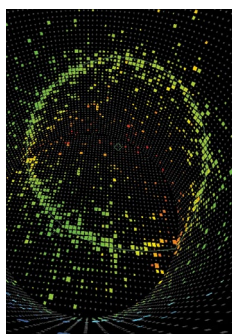




Meet our first Provost

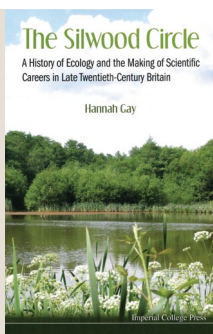
Professor James Stirling joins the College
in the new role of Provost  **CENTRE PAGES**



MYSTERIOUS MESSENGERS

Neutrino
particles may
show the way
to new physics

PAGE 5



THE SILWOOD CIRCLE

The top
ecologists who
made their name
at the campus

PAGE 8



MEDICAL PERSPECTIVE

Imperial students
hone their skills
at new medical
school in
Singapore

PAGE 3



EDITOR'S CORNER

Wanderlust

With all the great work that goes on across our campuses in the UK, it can sometimes be easy to forget that **Imperial has a truly global reach**. In this issue alone we report on Yoshi Uchida and Morgan Wascko's research at the T2K particle experiment in Japan (page 5); Sunday Popo-Ola's work with the United Arab Emirates using date palms as sustainable building materials (page 10); and Imperial medics on elective at the new **Lee Kong Chian School of Medicine** in Singapore (page 3). The School – established by Nanyang Technological University and Imperial in October 2010 – will admit its first students on 5 August after three years of careful planning.

Perhaps our most **exciting adventures happen in outer space**, with Imperial technology having been used on interplanetary missions over the years. That expertise was called upon for a recent BBC interactive series, *How to put a human on Mars*, to which academics across the Faculties of Natural Sciences, Engineering and Medicine contributed (page 4). For those with sights closer to Earth this summer though, keep safe and have fun.

ANDREW CZYZEWSKI, ACTING EDITOR

Reporter is published every three weeks during term time in print and online.

Contact Andrew Czyzewski:

reporter@imperial.ac.uk

Imperial launches Alumni Visitor Centre

Mr Koh Boon Hwee, Imperial alumnus (Mechanical Engineering, 1972) and Chairman of Nanyang Technological University, joined members of the College's Council and other prominent alumni to formally open the new Alumni Visitor Centre on the South Kensington Campus last month.

The Alumni Visitor Centre provides an exclusive space on campus for visiting Imperial alumni and their guests to relax, work, meet friends and colleagues, and catch up with the latest developments at the College.



Mr Koh noted how much the College had changed since he was a student, with iconic campus buildings now facing onto Exhibition Road. He said: "It's important to engage alumni and it's great to see Imperial

developing these activities. Imperial has alumni all over the world and London is probably the most cosmopolitan city. Alumni will pop by and the Alumni Visitor Centre provides a very good point of contact."

Anne Blake, alumnus (Mechanical Engineering, 1974) and a member of Imperial's Court, said: "Alumni coming to Imperial can wander round campus, reminiscing about their time here, but it's invaluable that they now have a space specifically for them, where they feel welcome."

— CAROLINE DAVIS, COMMUNICATIONS AND PUBLIC AFFAIRS

New centre will reap rewards of synthetic biology



A £24 million cash injection will help realise the UK's goal of commercialising synthetic biology into a range of new industries.

The Imperial-led SynbiCITE Centre will be a national resource, involving researchers from a further 17 universities and academic institutions across the UK, as well as 13 industrial partners including the research arms of Microsoft, Shell and GlaxoSmithKline.

The main aim of the Centre will be to provide a bridge between academia and industry to speed up the development of new technologies in synthetic biology. This is a field of science where researchers re-engineer cells to develop microscopic devices that can be used to address a range of global challenges such as producing low-carbon fuel, reducing the cost of industrial raw materials and producing new pharmaceuticals.

The Centre will be led by Professors Richard Kitney (Bio-engineering) and Paul Freemont (Life Sciences).

"One of the major challenges that industry and academia face in synthetic biology is translating breakthroughs in research into new products. The aim of the new Centre is to break down roadblocks so that new industries can be developed that could ultimately help to safeguard the UK's economic future," said Professor Kitney.

"The UK is a global leader in synthetic biology and we hope the establishment of SynbiCITE will help us to capitalise on our research success," said Professor Freemont.

— COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS

Major grants for future technologies

Storing energy from sustainable sources and improving surgical robotic technology are two Imperial-led projects receiving major funding from the government.

The projects received a combined total of £18.3 million from the Engineering and Physical Sciences Research Council and were announced this week by David Willetts, Minister for Universities and Science. Imperial is one of 20 UK universities to receive funds for research that has been identified by the government as a future driver of UK growth.

Professor Nigel Brandon, Director of Imperial's Energy Futures Lab, has been awarded a £14.3 million project to develop new technologies for storing energy captured from low carbon sources, such as wind farms and nuclear reactors, so that it can be used more effectively by the National Grid. He will lead a group of 10 universities in the project.

Professor Guang-Zhong Yang, co-director of the College's Hamlyn Centre for Robotic Surgery, will take the helm of a £4 million project that will establish new engineering facilities for developing miniaturised robots for surgery and new types of targeted therapies for patients.

Imperial's President & Rector Sir Keith O'Nions said: "These two projects exemplify some of the technologies that could successfully power the UK's economy well into the future. Developing better surgical robots could pave the way for their wider use, which should mean better outcomes for patients, and creating better ways for storing green energy should put the UK on a much more sustainable path in terms of our power usage."

— COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS

Huawei and Imperial explore research collaboration

Chinese networking and telecommunications company Huawei and Imperial have signed a memorandum of understanding (MoU) to consider the development of a research and innovation centre focused on the next generation of big data technologies.

Imperial and Huawei plan to collaborate on a joint R&D hub, enabling academic researchers and business experts to collectively develop innovations and applications in research areas including digital, energy, healthcare, future cities and life sciences. The proposed joint centre would be located on Imperial's new research and translation campus, Imperial West, in White City, west London.

The MoU was signed by Imperial's President & Rector, Sir Keith O'Nions, and William Xu, Chief Executive of Huawei's Enterprise Business Group. Oliver Letwin MP, Minister of State at the Cabinet Office, attended the signing ceremony at Imperial and underlined the government's support for the partnership.



Sir Keith said: "We are excited to have taken the first step in what we hope will be a long-term collaboration with Huawei, a company which plays a major role in the global ICT industry. Imperial and Huawei share a commitment to translating research, innovation and developing next generation data science technology for the benefit of society and the economy."

Under the terms of the MoU, Imperial and Huawei have also agreed to spend a year exploring other opportunities for collaboration over the next decade. Options being considered include a Huawei-Imperial Joint Innovation Centre suite, which would be used by Imperial researchers, students and Huawei staff as a meeting and work space. The suite could also act as a state-of-the-art demonstration centre where technology, including Huawei solutions, can be viewed by the public.

