



Roof garden

Plant scientists put their green fingers to work
in London's first GroDome **CENTRE PAGES**



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EDITOR'S CORNER

College cycle

Last week the summer term drew to a close and, before departing, **students blitzed their rooms** of revision notes, unwanted fancy dress outfits and rashly bought CDs (see page 13 for more about end of term recycling). But for the majority of us life at Imperial rolls on and we were reminded of the ongoing cycle when prospective students poured onto the campus for the science and technology Open Day. **As the sun beamed down**, there was excited chatter on the Queen's Lawn where the sixth-formers had time to reflect on the departmental tours that had given them **insight into life** at Imperial. And while they looked curiously around the campus, trying to envisage themselves part of the community here, staff and current students peered back wondering which of these school pupils might have the potential to become Imperial's next award-winning geologists and astrophysicists—helping the College's cycle of excellence to continue.

EMILY ROSS, EDITOR
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📅 *Reporter is published every three weeks during term time in print and online at www.imperial.ac.uk/reporter. The next publication day is 23 July. We welcome contributions from across the College. Please contact Emily Ross: ✉ reporter@imperial.ac.uk ☎ +44 (0)20 7594 6715*

Innovations in healthcare displayed at NHS Expo

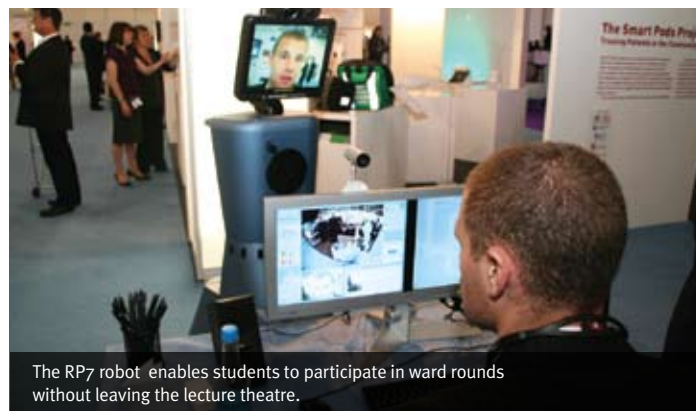
Imagine a hospital with an inflatable operating theatre, a robot that helps doctors perform complex surgery and a device that can be used to take out your gall bladder through your belly button. They might sound like they belong in the film *Back to the Future*, but all of these innovations are available for clinicians to use today and were on display at the national NHS Innovation Expo on 18 and 19 June 2009.

The NHS Innovation Expo, the first of its kind, is the biggest healthcare exhibition in the country and attracted around 6,000 visitors over two days.

Researchers from Imperial's Department of Biosurgery and Surgical Technology and



The inflatable operating theatre can be used to train doctors in different clinical settings.



The RP7 robot enables students to participate in ward rounds without leaving the lecture theatre.

clinicians from Imperial College Healthcare NHS Trust showcased technologies at the event that have been developed at the College and are now being used in clinical practice and education by the Trust and elsewhere in the NHS. Visitors had the chance to try their hand at robotic surgery and engage in simulated procedures, such as removing a gall bladder, removing lipomas and stitching up an arm after surgery.

High-profile speakers at the Expo included Professor Stephen Smith, Principal of the Faculty of Medicine at Imperial College London and Chief Executive of Imperial College Healthcare NHS Trust; Professor

Lord Ara Darzi, also from Imperial; Douglas A. Comstock from NASA, who is responsible for transferring space technology to healthcare; and Lord Drayson, Minister of State for Science and Innovation.

The driver behind all the Imperial research programmes on display at the Expo is to improve patient care and outcomes, which forms part of the vision of the Academic Health Science Centre (AHSC).

— LUCY GOODCHILD, COMMUNICATIONS

📺 To see a video about the Expo including interviews with researchers from Department of Biosurgery and Surgical Technology, visit www.imperial.ac.uk/news/nhs

Green update

Imperial has been ranked 62nd in the People and Planet Green League 2009, a jump from 108th place in 2008. The table, which rates the environmental performance of Britain's universities, was published in the *Times Higher Education* on 18 June.

Dr Neil Varey, Director of Corporate Social Responsibility, said: "It's welcome news that the College's efforts to pursue a green agenda have been recognised but we've got more to do to put Imperial in the lead. Over the coming weeks, display energy certificates (DECs) will be displayed across the majority of College buildings showing their carbon emissions. The low gradings across the board will act as a reminder that we still have some way to go."

The DECs, which are required by EU legislation on reducing carbon emissions, will show the energy performance of buildings

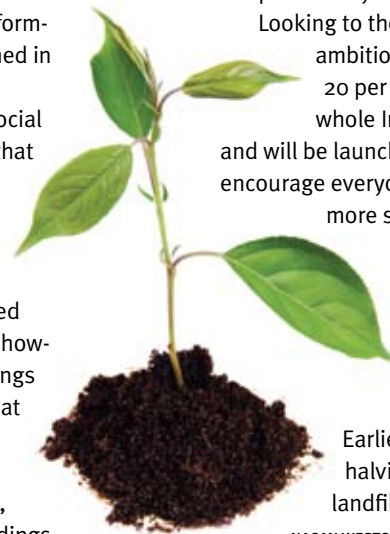
based on their previous energy consumption over a period of up to three years.

Looking to the future, Dr Varey added: "Our next ambition is to reduce carbon emissions by 20 per cent by 2014. We'll need help from the whole Imperial community to achieve this aim and will be launching a campaign later in the year to encourage everyone to help make the College more sustainable."

Over the last three years the College has invested around £7.5 million in green initiatives, which have focused on reducing the use of energy and water, cutting emissions of carbon dioxide and increasing levels of recycling.

Earlier in 2009 the College committed to halving the construction waste it sends to landfill by 2012.

— NAOMI WESTON, COMMUNICATIONS



Success for Imperial in Queen's Birthday Honours



Two Imperial academics, Professor Anne Dell (Life Sciences) and Dr Caroline Shuldham (NHLI), have been recognised in the Queen's Birthday honours 2009. In addition, former Deputy Rector Professor Sir Bill Wakeham received a knighthood.



Professor Dell (pictured top) was awarded a CBE in recognition of her services to science. She joined Imperial in 1975, after completing her PhD at Cambridge. During her time at the College, she has held many senior positions, including heading the Department of Biochemistry, and holding a prestigious BBSRC professorial fellowship in 2001–07.

Professor Dell's research focuses on a sugar-rich layer called the glycocalyx that coats every cell in the human body. These sugars play an important, but not yet fully understood, role in cell-to-cell communication and recognition.

On receiving news of the honour, Professor Dell said: "The scientific output for which I have received recognition would not have been possible without the enormous contributions of my mentor, Professor Howard Morris FRS, and the many gifted researchers in our biopolymer mass spectrometry laboratory."

Dr Caroline Shuldham (pictured bottom) received an OBE for services to healthcare. Dr Shuldham is an Honorary Clinical Senior Lecturer at Imperial and has a background in cardiac and intensive care nursing, nursing education and research. She is also director of nursing, clinical governance and informatics at Royal Brompton and Harefield NHS Foundation Trust, and is a nurse fellow of the European Society of Cardiology.

Commenting on the news, Dr Shuldham said: "I am delighted to have been given this award and for the recognition it confers on Imperial, Royal Brompton and Harefield, and nursing in general."

Professor Sir Bill Wakeham is a Fellow of Imperial and received his knighthood for services to chemical engineering and higher education. He was a member of the College for 30 years, joining the College's Department of Chemical Engineering and Chemical Technology in 1971 and becoming Deputy Rector in 1997. He left the College in 2001.

—DANIELLE REEVES, COMMUNICATIONS

Celebrating innovation in engineering



Dr Genge (right) is presented with his award from Prof. Bill Wakeham, Vice Chancellor of Southampton University

Last month academics and students celebrated innovative approaches to engineering education at the Faculty of Engineering's annual presentation of Awards for Teaching Excellence in Engineering Education.

The Faculty has been putting a renewed focus on teaching and learning activities over recent years as part of its ongoing *EnVision* initiative, which was launched in 2006 and aims to set the benchmark

for excellence in engineering education. As part of *EnVision*, the Faculty is developing new outreach, scholarship and undergraduate programmes.

Dr Matthew Genge (Earth Science and Engineering) was one of the winners. He was recognised for his dedication to his students, exemplified by the extra work he is undertaking to develop a new computer game for undergraduates. Through playing the game students will learn how to examine and map rock outcrops in different virtual environments.

