



# A new space race

Following the first ever comet landing, hear about some of Imperial's other space-related activities

... PAGE 2 AND CENTRE PAGES



**SENSATIONAL**  
Imperial team  
nets award  
in Sensing  
XCHALLENGE  
PAGE 2



**SAGE ADVICE**  
A look at the  
role of the  
College Consuls  
PAGE 10



**WAR WEARY**  
Care for  
amputees  
across a century  
PAGE 11



EDITOR'S CORNER

## Defining moment

I was 14 when the comet Hale Bopp streaked across the sky in 1997 – the most dramatic celestial event seen unaided for a generation. To think that less than 20 years on engineers and scientists landed a probe on a similar comet (opposite page), albeit a slightly slower and smaller one, almost defies belief. I wonder what the Egyptians and other ancient peoples who saw comets as *divine messengers* might have thought?

As the intense media coverage has shown, space exploration is important to the public as a way of *defining our humanity* and inspiring the next generation. There's also the chance that missions like these might lead to unexpected and tangible *benefits here on Earth*. It's already been suggested that the supremely powerful sensors on board the Philae craft might be used for breath tests to detect stomach ulcers linked to cancer. In this issue we take a look at some examples of Imperial 'SpaceLab' research that is having an impact in other sectors (centre pages).

ANDREW CZYZEWSKI, EDITOR

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

Contact Andrew Czyzewski: [reporter@imperial.ac.uk](mailto:reporter@imperial.ac.uk)

## Micro-machining laboratory opened



A £4 million mini-factory for developing the next generation of miniaturised medical devices and robots was officially opened at Imperial last week by President Alice Gast and Dr Lesley Thompson, Director of the Engineering and Physical Sciences Research Council (EPSRC).

The EPSRC Micro-Machining Facility for Medical Robotics will be led by Professor Guang-Zhong Yang, Director of the Hamlyn Centre. The new Facility will provide a national hub for academia and industry in the UK for

developing a range of miniaturised surgical robotics to improve the diagnosis of diseases, minimally invasive procedures and drug therapies for patients.

Professor Guang-Zhong Yang said: "At Imperial we are already in the process of developing a range of miniaturised medical robots and smart surgical devices that improve the way patients in the UK are cared for. Thanks to the foresight of the EPSRC, this new Facility will speed up and improve development and production processes not only for the Hamlyn staff but also for researchers across the College and at other institutions."

To develop miniaturised surgical robotic devices in the past, researchers at the College had to undergo a prolonged and costly design and construction process that involved getting parts made off-campus by a range of suppliers, which could take weeks and often months. The new Facility brings the entire construction process in-house, which could cut development time down significantly.

It will house advanced 3D printers for making components down to the nano-scale, imaging technology that will enable the researchers to see in real-time the tiny components they are working on and a micro-machine assembly line.

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS

## Health device propels Imperial team to international success

An Imperial team has won a distinguished award in a global competition and received \$120,000 prize money after creating a device that analyses the body's sounds to detect illnesses.

The GUES team from the Department of Electrical and Electronic Engineering were one of five runners up in the \$2.25m XPRIZE Nokia Sensing XCHALLENGE, and were the only UK based team. The international competition aimed to develop breakthrough high impact medical sensing technologies that will ultimately enable faster diagnoses and easier personal health monitoring. The winners were announced last week in Los Angeles, where the team had flown to take part in the finals.

The researchers have developed a wearable,



The Imperial GUES team (in white t-shirts, from left to right): Guangwei Chen, Esther Rodriguez-Villegas, Syed Anas Imtiaz

wireless device, the approximate size of a pound coin, which sticks onto a person's neck or chest to detect sounds emanating from the heart and respiratory system. AcuPebble uses advanced algorithms to sift through a range of sounds to determine parameters that may indicate deteriorating health or illness in patients.

Team leader Dr Esther Rodriguez-Villegas said: "The response to AcuPebble has been absolutely overwhelming. We've had people writing to us from the five continents, telling us how much they love the technology. This competition has shown us just how important it is to get AcuPebble into the market as quickly as possible, where it will have the most benefit to society. We can't wait to get started on the next steps to make this a reality."

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## Global energy cooperation needs urgent reform, say researchers



China and other developing nations must play a larger role in global energy governance, according to senior UK, Chinese and US energy experts.

A committee, led by Lord Browne of Madingley in the UK, along

with senior Chinese and US experts called for world leaders at the G20 summit in Brisbane on 15 and 16 November to commit to energy governance reform that is more inclusive of developing nations.

Their statement is underpinned by research carried out at the Grantham Institute at Imperial, together with China's Energy Research Institute (ERI) of the National Development and Reform Commission (NDRC).

Energy policy experts at these two institutions have published a report, "Global Energy Governance Reform and China's Participation", alongside the committee's statement.

Neil Hirst, Senior Policy Fellow at the Grantham Institute and head of the project in the UK, says: "It is vital to get the main players round the table to tackle the critical issues of climate change and energy supply that we are facing. Energy governance reform is key to this and the G20 now has a critical opportunity to give top level direction. The participation of senior Chinese figures in today's statement is a significant development, which shows that the door is open."

The committee highlights the challenges of global energy policy set out in the Grantham Institute/ERI report. In particular, it focuses on the need to increase the supply of energy services to support rising living standards and poverty eradication, the need to address critical issues of climate change and pollution, and the need to maintain energy security.

—NATASHA MARTINEAU, COMMUNICATIONS AND PUBLIC AFFAIRS

### in brief

#### Alumni US trip

Last month saw Professor David Gann (Vice President, Development and Innovation) lead an Imperial delegation to California, USA to solidify the strong community of Imperial alumni in the state. The team hosted two alumni receptions - one in Los Angeles and one at PARC, the headquarters of Xerox. They also met with a number of potential collaborators from industry and explored development opportunities.

#### Well in

Work has begun on drilling and constructing a water well in Princes Gardens to investigate the potential use of a natural aquifer underneath the South Kensington Campus. The aquifer, a saturated layer of chalk approximately 70m below ground, could be used by the College as an additional water supply for irrigation and also for sustainable ground source heating and cooling. Once the water well is complete, it will be used to pump out groundwater for a series of tests.

#### Big plans

The College's plans for The Michael Uren Biomedical Engineering Research Hub at Imperial West will be on display at a public exhibition on Thursday 20 November (15.00–20.00) and Friday 21 November (13.00–17.00) at the Community Hall, Shinfield Street, W12. The unprecedented £40m gift from Michael Uren OBE and his Foundation announced in May will help support the construction of the Hub, and will be designed by architects Allies & Morrison.

## Rosetta gears up for comet's dramatic solar approach

The Imperial designed plasma instrument on board the Rosetta spacecraft is getting ready to measure the increased activity of comet 67P as it approaches the Sun, following the successful landing operation of its daughter craft.

On Saturday 15 November, the Philae lander went into hibernation after a challenging and somewhat bouncy landing mission gathering data on 67P. While not directly involved in Philae, the Imperial-led Rosetta Plasma Consortium (RPC) set of instruments did prove important in the nail-biting descent, as principal investigator Chris Carr (Physics) explains.

"Our magnetometer sensor on the Rosetta orbiter, which measures the magnetic field around the comet, could be compared with the magnetometer sensor on Philae," he said. "In the end this information turned out to be really crucial to diagnosing the final orientation of the lander, since the two magnetometers were used like compasses to understand the rotation and pointing direction of Philae."

Rosetta and the RPC specifically will now investigate the plasma environment around the comet, and how this interacts

with the solar wind – the charged particles that constantly stream from the Sun. The comet's plasma derives from vaporised volatile compounds that are ionised by solar ultraviolet radiation. The plasma density will increase as it makes its approach.

"As the comet comes closer to the Sun, the science gets more and more interesting from a plasma point of view. However, we've already started to see some unexpected data, for example low-frequency waves of around 40 millihertz in the magnetic field, which we can't explain at present."

The Rosetta orbiter mission will continue until the comet reaches its perihelion – its closest point to the Sun – in August next year. The RPC team will test their prediction that the comet's ionosphere environment eventually deflects the solar wind.



An image taken by Rosetta of the comet's plasma



"Drones can be very beneficial for humanity – for example in search and rescue or delivery of blood supplies in remote areas."