— ANDREW SCHEUBER, COMMUNICATIONS AND PUBLIC AFFAIRS



"Our clinicians gave good feedback and I was personally impressed by the students' bedside manner"

Medics get unique experience in Singapore

Seventeen MBBS students from the College recently completed a clinical elective in Singapore – the first group of Imperial medics to undertake a placement there.

The elective was offered by the Lee Kong Chian School of Medicine (LKCMedicine), Singapore's newest medical school. Established by Nanyang Technological University and Imperial in October 2010, the School is awaiting its first intake of students in August this year.

The Imperial medics, who are in their sixth year of study, undertook a three or six-week placement. Supported by the School, the students gained an insight into the Singaporean healthcare system.

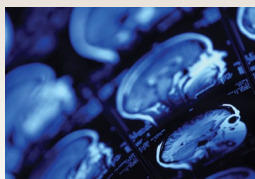
MBBS student, Anil Sunny Chopra, said: "I had always wanted to go to Singapore because of what I had heard about the weather, culture and food. After a one-week induction to Singapore's healthcare system with visits to hospitals, clinics and rehab centres, I spent the next three weeks in Tan Tock Seng Hospital's Emergency Department. I found it interesting how much more streamlined their admissions became as a result of their fully electronic medical record system – we could learn a few things from them."

The LKCMedicine team also found the pilot a success. Associate Professor Tham Kum Ying said: "The Imperial elective placements went well. The students were friendly and got along well with the other trainee doctors. Our clinicians gave good feedback and I was personally impressed by their bedside manner and good interpersonal skills."

Following the successful pilot the Lee Kong Chian School of Medicine elective will now be offered to eligible Imperial students every year.

— LUCY HANDFORD, COMMUNICATIONS AND PUBLIC AFFAIRS

in brief



Mind the funding gap

Disorders of the brain, including dementia, stroke, and mental health issues, cost the UK around £112 billion annually, a new report says. The research, led by scientists from the University of Cambridge, the University of Hertfordshire and Imperial, is the most recent and comprehensive study of the costs and prevalence of brain disorders in the UK. The figure includes direct medical costs as well as indirect costs, such as lost productivity due to absence from work or early retirement.

Business School launches first summer school

Students from around the world have attended the Business School's first summer school programme. The one-month programme aims to give students a taster of what it's like to study here and also provides a pathway for them to apply for a graduate degree programme in the future.

Passing on the Innovations baton

Susan Searle has stepped down as Chief Executive Officer of Imperial Innovations Group after 20 years of service, 11 as CEO. Russ Cummings, Chief Investment Officer and a Director since the group's flotation in 2006, has become Chief Executive Officer with immediate effect. Dr Martin Knight, Group Chairman, said: "On behalf of the board and the group as whole, I would like to thank Susan for her considerable contribution. During her tenure, she transformed the group from an operational division of Imperial College London, as its technology transfer office, to a major independent venture capital and technology licensing business."

"I received a call on Monday from the College to ask if we could ring the bells to celebrate the birth of the royal baby. After a series of emails and phone calls, I had assembled our team by Tuesday morning."

JAMES WHITE, WHO HAS RUNG THE BELLS IN THE QUEEN'S TOWER REGULARLY OVER THE LAST 13 YEARS.

media mentions

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS



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Revolution in the air

FINANCIAL TIMES ► 11.07.2013

Synthetic biology could be the next 'industrial revolution' for the UK, where tiny devices manufactured from cells are used to improve many facets of our lives, Professor Richard Kitney (Bioengineering) told the *Financial Times*: "From producing new, more sustainable fuels to developing devices that can monitor or improve our health, the applications in this field are limitless." His comments followed the announcement that Imperial academics will join the US, China, India and other countries in the synthetic yeast project, which aims to recreate the yeast genome from scratch in the laboratory. "Now we have the opportunity to adapt yeasts further, turning them into predictable and robust hosts for manufacturing the complex products we need for modern living," Professor Paul Freemont (Life Sciences) added.

Mock Martian mission

BBC NEWS ► 24.07.2013

Scientists from the College have worked with journalists from the BBC to design a concept mission to land astronauts on Mars. The plan envisages a three-person crew journeying to Mars aboard a small two-part craft, which would rotate to generate artificial gravity and use a heat shield to protect itself against solar flares. "Every part of this mission scenario has been demonstrated one way or the other, including the *in situ* propellant production on the surface of Mars," said Professor Tom Pike (Electrical and Electronic Engineering), who led the Imperial design team. "There are big, big jumps between a demonstration at one level and putting together the engineering systems for a mission, but they are engineering challenges."

Cancer sniffing knife

BBC NEWS ► 17.07.2013



An 'intelligent' knife that can sniff out tumours to improve cancer surgery has been developed by scientists. The Imperial team aim to overcome the dangerous and common problem of leaving bits of the tumour in a patient, which can then regrow. Early results showed the iKnife could accurately identify cancerous tissue on the spot. "These results provide compelling evidence that the

iKnife can be applied in a wide range of cancer surgery procedures," Dr Zoltan Takats (Surgery and Cancer) told *BBC News Online*. "It provides a result almost instantly, allowing surgeons to carry out procedures with a level of accuracy that hasn't been possible before."

Anti freeze

DAILY MAIL ► 21.02.2013

A period of global warming five million years ago may have caused parts of Antarctica's large ice sheets to melt and sea levels to rise by approximately 20 metres, reported the *Daily Mail*. The researchers studied mud samples to learn about ancient melting of the East Antarctic Ice Sheet. "Our study underlines that these conditions have led to a large loss of ice and significant rises in global sea level in the past," said co-author Dr Tina van de Flierdt (Earth Science and Engineering). "Scientists predict that global temperatures of a similar level may be reached by the end of this century, so it is important for us to understand what the possible consequences might be."

awards and honours

CAMPUS SERVICES

Just desserts

Imperial's Catering team was recognised with an award for Best Catering Service at the annual College and University Business Officers (CUBO) awards ceremony last month. They faced stiff competition from fellow nominees and won the overall award jointly with Kent. Part of Campus Services, Catering has undergone considerable growth and development over the past six years, turning around a loss-making operation and improving its satisfaction score by 44% to 80%.



NATURAL SCIENCES

Five physicists receive IoP accolades

Five leading academics from the Department of Physics are among the 2013 Institute of Physics (IoP) award winners. Professor Sir John Pendry received the Isaac Newton Medal for his outstanding contribution to physics, in particular his work exploring metamaterials. Professor Paul French won a Joule Medal Subject Award for his contributions to the development of fluo-

rescence lifetime imaging. Emeritus Professor Tom Kibble becomes one of four new honorary fellows of the IoP for his exceptional service to physics. Professors Ed Hinds and Lyndon Rees Evans both received Gold Awards.