Professor Nilay Shah (Chemical Engineering and Chemical Technology) was also presented with an award at the event held on 16 June. He was recognised for his work as Director of Undergraduate Studies, in which he has recruited new Graduate Teaching Assistants (GTAs) and developed training schemes for them. The GTAs provide extra teaching support for academics and learning support for students.

—COLIN SMITH, COMMUNICATIONS

Engineering podcast

In another show of innovation, last month 12 engineering students put their first podcast online as part of a student-led podcasting initiative, which aims to help students from across the Faculty to develop their communication, teamwork and technical skills. The first podcast includes a story on photovoltaic cells being developed at Imperial to harness more solar energy and accounts of students' experiences of living in developing countries while working on engineering projects.

® The *EnVision* podcast is available to download at: www.imperial.ac.uk/envision/experiences/podcasting. For full details and videos of the award winners visit: www3.imperial.ac.uk/news/innovation

in brief

Cameron visits College

David Cameron, leader of the Conservative Party, visited the South Kensington Campus on 25 June to deliver a speech on the balance of power between the citizen and the state. The event in the Central Library attracted a varied audience of Conservative Party members and Imperial staff and students, who heard Mr Cameron describe Imperial as a university whose innovations "have put real power into people's hands and changed the world".



Green gown awards

A joint initiative between ICT and Finance, which aims to make purchasing and invoicing processes at the College more sustainable, was highly commended at the Green Gown Awards—which recognise best practice in universities and colleges—held at Imperial on 23 June. The project involves reducing the amount of paper used in the Finance Division and using new software to implement online catalogues, web based document storage and electronic invoice exchange.

Imperial tackles infection

Imperial's Centre for Infection Prevention and Management was launched at an event held on 29 June at the Hammersmith Campus. The Centre will look at healthcare-associated infections from a wide range of angles, from exploring the molecular makeup of bacteria to addressing how best to bring about changes in practice across healthcare.

“The current world climate is changing...we don't know exactly how plants will respond to increased temperatures, to changing rainfall, to droughts, to floods as well as to increasing carbon dioxide levels in the atmosphere”

—DR COLIN TURNBALL ON THE GRODOME. SEE PAGES 8–9 FOR THE FULL STORY ON THE GRODOME AND LOG ON TO WWW3.IMPERIAL.AC.UK/COLLEGE/MEDIA/PODCASTS

Imperial College Healthcare NHS Trust

Huge fall in cardiac arrests

Cardiac arrest cases have dramatically decreased at the Trust thanks to training which helps staff recognise early warning signs.

The number of patients experiencing cardiac arrest has fallen by more than 40 per cent and deaths resulting from cardiac arrest have dropped by 15 per cent since the introduction of the Immediate Life Support (ILS) course in 2002.

The in-house training teaches staff to recognise critically ill patients before cardiac arrest occurs and to alert the resuscitation team, so that interventional treatments can be delivered pre-arrest.

Consultant nurse Ken Spearpoint said the course had engendered a shift in attitude and behaviour towards cardiac arrest, which had resulted in a quadrupling of the number of pre-arrest calls received by the resuscitation team.



Cardiac arrest
The sudden loss of cardiac function, when the heart abruptly stops beating

He said: “In the past, nursing staff would feel anxious about calling the crash team to patients not yet in cardiac arrest, as the team used to only provide cardiopulmonary resuscitation (CPR). This is no longer the case—a major part of our role is to prevent the patient’s condition deteriorating.”

The one-day scenario-based course is for all grades of nursing and clinical staff and is accredited by the Resuscitation Council (UK). Participants are trained to make pre-arrest calls if a patient meets at least two of the following criteria:

- Airways potentially blocked
- Breathing abnormally slow or fast
- Circulation abnormally slow or fast with low blood pressure
- Have a disability
- Drowsy or unconscious
- Other general concerns about the patient

—IMPERIAL COLLEGE HEALTHCARE NHS TRUST PRESS OFFICE

Building the next generation of international research facilities

Facilities such as the Large Hadron Collider at CERN in Switzerland and the Joint European Torus in the UK have a role to play, not only in pushing back the frontiers of human knowledge, but in developing the cutting edge science needed to tackle the world’s biggest challenges, such as life-threatening diseases and climate change.

Imperial has been chosen to lead a pilot project on behalf of the European Commission which aims to train a European-wide community of policy makers and research managers by sharing the best practices, as well as the challenges, of planning, funding and running the next generation of international research infrastructures.

Headed by Professor John Wood (International Office), the RAMIRI project (Realising and Managing International Research Infrastructures) will run three conferences in 2009 in London, Grenoble and Hamburg and produce a series of recommendations for the future training of the science policy community. Imperial was chosen to coordinate this project as part of a consortium that includes partners in France, Germany, Italy and the UK.

Professor John Wood, who also chairs the European Research Area Board for the European Commission, explains why RAMIRI is so important:

“It’s very clear to me that the European Union needs to share best practice between the established member states and the new member states in order to maintain Europe’s leading role in supporting innovative scientific research. Research infrastructures, be they large physical structures, such as



The Large Hadron Collider at CERN

nuclear reactors, or ‘virtual’ infrastructures, such as data banks, inevitably require buy-in from a number of countries, and this can be a slow and painful process. At present the decision-making process is too long and places Europe at a disadvantage.

“I’m delighted that the European Commission has recognised the role that Imperial has to play in shaping the future of cutting edge scientific research.

“Heading up this project places Imperial in a European context. If we want to build the next CERN, for example, we want to make it possible in seven years rather than 20. What Europe needs is to get its act together and become competitive in the world.”

The RAMIRI Symposium will be held at the Royal School of Mines on the South Kensington Campus on 15–16 July and is geared towards those working in managing research infrastructures and research policy. To find out more about the event contact the programme manager, Naomi Wynter-Vincent, at ramiri@imperial.ac.uk or visit the project website at www.ramiri.eu

Astrophysics group launch debate series on the origins of our universe

Burning questions about the universe and our place in it are explored in a new debating series entitled *Big Questions* which began at Imperial last month.

The debates, which are an initiative of the Astrophysics Group in the Department of Physics, aim to

spark conversations about big issues in astronomy and cosmology. Dr Roberto Trotta, a Physics lecturer and one of the organisers, said:

“Physics is a discipline exploring questions that have exercised the human mind for millennia—how did the cosmos begin, what is it made of and how do our answers shape our understanding of our place in the universe? We hope to get a lively debate going about these questions and explore a range of different ideas. It’s an

event that should interest anyone with an opinion on these topics, and anyone of any background or viewpoint is invited to join us.”

Future debates in the series will cover topical subjects in the field of astrophysics and cosmology, such as black holes and the possible existence of other universes.

—NAOMI WESTON, COMMUNICATIONS

✉ Attendance is free but registration is essential. To sign up for one of the debates please email: BigQuestions@imperial.ac.uk



For more information on upcoming debates and research being conducted in the astrophysics group, please visit: www.imperial.ac.uk/astrophysics

media mentions

—NAOMI WESTON, COMMUNICATIONS



✉ **JOIN OUR MAILING LIST** for regular news, information and website alerts:
www.imperial.ac.uk/media/jointsignonup

REUTERS ▶ 10.6.2009

Healthcare industry struggling in recession

The global healthcare industry may face tougher times from 2010 whilst other sectors may show signs of recovery, according to predictions about the impact of the recession made by *Reuters*. Health service managers in the UK predicted a \$25 billion shortfall for the National Health Service in the five years from 2011, due to large government deficits, which could lead to budget cuts, longer patient waiting lists, job reductions and a possible cap on the budget for new drugs. "The problem is Britain has been raising spending at a time when the risk, and now the reality, of recession has hit," said Nick Bosanquet (Bioengineering), adding that countries like Germany and the Netherlands were already adopting strong reform programmes.



BBC NEWS ONLINE ▶ 15.6.2009

Swine flu risk remains low say health officials

Despite widespread news coverage of the death in Scotland of a patient suffering from swine flu, who also had other underlying health problems, health officials maintain that the swine flu virus continues to pose a low risk to the public, reports *BBC News Online*. Health experts say the death does not mean the virus is getting nastier and Professor Peter Openshaw (NHLI) told the BBC: "About 98 per cent of people who get infected will recover fully without any hospital treatment, so I think the public needs to be reassured."

NEW SCIENTIST ▶ 19.6.2009

Ocean movements may affect magnetic field

A new hypothesis put forward by an American physicist suggests that the oceans' currents are responsible for the movement of the Earth's magnetic field, reports *New*



Scientist. Oceans could drag the field along global currents and could also generate their own

weak magnetic field, says Gregory Ryskin from Northwestern University, USA. Although the theory has sparked some objections, Professor Raymond Hide (Mathematics) said: "The oceans almost certainly slightly modify the geomagnetic field observed at the surface due to electric currents flowing within the Earth and in the ionosphere."

