rosetta spacecraft, which is due to land a robotic probe on the surface of a comet. Interact with Professor Chris Carr (Physics) on Twitter @CatchAComet.



4 JULY ▶ PUBLIC TALK

The physics of climate change

Lecture by atmospheric physicist Professor Joanna Haigh FRS (Grantham Institute) at the Royal Society Summer Science Exhibition 2014.

8 JULY ▶ SEMINAR

Do the data support the rhetoric?

Dr Katharina Hauck (Business School) presents this Centre for Health Policy seminar about the social determinants of health.

12-15 JULY ▶ CONFERENCE

Hamlyn symposium on medical robotics

Discussions about robot-assisted surgery, robot-human interaction and augmented reality systems. Toshio Fukuda, Emeritus Professor at the Institute for Advanced Research of Nagoya University, Japan, presents the keynote lecture.



26 JULY ▶ MUSIC AND ARTS

Silfest 2014

Annual student-led festival held at Silwood Park Campus, filled with music, arts, games and food. Silfest is raising money for the Bumblebee Conservation Trust, which works to raise public awareness of bumblebee species and aims to create and restore suitable habitat.

14 AUGUST ▶ EXHIBITION

Climate-KIC UK Venture Competition 2014

Eight innovative start-up companies aiming to tackle climate change give five-minute presentations for a chance to win €20,000 for their project.

14-17 AUGUST ▶ EXTERNAL

Performing surgery at Green Man Festival

Professor Roger Kneebone (Surgery & Cancer) joins artist Matt Lane Sanderson and magician James Brown at Green Man Festival 2014.

take note

All change at the Library

A two year project to transform the Central Library space is commencing this summer, addressing issues including climate control and power and data availability in addition to converting the former Science Museum Library into a new study area. The Library will remain open throughout with some areas unavailable and some noise and service disruption.

Visit bit.ly/1pOmGPK or follow @imperiallibrary on Twitter for more info

Imperial College London



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