DR MIRKO KOVAC DISCUSSES THE RECENTLY ANNOUNCED BRAHMAL VASUDEVAN AERIAL ROBOTICS LAB IN AN IMPERIAL PODCAST INTERVIEW [IMPERIAL.AC.UK/MEDIA/PODCASTS](http://IMPERIAL.AC.UK/MEDIA/PODCASTS)

## Imperial champions women's leadership

Imperial celebrated the successes of women in science and business at an event held on Tuesday 4 November.



Titled Women's Leadership in Entrepreneurial and STEMM cultures, the event brought together high achieving women from across the higher education, business and the public sectors to share their personal career journeys.

Aiming to stimulate discussion about how to encourage female leadership, the event was organised by Karen Makuch (Centre for Environmental Policy), Lecturer in Environmental Law and Ambassador for Women in the Faculty of Natural Sciences.

Imperial's Provost Professor James Stirling opened the event, saying: "At Imperial we are committed to the Athena SWAN programme – with all departments either holding awards or with applications in progress. New initiatives to promote, support and celebrate women in science are springing up all the time. These collectively impact on the culture of our institution, and make the College a place which appreciates and nurtures talent, regardless of gender."

Baroness Jolly, Life Peer in the House of Lords and Government Whip, discussed the importance of levelling the playing field for the UK economy. Norma Jarboe OBE, founder and Director of Women Count, presented the findings of the organisation's recent Leaders in Higher Education report. It showed that a fifth of university boards are now considered gender balanced, with women making up only 17% of UK Vice Chancellors and just 12% of university chairs.

Imperial's President Professor Alice Gast brought the presentations to a close by sharing her thoughts on what could be done to increase women in STEMM. This included boosting collaboration, increasing the number of female role models, providing inspiring mentors, recognising the success and achievements of women scientists and ensuring access to funding.

## Prize-winning student innovators set to make a difference



Overall winners, ZymeDeal were presented with certificates and a cheque for £1000 in personal prize money.

**The winning teams for the Faculty of Natural Sciences' Make-a-Difference Impact Challenge Competition have been announced, with an idea for preserving milk and fruit juices at room temperature scooping the overall prize.**

The competition, running for the first time this year, challenged all undergraduates in the Faculty of Natural Sciences to harness their creativity to develop solutions that could bring real benefits, under the theme 'healthcare and well-being'.

The top three teams (see panel, right) were decided by the judges in June and were given access to facilities to develop their project to a proof-of-concept stage over eight weeks in the summer – each student receiving a bursary of £1,500 to cover their costs.

At an event on 28 October, the three teams presented their projects to an audience of judges comprising Lord Robert Winston, Professor of Science and Society at Imperial; Professor Sir John Pendry (Physics), Chair in Theoretical Solid State Physics; and Professor Lesley Yellowlees, Vice-Principal and Head of the College of Science and Engineering at the University of Edinburgh.

Jiawen Dou (Life Sciences), ZymeDeal team member, said: "The product we've designed will hopefully be of benefit to potential users – but perhaps more importantly it really helped us develop as a team of innovators and I think we grew with each challenge we overcame whilst working on it. I would recommend that students participate in competitions such as FoNS-MAD. You can meet new friends, develop

team working and presentation skills and lots more."

Competition organiser Professor Ramón Vilar (Chemistry) said: "It has been a real pleasure to see the three finalist teams develop their projects throughout the year. They have shown great creativity, hard work and enthusiasm to tackle problems that may ultimately benefit society."

Professor Maggie Dallman, Dean of the Faculty Natural Sciences, who launched the event, said: "The three finalist teams have demonstrated the incredible capacity, drive and ability that our students have to solve challenging problems."

Following the success of this year's event, the Faculty has confirmed that the competition will run again next year, with the launch event being held in January 2015.

For more information on the contest and how to enter visit: [imperial.ac.uk/impactchallengecompetition](http://imperial.ac.uk/impactchallengecompetition)

### The winning teams

#### ZymeDeal

Jiawen Dou, Evelyn Liu, Sijia Yu and Qiyun Zhong devised a natural, low-cost method for preserving beverages like milk and fruit juices at room temperature by developing an enzyme coated polymer that can be used in long-term storage.

#### FunGu(Y)s

Tim Pauwels and Vasily Shenshin came up with a new design for an air displacement micropipette – routinely used across all areas of bioscience research – which is less prone to errors and demands less force from users' fingers and hands, in theory decreasing the risk of repetitive strain injury when used for long periods.

#### BioMilk

Alan Chang, Timothy Yin Ho Hui, Tin Shing Lee and Xin Zhan employed synthetic biology techniques on a project to create a milk substitute to provide a lactose-free milk option to the public. The core objective of their project was to make milk affordable and readily accessible to everyone.

## media mentions



### Craft lessons 'vital' for next generation

THE TIMES ▶ 10.11.2014

Pastimes such as knitting and jewellery-making are enjoying a resurgence, with a booming market in craft materials and homemade gifts. Yet the trend has not been mirrored in our schools – the number sitting craft-related GCSEs has fallen by 25 per cent in six years. Now academics have warned of the disastrous impact it could have on British industries. An Imperial surgeon has also emphasised the importance of craft in his profession. Professor Roger Kneebone (Surgery and Cancer) told *The Times*: "Of course you need a lot of scientific knowledge but you can cram your head full of facts more quickly than you can acquire the skills of a craft. The craft element is sometimes undervalued, and the gradual acquisition of its mastery."

### How to navigate an academic career

NATURE JOBS ▶ 29.10.2014

As a PhD student or postdoc, in thrall to lab work and grant applications, it can be easy to forget that pursuing an academic career is seldom solely about the research, with a breadth of opportunities available. Dr Anita Hall (Life Sciences) has a teaching-only position as a senior fellow at Imperial. Her responsibilities include course design, teaching, assessment and giving careers advice. Writing in *Nature Jobs*, Hall says she appreciates the rewarding nature of teaching, and says that, in terms of work/life balance, "teaching is much more liberating" than research".

### Misleading advice for egg freezing

THE TIMES ▶ 28.10.2014

Lord Robert Winston (Professor of Science and Society at Imperial) writes in an open letter to *The Times* that recent advice by the American Society for Reproductive Medicine that women 'Freeze eggs early if [they] want to delay babies'

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is likely to mislead. "Women need to be aware that this does not appear to be a secure technology," he writes. "In the UK just over 2,600 women have a total of more than 20,000 eggs frozen. Of these women 243 have had one cycle or more of egg thawing and IVF; only 21 have achieved a pregnancy. The chance of success, even when young women freeze their eggs, appears to be well under 10 per cent."

### Illegal drugs could show way to better psychiatric meds

THE INDEPENDENT ▶ 12.11.2014

Studying potential positive effects of recreational drugs on mental wellbeing could help to unblock the logjam preventing much-needed psychiatric medicines from being developed, according to a former Government drugs tsar Professor David Nutt (Medicine). There is a crisis in the drug-discovery pipeline for mental health but one way of helping would be to collate the personal experiences of the many people who regularly use drugs on a recreational basis, he says in *The Independent*. "The drugs that we need to ease the burden of mental illness could be out there – we just need to look," he says.

## awards and honours

### COLLEGE Sport Imperial scheme gets Euro award



Imperial's gofit and One Big Thing challenge have been recognised as an example of best practice by the European Network of Academic Sport Services (ENAS). The scheme, aimed to increase the well-being and physical activity of staff and students by encouraging them to increase the number of minutes spent on

physical activity each week. This information was then recorded with the gofit fitness trackers allowing users to track their efforts. This culminated in the One Big Thing '5k anyway' event in Hyde Park which saw staff and students take part in a 5k fun run. Neil Mosley, Head of Sport Imperial, collected the award at the ENAS Annual Conference in France earlier this month.

### ENGINEERING Student synthetic biology prize

A water filter made from a by-product of herbal tea has helped a student team come second in an international synthetic biology competition. The team of undergraduates from Imperial competed against 220

teams from universities around the world at the International Genetically Engineered Machine (iGEM) competition, held in Boston, USA. They were given a kit of biological parts including harmless bacteria and cells. Working at the College over the summer, the team used the parts to design and build a new type of membrane able to remove more than 99.9 per cent of nickel from a concentrated nickel solution of 30,000 parts per million, using less energy than conventional systems.



## Smart material virtually eliminates arsenic from drinking water

Scientists have created a new material that can remove double the amount of arsenic from water than the leading material for water treatment.

Arsenic is a toxic element found naturally in groundwater. Long-term exposure over a number of years to elevated concentrations of arsenate, the chemical form of arsenic in water, is associated with debilitating, and potentially fatal, illnesses including cancer, heart and lung disease, gastrointestinal problems and neurological disorders.