BBC NEWS ONLINE ▶ 21.6.2009

MRSA risk from cats and dogs

US researchers have warned that doctors treating cat and dog bites should be aware of the risks of MRSA infection, reports the BBC. Writing in *Lancet Infectious Diseases*, researchers reviewed existing evidence on infection risks from domestic animal bites and found that, as community-acquired MRSA increases, there is a greater chance of it being passed between humans and animals. However Professor Mark Enright (Epidemiology, Public Health and Primary Care) said that it was likely to be owners, not their pets, who carried MRSA. He explained: "MRSA might be on a person's skin and, as they get bitten, it goes inside."



awards and honours

ENGINEERING

Smith elected Deputy President of IMechE



Professor Roderick A. Smith (Mechanical Engineering) has been elected by the members of the Institution of Mechanical Engineers to be their Deputy President. This honour will lead to him becoming President in 2011 and 2012. He will be the 126th President to serve in this prestigious role. The last Imperial President was Sir Hugh Ford in 1977.

NATURAL SCIENCES

Prestigious maths prize for Donaldson

Professor Simon Donaldson (Mathematics) has added another of the world's most prestigious mathematics awards to his collection with the recent announcement of the Shaw Prize Laureates 2009. Professor Donaldson receives the one million US dollar Shaw Prize in Mathematical Sciences jointly with Professor Clifford Taubes from Harvard University, for their contributions to the field of three and four dimensional geometry. In 1986 Professor Donaldson received the Fields Medal—often described as the 'Nobel prize for mathematics.'

ENGINEERING

Livingston wins silver medal

Professor Andrew Livingston FREng, Head of the Department of Chemical Engineering and Chemical Technology, has been awarded a silver medal by the Royal Academy of Engineering at the 2009 Academy Awards Dinner. The award recognises him as an outstanding innovator and researcher who combines academic research with engineering and manufacturing achievements. Professor Livingston has made multiple inventions, several of which have reached industrial implementation.



ALSO...

Good Egg Award • Imperial has been awarded a Good Egg Award on behalf of Compassion in World Farming. The award was made in recognition of Imperial's switch to free range eggs in all its catering outlets.

CERN scientist has the X factor • Physics PhD student Tom Whyntie, who works at CERN, has beaten nine other finalists in FameLab, the UK's top science communication competition.

Central library design feat • The Level 1 refurbishment of the Central Library was recognised last month when Architects A-EM Studios Ltd were awarded a prize by the Royal Institute of British Architects for innovative design.



If you can't stand the heat...

African bird species could struggle to relocate to survive global warming because natural features of the landscape will limit where they can move to, according to new research published by Imperial researchers in *Proceedings of the Royal Society B* on 10 June.

As the global climate changes, some land bird species will be forced to move to new habitats, expanding and shifting their natural geographical range, in order to maintain suitable living conditions.

The research team behind the findings says, however, that some sub-Saharan African species are in danger of getting trapped in environments that will become too hostile for them to survive. Birds may not be able to move across areas containing dramatically different kinds of landscapes, such as arid plains, tropical forests or mountain ranges. This is because the different natural features of the African landscape present uniquely difficult survival challenges for species not already adapted to living in multiple habitats. This may prevent species from completing their journeys to new homes with suitable climates.

Lead author of the new study, Lynsey McInnes, a PhD research student at the Grantham Institute for Climate Change, explains: "As the climate changes and some habitats become inhospitable, bird species may start to move, stretching their range as they track the changing climate across the landscape, looking for new, agreeable habitats.

"Our study suggests that these vital movements could run into difficulties if the birds' escape routes cross regions that they're not well adapted to survive in, such as mountain ranges, arid plains or tropical forests."

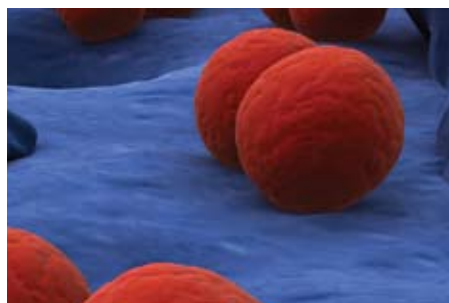
—DANIELLE REEVES, COMMUNICATIONS

Bacterial 'sex' causes antibiotic resistance

Some disease-causing bacteria are becoming resistant to antibiotics because they have peculiar sex lives, say Imperial researchers publishing new results in the journal *Science*.

The new study helps scientists understand how bacteria develop resistance to antibiotics, which is a major challenge for those treating infectious diseases.

The research looks at bacteria called pneumococcus (*Streptococcus pneumoniae*), which cause diseases including pneumonia and bacterial meningitis. Pneumococcal infections cause approximately one million deaths every year globally and the bacteria are becoming resistant to many antibiotics, making treatment increasingly difficult. The scientists behind the study believe this resistance is due to the pneumococcal bacteria adapting by occasionally picking up DNA from other bacteria, even from other species.



The lead author of the study, Dr William Hanage (Epidemiology, Public Health and Primary Care), said: "Bacteria have very peculiar sex lives. When humans have kids, they mix up their DNA with that of their partner but bacteria can pick up DNA from all sorts of places, even other species. Our research shows that bacteria that do this, that is, undergo sex with their own and other species, are more likely to develop resistance to antibiotics, protecting them from being killed by these drugs."

Bacteria reproduce asexually by splitting in two to produce identical 'daughter' cells. Sometimes, however, they can take up DNA from other bacteria or the environment, and incorporate it into their own genome. This mixing process, called recombination, is what happens in animals during sexual reproduction.

—LUCY GOODCHILD, COMMUNICATIONS



Mars mission could ease Earth's energy supply crisis

Techniques and instrumentation initially developed for ExoMars, Europe's next robotic mission to Mars in 2016, but now due to fly on a NASA mission in 2018, could also provide the answers to the globally pressing issue of energy supply.

A major study by Imperial, funded by the Science and Technology Facilities Council (STFC), aims to use this new technology as an inexpensive and efficient way to help process unconventional energy resources, potentially having an enormous impact on the UK and global economy.

Professor Mark Sephton (Earth Science and Engineering) said: "The research involves using extraction-helping materials, called surfactants, to liberate organic matter from rock in space to gain a deeper understanding into the biological environment on Mars. We aim to show that the same technique could also be used to recycle the prodigious amounts of water necessary to process tar sand deposits and turn them into conventional petroleum."

“We aim to show that the technique could also be used to recycle the prodigious amounts of water necessary to process tar sand deposits and turn them into conventional petroleum”

Usable energy resources are essential to the global economy. Conventional crude oil is a staple energy resource and accounts for over 35 per cent of the world's energy consumption. As the demand for oil exceeds supply, focus has now turned to trying to tap unconventional fossil fuel deposits, such as tar sands. However, these unconventional fossil fuels must be extracted and upgraded to match the characteristics of more conventional oil deposits and make them commercially viable.

The extraction process requires substantial amounts of water which is then left contaminated for extended periods of time. In just hours, the new technology can strip this water of its oily contaminants, removing a bottleneck in the refining process.

—SCIENCE AND TECHNOLOGY FACILITIES COUNCIL PRESS OFFICE

Space hotel



Plans for a new international space hotel were unveiled by students last month in a project forming part of the Master's course in Innovation Design Engineering (IDE), run jointly by Imperial's Department of Mechanical Engineering and the Royal College of Art.

Students from the course have developed plans for a hotel that could be built in space and fitted to the International Space Station, which is currently orbiting the Earth.

On 19 June, students unveiled a 12-metre-long replica of the hotel interior, together with animated computer designs that showed what the inside of the space

hotel would look and feel like for tourists.

During the project, students had to grapple with the challenges of creating designs that could function in space, for example, toilets that save space and have the suction power of a vacuum to counteract zero gravity.

IDE student Katrin Baumgarten was part of a team that had to develop new fashions for space tourists. She said: "There are no washing machines or tumble dryers in space, so we had to design clothes that enable the skin to breathe, reducing sweating, smells and the need to wash clothes.

“There are no washing machines or tumble dryers in space so we had to design clothes that enabled the skin to breathe”

We achieved this by using natural fibres, and made small chest flaps which let the air in to keep the body cool and comfortable.”

Throughout the project, the team worked with visiting lecturer

and space architecture expert Daniele Bedini, who has worked for NASA and the European Space Agency on projects for a Moon base and new missions to Mars.