ENGINEERING

Alumni association recognises students

Nineteen students from across the nine departments of the Faculty of Engineering have received awards in recognition of extra curricular achievements. The Student Activity Awards are conferred by the Old Centralians' Trust – the charitable arm of the City and Guilds College Association, the Engineering alumni organisation. The student activities ranged from

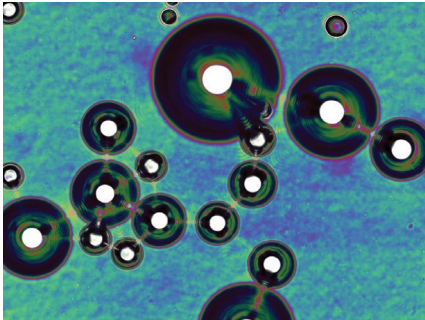
charity fundraising and drama, to knitting and American football. The nominees each received an award valued at £700.

ENGINEERING

Toumazou wins Royal Society medal

Professor Chris Toumazou (Electrical and Electronic Engineering) has been awarded the Royal Society's biennial Gabor Medal for his work in applying semiconductor technology to biomedical and life science applications. The technology's most recent application has been to DNA analysis. The Gabor Medal is named after the late Imperial physicist Dennis Gabor and is awarded for interdisciplinary work between the life sciences with other disciplines.

Bubbles could be used to deliver drug treatments



Scientists have found a way to illuminate tiny bubbles injected into the bloodstream to aid ultrasound imaging of blood flow, potentially allowing the targeted delivery of drugs.

Until now, researchers have been unable to study the flexibility of the bubble shells, making it hard to predict their behaviour under ultrasound beams precisely.

By inserting a glowing molecule just beneath the outer shell of the bubbles, researchers at Imperial and the University of Oxford were able to study the shells of bubbles in minute detail for the first time

using a powerful microscope. This allowed them to map the microbubble shells accurately and determine their flexibility.

Information about the properties and behaviour of microbubbles could be used to improve their manufacture so that they can be designed for specific biomedical purposes, such as ultrasound and for delivering drugs.

The researchers also demonstrated that adding certain molecules to the bubble shells makes them more stable. In the future, scientists could replace these molecules with drugs, so that the bubbles could deliver medicine to where it is required in the body in an efficient, targeted way.

One of the lead researchers, Dr Marina Kuimova (Chemistry), said: "The new technique can potentially have a big impact on our understanding of how microbubbles interact with living cells and each other in blood vessels. We can now begin work on how to manipulate or manufacture microbubbles for use in medical treatments."

—MICHAEL JONES, COMMUNICATIONS AND PUBLIC AFFAIRS

Bird and human brains wired similarly

You may have more in common with a pigeon than you realise, according to new research showing that humans and birds have brains that are wired in a similar way.

Professor Murray Shanahan (Computing) and colleagues have developed a map of a typical bird brain, showing for the first time how different regions are connected together to process information. By comparing it to brain diagrams for different mammals such as humans, the team discovered that areas important for high-level cognition, like long-term memory and problem solving, are wired up to other regions of the brain in a similar way.

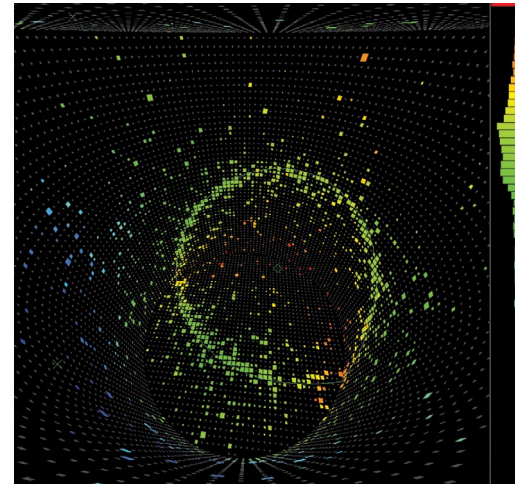
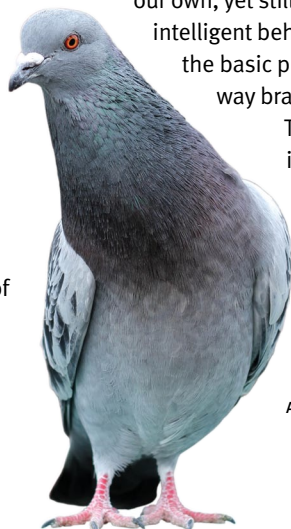
Birds have been shown in previous studies to possess a range of skills, namely a capacity for complex social reasoning, an ability to solve problems, and some have even demonstrated the capability

to craft and use tools.

Professor Shanahan commented: "Birds have been evolving separately from mammals for around 300 million years, so it is hardly surprising that under a microscope the brain of a bird looks quite different from a mammal. Yet birds have been shown to be remarkably intelligent in a similar way to mammals such as humans and monkeys. Our study demonstrates that by looking at brains that are least like our own, yet still capable of generating intelligent behaviour, we can determine the basic principles governing the way brains work."

The team's long-term goal is to use the information generated from the wiring diagram to build computer models that mimic the way animal brains function in order to control a robot.

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS



Shape shifting particles could hold key to new physics

New research has shown that subatomic particles called neutrinos have a previously unseen identity-shifting property.

The T2K experiment in Japan fires beams of neutrinos – ghostly particles that have almost no mass and interact very weakly with matter – underground to a detector 295km away.

Scientists from the T2K collaboration, which involves Dr Yoshi Uchida and Dr Morgan Wascko (Physics), recently confirmed that neutrinos change between different types, or oscillate, in three ways.

Dr Uchida said: "Using huge volumes of data collected at the T2K experiment, we have been able to check and cross-check the results of our neutrino experiments, and are now ready to make a statement that stands up to scientific scrutiny."

Following the new findings, the researchers are keen to explore whether neutrinos oscillate in a different way to their antimatter particles (called anti-neutrinos). Equal amounts of matter and antimatter were thought to have existed at the start of the universe but now everything that we know is made of ordinary matter.

If any such differences between neutrinos and anti-neutrinos can be found, this will help scientists explain how all the antimatter has disappeared from the universe.

"The exciting thing is that, combined with other neutrino experiments, this work can help us understand whether there is a significant matter-antimatter asymmetry in neutrinos," said Dr Uchida.

—SIMON LEVEY, COMMUNICATIONS AND PUBLIC AFFAIRS

"We are now ready to make a statement that stands up to scientific scrutiny"

James the first

This month Professor James Stirling becomes Imperial's first Provost, responsible for the College's core academic mission, following an esteemed career in physics research and higher education leadership.

When Henry Taylor Bovey was appointed Imperial's first Rector in 1908, the College had an income of £65,000, just three buildings and only around 500 students.

Since then the role has become infinitely more complex, requiring the juggling of many different priorities – not only excellence in research and teaching but also in forging corporate partnerships and alumni relationships.

For this reason Imperial has now decided that a President and Provost model – which has proved successful in many top US universities – is the right path for the College.

Dual leadership

After a global search, Professor James Stirling becomes Imperial's first Provost this month.