Scientists at Imperial have designed, tested and patented a new zinc-based material that can selectively bind to arsenate with strong affinity. The scientists hope this material could ultimately be used to improve the quality of

domestic water filters and reduce the amount of arsenic that people are exposed to, in areas with known or suspected high arsenic content.

Lead researcher Chris Moffat (Earth Science and Engineering) said: "Our material has such high affinity that it is able to remove and 'mop up' the arsenic even when concentration levels are low. We hope that it could one day be easily added to water filters to make sure that when you pour a glass of water it is the cleanest it can possibly be, allowing you to control your arsenic exposure at home."

The team point out that the work is at a very early stage and the estimated material costs per unit are higher than the current available materials. But when manufactured to scale they hope that given the efficiency of their technology, less material will be needed, making it price competitive,

and possibly cheaper than existing products.

With funding from the Natural Environment Research Council (NERC) the team hopes to develop a mass market application for the sorbent.

—GAIL WILSON, COMMUNICATIONS AND PUBLIC AFFAIRS

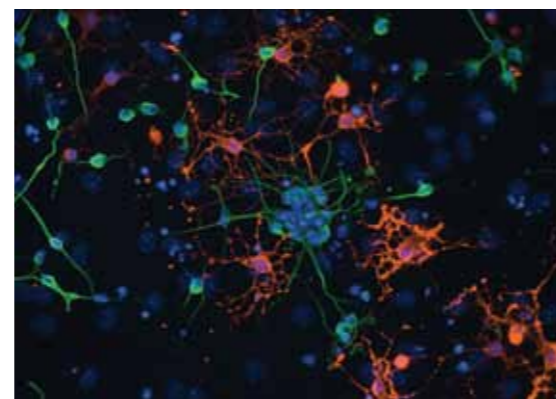
### QUICK FACTS

More than **200 million** people worldwide are unknowingly exposed to unsafe levels of arsenic in drinking water



### The chemistry

Adsorption, a process where atoms, ions, or entire molecules attach to a surface, is the most widely used method for removing arsenic from drinking water. Existing adsorbents, however, are not always selective in what they remove – by attaching lots of other chemicals in addition to arsenic, they can become clogged, saturated and ultimately inefficient. The researchers found a zinc-based chemical receptor attached to a 'bead-like' structure called HypoGel™ resin (allowing suspension in water samples) was highly selective and efficient in binding arsenate in a mixed test solution. In fact the Zinc-HypoGel resin had significantly greater affinity to arsenate than currently used sorbents – particularly at pH values typically found in limestone aquifers used for drinking water.



## Vital new insight into how we produce new brain cells

Researchers have identified a key mechanism in the birth of new brain cells, with implications for treating brain injury and diseases.

Neurogenesis is the process by which new brain cells are generated. It is known that the initial steps of neurogenesis involve neural stem cells dividing and specialising, but exactly how this is initiated and controlled is unclear.

The new study has revealed a crucial mechanism that keeps stem cells in a dormant state, preventing them from dividing or specialising. The hope is that if this mechanism can be blocked by medication then it could allow neural stem cells to develop into new neurons, providing a possible way to replace or repair damaged brain cells caused by brain injury, stroke or neurodegenerative diseases such as dementia.

Lead author Dr Simona Parrinello (Institute of Clinical Science) said: "Until about 25 years ago it was assumed that we only possess the neurons that we are born with, but the discovery that

neurogenesis continues into adulthood has opened up a very exciting area of research with important clinical implications.

"Neurogenesis is a bit like a production line, where neural stem cells become activated

to proliferate and specialise and then migrate to different regions of the brain where they become mature functional neurons," said Dr Parrinello.

The fate of neural stem cells is strongly influenced by their surrounding micro-environment. For the first time, the researchers revealed an inhibitory process that occurs when stem cells are in contact with blood vessels, driven by two proteins in the lining of the vessels – ephrinB2 and Jagged1.

The team say that agents that block the activity of these proteins represent prime candidates for therapy, especially since the blood vessels are more accessible for intervention.

—FRANCESCA DAVENPORT, COMMUNICATIONS AND PUBLIC AFFAIRS

### QUICK FACTS

There are around **86 billion** neurons in the human brain

## Engineers demonstrate how heat can transmit data

Prototype technology that uses bursts of heat to transmit information over short distances has been developed by a team of engineers.

The researchers have created a low-cost, wireless communications technology that exploits black-body radiation in the infrared heat spectrum, which is currently used for thermal imaging.

This part of the spectral range is currently underused, and the team behind the technology believe it could provide a new form of secure communication that could be concealed in background noise, making it harder to intercept or jam using conventional technology.

The prototype consists of a transmitter with miniature incandescent light bulbs that emit bursts of heat in patterns that encode information. This data is picked up by a receiver that filters out external interference to detect the information



in the thermal infrared spectrum as it is transmitted and is then decoded by a silicon chip.

The researchers believe that their prototype device could improve technologies such as wireless door entry systems so that information can be sent more securely to other devices in the future.

Inventor Dr Stepan Lucyszyn (Electrical and Electronic Engineering) said: "Code grabbing is a major problem for wireless door entry systems. For example, thieves are currently able to intercept information wirelessly transmitted from your key fob to your car's door entry system, which they can then use later on to break into your car when it is left unattended. One potential application for our technology could see the

development of a new type of key fob for cars that transmits data via bursts of infrared heat, which would be much harder to intercept by crooks."

The next step will see the researchers upgrading the hardware so that it can transmit information at faster speeds over longer distances. Following that the team plan to integrate the technology into one complete system, which will be miniaturised into handheld applications like smart phones or door entry smart key fobs.

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS



**Ships in the night**  
Wireless ship-to-ship communication was introduced by the Royal British Navy in 1867, which saw sailors using oil lamps to transmit signals using heat at the visual part of the spectrum. Today, NATO forces still use signal lamps, which emit heat at the near-infrared part of the spectrum, when radio communications have to be silent. However, these communications need to occur at night for them to be effective, and users employ infrared telescopes to receive information.

## Low birth rates bring economic benefits

Moderately lower birth rates can actually improve broader standards of living, according to a new global study.

In wealthy countries, including the UK, couples are having fewer babies or none at all, leading to widespread concern about ageing populations, declining tax revenues, higher spending on pensions and healthcare, and possible economic decline.

The UK has a moderately low birth rate, 1.88 births per woman, which is considered to be a little below the replacement rate of two children per woman.

Some governments tend to favour higher birth rates; however, researchers from Imperial College Business School found that when public and private costs are taken into account, a moderately low birth rate can improve the overall standard of living, especially in wealthier countries.

The team correlated birth rates for 40



### QUICK FACTS

**698,512** babies were born in the UK in 2013, down from **729,674** in 2012.

countries with economic data from the National Transfer Accounts project, which measures how people at each age produce, consume, and share resources and save for their future.

According to the study, published in the journal *Science*, a moderately low birth rate enables the families in wealthier countries to maintain their standard of living, even with an ageing population. The researchers explain that even if countries have to raise their taxes to pay for an increasingly older population, it is far less of an expense on the nation's wealth

than if people had to fund larger families, which ultimately costs the nation more.

Professor James Sefton (Business School) co-author of the report said: "Our study demonstrates that the UK's birth rate is actually just about right to foster overall prosperity. I hope the relevant governments will focus more on targeting policies to accommodate an ageing population rather than on encouraging people to have more children."

—MAXINE MYERS, COMMUNICATIONS AND PUBLIC AFFAIRS

# The new space race

The private and government-backed UK space sector is set to quadruple in size by 2030 and Imperial is aiming to get in on the action



Artist's impression of the Philae daughter craft that launched from Rosetta and landed on comet 67P

Some people would have you believe that the pioneering spirit that put a man on the moon in 1969 has been lost in the past half century. Although piloted-missions have proved prohibitively costly and dangerous, you could conversely argue that we're in a golden age of discovery – for example uncovering amazing and possibly life-harboring worlds such as Saturn's moon Enceladus and most recently chasing down, then landing on, comet 67P (all while zipping along at a cool 135,000 kilometres per hour).

Both these respective missions, Cassini and Rosetta, have had key experiments and technology build and designed here at Imperial. Indeed, the College has one of the largest and longest running space 'harbours' in the UK – dating back to Imperial's involvement in the Ariel satellite missions of the late 1960s.

Traditionally though, the College's space research groups have tended to operate quite independently – dispersed across a number of departments. But with the £9 billion UK space sector projected to grow to £40bn by 2030,

spearheaded by the UK Space Agency, there's a need for more collaboration both internally and externally.