—COLIN SMITH, COMMUNICATIONS

New trigger for chronic inflammation in rheumatoid arthritis discovered

A signal molecule made by the human body that triggers the immune system into action may be important in rheumatoid arthritis, according to new research published in *Nature Medicine* on 26 June. The authors of the study, from the Kennedy Institute of Rheumatology, say

“We hope our new findings can be used to develop new therapies that interfere with tenascin-C activation of the immune system”

that if scientists could block this signal, it might be possible to develop more effective arthritis treatments.

Rheumatoid arthritis is the most common auto-immune disease, affecting around one in 100 people. It causes painful and persistent swelling in the joints that can result in damage to the bone and cartilage.

Around half of all patients do not respond to one or more of the treatments currently available, and even the successful drugs can become less effective over time. The researchers behind the new study say stopping the disease closer to the root of the problem could be the best way to treat it, and their results suggest a new target for therapies.

When a microbe infects the body, the body responds by turning on a molecular switch to set the immune system into action and protect the body from disease. Today's findings show that a signal molecule called tenascin-C can trigger the same molecular switch and also activate the immune system. High levels of tenascin-C present in joints therefore may cause the activated immune system to attack the joint leading to the persistent inflammation of rheumatoid arthritis.

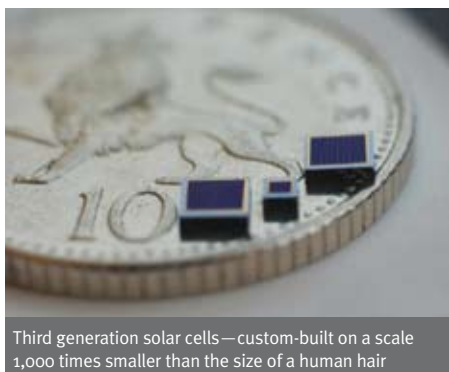
The lead author of the study, Dr Kim Midwood (Kennedy Institute), said: “We hope our new findings can be used to develop new therapies that interfere with tenascin-C activation of the immune system and that these will reduce the painful inflammation that is a hallmark of this condition.”

—LUCY GOODCHILD, COMMUNICATIONS



The key to a solar-powered future

A new generation of nano-structured, millimetre-sized solar cells that could convert the sun's energy to electricity more than twice as efficiently as current technology is the subject of an Imperial exhibit called 'A Quantum of Sol' at the *Royal Society Summer Science Exhibition 2009*, which will be showing until 4 July.



Third generation solar cells—custom-built on a scale 1,000 times smaller than the size of a human hair

Visitors to the exhibit will be able to play at being solar power engineers, and use prisms to see how much energy can be generated by the different colours within the spectrum of light.

The exhibit is led by Dr Ned Ekins-Daukes (Phys-

ics and the Grantham Institute for Climate Change), who also launched the first in a series of Grantham Institute briefing papers at the exhibition.

The Quantum of Sol exhibit explains the technology behind so-called third generation solar cells. These are designed on the nanoscale, which means the materials they are made of are custom-built on a scale 1,000 times smaller than the size of a human hair. These third generation solar cells can capture more of the sun's

“Our exhibit gives people the chance to get a hands-on understanding of the research underway at Imperial”

energy than existing silicon solar panels because they contain different layers of material that absorb a broader spectrum of colours. Individually targeting different colours of sunlight in this way captures more of the sun's energy, creating much more efficient solar cells.

Commenting on the show, Dr Ekins-Daukes said: “Our exhibit gives people the chance to get a hands-on understanding of the research underway at Imperial and elsewhere in the world to develop new solar cells that capture the light missed by other solar panel designs.”

—DANIELLE REEVES, COMMUNICATIONS



Greenhouse in the sky

A month ago a futuristic looking greenhouse appeared on the roof of the Roderic Hill building on the South Kensington Campus—making it possible to do plant sciences in an urban environment. *Reporter* finds out more about London's first GroDome and how Imperial researchers will be using it to tackle some of the world's biggest problems.

In the photo above: Dr Richard Murphy (right) and PhD student Nick Brereton explore whether growing willows at an angle makes it easier to extract sugars needed to make biofuel.

Entering the GroDome from a dark corridor on the top floor of the Roderic Hill building, the senses are hit by blinding light and the earthy aroma of leaves and tomatoes coming from the plants atop six large benches. The 3.8 metre tall greenhouse is made of plastic sheeting, rather than glass, for maximum sunlight transmission and high energy efficiency. The GroDome has a constant temperature of 23° Celsius and fans run along both sides of the facility to bring in and circulate fresh air to provide the plants with much needed CO₂. In the winter and during the night, artificial lights are used to aid photosynthesis, and every night blinds are activated to prevent the College's neighbours from being disturbed by the beams.

GroDome is the final part of a development project to support plant science research at South Kensington. In April 2008, six plant science research groups from Wye Campus were relocated to South Kensington. To enable the move, laboratories in the College's RCS1 and Sir Alexander Fleming buildings were refurbished and kitted out with controlled environment plant growth rooms, as well as imaging labs and mass spectrometry facilities.

Dr Colin Turnbull, Reader in Molecular Plant Physiology, who has been involved in commissioning for the GroDome, explains why the facility is so significant for plant scientists:

"For Imperial to remain competitive in the field, we have to conduct our growth work on site so we're efficient and can be scientifically more creative. With 200 square metres to grow trees, fruit and larger plants under natural light every day of the year we can really tackle some of today's big challenges, including climate

change, food security and the need to look at alternative energy sources."

Finding the right location was key for the GroDome to be successful: "We looked at a

couple of other rooftops including the Huxley Building but there were issues with each of them," said Colin. "The Roderic Hill Building roof was vacant, flat, attracts the sun and doesn't overlook any of our neighbours and, most importantly, it can be easily accessed by a building lift from the ground floor."

One of the key aims behind the GroDome is to encourage lots of new plant science projects, and all College academics can request space to conduct their work.

month after opening its doors, the GroDome is already filling up and there are hundreds of plants in there tended by researchers working in three key areas: growing plants for bioenergy, looking at how aphids interact with plants and investigating the impact of stress on tomatoes.

Finding alternative sources of energy

Dr Richard Murphy, Reader in Plant Sciences (Life Sciences), and his PhD student Nick Brereton (jointly supported by Rothamsted Research and the Porter Institute) were the first researchers to take root in the GroDome—introducing 50 willow trees as part of bioenergy research looking at producing biofuels from plants.

Richard's research focuses on extracting sugars from the cell walls of willows and other woody species, to ferment and turn into bioethanol, a biofuel which is already being used as a green alternative to petrol.

Willows are a good potential biofuel crop because they have a large amount of carbo-

One of the key aims behind the GroDome is to encourage lots of new plant science projects and all College academics can request space to conduct their work.

hydrate in their stems, and can grow quickly in the UK's climate, in a variety of soils. However, getting the sugars out of their woody stems is difficult, because the cell walls in the stems have evolved to be tough—the very property that helps the trees stand upright and resist invasion by pathogens and diseases.

The research group is making use of the new GroDome to compare how easy it is to extract the sugars from different types of willows. One experiment is testing whether forcing trees to grow at an angle—which causes changes in the composition of the stems—makes it easier to get these all-important sugars out of them.

The GroDome facility is of particular importance to bioenergy research which relies on having a facility big enough to house large plants. He says: “Having the facility on campus will save us a lot of time that we would have otherwise spent travelling to partner institutions and organisations to harvest the plants we've grown. Now, we can transport plants from the GroDome to the lab in a matter of minutes, which makes our work much more efficient, and opens up new opportunities to do different sorts of experiments, where we need to closely monitor our plants on a daily basis.”

Speaking of the long-term outcomes for his research, Richard says: “We're hoping to develop superior plants for liquid biofuels, which could be used to run our cars, and for biomaterials which, for example, could replace some of the plastics used in packaging. In the future, plants will need to be used much more widely in society, and the fundamental research we're doing here is an important part of preparing for that future.”

Climate change and plant infestation

Another problem which researchers are tackling in the GroDome is the effect of the global temperature increase on plants and the raised threat of infestation by agricultural pests. In this vein, Dr Glen Powell (Biology) is using the GroDome to look at the interaction between aphids (otherwise known as greenfly) and plants.

His research group has around 200 small Barrel Medic legume plants (*Medicago truncatula*) which have been subjected to aphids in the lab before being transferred to the greenhouse for

seed production.

Glen's research group (funded by Biotechnology and Biological Sciences Research Council) is focused on identifying the genomic differences between plants which are resistant to aphids and plants which are more susceptible. A long-term aim of the research is to breed resistance into plants that aren't naturally resistant.

