

REPORTER

#307
26 JULY 2018

SHARING STORIES OF IMPERIAL COLLEGE LONDON'S COMMUNITY

GLASS ACT 3

Touching gift for Professor Stirling



SUMMER OF HACK 13

Imperial inventors come together

IMPERIAL PEOPLE 14

The postdocs in their own words



RAINBOW CITY 18

Imperial at Pride in London parade



“
**OH MY GOSH,
THIS MUST BE THE
SUMMIT RIDGE!**
Imperial's Melanie Windridge
scales Everest with some help
from science.
4

EDITOR'S LETTER

People first

In nearly six years as Editor of *Reporter*, I've always strived to give a platform and a voice to a diverse spectrum of Imperial people – whether it's long form feature articles about the work of technical support staff or regular columns such as the long service anniversaries. But it's always good to refresh things and mix it up – that way you ensure you really are capturing new voices. The first phase of that was the re-launch of a new-look *Reporter* back in March. We've also recently launched a digital-focused project under the apt banner of 'Imperial People' featuring staff in a variety of diverse and interesting roles, who are profiled on the big screen at the main entrance of the South Kensington Campus, across social media (under #OurImperial) and in a dedicated blog. In this issue I look at a group of Imperial People from that campaign – namely postdocs (page 14–15). It's an extremely exciting but very challenging time for early career scientists, so it's interesting to hear from them directly. A note on the front cover and main feature. We usually leave coverage of alumni to our sister publication *Imperial* magazine, but we were blown away by Melanie's conquering of Everest (pages 4–7) so got in touch almost as soon as she was down the mountain! It also led to a rather unexpected historical find from the archives (on page 7).

Andrew Czyzewski
EDITOR AT LARGE

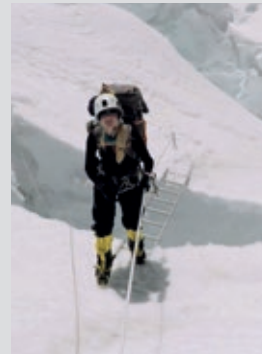
Reporter is the voice of the staff community at Imperial College London and we're always keen to share success, both on and off campus. If you've a story you'd like included in a future edition, please contact Andrew Czyzewski.

► **GET IN TOUCH:** reporter@imperial.ac.uk



IT'S AN EXTREMELY EXCITING BUT VERY CHALLENGING TIME FOR EARLY CAREER SCIENTISTS, SO IT'S INTERESTING TO HEAR FROM THEM DIRECTLY.

In this issue



4

FEATURE

Find out what it takes to scale Everest with Imperial's Melanie Windridge



8

RESEARCH

What happens when research and education meet in the electronics classroom



12

EDUCATION

How to navigate the fast-evolving digital learning landscape with Dr Katie Stripe



16

COMMUNITY

Celebrating long service, excellence in HR and the passing of an astrophysics giant



Scientific glassblower Steven Ramsey (left), who retired in June, makes a gift (inset) for Provost Professor James Stirling (right), who retires in August.

► FULL STORY: bit.ly/reporter307-gift

IMPERIAL IN BRIEF

AWARDS

PROFESSOR HASKEL CELEBRATES

It was a seriously stellar spring for Professor Jonathan Haskel, Chair of Economics in the Business School, who was appointed to the Bank of England’s Monetary Policy Committee (MPC), which sets the UK’s interest rates and other aspects of policy, and awarded a CBE in the Queen’s Birthday Honours.



It follows his highly acclaimed 2017 book *Capitalism Without Capital: The Rise of the Intangible Economy*. “The award reflects, I hope, my contributions to helping solve some of the most pressing issues facing today’s economy, including the contribution of science to boosting the UK economy,” he said.

RANKINGS

BUSINESS SCHOOL BREAKTHROUGHS

Imperial’s Global Online MBA programme has made its debut as first in the UK in the 2018 QS Distance Online MBA rankings. The programme has also been ranked as the third best distance online MBA in the world. Meanwhile, Imperial College Business School has entered the world’s top 10 in today’s Financial Times Masters in Finance rankings. Imperial is the highest ranked UK based school in the world, ranked in 9th place, moving up three places from 12th position last year.

GLOBAL EXCHANGE

International research bursaries

Three scientists have won prestigious Stevenson Fund awards to support postgraduate research secondments at global partner universities. Available to women studying degrees in Physics, Chemistry, Maths, Life Sciences and Geology, the awards are named after their benefactor, Dr Greta Stevenson (1911–1990) – distinguished Imperial botanist, mountain climber and adventurer:



SARAH KWOK YAN HO

Second year PhD chemist at Imperial, studying the development of light-driven oxygen insertion reactions for late-transition metal alkyl complexes. She will be visiting the University of Pennsylvania’s Department of Chemistry.