That's the thinking behind the Imperial SpaceLab, now in its second year, which gathers 140 researchers across all three faculties and the Business School.

Director of the SpaceLab Professor Steve Schwartz (Physics) says: "The space research that we carry out is partly about the wonder of space and understanding the universe, but it also brings benefits here on Earth. When scientists, engineers, industry and government collaborate on space research great things can happen from weather forecasting and GPS navigation to medical diagnosis.

"SpaceLab is about reaching out across different academic departments and scientific disciplines, as well as industry, to come together, do something different and see what wider impacts our research might have."

→ We take a look at three SpaceLab researchers making an impact.

## Health Tips from Zero-G

Working at the interface between medicine and space is Dr Richard Abel, Lecturer in Musculoskeletal Sciences in the Department of Surgery and Cancer. Having gained a PhD in palaeontology and comparative anatomy of monkeys before working in the mineralogy department at the Natural History Museum, Richard is accustomed to crossing boundaries.

Around a year ago he became interested in physiological conditions that afflict astronauts who spend several months at a time in the weightlessness of space – namely bone degradation similar to osteoporosis on Earth and eye and vision problems with parallels to glaucoma.

"Once you start to understand some of the mechanisms that lead to illness in astronauts, or lead to illness on Earth, you can extrapolate across and work out what's really going on in both –

revealing the bigger picture."

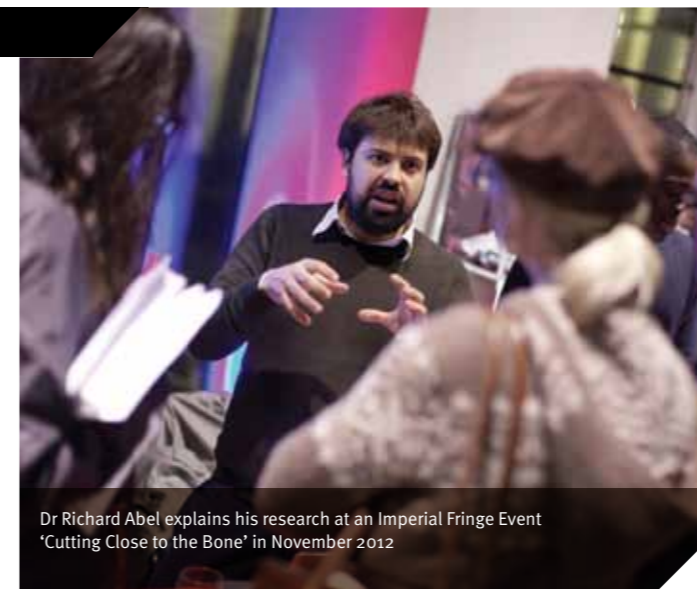
Osteoporosis is chiefly caused by diminishing sex hormones, which are required for bone maintenance. Conversely, bone weakness in astronauts is chiefly caused by lack of impact-based exercise and loading.

"We know that somehow, loading works in concert with the sex hormones to maintain bone, but we don't quite understand how. Engineers, if they want to understand how a system works, they will remove or break it part of it. Studying astronauts' bones presents that opportunity because they cannot exercise with impact, only resistance."

Richard is also looking at glaucoma, a condition caused by a build-up of pressure inside the eye, disturbing the optic nerve and in some cases leading to vision loss. Something similar can happen to astronauts who spend time in space but as a result of pressure decreases.

Working in collaboration with researchers at Georgia Institute of Technology in the USA, Richard has been performing high resolution CT scans of donated eyes whilst subjecting them to different levels of internal pressure in a special experimental set-up at the Diamond Light Source Facility in Oxfordshire.

Ultimately they are aiming to build up a dynamic three-dimensional computational model of a key part of the eye, which will help them to develop new diagnostic tools and treatments for terrestrial and extra-terrestrial diseases.



Dr Richard Abel explains his research at an Imperial Fringe Event 'Cutting Close to the Bone' in November 2012

## Market Insight ... from space

One exciting new area of SpaceLab research that cuts across the Faculty of Engineering, the Business School and Grantham Institute for Climate Change is led by Dr Enrico Biffis (Business School) – an economist who specialises in risk management and insurance. In recent years he and his team became interested in how the increasing occurrence of extreme weather and climate events poses a global threat to various economic sectors such as energy, transport and food production.

"From an economic point of view, when there is a big hurricane or flood for example, it's very important to have a quick estimate of what the losses might be because there's a lot of insured value that is supported by limited capital or securitised and hence people try to trade out with hedging instruments."

There are two main aspects to Enrico's team's work: one is to better understand the market repercussions of extreme weather in real time as events unfold and the other is to model future events in order to understand how certain mitigation strategies might for example make crop yields more resilient.

However, most current sources of data simply are not accurate enough in terms of either spatial resolution or frequency to be put to good use for the rigours of economic modelling. Enrico's team is investigating how integration of different data sources – geostationary space satellites, orbiting satellites and ground-based meteorological stations – can achieve better predictive models.

Those models will also help when it comes to changing practices and procedures in an effort to protect against future shocks.

"Of course you can't talk to every farmer, but by teaming up with producers you can provide the right incentives using the price of insurance as a way of convincing farming cooperatives to adopt new technology, change seeds or use different areas for cultivation. That can create a lot of value and resilience in the market. But you need good information to do it."



## Busting fraud with supernovae

While the previous two academics featured were examples of non-physicists finding new avenues in space research or uses for space data, Dr Roberto Trotta (Physics) is a cosmologist through and through. One of his research areas focuses on supernovae – specifically how studying these stellar explosions can help map the expansion of the universe.

"We use them as signposts, to work out how the expansion of the universe changes with time. That in turn is influenced by what the Universe contains," explains Roberto. "The ever increasing rate of expansion suggests that three quarters of the Universe is made of a mysterious form of energy, called dark energy."

The real challenge is in interpreting the vast quantity of data, and in discerning whether certain patterns represent something cosmologically interesting and 'real' – or just background noise.

Roberto is now applying analysis methods used for supernovae to the detection of fraud in the consumer banking industry, flagging up when customers' details might be being used nefariously.

"There is a great variability in consumer behaviour, and most transactions are perfectly fine. But if you haven't seen



"The challenge for us... is to make sure that the outside world perceives us as being at the forefront of data science challenges..."

a certain activity before how do you classify it? How do you pool your knowledge from other types of transactions in order to say something about that particular one for that customer at that time – and react quickly; you can't mull it over for days!"

With funding from an EPSRC/ STFC impact acceleration grant, Roberto is now conducting a pilot study with a start-up company working with a major bank. It is sensitive work that requires patience, but it could be the start of something bigger.

"I think the challenge for us at Imperial and the SpaceLab is to make sure that the outside world perceives us as being at the forefront of data science challenges, because if you are a potential customer in the banking sector, insurance, shipping or energy, you wouldn't necessarily dream of coming to an astrophysicist for help. So we need to be on the map and that takes time."

Comet 67P is around 4km across and travelling at 135,000km/h

# Sage advice: shedding light on the role of Imperial's Consuls

Consuls, formerly known as Deans, are elected by professors, readers and senior lecturers from three Faculty constituencies to represent the views of the College's academic community.

The three constituencies comprise of the Faculty of Engineering and the Imperial College Business School; the Faculty of Natural Sciences and the Centre for Co-Curricular Studies and the Faculty of Medicine.

Professor Richard Thompson, who is based in the Department of Physics, serves as Senior College Consul, following three years as a Consul for the Faculty of Natural Sciences and Centre for Co-Curricular studies.

We caught up with him to find out more about the role of Consuls at the College.

## What is a Consul?

Consuls essentially act as spokespeople for Imperial's academic community. We are elected by Faculty constituencies, and work to complement and broaden the expertise of senior College management by lending the perspective of teaching and research staff. Consuls deliberately sit outside of the usual management structure to enable us to speak freely and provide impartial and independent viewpoints on a range of issues.

## What kinds of activities are the Consuls involved in?

It's a bit of a mixed bag! Much of what we do involves ensuring that academic standards of excellence are upheld consistently across the College. For instance we serve as members of academic promotion and recruitment panels to ensure that things are handled fairly across all



6 of the 7 College consuls (see index) with Professor Stephen Richardson Associate Provost (Institutional Affairs)

Faculties and that appropriate processes are followed. Consuls are trusted to act fairly and with integrity, and we are often parachuted in to help with tasks that require impartial judgement, such as disciplinary issues or student appeals.