The reason aphids are such a threat to agriculture is their speedy reproduction, which differs by the season. Female aphids reproduce asexually and can have around 50–100 offspring, which may themselves become reproductively mature within a week. In the summer, aphids give birth to live offspring, while in the winter many aphids produce cold-hardy eggs that take time to hatch, giving crops more of a chance to grow and survive in the spring.

As the temperature increases across the world, it becomes less vital for aphids to interrupt their life cycle with the dormant overwintering egg stage. Many vegetables which are grown in traditionally colder parts of the UK, for example seed potatoes in Scotland, will be at a higher risk of infestation and virus infection.

Glen says: “The plant and insect interactions which we are looking at are incredibly sensitive to climate change. I hope that our work on the mechanisms of resistance may help to bolster crop protection in the future when food shortages and the issue of food security become a reality.”

Glen explains how aphids infest plants: “Aphids are sap-feeding pests with long, sharp, needle-like mouth parts which penetrate from the leaf surface down to the vascular system of plants—similar to the way a mosquito feeds on us!

“They extract the plant's nutrients—sugars and amino acids—and therefore reduce plant growth rates. Aphids cause even more severe problems by transmitting numerous plant viruses, resulting in mottled leaves, yellowing, stunted growth, curled leaves, browning, wilting, low yields and death.” However aphids don't attack every plant—particular varieties of lettuce, melon and tomato plants are all known to be resistant and this is the area we are interested in exploring.”

“Our work on the mechanisms of resistance may help to bolster crop protection in the future when food shortages and the issue of food security become a reality”

—Dr Glen Powell

Food sources at risk of climate change

With the increasing global population, growing more food on the planet and understanding how plants can be generated to have higher yields and be more stress-resistant will become essential for food security.

Dr Gerard Bishop, Reader in Plant Sciences (Life Sciences), leads another research group that is working with several types of tomato plants (including dwarfs and the Heniz variety) in the GroDome to look at plant growth and stress-resistance.

Tomatoes are a billion pound industry worldwide—from fresh produce sold in markets to tomato sauce. But Gerard explains just how vulnerable the fruit is: “Too often tomatoes fall prey to insects, droughts, stress and pathogens. They perceive these stresses by receptors within the plant cell.”

Gerard explains how his research fits in: “We are looking at these receptors to understand how hormones, which affect plant growth and response to stress, can be used to generate better crops. We are specifically looking at dwarf tomatoes and trying to understand what affects their growth and development with the ultimate aim of growing higher yielding plants.”

Gerard's group is also involved in a tomato genome sequencing project sponsored by the EU and the research is part of the wider International Solanaceae Genomics Project. Gerard explains how tomato genome sequencing links to his other research, and why it is so important for food security: “Understanding the fundamental make-up of tomatoes will help strengthen our breeding strategies in the future.”

—EMILY ROSS, COMMUNICATIONS



Top: Glen Powell is looking to identify the genomic differences of aphid-resistant plants.

Bottom: Dr Gerard Bishop is trying to understand how hormones, which affect plant growth and response to stress can be used to generate better tomato crops.



The sound of music

Director of Music Richard Dickins speaks to *Reporter* about his path to Imperial, his enthusiasm for the College's musically talented students and how he's never got his head around the piano.



Richard discovered music at the age of ten when he was living away from home for the first time at a boarding school in Hampshire. He recalls feeling incredibly lonely so when the new Director of Music arrived, eager to get pupils involved in performing Gilbert and Sullivan operas, Richard decided to give it a go. He says: "I'd never done any singing before and was immediately hooked—it was brilliant timing for me—I felt like a door had opened."

Within months Richard was singing in ensembles in Winchester and Salisbury and had his heart set on a future career. "When I was at prep school I watched the Director of Music conduct and was convinced his job was the best thing in the world," he says, "I would tell anyone who would listen that this was what I was going to be. My parents were great music lovers but they were convinced my sudden interest in music was just a flash in the pan."

As he neared his teens, Richard was encouraged to take up an instrument at school before his voice broke. He settled on the clarinet and took to it straight away. After being an active participant in music groups at prep school, he recalls feeling furious when he discovered his new secondary school didn't have a school orchestra. Convinced it was something the school needed, Richard took it upon himself to create one—drawing together musical talents from across the school including the headmaster's wife and a history teacher who played the viola.

A year later Richard made his first appearance with the Bournemouth Sinfonietta and a year after that he joined the Hampshire County Youth Orchestra and was thrown in at the deep end as principal clarinettist.

But Richard worked hard and his natural ability was recognised a few years later when he was one of only four clarinettists accepted into the Royal College of Music (RCM) in 1975. Arriving at

the RCM Richard was excited to discover that the conductor Norman Del Mar was running classes and he was determined to sign up. He says: "I was told Norman didn't accept first years but I thought I had nothing to lose by asking and to my delight he let me join the class."

Richard quickly took to conducting in the same way as singing and playing the clarinet, and while he is keen to state he is the world's worst pianist, he admits that having a natural affinity for music and instruments has helped him progress.

Within a few months of working with Norman, Richard began conducting orchestras at the RCM. He describes how daunting his first performance was. "The first time I got up on the podium in front of the orchestra I was completely overwhelmed by the immense sound and also the terrifying realisation that I was the one who was in control of this complicated piece."

Despite his fears his natural talent shone through and he decided to take on as much conducting work as he could find. Characteristically he did this alongside both his degree and his work as a professional clarinet player which included playing opera music at prestigious opera house Glyndebourne.

After years of juggling his passions, it was the prospect of a full time conducting role at Imperial which led him to hang up his clarinet and concentrate on conducting. Richard had been desperate to get some regular conducting experience and received a tip-off that the College was looking for a conductor for their Symphony Orchestra. The position appealed to Richard and he took up the post in 1979.

Over the years his role developed through Musician-in-Residence to his role today—Director of Music. While he admits he misses playing the clarinet it has allowed him to take on a huge range of musical projects with a

repertoire that stretches from baroque to contemporary music.

Today he works two and a half days at Imperial and for the other four-and-a-half days he continues to pursue his musical infatuation, conducting orchestras across the UK including the Royal Liverpool Philharmonic and he's also principal conductor at the RCM.

Richard has seen the music scene grow dramatically since he first started at Imperial, most notably with the creation of the Blyth Centre, a dedicated music practice area on the South Kensington Campus which is used by over two thousand students and staff members from all campuses.

“The first time I got up on the podium in front of the orchestra I was completely overwhelmed by the immense sound”

Today the College has five orchestras, five choirs, a jazz band, wind band and musical theatre society in addition to numerous informal ensembles. Richard comments: "The sheer excellence of the performance standard keeps going up." He points to the Symphuni competition last year in which the Imperial College Symphony Orchestra was named the UK's best university orchestra as an example.

Seeing and supporting raw talent is one of Richard's favourite aspects of his role. He says: "The staff and students' dedication to their music has a very Imperial buzz about it—even when they are pursuing it as a creative outlet—they always strive for excellence."

—EMILY ROSS, COMMUNICATIONS

inside

story

inventor's corner



Froth flotation

For the last 15 years, Professor Jan Cilliers (Earth Science and Engineering) has been researching froth flotation, a process applied when extracting metals from mined rock. Flotation separates the valuable mineral particles from the 98 per

cent which is waste. The process uses bubbles to lift these valuable minerals to the surface of the tanks in a froth concentrated enough for further processing.

Froth flotation is not a new concept but Jan has pioneered investigation into the physics of the froth itself. Through his work on modelling foams and froths, he identified that the froth structure, and way it flows, determines how well the separation works. He then turned this into a measurement and control system, allowing the flowing froth structure to be manipulated for maximum metal yield.

The mining of minerals is performed on a huge scale, meaning a fractional improvement in process efficiency results in additional revenue of millions of dollars.

With experimental mine sites in Australia, South Africa, Chile, Utah and Alaska, embarking on the practical field work and on-site trials can

be quite trying for Jan and his team, particularly in the harsh mining environment. But these challenges make it worthwhile, as Jan points out:

“Not only are we working in a very exciting area, but we get to travel extensively as the mines are in remote locations. Seeing our research implemented in industry is also fantastic.”

With his findings on the flotation process at

the early stages of implementation by industry, Jan is in discussions with Imperial Innovations about how to accelerate the adoption of the technology by establishing a spin-out company. Alongside this, Jan's continued research is made possible by a £6 million grant and five-year contract that established the Rio Tinto Centre for Advanced Mineral Recovery at Imperial. Having completed a successful first year, its goal is to continue research into Rio Tinto's operations, as a springboard for commercialisation into other mining companies.

—ANOUSHKA WARDEN, IMPERIAL INNOVATIONS

www.imperialinnovations.co.uk

mini profile

David Hand

Professor David Hand (Mathematics) reveals what makes statistics exciting...