James was born and raised in Belfast and went on to study at the University of Cambridge on a Natural Sciences Entrance Scholarship. After appointments in the USA, Switzerland and the UK, in 2011 he became Head of Cambridge's world famous Cavendish Laboratory – boasting some 30 Nobel laureates – from where he joins Imperial.

"I was the 13th Head of Department and, when you look back at the history of the Cavendish, the phrase 'standing on the shoulders of giants' comes to mind," James says. "You look at the names of the first few heads of department – James Clerk Maxwell, Lord Rayleigh, J.J. Thompson, Ernest Rutherford – and to be part of that line of command has been an immense privilege."

Still, James says he has admired Imperial from afar for some time. Having previously concluded himself that a



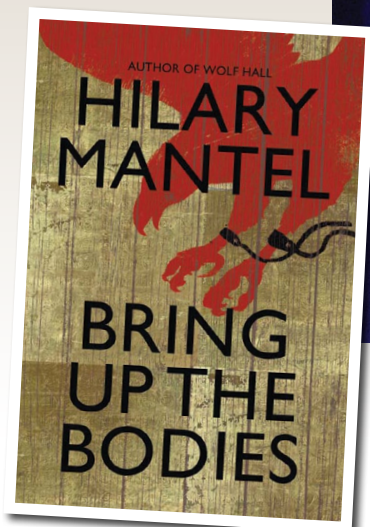
Q&A

What novel or book are you currently reading?

I've just finished *Bring up the Bodies* by Hilary Mantel. As good, if not better, than *Wolf Hall*, and I put the book down thinking, "please hurry up and write the third one!"

Who has influenced you most in your career?

Richard Feynman. I had the privilege of meeting him a couple of times as, back in the 1980s, there was a tiny portion of his extensive research career that overlapped with mine. The word genius should of course be used sparingly, but his contributions to science are so many, so varied and so influential that I think he deserves the accolade.



What would be your desert island disc?

Probably a Leonard Cohen compilation CD. There's just something magical about the man and his music. When I was getting into popular music as a teenager he was an early favourite and now, all these years later, we've got tickets to see him perform at the O2 arena in September, still going strong at 78 years old.

“Imperial has adapted very well to the challenges facing any UK university with aspirations to be world class in the twenty-first century”

dual leadership model was the best way forward for UK universities, he was immediately interested when he heard that the Imperial Provost job was available, noting that it wasn't just any university, but one of the world's best.

“The external perception of Imperial is an institution that has adapted very well to the challenges facing any UK university with aspirations to be world class in the twenty-first century. There is a certain amount of envy, not least in Cambridge, of the excellent research environment at Imperial, and of the quantity and quality of research outputs and impacts that are produced.

As Provost, James will report to the President & Rector and take responsibility for delivering and enhancing Imperial's core academic mission – education, research and translation. This allows the President & Rector, Sir Keith O'Nions, to give more emphasis to strategic issues and the College's development.

In taking on the Provost role, James will also draw on his three years' experience as Pro-Vice-Chancellor for Research at Durham University, where he had overall responsibility for preparing the university's submission to the 2008 Research Assessment Exercise.

“It was there that I came to realise that the way world class research is defined, carried out and assessed doesn't differ too much whether one is talking about engineering or mathematics, history or French.

“The values that people attach to scholarship, in both research and teaching, are common across all the subjects – the key is to recruit the very best people and then give them the time and space to discover and innovate. Excellent infrastructure and support are also crucial.”

Academic success

James has enjoyed considerable success and recognition in his own research area of theoretical particle physics – publishing over 300 research papers and picking up prestigious accolades, notably Fellowship of the Royal Society and a CBE for services to science.

While impartial in the role of Provost, James is clearly pleased to be coming to an institution with a strong her-

itage in his own field – physics – noting the pivotal role Imperial Professors Abdus Salam, Tom Kibble and others played in developing the theory relating to the now-confirmed Higgs Boson particle.

“One of the things that has pleased me most about the Higgs Boson discovery is the way it has grasped the public's imagination; I think as scientists we communicate the excitement of what we do to a general audience much better than we used to. This is another of Imperial's great strengths.”

Out and about

James says one of his first tasks at Imperial will be to help 'bed in' the new management structure and of course getting out and about meeting staff and students.

“My learning curve started back in January and has been getting steeper and steeper all the way through. I've been fortunate to have been able to spend a significant amount of time here in the last few months but I still have the feeling I've only scratched the surface. So, over the next few months I will be very busy finding out more about the organisation, which will involve a programme of visits to all the academic and administrative departments and meetings with student representatives.”

As a keen folk musician who has played in a ceilidh band, James was interested to find out about some of the artistic and musical activities that happen at the College.

“There is perhaps a perception out there that Imperial is a university that focuses on its core academic subjects – science, technology, medicine and business – to the exclusion of everything else, and so it was a pleasant surprise to come here and see how culturally diverse it in fact is.”

James might also be vying with President & Rector Sir Keith O'Nions to present the medals at the annual varsity rugby match, being an avid follower of the game from his student days, when he captained his College team at Cambridge.

And who knows, perhaps we'll see James cheering on Imperial against Cambridge in the not too distant future.



Do you have a favourite travel destination?

Much of my career has been spent travelling to meetings, conferences and so on in some amazing places around the world, but on such trips it is often difficult to experience the places fully. We've just come back from a week on Corsica which was great, and we've also enjoyed many holidays on the Greek island of Ithaca. But my favourite would have to be our house in the west of Ireland.



Who will win the Six Nations this year?

Wales will be hard to beat, having recently beaten Australia masquerading as the British and Irish Lions. But Ireland did beat Wales quite convincingly last year, and so we live in hope. In fact if you're an Irish supporter you always live in hope!

inside*

story

mini profile

Lena Heinrich

Lena Heinrich recently joined the College in the new role of Anglian Water Research Coordinator, working in the Centre for Environmental Policy. Trained as a water engineer, Lena has extensive experience working for the water industry, as well as for organisations like UNESCO, where she examined issues such as the sharing of ground-water resources between neighbouring countries.

What are the current challenges for water in our region?

Quite simply we have too little water to support such a large population; we are living in the driest and most densely populated area in the UK. When we last had a drought and hosepipe ban – around a year and half ago – the authorities considered multi-million pound solutions such as desalination of sea water and even the creation of a national water grid – pumping water from the north to the drier south. Then, thankfully, it started raining. But the point is, if there's been a prolonged dry spell, a month of rain will not do the trick. You need to look at managing it better, reducing losses and developing alternative resources.



Can you give an example?

One key topic is re-use. At the moment we don't have water re-use and that's partially down to public perception. We're not talking about drinking waste water; you don't necessarily take water out of the sewage treatment works and make it drinking water again, but it could be used for industrial processes or to recharge groundwater.

How are you tackling this at Imperial?