## What does your new role as Senior Consul entail?

It's not substantially different to that of my fellow Consuls, actually! I'm here to serve in a representative function for the group as a whole when required, but am involved in much the same activities as the others.

## Why did you decide to put yourself forward for the role of Consul?

I was attracted to the prospect of doing something that would make a difference at the

College, and which would bring real benefits to both staff and students. The role also offered a unique insight into the way that the College as a whole operates. As well as being incredibly interesting, this provides a useful perspective to take back to my own research and teaching work. It is an enormous privilege, and very affirming, to be trusted by my colleagues to represent them in this way.

## What aspect of the role do you enjoy most?

I find contributing to academic promotion panels particularly fulfilling. It is a decision that has the potential to change a person's future, and having a hand in that – especially when it leads to a positive outcome – is extremely rewarding.

—DEBORAH EVANSON, COMMUNICATIONS AND PUBLIC AFFAIRS

## COLLEGE CONSULS

### SHOWN IN MAIN IMAGE (L TO R):

Faculty of Medicine (clinical):  
Professor Desmond Johnston

Faculty of Natural Sciences and  
Centre for Co-Curricular Studies:  
Professor John Seddon

Faculty of Medicine (non-clinical):  
Professor Myra McClure

Senior Consul: Professor  
Richard Thompson

Faculty of Natural Sciences and  
Centre for Co-Curricular Studies:  
Professor Andrew Parry

Faculty of Engineering and  
Business School: Professor  
Peter Lindstedt

### NOT SHOWN IN MAIN IMAGE:



Faculty of Engineering  
and Business School:  
Professor Richard  
Jardine

# inside\* story

## mini profile

## Michele Dougherty

Professor Michele Dougherty is leading missions to Saturn and Jupiter and has recently been awarded a prestigious Research Professorship by the Royal Society.

### How did you come to work in space physics?

I never thought I'd end up in this field because I didn't do science at school – I went to an all-girls' school in South Africa and it wasn't usual for girls to do Physics in those days. But I was quite good at Maths and so I persuaded the university to let me do a BSc. When I came to Imperial, a few years after finishing my PhD, I was asked to spend a little bit of time putting a magnetic field model together to look at Jupiter and eventually took over as Principal Investigator on the magnetometer instrument on Cassini.

### What have been the best moments of your career so far?

There are two, both linked to the Cassini mission. The first was when we all went to the Jet Propulsion Lab in California to watch the spacecraft when it first went into orbit around Saturn, six and a half years after it had launched. The second was discovering an atmosphere on one of Saturn's moons. Observations from



two flybys suggested an atmosphere but we weren't sure. So on the next flyby we persuaded the project team to take the spacecraft really close, at 170km away from the moon's surface. I watched the data coming back with my heart in my mouth because if we had messed up no one would have ever believed me again!

### What are you looking forward to doing over the ten years of your Royal Society Professorship?

I am looking forward to having the time to do research, although I love teaching. I think the scariest thing I ever do is teach 250 undergraduates, but I will miss it. Cassini has another three years to run, and then the spacecraft will burn up in the atmosphere of Saturn. We'll get really close and be able to measure the internal planetary field, something that we don't yet understand.

—LAURA GALLAGHER, COMMUNICATIONS AND PUBLIC AFFAIRS

## The ongoing pain of war

With recent military campaigns in Iraq and Afghanistan, we've become acquainted with the terrible consequences of war – brought into stark focus with the number of amputee veterans of those conflicts.



It was a similar picture a hundred years ago, in the First World War – but on a far larger scale with 41,000 surviving amputees.

The comparison is highlighted in a paper published in *The Lancet* this month by Dr Emily Mayhew, a medical historian at the College; pain specialist Professor Andrew Rice (Surgery and Cancer); and army surgeon Major Dafydd Edwards, also a researcher at the Royal British Legion Centre for Blast Injury Studies at Imperial.

The researchers delved into the archives of the same journal to explore how amputation-related pain was understood and treated by surgeons on the Western Front.

"Although surgeons worked very hard to understand and resolve the chronic pain problems that many amputee patients faced, they really weren't able to get to grips with them," Dr Mayhew says.

During the Battle of the Somme in 1916, Marmaduke Sheild, a senior consulting surgeon who treated many military casualties after they returned to England, wrote that post-amputation pain was "a source of intolerable suffering to [his amputee patients], and of despair to those who fit them with artificial limbs." He later called for surgeons not to use the guillotine method, reporting that it left nerves exposed, causing both stump pain and poor prosthetic fit.

Today, instead of resorting to amputation in the first instance, surgeons use a technique called debridement to remove soft tissue, preserving as much of the limb as possible. Surgeons are part of a multidisciplinary team involving specialists in pain medicine and rehabilitation.

There was very little discussion in the archives pertaining to the pain that amputees felt in their missing limbs – known as phantom limb pain – possibly because surgeons were helpless to do anything about it.

The condition is now understood to be a consequence of how the nervous system adapts to damaged nerves and the loss of a limb, and affects around 59 per cent of amputees. However, it is still poorly understood and difficult to manage.

Major Edwards said: "Even now, we're not entirely sure what the right answer is. There isn't one answer for everyone; it's a tailor-made modality of treatment for each casualty. That's a long departure from 100 years ago, where the chronic pain of amputation was almost brushed under the carpet."

—SAM WONG, COMMUNICATIONS AND PUBLIC AFFAIRS



Stretcher bearers carry a wounded man through the mud at Passchendaele, August 1917

## Re-righting wheelchair technology developed by students



Students demonstrate their solution to re-right wheelchairs after a crash

Anyone who has seen wheelchair basketball and rugby will know how fast, exciting and furious it can be. Now a new assistive technology developed by students from Imperial could increase the tempo even more by enabling players to re-right their wheelchair after a crash, thereby minimising stoppages.

In wheelchair basketball and wheelchair rugby, players can crash into one another and tip over

onto the floor. Players are strapped into the wheelchair and often have the ability to move it into a frontal position, but find it difficult to push the wheelchair upright because of the way these wheelchairs are currently designed. This means that games have to be stopped while assistants run onto the court to help the players upright their chairs, which is time consuming.

The Imperial team has developed a device that enables players to push their

wheelchairs into an upright position. They have augmented the front bumper section of a sports wheelchair and inserted a metal wheel with rubber casing and a clutch mechanism into the frame. This provides a lockable pivot point between the wheelchair's bumper and the floor so that a player can push themselves up from the floor and re-right the chair and resume playing.

The students have already trialled their augmented sports wheelchair with members of the London Titans wheelchair basketball team.

The Imperial team consists of Jacqueline Beddoe-Rosendo, Bianca de Blasi and Simone Castagno. This project is part of the five-year Rio Tinto Sports Innovation Challenge, now in its third year.

Simone Castagno said: "We want to empower players who compete in wheelchair sports, so that they don't have to rely on others to get them upright and back in the game. Ultimately, we hope to see our device being used by sportspeople in the near future."

To speed up the process, as a philanthropic gesture, the team is approaching manufacturers of sports wheelchairs and offering their technology for free.

—COLIN SMITH, COMMUNICATIONS AND PUBLIC AFFAIRS

See a video demonstration of the technology: [bit.ly/pivottech](http://bit.ly/pivottech)

## Bitcoin competition launched for students

Digital currency is arguably one of most rapidly growing and potentially revolutionary technologies out there. While aspects are still shrouded in controversy, there's undoubtedly a genuine opportunity to create new, more open business models. Now, thanks to a new partnership at the College, developing new forms of bitcoin technology will be the focus of a student competition.

Bitcoin is a type of digital currency which does not rely on a bank's central server to process payments, and that uses encryption technology to help prevent fraud. According to Ebay CEO John Donahoe, Bitcoins and other digital currencies will play

an increasingly important role in internet payment platforms.

Imperial College Business School, in partnership with Entrepreneur First (EF) – a pre-seed investment programme – has established the Imperial/EF Bitcoin Prize Fund for students. The aim of the Fund is to encourage innovation in the field of blockchains – used to describe technologies such as bitcoin. Blockchain technology allows secure digital transactions without any central authority.

Students from across the College, including those studying computing, engineering and business, can apply to carry out projects under the Imperial/EF Bitcoin Prize Fund either as part of

a group or individually. The projects will count towards credits for degree courses, and the best projects will win cash awards of up to £3,000. Grants of up to £500 will also be awarded to students to purchase equipment used in the projects.