Why are statistics important?

Statistics are involved in almost every part of modern life that you can think of. Statisticians are working behind the scenes with drug companies to design clinical trials, with physicists to describe the structure of the universe, with supermarkets to decide whether to send you money-off vouchers for your favourite brands, and with governments to keep track of crime, immigration and unemployment. This is what makes it such an exciting dynamic field.

Is the field sometimes misunderstood?

Yes, it can be: people tend to assume that statistics involve dusty chalkboards and endless columns of numbers—but it's a sophisticated science that uses incredibly powerful software tools to probe data and reveal fascinating patterns we couldn't otherwise see.

What new areas would you like to see statistics used in?

Statistics are revolutionising the way governments make decisions about social policy. At the moment, ques-

tions like “do prisons work?” and “how should money be spent in the health service?” tend to be answered using ideological arguments. Instead, statisticians can run data experiments to find out what the right answer is. Unfortunately policy makers are often keen to make decisions about these issues quickly, and collecting and analysing this kind of data can be a long process. It is crucial that it is done though, so that in the long run these and other important decisions are taken based on cold hard evidence.

Could statistics help in the economic downturn?

Data is vital to solving the current problems with the global economy. Statistics turn the numbers into knowledge—without statistics we are just grasping for answers in the dark.

—DANIELLE REEVES, COMMUNICATIONS

▶ SCIENCE FROM SCRATCH

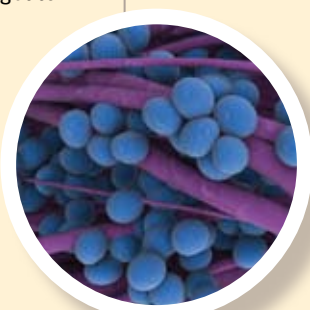
As explained by Elizabeth Hauke, MSc Science Communication

MRSA

(Methicillin-Resistant *Staphylococcus Aureus*)

This hospital superbug is a strain of the common *Staphylococcus aureus* bacterium. It often lives on the human body without causing harm but when the body's defences are weakened, it may cause an infection.

Individually, the bacteria appear spherical (-coccus from the Greek *kokkos*, meaning ‘berry’ or ‘grain’), but they can arrange themselves in groups or colonies shaped like bunches of grapes (staphylo- from the Greek word *staphyle*, meaning ‘bunch of grapes’) and in laboratory culture appear yellowish (*aureus* from Latin meaning ‘golden’). MRSA has developed a defence against penicillin-type antibiotics (it is methicillin-resistant). It produces an enzyme (called β -lactamase), which breaks down the crucial central structure of the drug, preventing it from killing the bacteria.



Is there a phrase you would like us to explain? ✉ Email the editor: reporter@imperial.ac.uk

IMPERIAL STUDENTS SHARE THEIR EXPERIENCES OF LIFE AT THE COLLEGE ON THE STUDENT BLOGGERS WEBSITE.

Student blogger Natalia on working myths:

“Six in the evening has always been an exciting hour for me. It signals a loose schedule of activities both unexpected and anticipated... So I never really understood my parents’ sluggish approach towards the nearest bottle of wine before slouching on the sofa. Forget about couch potato children, parents are the real victims. Here’s what I don’t get: you work hard to get paid, to (in theory) pay for pleasures that will help you enjoy life, but then you can’t be bothered to delight in your earnings. Their lethargy was unacceptable and incomprehensible. That is, until I began working myself.”



www.imperial.ac.uk/campus_life/studentblogs

blog
SPOT

Dalby Court Aeronauts

On 12 June, staff and students from the Department of Aeronautics took over Dalby Court on the South Kensington Campus to lay out a scale drawing of Aether—a 63-metre-wide solar-powered plane. Aeronautical Society Chairman Nikhil Chandaria reports on the exercise.

“With the world’s unwavering interest in climate change, a lot of research is going into the study of high-altitude, long-endurance, unmanned aerial vehicles (UAV). Keen to keep on top of the developments in the world of aerospace, 20 third year students from Aeronautics, along with five lecturers, spent an intensive month designing Aether—a solar-powered UAV that will fly for a year and act as a platform for environmental research, communications and surveillance. Armed with almost a kilometre of tape and copious amounts of string, we began



to lay out a 1:1 scale drawing of Aether in Dalby Court. The main challenges were trying to get straight lines and working around the contours of the court. Aether itself is quite a simple layout from a top-down view but don’t let this fool you about the plane’s complexity. Working in Dalby Court meant we had a large number of members of College moving through our work throughout the day. It prompted a lot of questions ranging from ‘what?’ and

‘why?’ to ‘how much?’ but it was a great opportunity for us to explain what we had spent the last month working on. Seeing everyone’s faces on looking at the work on the ground and then seeing it from the balcony of Electrical Engineering was a brilliant experience – it allowed everyone to really put Aether into perspective.”

▶ Watch a video about the solar powered plane: www3.imperial.ac.uk/news/innovation

top tips

Work-life balance

A work-life balance often seems elusive. In fact, many people think getting balance in their lives is an unobtainable goal. While you can’t control all the factors that impact your work-life balance, there are some things you can control. A work-life balance can be achieved by spreading your energy between all aspects of your life, which include work, home and your community. Here are some tips from Employee Assistance Resource (EAR) that can help you to achieve this.



How to improve your work-life balance

1. Create a buffer between work and home. After work, take a brief walk, do a crossword puzzle, or listen to some music before beginning the evening’s routine.
2. Exercise. Even if it’s only for 15 minutes at a time, you’ll feel more energised and refreshed.
3. Address concerns about deadlines and deliverables early. As soon as you see that a deadline is unrealistic, communicate your concern—don’t wait until the deadline passes.
4. At the end of each day, set your priorities for the following day. Be realistic about what you can achieve in the time you have available.
5. If you are a parent, or a parent to be, look at your employer’s support mechanisms for childcare—consider flexible working options.
6. Protect your private time by turning off electronic communications. Don’t be available 24/7.
7. Pursue a hobby, either with friends or family, or for some quality time on your own.
8. Learn to say no. Don’t over-stretch yourself. It’s lovely to see friends or volunteer to help others but easy to over-stretch yourself. Be a little selfish sometimes!

A friendly EAR

The College’s new counselling service EAR provides free assistance, counselling, resources and referrals for issues ranging from debt and wills to quitting smoking and depression. The free service can be accessed by phone or web, 24-hours a day, seven days a week and it is entirely confidential.

☎ 0800 243 458
www.ear.co.uk
assistance@ear.co.uk

Students think green

Last month, students were encouraged to recycle any unwanted belongings at the end of term when they moved out of their halls of residence for the summer break. Imperial's Accommodation Services and Facilities Management divisions joined forces with CRISP—a community recycling organisation which sets up schemes to help divert waste from landfill.

CRISP provided bins for eleven of Imperial's halls of residences where students could discard of a range of items including unwanted clothes, CDs, books, DVDs and non-perishable foods. Steve Long, a second year student from the Department of Mechanical Engineering, describes his part in the scheme.

"My main role was to spread the word amongst the students and encourage recycling to take place. I'm a big fan of recycling—it's a really great sign that Imperial has got this scheme going. It's so simple having the boxes in the halls. You collect so much junk over the year—from CDs you don't really want, to fancy dress items from parties and events—it's a good opportunity to have a good clearout. It also makes you think twice about



Last year CRISP diverted 24 tonnes of waste from London University Halls, and with Imperial's help, hope to divert even more this year.

throwing stuff away as you realise there's a home for everything.

CRISP first looks to try and reuse the items and our stuff can be considered for use by new students, homeless shelters or refugee units and then anything that can't be reused is sent for recycling."

—EMILY ROSS, COMMUNICATIONS

course review



By course attendee Ukachi Nwosu,
Project Support Officer (ICT)

Black and minority ethnic Leadership and Management Programme

What was the purpose of the course?

The main purpose was to encourage and support the participants—who were all from a black or minority ethnic group, and in level four posts—to develop their leadership potential. The course was split into modules and was a combination of lectures, interactive participant sessions, role play, topical exercises and personal assessments.

Why did you go on the programme?

I wanted to maximise my potential to become an effective leader and knew that the course would provide me with insights, tips and tools. I also wanted a specific steer for my role which is reliant on building a rapport with clients and managing ICT projects.

How have you benefited from it?

As I result of the course, I have learnt to value and recognise the leadership attributes I already possess in terms of relating to people, enthusing others and taking a strategic approach. I'm now keen to develop these innate skills, as they are part of my leadership style. The course has also encouraged me to appreciate how my diversity could be construed as a strength in the professional environment.