There had previously been some collaboration with Anglian Water but, given how much expertise we have here at the College, we could be making more of this; helping the company find the best solutions for their challenges and, ultimately, our water and environment. I will be coordinating this, bringing together experts from all parts of Imperial and Anglian Water. That, of course, involves engineers but also includes medics, psychologists and business experts.

“At the moment we don't have water re-use and that's partially down to public perception”

For more information contact l.heinrich@imperial.ac.uk



Imperial students celebrate as they edge out Oxford to win the Prince Albert Challenge Cup, a race contested by men's student crews in coxed fours at Henley Royal Regatta. Head Coach Stuart Whitelaw has been working with the team, comprising Club captain Ben Spencer-Jones (Medicine), Henry Goodier (Medicine), Tim Richards (Medicine), Jonny Rankin (Mechanical Engineering) and cox, Ellie Smith (Medicine) since last September.

BOOK PREVIEW

The Silwood Circle

Many staff at the College will be familiar with *The History of Imperial College 1907–2007*, the highly regarded book by Dr Hannah Gay, Honorary Research Associate in the Centre for the History of Science, Technology and Medicine, which has just moved to King's College London. Now, for readers who have worked their way through that impressive volume, there is more.

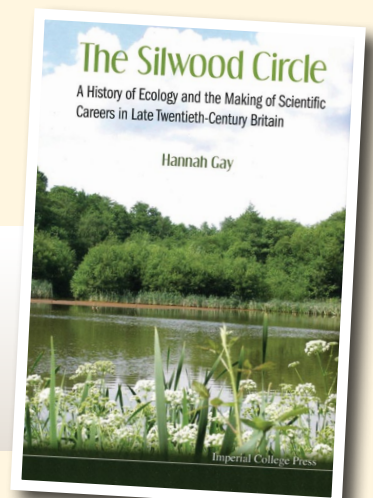
Hannah recently completed *The Silwood Circle: A History of Ecology and the Making of Scientific Careers in Late Twentieth-Century Britain* (Imperial College Press, 2013). It recounts the careers of a close-knit group of 10 ecologists that formed at Silwood Park Campus in the late 1960s and early 1970s, namely Richard Southwood, Robert May, Gordon Conway, Michael Hassell, Roy Anderson, Michael Crawley, John Lawton, John Beddington, John Krebs and David Rogers.

Members of this group, which became known as 'the Silwood circle', have since acted as government advisors for conservation and biodiversity, resource management, pest control, food policy, GM crops and foods, sustainable agriculture, international development, defence against biological weapons, and epidemiology and infectious disease control. May and Beddington both became chief scientific advisors to the UK government, and May was elected President of the Royal Society.

The book also shows how ecology, a peripheral discipline in the first half of the twentieth century, came to be viewed as a science central to modern existence.

Hannah, who is an Imperial alumna (Chemistry, 1961; PhD, 1964), is currently working on a history of the Department of Chemistry with Professor William Griffith.

“The book shows how ecology came to be viewed as a science central to modern existence”





INVENTOR'S CORNER

Life online

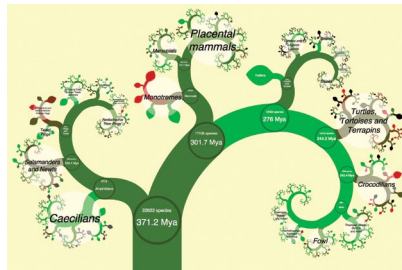
Dr James Rosindell (Life Sciences) is a Natural Environment Research Council (NERC) Fellow in the Division of Ecology and Evolution. He recently launched the website www.onezoom.org, which maps the diversity of life on earth and shows how it's all related through evolution.

Why did you decide to launch this website?

Thanks to advances in genetic analysis scientists have sequenced many different biological species and can produce bigger and bigger evolutionary 'family trees'. However, there is no way to visualise this large amount of data. I felt that scientists and the public would benefit from a website where they could easily explore this information in an appealing and user-friendly way.

How did you achieve this?

I used algorithms based on a branch of mathematics known as fractal geometry that is not typically applied to data visualisation. OneZoom adapts these techniques to automatically build a single, visually striking image containing huge amounts of information. Users can explore the information easily by zooming in and out, just as they would on a large map – hence the name OneZoom.



Can you adapt OneZoom?

OneZoom currently acts as a visualisation tool for universities, researchers and schools, but we can also imagine it as a touch screen display in museums or exhibitions. I have already adapted it for use as an index for Simon Fraser University in Vancouver, Canada. On their customised display, species on the tree include information about the relevant departmental researchers studying them. In general, the OneZoom concept should be useful in any big data visualisation, from recording threatened species to charting government spending. It is a novel way to make large amounts of data freely available, easy to understand and fun to explore for a non-expert. I hope that what we have seen so far in OneZoom is just the start of something much more.

—KAILEY NOLAN, IMPERIAL INNOVATIONS

For help in finding a commercial application for your research visit: bit.ly/YQZ1Vi

Green designs

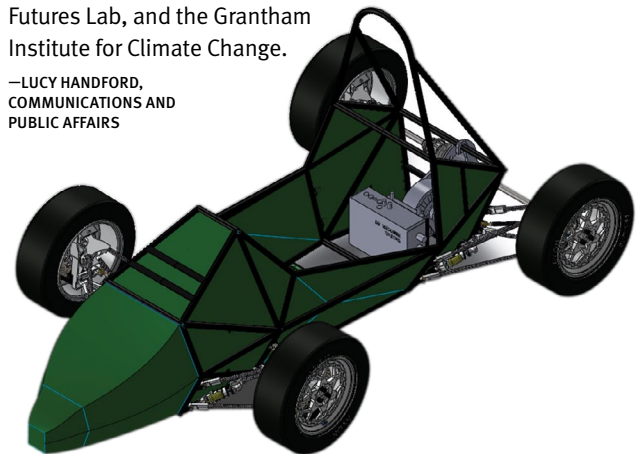
Imperial Racing Green, the student-led, low-emission racing team, has won first prize for its latest electric car design at the 2013 Formula Student competition.

After months of work, the students presented their EV2 design at the competition finals at the Silverstone motor circuit on 4 July, vying with 24 other UK and international university teams. The team were questioned on every aspect of the vehicle, from the overall concept through to the design. They were also asked to produce a viable business proposition, budgets and management plans.

Santhosh Sankaranarayanan (Mechanical Engineering), EV2's Chief Engineer, said: "The competition level was very high and the only reason we got the edge over our competitors was because of the solid engineering design of our vehicle and the fact that we have a great team."

Imperial Racing Green was created in 2007 to give students from engineering disciplines the opportunity to design, build and race low-emission vehicles. The team is mostly based in Mechanical Engineering but support for the student-led project also comes from staff across the Faculty of Engineering. It is sponsored internally by Climate-KIC, the Energy Futures Lab, and the Grantham Institute for Climate Change.

—LUCY HANDFORD,
COMMUNICATIONS AND
PUBLIC AFFAIRS



Breaking barriers

A weekend of talks, workshops and panel sessions took place at the College last month, aimed at inspiring young men aged 16 to 24.