Researchers from a range of departments at Imperial have formed the Imperial Bitcoin Forum (IBF), which will work alongside EF to provide mentoring and education to students who carry out the projects.

Dr Llewellyn Thomas, a researcher in the Innovation and Entrepreneurship group at the Business School, said: "We're in



an era of change and we're all aware of the digital world that is around us. Bitcoins are just one of a new wave of innovations

that could have an impact on our daily lives. The Imperial/EF Bitcoin Prize Fund hopes to tap into the full potential of these technologies by giving students the opportunity to explore and innovate in the field of blockchains."

—MAXINE MYERS, COMMUNICATIONS AND PUBLIC AFFAIRS

Listen to an interview with Dr Llewellyn Thomas here: [bit.ly/impcoz](http://bit.ly/impcoz) and for more info on the prize visit: [imperial.ac.uk/bitcoin/prizes](http://imperial.ac.uk/bitcoin/prizes)

## School meals made healthier with new planning tool

An innovative free school meals planner developed at Imperial is improving the nutritional intake of millions of school children.

The tool supports the planning of nutritionally balanced and fully costed school meals using locally available food.

Developed by Imperial's Partnership for Child Development (PCD) and trialled by the Ghana School Feeding Programme, the School Meals Planner was unveiled at the Global Child Nutrition Forum 2014 in October.

"Creating a nutritionally balanced school menu using local ingredients is not an easy thing to do, especially when you are working within a tight budget," said Dr Lesley Drake, Executive Director of the PCD at Imperial. "This is doubly true when the children relying on your school meals are from communities where food insecurity is high and malnutrition and anaemia are common conditions."

The tool, which is available both online and offline, employs gingerbread men to show visually if a meal is meeting the recommended daily intake of nutrients as identified by the UN's Food and Agriculture Organisation and the World Health Organisation.

By linking local market prices for the ingredients, the planner shows the user the actual cost of each meal. With this information, programme managers are able to create accurate and realistic school meal budgets.

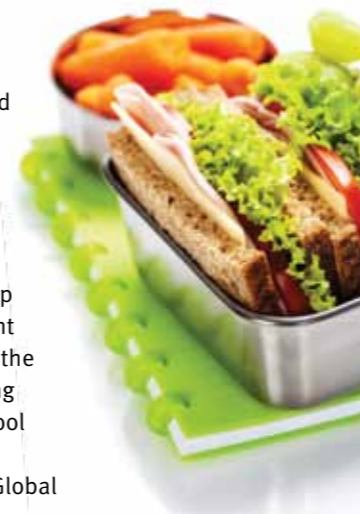
The school meals planner also works as an information source for smallholder farmers, so they know what foods to supply to schools, and as an educational resource for schools to teach children about healthy eating.

The Ghana School Feeding Programme is using the tool to plan meals for some of the 1.6 million schoolchildren fed by the programme every school day.

Victoria Kuma-Mintah, from the Ghana School Feeding Programme, said: "One of the strengths of PCD's meal planner is that it allows us to select nutritious local dishes using local ingredients which we know our farmers are producing."

Following the success of the School Meals Planner in Ghana, the tool will be rolled out in other countries to ensure that millions more children are able to enjoy healthy and nutritious hot school meals.

—FRANCIS PEEL, SCHOOL OF PUBLIC HEALTH



## Local school students turn science buskers at Imperial

More than thirty school students gathered in the Wohl Reach Out Lab last month to show off their science skills to the Imperial community.

In sessions led by Imperial Physics alumnus and science-performer Neil Monteiro, Year 7 students from Westminster Academy were tasked with coming up with posters and performances to demonstrate scientific concepts in an engaging way. The students then put these to the test in an hour of 'science busking' attended by Imperial staff and students.

The science busking activity forms part of a new long-term engagement programme with Westminster Academy and its primary feeder schools, funded by College alumnus and Westminster Academy sponsor David Dangoor.

The programme will fund 30 days of activity in the Wohl Reach Out Lab for the school each year for the next five years and will involve students across all year-groups – from the school's associated primary schools up to its sixth form classes.

Westminster pupil Daniel Goldfeld explained how carbon dioxide extinguishes flames by conducting an experiment using dry-ice (frozen carbon dioxide), water and candles.

Daniel said: "I've had a fantastic time learning about science and thinking about how best to share my new knowledge with other people. I always think that you can achieve anything as long as you try hard enough and today proves that – we've learnt such a lot in a short period of time and now we're teaching others about it!"

Annalisa Alexander, Head of Outreach at Imperial, said: "We are delighted to see how these pupils rose to the challenge of our Science Busking day. The lab has been buzzing with excitement and it was fantastic to hear the groups explaining their experiments to the audience with such eloquence and enthusiasm. The key to most of our work in the Wohl Reach

Out Lab is hands-on practicals; children learn best when they are engaged in and excited by what they see and do."

—DEBORAH EVANSON, COMMUNICATIONS AND PUBLIC AFFAIRS



Students were tasked with coming up with posters and performances to demonstrate scientific concepts

"I've had a fantastic time learning about science and thinking about how best to share my new knowledge with other people."

## Exhibition highlights the history of College homepage

A recent exhibition in the Blyth Gallery looked back over seven years of Imperial's homepage as the College prepares to launch its redesigned website.

The current homepage has been in place since 2007 and has been viewed over 70 million times since then. Having featured almost 1,500 images and more than 870 accompanying pairs of words, the homepage has helped Imperial tell some of its most exciting stories – including cutting-edge research, outstanding student achievements, and important College announcements.

On display in mid-November, two|words: The Life of the College Homepage showcased over 800 of Imperial's past homepage designs.

Peter Gillings, New Media Manager, is responsible for curating the College homepage, working alongside colleagues to find the perfect picture and pair of words for each homepage design.

Peter said: "A lot of thought goes into the design of each homepage. We want to capture the richness of our community and give a true flavour of life at Imperial so we try to feature stories from all corners of the College."

The current homepage will be retired on 8



Some of the 1,500 images and 870 accompanying pairs of words featured on the College homepage since 2007

December as the two-year project to review and redesign Imperial's website begins its roll-out.

Peter added: "The current website



design, including the homepage, has served us well but technology has moved on a lot since 2007. People are now accessing the website from many different kinds of devices – and what works well on a computer won't necessarily be right for a smartphone or a tablet. The new design will be more flexible and responsive – content will move and rearrange on the page to best fit the screen size and device the user is accessing the site from."

—DEBORAH EVANSON, COMMUNICATIONS AND PUBLIC AFFAIRS

Find out more about the Web Redesign Project at: [imperial.ac.uk/webredesign](http://imperial.ac.uk/webredesign)

## obituaries

JOHN WESTCOTT

**John Westcott (Electrical and Electronic Engineering), Emeritus Professor of Control Systems, died on 10 October, shortly before his 94th birthday. His colleague from the Department, Professor David Mayne, pays tribute.**

John's route into academia was a rather unusual one. Having won a university scholarship, he elected, on the advice of his father, to instead serve a five year apprenticeship at the British Thomson Houston Company (BTH), a large electrical company that was active in the Second World War effort. Based at BTH's research laboratory, he worked on Patrick Blackett's magnetometer for detecting submarines and in 1942 was seconded to the Air Defence Research and Development Establishment. Typical of John's self-sufficient and enterprising nature he also completed an external degree in electrical engineering, partly via night school.

After the war, John was awarded a postgraduate scholarship to study at Imperial, completing his

PhD in 1950. That set in motion a whirlwind career with John founding the Control Group and directing large projects on adaptive control, industrial automation, compiler construction and control of the UK economy.

Notably, John was responsible for the College getting its first large computer (a gift from IBM) and he co-founded and headed the Centre for Computing and Automation (a forerunner of the Department of Computing). He also oversaw the introduction of Imperial's first undergraduate course in computing.

John brought a wonderful human dimension to his work. His gentleness, humour, and affinity for people were great assets. His personal qualities were reinforced by his happy family life and by the love, support and encouragement of his wife Helen Fay and his children Gill, Nick and Tom.

He will be missed, both as a leader and innovator, and as a gentle and wise friend. His legacy remains a source of strength to the group he founded, and the Departments in which he worked.