For more information on this course visit:
www.imperial.ac.uk/hr/equality/events/bmeleadership



Climb every mountain

Every year, the Silwood Park Escape Club breaks out of the flatlands of Berkshire and heads off for a weekend in North Wales. Dr David Orme, RCUK Lecturer (Life Sciences), reports.

"On 14 June, 16 staff and postgraduates from the Ecology and Evolution section in the Department of Life Sciences made the journey up to Imperial's mountain hut in the heart of Snowdonia, arriving with enough time to clear the brambles from the barbecue and use it. Bright blue skies and a cool

breeze made for a fantastic Saturday walking on the Carneddau, taking in four 3,000-foot peaks with views over the whole national park. The day was marred only by sunburn and clouds of midges in the beer garden at the Bryn Tyrch. The good weather stayed for a shorter Sunday walk along the stunning and rather steep Nantlle Ridge, adding a chough and ring ouzel to our spotting list of plants and animals, before the long drive home to Silwood."

How you can contribute

For guidelines on Imperial's Flickr group and YouTube Channel visit www.imperial.ac.uk/campus_life/contribute

To see Imperial's latest multimedia content showcasing campus life visit: www.imperial.ac.uk/interact

If you are planning an activity, expedition or trip, and think it could make an interesting subject for a film, please contact us. We may be able to loan equipment or advise on technique: amy.thompson@imperial.ac.uk

Snapshot of the College

Have you captured a moment of College activity which you'd like to share with the world? From Silwood's beehives to egg-throwing competitions on the Queen's Tower, life at Imperial is a picture book. The Communications Division now needs your help to compile snapshots of College activities through **Imperial's official Flickr photo group** and **YouTube Channel**. You can add pictures/video footage from the labs, field trips, societies, sporting events, lectures, conferences or any other aspects of life on your campus.

—AMY THOMPSON, COMMUNICATIONS



Left: St Mary's in the snow (February 2009) by Professor Ajit Lalvani (NHLI).

Right: Polarising microscopy images by Jack Cornish, fourth year undergraduate student in the Department of Chemistry.

Fleming stone unveiled

On 29 May Kevin Brown, Curator of the Alexander Fleming Laboratory Museum at St Mary's Campus, unveiled a restored and regilded memorial stone to Fleming at the great man's birthplace, Lochfield Farm in Ayrshire, at an event attended by local dignitaries and local people.



Philip and Heather Scott, the owners of the farm, had had the stone restored with support from the Loudoun Valley Trust and Galston Rotary Club, and

advice from the local MP and former Defence Secretary, Des Browne, who was among the guests.

Imperial College
London

want to promote your research?

Raise the profile of your work with over 30,000 people, including politicians, funders, business leaders, academics, journalists, members of the general public and secondary school students.



Become part of the BBC's Year of Science and the Royal Society's 350th anniversary celebrations, by applying to exhibit at the Royal Society's 2010 Summer Science Exhibition.

Visit: www.royalsociety.org

The call for proposals closes 31 July 2009 (Note the deadline is several months earlier than in previous years)

long
service

Reporter shares the stories of staff who have given many years of service to the College. Staff featured celebrate anniversaries during the period of 3 July–20 August. Data is supplied by HR and is correct at the time of going to press.

—ELIZABETH HAUKE, MSC SCIENCE COMMUNICATION STUDENT

20 years

- Dr Rosemary Fisher, Principal Research Fellow (SORA)
- Lee Parker, Technician (Physics)
- Sergio Velez-Moss, Senior Reactor Technician (Reactor Centre)
- Dr Huw Williams, Reader in Microbiology (Biology)

30 years

- Bob Brace, Technician (Chemical Engineering and Chemical Technology)
- Susan English, Senior Assistant Faculty Operating Officer (Undergraduate Medicine Office)

40 years

- Professor Max Lab, Senior Research Investigator (NHLI)



SPOTLIGHT

Professor Geoffrey Hewitt,
Emeritus Professor of Chemical Engineering
20 years

Professor Geoffrey Hewitt has worked in the Department of Chemical Engineering and Chemical Technology for the last 20 years, specialising in heat transfer and fluid flow. As a child, Professor Hewitt was inspired by his father, himself an engineer. He says: "He pushed me in the direction of chemical engineering, which of course was the best thing that ever happened to me." During the week he is kept busy with lecturing, preparing for the launch of a new undergraduate course combining nuclear and chemical engineering and supervising his team of research students. Before coming to Imperial, Professor Hewitt worked at the Atomic Energy Authority Laboratory in Harwell, Oxfordshire for over 30 years. He explains why he decided to move on: "The idea of having an academic end to my career was very attractive." Professor Hewitt splits his time between London—which gives him the perfect opportunity to indulge his pleasure for music and opera—and Oxfordshire, where he relaxes at the weekends.

obituaries



EMERITUS PROFESSOR DON PASHLEY

Emeritus Professor Pashley FRS (Physics) died on 16 May. Emeritus Professor Bruce Joyce (Physics), a close friend and colleague, pays tribute: "Don was an outstanding materials scientist. He was appointed Professor of Materials and Head of the Department of Metallurgy and Materials (subsequently the Department of Materials) in 1979 and was Dean of the Royal School of Mines from 1986–89. Professor Bill Lee, the current Head of the Department of Materials, fondly remembers the classic book *Electron Microscopy of Thin Crystals*, of which

Don was co-author, being referred to as the 'yellow bible' during his DPhil at Oxford. He formally retired in 1992, but continued his research until 2008. Before Imperial, Don had been Director of Tube Investments Research Laboratories. The move to the College meant a return to the university where he had been an undergraduate, research student, PDRA and research fellow, all in the Department of Physics. He was renowned for his *in situ* studies of thin-film growth and epitaxy—the process of growing a crystal of a particular orientation on top of another crystal—using transmission electron microscopy (TEM) and electron diffraction. He was elected Fellow of the Royal Society in 1968 at the age of 40, testimony to the regard in which he was held by his peers. He was a man of quiet authority who never sought the limelight despite his distinction as a scientist. A devoted family man, he is survived by his wife, Glenys, two children and seven grandchildren."

Support libel law petition, says Imperial blogger

Professor Stephen Curry (Life Sciences) has recently written on his blog *Reciprocal Space* about why he believes libel laws should be kept clear of science. He gives the background to the case sparking much debate in the scientific blogosphere.

“Simon Singh, the popular science writer and former Imperial physics student, is embroiled in a dispute with the British Chiropractic Association. In a commentary piece in *The Guardian* in April 2008, Singh criticised the BCA for promoting chiropractic—a popular form of alternative medicine—as a treatment for childhood colic and asthma in spite of insufficient scientific evidence for its efficacy.

The BCA disagrees. But instead of responding to Singh’s argument by citing the scientific literature to support their argument, they have sued him for libel.

This course of action runs counter to the culture of open and robust debate that pervades scientific life. It has unleashed a powerful reaction in the blogosphere where scientists and lawyers have sharply criticised the BCA’s stance. English libel law is increasingly being used to stifle scientific discourse in the public domain.

The Singh case has been taken up by the campaigning organisation Sense About Science, who recently started a petition in support of Singh calling for the reform of the libel law. The petition has already gathered over 12,000 signatures, including about 100 of Imperial staff and students.”

To sign the petition visit: <http://tiny.cc/YW59x>. Visit Stephen Curry’s blog: <http://network.nature.com/people/scurry/blog>



Summer ball 2009

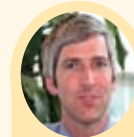
The annual student summer ball took place on 20–21 June. Hannah Theodorou, Imperial College Union’s Deputy President for Education and Welfare, reports.

“Whether enjoying the champagne reception, fairground rides or live acts, everyone seemed to be having a brilliant time. The smiles of the crowd at the 4 a.m. survivors’ photo made the months of planning by Union staff all worth it. Watching fireworks light up the sky behind the Queen’s Tower with over 1,000 students was magical.”

www3.imperial.ac.uk/campus_life/summerballo9

Welcome new starters

Dr Emre Amirak, NHLI
Dr Hemmel Amrania, Physics
Dr Shahid Ashraf, Chemistry
Miss Claire Batters, Registry
Dr Moerida Belton, Investigative Science
Dr Josephus Bezemer, SORA
Mr Matteo Bocchi, Physics



Henry Muss,
Energy and Environment

Manager, joined the Facilities Management Division on 20 April. In his new role he will help the College to reduce its environmental impact and CO₂ emissions. Among his aims is to make heating and lighting systems more efficient to cut Imperial’s energy consumption.