Supported by Imperial's Equality and Diversity Unit and held at South Kensington Campus, the student conference was organised by the Amos Bursary, which supports young men of British African and Caribbean heritage from schools and sixth form colleges in London.

The Amos Bursary helps students with gaining entry into university, ensuring they achieve their potential educationally and professionally. As well as financial assistance, the scheme facilitates access to a range of opportunities including internships, work



experience and networking.

Every young person has a peer and professional mentor to support and guide them.

Currently seven members of Imperial staff and one postgraduate

student volunteer as mentors, many of whom heard about the charity through Imperial as One, the College's diversity forum. Two mentors, Dr Mark Richards (Physics) and Dr Sunday Popo-Ola (Civil and Environmental Engineering), spoke at the event, giving the students an insight into life as an academic.

Amos Bursary graduate Richard Butler recently completed a BSc in Economics at Coventry University: "The Amos Bursary really supported me, pushing me forward to achieve my goals at university. I've already secured a job and I'd love to keep in contact with the Amos Bursary and become a peer mentor in the future."

—LUCY HANDFORD, COMMUNICATIONS AND PUBLIC AFFAIRS

"The Amos Bursary really supported me, pushing me forward to achieve my goals"

A date with sustainability

Phoenix dactylifera, or the date palm tree, is perhaps best known for its fruit but, as growers in the United Arab Emirates (UAE) have known for thousands of years, its leaves can also be used in construction.

A collaborative project involving Imperial, UAE, Buro Happold Consultants and architect Sandra Piesik of 3 Ideas Ltd is now looking at expanding the use of the leaves as a renewable, low-carbon building material.

On 5 June, His Highness Sheikh Mohammed Bin Maktoum Al Maktoum, First Secretary of the UAE Embassy, visited the Structures Laboratories in the Department of Civil and Environmental Engineering where the innovative work is being carried out.



Known for his keen interest in evidence-based eco-technology, His Highness observed testing of palm leaf structures using rigs normally applied to steel.

Dr Sunday Popo-Ola (Civil and Environmental Engineering), who is leading the work, said: "This is the first opportunity to evaluate the structural characteristics of the date palm leaf material and determine its structural performance. These properties can then be used to invent modern, more ambitious versions of traditional palm leaf structures".

His Highness noted that scientific testing on the leaves could influence date palm leaf industries in the UAE, as well as in other countries in the region.

Demonstration projects are now being planned, the first of which is likely to be a food shelter, where a large-spanned palm leaf structure could offer weather protection for harvests in countries where the logistics of food storage are critical for food security.

long
service

Staff featured in this column have given many years of service to the College. Staff listed below celebrate anniversaries during the period 1 July-30 August. The data is supplied by HR and is correct at the time of going to press.

20 years

- Mrs Fereshteh Afshari, Team Leader: Strategy and Innovation Support Services, Library Services
- Dr Sally Power, Reader in Ecosystems Ecology, Division of Ecology and Evolution

30 years

- Dr Michael Coppins, Reader in Physics, Department of Physics
- Mr Roland Hutchins, Main Aeronautics Workshop Supervisor, Department of Aeronautics
- Mr Herbert Lewis, Mechanical Supervisor, Estates Division
- Mrs Susan Jackson, Secretary to Head of IT Services, Information and Communication Technologies

SPOTLIGHT

Susan Jackson, Secretary to Head of IT Services, ICT

30 years



I started at Imperial as a 22-year-old and worked in the Department of Chemistry for two years, followed by another two years at the Department of Computing, before finally coming to ICT, where I've been for 26 years. Before email everything was hand typed in memo form and, if urgent, had to be hand delivered to other departments. I have seen a vast amount of change – some for the better and some for the worse. Back in the day, technology used to fill a whole room, now I need my glasses to see it! My father worked here before me, so I have been coming to the College since 1966. I have enjoyed working at Imperial and have some happy memories.

Research students present best of Imperial science

A new method to scan the brains of unborn babies, a surgical robot controlled by gestures and a 'magic' theory of gravity were just a few fascinating research projects on display at this year's Graduate School Summer Research Symposium.

Over 100 students were nominated by their departments to participate in a poster presentation competition in the Great Hall on Friday 12 July, where they gave a two-minute 'elevator pitch' to three judges.

With scores awarded for content, visual impact, design and public engagement, Andrea Marongiu (National Heart and Lung Institute) emerged as the overall winner for his plan to study the cardiorespiratory effects of arc welding in shipyards.



"It's not often we get this opportunity to look at the entire breadth of research being carried out here"

Andrea, a second year PhD student, said: "Being able to communicate science in a simple manner that's accessible to all is easier said than done. If we get wrapped up in our own little world of research, we



run the risk of becoming alienated from the lives of those whom we set out to help with our research in the first place."

Presenting the prizes for the winning and highly commended posters, the Director of the Grad-

uate School, Professor Andrew George, mentioned that several of the judges had told him how much they had enjoyed the event and that it had shown them something new about the College.

"It's not often we get this opportunity to look across the entire College at the breadth of research being carried out here," Andrew said.

Andrew also presented Mr Ebrahim Mohammed (Business School) with the Graduate School Director's Award for Professional Skills Training recognising his outstanding contribution to and support for the professional skills training programme.

The day concluded with a keynote lecture by Professor Lord Winston, holder of the College's first Chair in Science and Society, entitled *Why bother with science communication?*

Welcome new starters

Mr Dennis Affram, NHLI
 Dr Mohammed Afsar, Mathematics
 Miss Resha Al Rabeh, Medicine
 Dr Neza Alfazema, Clinical Sciences
 Mr Ryan Armstrong, Security Services
 Dr Ali Awan, Bioengineering
 Miss Leman Aydemir, Faculty of Engineering
 Mr Sunit Bagree, Public Health
 Mr Ioannis Bakolis, Public Health
 Mr Evgeny Barkhudarov, Physics
 Miss Nicole Barnes, Faculty of Medicine
 Ms Nisha Barot, Registry
 Professor Facundo Batista, Medicine
 Mr Sergey Belyakov, Materials
 Miss Victoria Bemmer, Materials
 Mr Adam Bernard, Surgery and Cancer
 Mrs Iveta Biriukove, Catering Services
 Miss Cynthia Bishop, Medicine
 Mr Gavin Blake, Accommodation
 Dr Julie Borgel, Clinical Sciences
 Ms Julie Bourguignon, Business School
 Mrs Hanna Box, NHLI
 Dr Valeria Branciforti, Faculty of Engineering
 Mr Andrew Brand, Mechanical Engineering
 Dr Michael Brown, Chemistry
 Miss Laura Brown, Faculty of Medicine
 Dr Alfredo Camara, Civil and Environmental Engineering
 Miss Sandra Charlemagne, Finance
 Mr David Charles, Life Sciences
 Dr Ciro Chiappini, Materials
 Dr James Cole, Medicine
 Miss Silvia Colicino, NHLI
 Mr Nick Collis, Business School
 Dr Alessia David, Life Sciences
 Dr Rachel Davis, Surgery and Cancer
 Mr David Davis, Public Health
 Miss Diana De Freitas Batista, Faculty of Engineering
 Mr Fabian Denner, Mechanical Engineering
 Mr Nikolaos Dangelakis, Chemical Engineering
 Dr Anne Ducout, Physics
 Miss Zoe Durrant, Registry
 Miss Sarah Faux, Graduate School
 Mrs Katherine Fletcher, NHLI
 Mrs Maureen Francis, Surgery and Cancer
 Dr Anton Gabrienko, Chemical Engineering
 Dr Ranjani Ganji, Life Sciences
 Dr Benjamin Garfield, NHLI
 Dr Carole Garnier, ESE
 Mr Amit Gautam, Medicine
 Miss Katrin Glatzel, Centre for Environmental Policy