## Welcome new starters

Ms Idil Ahmed, Medicine  
Mr Alireza Ahrabian, EEE  
Dr Nadav Amdursky, Materials  
Dr Martin Archer, Physics  
Mrs Neha Arora, Life Sciences  
Dr Paloma Arroyo Huidobro, Physics  
Dr Edouard Auvinet, Surgery & Cancer  
Mr Paul Balcombe, Chemical Engineering  
Mr James Balloch, Registry  
Mr James Bannock, Chemistry  
Mrs Valerie Barber, Development  
Dr Martin Barrere Cambrun, Computing  
Ms Daniella Bedeau, Sport and Leisure  
Dr Sean Bello, NHLI  
Dr Kevin Blighe, Surgery & Cancer  
Dr Stuart Bogatko, Materials  
Mr David Boldrin, Physics  
Dr Julius Bonart, Mathematics  
Mr Rodrigo Braga, Medicine  
Mr Mads Brevadt, Surgery & Cancer  
Miss Catriona Briggs, EYEC  
Miss Emily Brooke, Materials  
Miss Lucy Brooks, Medicine  
Miss Ellen Busink, Public Health  
Miss Catherine Carter, Registry  
Ms Elif Ceran, EEE  
Ms Irene Chang, Public Health  
Dr Faiza Chowdhury, Medicine  
Mr Grigorios Chrysos, Computing  
Miss Julie Comyn, Public Health  
Miss Naomi Cork, Life Sciences  
Mr Simon Crisp, Finance  
Dr Roxana Danger Mercaderes, Public Health  
Mr Robert Davidson, Chemistry  
Mr Peter Diamond, Public Health  
Ms Jo Donkin, Registry  
Mr Miguel Duran Olivencia, Chemical Engineering  
Mrs Sarah Edwards, NHLI  
Mr Yuval Elani, Chemistry  
Mr Robert Elvin, Medicine  
Mrs Marzena Esposito, Catering Services  
Mr Gazis Evangelos, Centre for Environmental Policy  
Dr Sarah Fadda, Chemical Engineering  
Miss Gala Farooq, Medicine  
Dr Noelia Fernandez-Rivero, Clinical Science  
Dr Frederic Francois, EEE  
Miss Suzanne Fuente, Development  
Dr Paula Gago, ESE  
Dr Fengxia Gao, ESE  
Ms Katherine Goddard, Surgery & Cancer  
Mr Benjamin Goislard De Monsabert, Bioengineering  
Dr Hanney Gonna, NHLI  
Dr Daniel Goodman, EEE  
Dr Alex Grant-Morris, Medicine  
Miss Kerrie Hall, Business School  
Ms Eleanor Harding, Development  
Ms Vinita Hassard, Physics  
Mr Mohammad Hormozi Sheikhtabaghi, Mechanical Engineering  
Miss Emma Jameson, Development  
Mr Cameron Jellett, Chemistry  
Mr Yasin Kadioglu, EEE  
Mr Zak Kadrou, Public Health  
Ms Nicole Kalas, Centre for Environmental Policy  
Dr Eleni Karinou, Medicine

Ms Okdeep Kaur, Medicine  
Mr Dimitrios Kontopoulos, Life Sciences (Silwood Park)  
Mr Tomasz Kostrzewski, Life Sciences  
Miss Larissa Kunstel-Tabet, Mechanical Engineering  
Dr Richard Kwasnicki, Surgery & Cancer  
Miss Myriam Lambelet, ESE  
Miss Josephine Lewis, ICT  
Ms Florence Libert, School of Professional Development  
Dr Nick Linton, NHLI  
Dr Johannes Lischner, Physics  
Dr Victoria Lopez Morales, Computing  
Mr Thomas Luth, EEE  
Mr Andrew MacLachlan, Chemistry  
Dr Gesham Magombedze, Public Health  
Mr Maurizio Marianetti, ICT  
Mr Karundeep Matharu, Computing  
Mr Sam McGarry, Outreach  
Mrs Deborah McKenna, Medicine  
Mr Malcolm McLean, School of Professional Development  
Miss Janet McMahon, Finance  
Miss Nicola McSkeane, International Office  
Miss Celeste Miles, Medicine  
Mr Frank Milthaler, ESE  
Dr Laura Miranda de Amorim, Medicine  
Dr Kate Mitchell, Public Health  
Professor Elias Mossialos, Surgery & Cancer  
Mr David Mountford, Chemistry  
Dr Luis Muñoz Gonzalez, Computing  
Mr Keylor Murillo Moya, School of Professional Development  
Mr Adi Nako, Chemistry  
Miss Sophie Nicod, Medicine  
Miss Philippa Northcott, Catering Services  
Mr Timothy Oates, NHLI  
Mr Neasan O'Neill, Faculty of Engineering  
Mr Juan Ossa Moreno, Civil and Environmental Engineering  
Dr Mikko Pakkanen, Mathematics  
Mrs Harriet Parker-Wright, School of Professional Development  
Miss Bryony Parrish, Centre for Environmental Policy  
Mrs Wendy Pearson, Faculty of Medicine Centre  
Mr Christopher Pinder, Medicine  
Mr Christopher Poll, Materials  
Ms Rachel Power, Careers  
Mrs Chiyoko Pownall, Catering Services  
Miss Franze Progtatzky, Life Sciences  
Ms Emma Rainbow, EEE  
Ms Pooja Raja, Finance  
Miss Vian Rajabzadeh-Heshejin, Public Health  
Mr Karthik Ravichandran, Bioengineering  
Mr Simon Rawstron, Business School  
Ms Randle Roberts, ESE  
Miss Cristina Rodriguez Oitaven, School of Professional Development  
Mr Georgios Rokos, ESE  
Dr John Rowland, Life Sciences  
Mr Alan Sahin, Medicine  
Miss Carlyn Samuel, Life Sciences (Silwood Park)  
Ms Amber Sarna, Faculty of Engineering  
Mr Joseph Shaw, Physics  
Dr Eleanor Sherrard-Smith, Public Health  
Ms Kathryn Shuford, Public Health  
Miss Madalena Simao, Estates Division  
Ms Anna Skordai, Medicine  
Miss Erica Smyth, NHLI  
Mrs Harjeet Sohanpal, Estates Division  
Dr Qilei Song, Chemical Engineering

Mr Karol Stepien, Aeronautics  
Mr Thomas Stork, Business School  
Mr Graham Stutter, Physics  
Dr Hiromu Tanaka, Mathematics  
Mr Jose Teixeira Monteiro, Outreach  
Mr Thayne Thanthawarithsai, EEE  
Mr Tong Tong, Computing  
Dr John Townend, NHLI  
Miss Alice Tsai, Surgery & Cancer  
Miss Junjuda Unruangsri, Chemistry  
Miss Valerie Vaissier, Physics  
Miss Marta Vazquez Lopez, Surgery & Cancer  
Miss Emanuela Vinci, ESE  
Professor Richard Vinter, EEE  
Dr Cameron Weber, Chemistry  
Dr Margot Wenzel, Chemistry  
Mr Ian Williams, EEE  
Mr Bjorn Witt, Physics  
Miss Shulin Yan, Computing  
Dr Jie Yu, Chemical Engineering

## Farewell moving on

Miss Samanta Adomaviciute, Public Health  
Dr Ricardo Aguas, Public Health  
Miss Katie Archer, Business School  
Miss Azadeh Bahrami, Chemistry  
Dr Clare Bakewell, Chemistry  
Dr Consuelo Barroso Gutierrez, Clinical Science  
Dr Roy Behnke, Life Sciences (Silwood Park)  
Mr Mate Car, Public Health  
Mr Giles Carlin, ICT (9 years)  
Miss Mahalia Chambers, Accommodation  
Mr Alan Cheung, Sport and Leisure  
Dr Alexandros Chremos, Chemical Engineering  
Dr Antony Constantinou, Life Sciences (6 years)  
Mr Nicola De Laurentis, Mechanical Engineering  
Mr Ajaya Dhungana, Catering Services  
Ms Joanne Donkin, Aeronautics  
Miss Catherine Edlin, Business School  
Mrs Sarah Edwards, NHLI  
Ms Nabila Ezziane, Catering Services (5 years)  
Ms Judy Fernandes, Public Health  
Mr Simon Funke, ESE  
Miss Frankie Galati, Business School  
Dr Panayiotis Georgiou, Bioengineering  
Professor Frances Gotch, Medicine (6 years)  
Mr Henry Gregor, Public Health  
Professor Jana Gronow, Centre for Environmental Policy  
Mr Marcel Guenther, Computing  
Dr Philipp Hack, Mechanical Engineering  
Dr James Hall, Chemical Engineering  
Dr Rola Hallam, Medicine  
Ms Eleanor Harding, Development  
Dr Valentin Heller, Civil and Environmental Engineering  
Mr Philip Hendy, Surgery & Cancer  
Ms Anna Henley, Registry  
Dr Sherine Hermangild Kottoor, NHLI  
Miss Laura Heseltine, School of Professional Development  
Dr Lesley Hoyles, Surgery & Cancer  
Mr Sejal Jiwan, Surgery & Cancer (9 years)  
Mr Gareth Jones, Computing  
Dr Carol Kerven, Life Sciences  
Dr Andrea Kreideweiss, Business School