Mr Konstantinos Bousmalis, Computing
Dr Victoria Brookes, NHLI
Mr Dominic Buchstaller, EEE
Dr David Carpentier, Medicine
Mr Aidan Cassidy, Medicine
Dr Anthony Centeno, Materials
Dr Neil Clancy, SORA
Mr Andrew Coulson, Kennedy Institute
Dr Lydia Eccersley, Investigative Science
Mr Stuart Ellison, Medicine
Miss Susan Farrell, Investigative Science
Dr Antonio Fernandez-Dominguez, Physics
Dr James Flanagan, SORA
Dr Ana Fonseca, SORA
Dr Torsten Frosch, Chemical Engineering
Dr Paolo Giannetti, Neurosciences and Mental Health
Mr John Goulding, NHLI
Dr Isaac Jamieson, CEP
Professor Mark Johnson, SORA
Dr Carla Jones, NHLI
Miss Mary Keeling, Neurosciences and Mental Health
Mr Daniel Key, NHLI
Miss Livia Lai, Molecular Biosciences
Miss Esme Longbottom, Medicine
Mr Morgan Mager, Materials
Mr Sanjay Modgil, Computing

Miss Joanne Monger, SORA
Dr Rebecca Nadal, Faculty of Natural Sciences
Ms Louise O’Byrne, NHLI
Dr Koralia Paschalaki, NHLI
Miss Sarah Pawlett, Registry
Dr Husein Salem, Medicine
Dr Michael Schmidt, Investigative Science
Mrs Revital Shahar, EPHPC
Dr Sate Songhor-Abadi, NHLI
Miss Theodora Tsigani, Kennedy Institute
Dr Clare Turner, Medicine
Mr Antony Tyler, ICT
Dr Pinar Ulug, SORA
Dr Eszter Vamos, EPHPC
Dr Wendy Vandoolaeghe, EPHPC
Mr Kumaara Velan, EEE
Dr Krzysztof Wargan, Physics
Mr Marko Weimar, Chemistry
Mr Mark Williams, Kennedy Institute

Farewell moving on

Mr Terry Ablett, Kennedy Institute (5 years)
Dr Ferhana Ali, NHLI
Dr Sarah Brice, SORA
Mr Mark Burden, Security Services
Miss Amanda Bye, Neurosciences and Mental Health
Miss Maria Chico, Catering Services
Miss Elisa de Carvalho, Catering Services
Mrs Nicola Drage, Commercial Services
Dr Gloria Dura-Vila, Neurosciences and Mental Health
Miss Kate Edwards, Division of Medicine
Mr Gary Firkin, Estates Division (7 years)
Mr Sebastien Fleurance, Catering Services
Dr Alec Forsyth, Division of Biology
Dr Sashikumar Ganesan, Aeronautics
Mr Akram George, SORA
Mr Rory Goodbody, Investigative Science
Mr Ben Gooden, Division of Biology
Dr Thomas Harwood, CEP
Mr Thomas James, Aeronautics
Dr Rui Jin, Chemistry
Miss Rebecca Johnson, Neurosciences and Mental Health
Ms Linda Jones, SORA
Dr Ozan Kahramanogullari, Computing
Mr Andrew Kirkpatrick, Development and Corporate Affairs

Dr Isidora Kitsou-Mylona, Investigative Science
Dr Prathiba Kurupati, Investigative Science
Dr Mary Leamy, Neurosciences and Mental Health
Professor Nick Lench, Development and Corporate Affairs
Dr Fabrizio Lombardo, Cell and Molecular Biology
Dr James Marriott, Chemical Engineering
Mr Paul Matt, Computing
Ms Christine McCulloch, EPHPC
Mr Evangelos Nastos, EPHPC
Miss Cindy Nelson, Catering Services
Dr Viacheslav Nikolaev, NHLI
Miss Alison Parker, Development and Corporate Affairs
Dr Andy Photiou, SORA (4 years)
Mr Samuel Sharpe, ICT (5 years)
Mr Owen Stephens, Library Services
Dr Graham Sturton, NHLI (6 years)
Dr Katrina Sutton, SORA
Mr Paul Tinsley-Marshall, Biology
Dr Rob Tolhurst, SORA (9 years)
Dr Benjamin Wakerley, Investigative Science
Dr Bo Wang, Chemical Engineering
Dr Andrew Williams, NHLI (8 years)
Mr Pawel Wojcilewicz, Sport and Leisure Services (6 years)
Dr Sara Zanardelli, Investigative Science
Dr Jinfei Zhang, Computing

retirements

Dr Alan Herod, Chemical Engineering (16 years)
Professor Arkady Tsinober, Aeronautics

This data is supplied by HR and covers the period 31 May–20 June. It was correct at the time of going to press. Years of service are given where an individual has been a member of College staff for over five years. Asterisk (*) indicates where an individual will continue to play an active role in College life.

✉ 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.



10 JULY ▶ CONFERENCE

Graduate School of Life Sciences and Medicine Summer Research Symposium 2009

The guest lecture at this symposium will be delivered by evolutionary biologist, author and

science television presenter Professor Armand Leroi (Biology). Professor Leroi has made several TV documentaries, including *What Makes Us Human?* for Channel 4 and his most recent programme, *What Darwin Didn't Know*, for BBC4. The symposium will also feature research student poster presentations. See *Reporter 201* for an interview with Professor Leroi: www.imperial.ac.uk/reporter



22 JULY ▶ INAUGURAL LECTURE

Of the earth and the heavens: towards seamless positioning

Professor Washington Ochieng, Chair in Positioning and Navigation Systems, will take his audience on a journey through the last 18 years of improvements in the performance

of Global Positioning Systems and will look forward to techniques, which could contribute to the eventual realisation of high performance, affordable, seamless and ubiquitous positioning. Professor Ochieng is a Fellow of the Royal Institute of Navigation and the Institution of Civil Engineering Surveyors. In May 2009, he was named among the global navigation satellite system leaders to watch.

3 JULY ▶ CONFERENCE

Valve, rhythm and bypass

The Imperial College Healthcare and Hammersmith Hospital second Annual Symposium

6-7 JULY ▶ CONFERENCE

Light energy for a brighter future

Professor Jim Barber, Ernst Chain Professor of Biochemistry, speaks at the Weizmann UK 2009 Making Connections Symposium

10 JULY ▶ CONFERENCE

Graduate School of Life Sciences and Medicine Summer Research Symposium 2009

Featuring guest lecturer Professor Armand Leroi (Biology)

15 JULY ▶ CONFERENCE

Graduate School of Engineering and Physical Sciences Research Students' Research Symposium

Annual GSEPS poster competition followed by keynote speech by Professor Dame Julia Higgins (Chemical Engineering and Chemical Technology)

21-24 JULY ▶ CONFERENCE

Neuronal glutamate and GABAA receptor function in health and disease

Senior Lecturer Dr Stephen Brickley (Biophysics) speaks at the Biochemical Society Conference

22 JULY ▶ INAUGURAL LECTURE

Of the earth and the heavens: towards seamless positioning

Professor Washington Ochieng, Chair in Positioning and Navigation Systems

take note

Interview the Rector

Reporter will be interviewing the Rector, Sir Roy Anderson, in the next month to find out about his experiences during his first year in office. We're now looking to you for the questions. Whether you want the Rector's take on College or educational issues or you're simply intrigued about the man himself—this is your chance to seek answers to the questions that interest you.



Send your questions to the Editor: reporter@imperial.ac.uk with the subject heading 'Interview with the Rector'

VOLUNTEERING

Events volunteers

Project ID: 2220
Organisation: Diabetes UK
Time: Flexible days, 10 hours per month
Location: N1 (nearest tube Camden Rd)

There are over 2.5 million diabetes sufferers in the UK, and an additional 500,000 people who don't know they have it. The Diabetes UK charity is looking for volunteers to work with its staff talking to members of the public about the condition and handing out information. The events range from manning stands in local shopping centres to getting involved in large events like county shows. The placements are flexible, so you can choose which events you want to help out at. No previous experience or knowledge about diabetes or Diabetes UK is necessary. Travel and meal expenses will be paid.



For more information

To take part in a scheme or to hear more about volunteering in general, contact Petronela Sasurova
☎ 020 7594 8141
✉ volunteering@imperial.ac.uk

For full details of over 250 volunteering opportunities please visit:
www.imperial.ac.uk/volunteering

✉ *Subscribe to the weekly newsletter by emailing volunteering@imperial.ac.uk*

PHOTO EXPO

Exhibition Road Music Day, held on 21 June, featured free live music performances and colourful displays throughout the day, including big bands and ensembles from Imperial and the Royal College of Music.



Stay in the loop

✉ 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