Dr John Grasvik, Chemistry
 Ms Christine Greig, Clinical Science
 Mr Matthew Hadrill, School of Professional Development
 Dr James Hall, Chemistry
 Dr Adam Hampshire, Medicine
 Mrs Ania Henley, Surgery and Cancer
 Dr Yonek Hleba, Life Sciences
 Miss Rebecca Holmes, Surgery and Cancer
 Ms Suzanne Hoy, Catering Services
 Dr Yilin Huo, NHLI
 Dr Carl Jacquemyn, ESE
 Mrs Fatama Jagne, EYEC
 Mr Timothy Jefferson, Chemistry
 Mr Jun Jiang, Materials
 Mr Thomas Joseph, Computing
 Professor Georgios Kassiotis, Medicine
 Dr Oliver Keown, Surgery and Cancer
 Miss Marion Koch, Medicine
 Dr Marianna Kyritsi, Surgery and Cancer
 Mr Sebastian Lambert, Life Sciences
 Mr Mark Lancaster, Communications and Public Affairs
 Ms Maria Leal Sanchez, Public Health
 Dr Victor Lesk, Surgery and Cancer
 Mr Simin Li, Bioengineering
 Professor Jonathon Lloyd, Life Sciences
 Mr Jason Long, Medicine
 Miss María Lopez Heras, Materials
 Mr Andrew Lovell, Medicine
 Dr Li Lu, Materials
 Dr Yunxia Lu, Public Health
 Dr Robert Mahen, Physics
 Mr Thirukumaran Maheswaran, Accommodation
 Dr Julian Marchesi, Surgery and Cancer
 Ms Aino-Maija Maskuniitty, Chemistry
 Dr Lawrence Mitchell, Computing
 Dr Julia Morales Sanfrutos, Chemistry
 Dr David Morley, Public Health
 Mr Samuel Mugodza, Faculty of Engineering
 Dr Ummezeinab Mulla, Public Health
 Miss Alexandra Myers-Thomson, Estates
 Dr Saira Naeem, Materials
 Mr Charles Nash, Public Health
 Ms Ruth Nicholson, Faculty of Medicine
 Mr Patrick O'Driscoll, EEE
 Dr Daniel O'Keefe, Computing
 Mr Michael O'Shea, Accommodation
 Dr David Palomas Dona, Chemistry
 Dr Samraat Pawar, Life Sciences
 Miss Amanda Payne-Danson, Business School
 Dr Inma Perez Dorado, Life Sciences
 Mr Fotis Petrou, Surgery and Cancer

Mr David Pitman, Physics
 Mrs Tina Prendeville, Surgery and Cancer
 Dr Lucio Raimondo, Aeronautics
 Dr Paul Randell, Medicine
 Miss Heather Reeves, Surgery and Cancer
 Ms Sophie Ridewood, Life Sciences
 Mr Rob Robson, Human Resources
 Dr Ursula Rodgers, NHLI
 Mr Diogo Rodrigues Feleciano, NHLI
 Mr Pablo Salinas, ESE
 Professor Patrick Serruys, NHLI
 Dr Igor Shevchenko, Mathematics
 Dr Matthew Siggins, Medicine
 Ms Anna Skorecka, Bioengineering
 Mr Ian Smallman, Physics
 Miss Anita Solanke, Accommodation
 Dr Arash Soleiman Fallah, Materials
 Dr Dimitrios Stampoulis, Medicine
 Ms Sian Stanfield, Library
 Miss Claire Streatfield, Medicine
 Dr Sinbad Sweeney, NHLI
 Mr Marco Thiene, Aeronautics
 Mr Anthony Thomas, Public Health
 Professor Thomas Thum, NHLI
 Ms Tanya Tomic, ICT
 Dr Jonathan Underwood, Medicine
 Dr Jennifer Vail, Mechanical Engineering
 Mr Georgios Vamvakas, NHLI
 Mr Rajagopal Vellingiri, Chemical Engineering
 Mr Peter Wilcox, Estates Division
 Professor Ian Wilson, Surgery and Cancer
 Ms Eleanor Wilson, Public Health
 Dr Poonam Yadav, Computing
 Miss Jenna Yates, Medicine
 Mr Hao Ye, Civil and Environmental Engineering
 Miss Joanna Young, Life Sciences
 Dr Shu Yow, Aeronautics
 Miss Katharina Zeissler, Physics
 Mr Jie Zhang, Mechanical Engineering
 Dr Xiaowei Zhao, EEE

Farewell moving on

Dr Harith Alam, NHLI
 Ms Keren Alleyne, ICT (6 years)
 Sir Roy Anderson, Public Health (19 years)
 Ms Carolyn Andrews, Medicine (14 years)
 Mr Alistair Appleby, Educational Quality Office
 Miss Monique Arthur, Human Resources
 Mr Nabil Asif, ICT
 Ms Rebecca Atkinson, Medicine
 Dr Anna-Karin Axelsson, Materials (6 years)
 Dr Elena Barquero, Public Health
 Dr Ivano Benedetti, Aeronautics
 Miss Abigail Bentley, NHLI
 Mr Stephen Blake, Business School