Mr Frederick Lamptey, Accommodation  
Dr Mara Lawniczak, Life Sciences (7 years)  
Dr Jen Lee, NHLI  
Mr Benjamin Lester, Life Sciences  
Dr Simin Li, Bioengineering  
Dr Xinjie Liu, Mechanical Engineering  
Mr Chris Lord, Development  
Dr Samuel Macaulay, Business School  
Dr Lok Mak, Chemistry (5 years)  
Mr Jowayne Marks, Accommodation  
Dr JP Martin-Flatin, Computing  
Dr Neil McIntyre, Civil and Environmental Engineering  
Dr Parul Mehta, Life Sciences  
Mr Tamas Miklai, Estates Division (6 years)  
Dr Salvinia Mletzko, Medicine (5 years)  
Dr Esther Morel Barcena, Medicine  
Mr George Nolan, Accommodation  
Dr Robin North, Civil and Environmental Engineering (8 years)  
Dr Boris Oklander, EEE  
Miss Oluwadamilola Olaolorun, Accommodation  
Dr Denis O'Sullivan, Surgery & Cancer  
Ms Holly Page, Centre for Environmental Policy  
Dr Beth Pamba, Medicine  
Miss Dora Perenyi, Surgery & Cancer  
Dr Cristina Perez Becerril, Medicine  
Dr Konstantinos Petridis, Physics  
Dr Thomas Pogiatzis, Chemical Engineering  
Mr Tim Reeves, Library (15 years)  
Dr Anna Sroka-Bartnicka, Chemical Engineering  
Mr Simran Sroya, Accommodation  
Miss Franciska Szikszai, Accommodation  
Mrs Lavender Tembo, Medicine  
Mr Frazer Twyman, Surgery & Cancer  
Dr Jana Vandrovцова, Medicine  
Mr Alan Chang, Sport and Leisure (23 years)  
Miss Gail Wilson, Communications and Public Affairs  
Emeritus Professor John Woods CBE, ESE (8 years)  
Ms Josie Worner, Development  
Dr Bao Zhang, Mechanical Engineering

## retirement

Mrs Anna Dowden, Chemical Engineering (30 years)  
Mrs Danuta Mahiouz, NHLI (24 years)

This data is supplied by HR and covers staff joining the College during the period 22 October – 14 November 2014. This data was correct at the time of going to press. For Moving On, visit the online supplement at [www.imperial.ac.uk/reporter](http://www.imperial.ac.uk/reporter)

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

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





20 NOVEMBER, 18.00

## Brain health: it takes more than pills and potions (live-streamed lecture)

Watch this sold-out inaugural lecture live online and learn how the lives of Parkinson's and Alzheimer's patients could be transformed by neurotechnology and new concepts for treatment. Professor Paul Matthews is

Edmond and Lily Safra Chair in Translational Neuroscience and Therapeutics and Head of the Division of Brain Sciences. Watch at [http://bit.ly/brainhealth\\_lecture](http://bit.ly/brainhealth_lecture) and follow on Twitter #brainhealth



10 DECEMBER, 17.30

## How the genomics of TB is changing our view of the human immune system

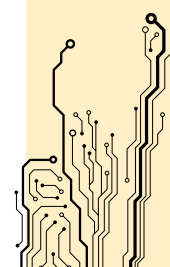
Up to two billion people may be infected with tuberculosis (TB), according to the World Health Organisation. Why are some people able to live unaffected while 1.5 million others die from the disease each year? Professor Anne

O'Garra (National Heart and Lung Institute) uncovers the science of transcriptomics and how our understanding of immunity is evolving with the help of TB bacteria, at her inaugural lecture. Follow on Twitter #TBgenomics

## take note

### Meet funding chief

Researchers are invited to a discussion with the Chief Executive of the Engineering and Physical Science Research Council, Professor Philip Nelson, to explore the opportunities and challenges of working in partnerships on 26 Nov at 11.30, LG Lecture Theatre, Business School. There is also a dedicated session for early career researchers on the same day at 14.30 at seminar room 120, Sir Alexander Fleming Building.



20 NOVEMBER, 18.00

### Biomechanical approach to lymphedema

Hear how engineering can fix the body's plumbing, with Professor James Moore Jr (Bioengineering), at this live streamed lecture from the Lymphatic Education and Research Network

21 NOVEMBER, 19.30

### Bette Davis on the edge

A solo theatre performance by Christine St John, with proceeds supporting liver, digestive and gut health research through the Imperial College Healthcare Charity

22 NOVEMBER, 10.00

### London Climate Forum 2014

Student-led conference, with presentations from the UK's leading climate scientists and analysts, including Professor Sir Brian Hoskins (Grantham Institute)

26 NOVEMBER, 11.30

### Working in partnership: opportunities and challenges

Opportunity for staff to discuss research priorities with Professor Philip Nelson, Chief Executive of Engineering and Physical Sciences Research Council (EPSRC)

24 NOVEMBER, 16.30

### The 100,000 Genomes Project and Genomics England

Dr Clare Turnbull, Institute of Cancer Research, discusses opportunities for researchers to get involved with upcoming genomics projects

26 NOVEMBER, 18.00



### Linking climate science with policy relevance

Professor Jim Skea (Environmental Policy) analyses the policy issues countries face in tackling global climate change, following the recently published IPCC Synthesis report from the UN

27 NOVEMBER – POSTPONED

### Asthma and allergy in Europe

Inaugural lecture of Professor Debbie Jarvis (National Heart and Lung Institute) will be rescheduled, please see website for updates

27 NOVEMBER, 13.00

### Lunchtime concert

Tippett Quartet performs Janacek's String Quartet No 2 'Intimate Letters', with narration

1 DECEMBER, 16.00

### HIV in 2015: on the edge of a revolution?

World AIDS Day discussion with experts Dr Roger Tatoud, Dr Goli Haidari and Lauren Rellis (all Medicine). This Disability Awareness Month event is organised by Able@Imperial and Imperial 600 staff networks

4 DECEMBER, 17.30

### Multi-parametric programming and control

Professor Stratos Pistikopoulos (Chemical Engineering) delivers the twenty first Professor Roger W H Sargent Lecture

10 DECEMBER, 12.30

### Postgraduate Open Day 2014

Information afternoon for anyone considering postgraduate study at Imperial

11 DECEMBER, 17.00

### The beginning of life

Fertility expert Professor Lord Robert Winston delivers the annual children's Christmas demonstration lecture for 11-16 year olds

11 DECEMBER, 17.00

### Festive Fringe 2014

Set your festive spirits alight as Imperial Fringe returns for a seasonal celebration of research. Come partake of hands-on demos, activities and games in the College Main Entrance. Drop in all evening and wet your whistle at the festive Fringe bar

17-30 NOVEMBER, 09.00 – 20.00

### The people who are keeping me alive

A Cancer Research UK portrait exhibition in the College Main Entrance by Rina Dave, a cancer patient, showing the people behind her treatment and support

## MEET THE READER

Kelly Gleason (Surgery and Cancer), Senior Research Nurse



**What are you doing in the picture?** I'm sitting for a portrait photography project called 'The people who are keeping me alive' [see listings to left] devised by a cancer patient of

ours, Rina Dave. She chose sunflowers as a prop after noticing that I often have flowers at my desk. It's very rewarding to help someone realise their creative aspirations, and it's been a delight supporting her.

### What would you do if you were editor of Reporter?

I would turn the spotlight on the research groups that take findings from the lab and turn them into treatments for the clinic. It's so important for clinicians to work closely with scientists on research that matters to patients and to shorten the time it takes to develop new treatments.

### Who would be your cover star?

The research nurses who plan and manage clinical trials. They work so hard to carry out high quality research while keeping patients at the heart of all they do. They are the engine that makes research happen in our AHSC and they are crucial to the success of our clinical research.

Want to be the next reader featured in Reporter? Send in a picture of yourself to: [reporter@imperial.ac.uk](mailto:reporter@imperial.ac.uk)

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