Dr Greg Brooke, Surgery and Cancer (8 years)
 Dr James Buckley, NHLI
 Dr Sarah Burl, Medicine
 Dr Ailsa Butler, Public Health
 Miss Pimphen Charoen, Public Health (5 years)
 Ms Emma Chesterman, Communications and Public Affairs (7 years)
 Dr Tim Cockerill, Centre for Environmental Policy (5 years)
 Dr Nicola Combe, Faculty of Engineering
 Dr Marcello Contestabile, Centre for Environmental Policy (9 years)
 Dr Karina Corware, Medicine
 Ms Alenah Da Costa, Sport and Leisure
 Dr Maria Dawson, NHLI
 Miss Claire Dempster, Mechanical Engineering
 Mr Jon Downing, Materials
 Mr Alexander Dugdale, Catering Services (6 years)
 Mrs Dagmar Durham, Materials (5 years)
 Miss Sophia Eglin, Faculty of Medicine
 Dr Davide Fabozzi, Chemical Engineering
 Dr Zheng Fan, Mechanical Engineering (6 years)
 Miss Zsófia Feltóti, Medicine
 Dr Marion Ferrat, ESE
 Dr Lin Fou, Grantham Institute
 Dr Elizabeth Gardner, NHLI
 Dr Moustafa Ghanem, Computing (13 years)
 Miss Charlotte Graham, Medicine
 Dr Li Guo, Computing (6 years)
 Dr Rory Hadden, Mechanical Engineering
 Dr Gareth Hall, Physics (6 years)
 Dr Heather Harrington, Life Sciences
 Dr Lucy Heinemann, NHLI
 Mr Kevin Hochstenbach, Medicine
 Dr Emmalina Hollis, Chemistry
 Dr Matthew Hughes, Chemistry
 Ms Robina Ibanda, Public Health
 Mrs Imogene Inge, Archives and Corporate Records
 Mr Xavier Jeanbourquin, Chemistry
 Dr Andrea Jimenez Dalmaroni, Life Sciences
 Dr Beril Kavukcuoglu, Materials
 Dr Dmitry Kovrizhin, Mathematics
 Dr Yiannis Kyratsis, Medicine
 Dr Dominic Lee, Chemistry
 Dr Jared Leisner, Physics
 Mr Lianbo Li, EEE
 Ms Jingjing Li, Humanities
 Dr Guangquan Li, Public Health
 Mrs Yanzhi Liu, Civil and Environmental Engineering
 Mr Jean-Eloi Lombard, Aeronautics
 Dr Katharine Looker, Public Health
 Mr Richard Lorch, Grantham Institute (6 years)
 Dr Boris Maciejovsky, Business School
 Dr Karine Macritchie, Medicine

Miss Kalliopi Makarona, Medicine
 Ms Luise Marino, Medicine
 Dr Silvia Martin Almedina, NHLI
 Dr Patricia Melo, Civil and Environmental Engineering
 Dr Mayur Mistry, Chemistry
 Dr Sachiko Miyata, Life Sciences
 Miss Katherine Mudge, Medicine
 Ms Sarah Nolas, Life Sciences
 Dr Niamh O'Sullivan, Medicine
 Ms Natalia Palasz, NHLI
 Dr Ariel Poliandri, Surgery and Cancer (6 years)
 Miss Lisa Pomfrett, Registry
 Dr Lee Potiphar, NHLI
 Mr Joe Prinold, Bioengineering
 Dr Hui Qian, Aeronautics
 Dr Kristof Raemdonck, NHLI (8 years)
 Dr Daniel Ramirez Cano, Surgery and Cancer (6 years)
 Dr Benoit Raymond, Life Sciences
 Ms Melanie Sanderson, ICT (9 years)
 Miss Gurpreet Sehra, NHLI
 Mr Rajandeep Singh, International Office
 Dr Weihua Song, NHLI (6 years)
 Dr Roberta Spaccapelo, Life Sciences
 Miss Luxumi Sridharan, NHLI
 Dr Rebecca Stephenson, Public Health (5 years)
 Ms Julianna Stylianou, Medicine (5 years)
 Dr Lee Tan, Medicine (5 years)
 Miss Stephanie Tapply, Business School
 Dr Jakub Trzebinski, EEE
 Ms Danielle Wagner, NHLI
 Dr Baojun Wang, Mathematics
 Dr Andrea Weisse, Bioengineering
 Mrs Theresa White, Catering Services
 Miss Suzanne Williams, NHLI
 Dr Poonam Yadav, Computing
 Mrs Jing Yang, EYEC
 Professor Allan Young, Medicine

retirements

Professor Paul Farrell, Medicine (17 years)
 Dr Patricia Ndhlovu, Medicine
 Dr Peter Slootweg, Physics (13 years)
 Mrs Anne Travis, Finance (31 years)

This data is supplied by HR and covers the period 18 June–15 July. 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.



12 SEPTEMBER ▶ PUBLIC LECTURE

What makes me 'me'?

As plans for the Imperial West campus evolve, come to the site and meet some of our doctors, scientists and engineers to find out things you never knew about yourself. Explore how our researchers are working

together to unlock the secrets of the human body and improve your life. The first in the 2013–14 Fringe programme, this free public event at Wood Lane Studios and ThinkSpace is all about you!



23–27 SEPTEMBER ▶ PUBLIC LECTURE

Research in motion

Join groundbreaking researchers from Imperial for thought-provoking demos while you munch your lunch. As part of the Royal Borough of Kensington and Chelsea's Celebration of Science week, the College's brain

boxes will be taking to the street on Imperial's pop-up tricycle to dazzle and amaze you from 12.00–14.00 each day from 23–27 September. For a full schedule of where to find them and what they will be doing see: www.imperial.ac.uk/festival/fringe

12 SEPTEMBER ▶ PUBLIC LECTURE

The scientist in an adventure with rocks, oil, water and volcanoes

Professor Matt Jackson (Earth Science and Engineering)

23 SEPTEMBER ▶ PUBLIC LECTURE

TEDxAlbortopolis

How art and science fit together in the modern world.

12 SEPTEMBER ▶ PUBLIC LECTURE

Science Uncovered

Imperial research returns to the Natural History Museum

take note

Call for award nominations

Nominations are invited for the 2013 Julia Higgins Medal and Awards, which recognise individuals and departments that have made a significant contribution to the support of academic women at the College.



Download the nomination form from bit.ly/1c9orTa and submit by 30 September 2013 to Professor Dot Griffiths, Chair of the Academic Opportunities Committee: d.griffiths@imperial.ac.uk

MEET THE READER



Herbert Lewis, Mechanical Supervisor, Estates Facilities

What are you doing in the picture?

Just browsing *Reporter* in the mechanical workshop, where I've been in and around for 30 years now after starting out as an apprentice. It's here where we keep the College infrastructure ticking over 24/7, be it electrics, plumbing or gas – you name it. I also coordinate contractual suppliers to the College. We've had air conditioning experts in this week to make sure we're all cool!

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

If I were editor for the day I would appeal to schools to come and have a look at all the possibilities of a career at Imperial, whether that's in research, teaching, administration, electrical, mechanical or management. There are so many aspects of Imperial that make it tick.

Who would be your cover star?

My main operational manager Chas Guirey (Head of Maintenance). He runs the complete estate, not just South Kensington but the hospitals too.



PHOTO EXPO

Exposat, showing at the Blyth Gallery until 13 September, is a series of artworks and photographs exploring perceptions of space and time. Shown left is Stephen Greenwood's Dragon – a fantasy sculpture made from forged mild steel. In the background, Sam McKenney's chainmail shirt is a reconstruction based on a tenth-century Anglo-Saxon and Viking design composed of approximately 20,000 8mm spring steel links, weighing 9.3kg. Simon Bastians' print meanwhile shows how the way we perceive things is influenced by light, medium, time and preconceptions of what we expect to see.

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