RAINBOW LO

Working toward a PhD in the EPSRC Centre for Doctoral Training in Medical Imaging, Department of Chemistry. She will spend three months working in collaboration with the University of Hong Kong, Department of Chemistry.



ENRICA MAZZON

Member of the London School of Geometry and Number Theory, a joint PhD program between Imperial, KCL and UCL. She will be visiting the Georgia Institute of Technology’s School of Mathematics.

New heights for Imperial

Dr Melanie Windridge takes on Everest in the name of science and adventure.

THERE'S ALMOST AN ENTIRE SUB-GENRE OF LITERATURE and film dedicated to dramas, tragedies and controversies on Everest – whether its killer storms, avalanches, queues for the summit, discord among teams and also littering and environment damage.

Thankfully, Dr Melanie Windridge, Imperial alumnus, scientist, author and speaker, encountered little of this on her recent successful summit bid in May – and she takes typically pragmatic view on the issues.

“Of course there have been very real, harrowing tragedies up there, but there can perhaps be a tendency to over-dramatize things a little as well, particularly for the benefit of the press. In reality, the very last thing you want on Everest is drama, and I’m glad there was none.

“My main goal, above everything else, was to come back in one piece. And I think there is a lot you can do to increase the chances of that happening. Have the right kit, make best use of the technology, go with the right company – management is crucial – listen to experts’ advice and understand where the risks are likely to occur.”

SCIENCE, ADVENTURE AND OUTREACH

Melanie, who completed her Imperial PhD in plasma physics in 2009 and remains an Academic Visitor in the Department of Physics, has carved out something of a niche at the interface between science, exploration and adventure.

With a professional interest in plasma physics through her work as a consultant for Tokamak Energy, she undertook an arctic adventure to explore a naturally occurring plasma phenomenon in the form of the Aurora or Northern Lights. After, she wrote a successful book *Aurora: In Search of the Northern Lights* – covering science, folklore and people’s relationships with the lights.

Everest was a very slowly gestating seed for Melanie. Trekking, skiing and ski touring (a combination







THE DEATH RATE IS GOING DOWN AND A LOT OF IMPROVEMENTS IN SAFETY AND PERFORMANCE ARE TO DO WITH SCIENCE. I WANTED TO HIGHLIGHT THAT.



Melanie on the summit (top), on the Khumbu Icefall (middle), and with her sherpa at base camp (bottom)

of the two) had always been part of her repertoire and she steadily increased the scale and difficulty of the challenges – to include Africa’s highest peak, Kilimanjaro (5,895m); South America’s highest peak, Aconcagua (6,960m); a cyclone-thwarted attempt at Himalayan peak Putha Hiunchuli (7246m) as well as skills-building climbing trips to the European Alps.

One recollection is perhaps very telling of her inner resolve and spirit.

“I went trekking to Nepal after university and chose to do the Annapurna Circuit and not the popular Everest Base Camp trek, partly because I knew in my heart that getting as far as Everest base camp and turning back without going further would just annoy the hell out of me!”

The definitive decision to climb Everest (8,848m) probably came in around 2013 (though she didn’t actually tell anyone then) when she was asked to help with preparations for the formal 60th anniversary celebrations of the first ascent of Everest in 1953. As part of the preparations, she started to read and learn more about the history of the mountain and met and mingled with people who had climbed Everest.

“I also began to realise that science was fundamental to getting up Everest in the 50s – the reason they hadn’t got up in the 30s or 20s was because of the state of science and technology and their appreciation of its importance. Understanding of physiology, nutrition, clothing, tents, boots, and oxygen made such a difference. That process continues to this day as well. The death rate is going down and a lot of the improvements in safety and performance are to do with science. I don’t think people fully realise that. I wanted to highlight that in the context of my own Everest bid.”

What emerged was the ‘Science of the Summit’ outreach project comprising a stage-by-stage live blog of the summit progress; a YouTube video series (see link below); snow pollution sampling on the mountain; speaking engagements at schools, colleges and festivals; and possibly even a book at some stage as well. Melanie self-funded the trip – with some additional support and sponsorship, including from Imperial, for the outreach component of the project.

A VERTICAL JOURNEY

And so at the beginning of April 2018, she found herself on a plane to Nepal’s capital, Kathmandu, connecting onwards to Lukla and the villages of Namche Bazaar (3440m) and Pengboche (3930m) for what marks the start of very a long period of acclimatisation.

Progressing slowly up the mountain and giving the body time to acclimatise is really important when climbing at high altitude. As we get higher the air gets thinner (the air pressure reduces) and in every lungful of air we breathe, we get less oxygen than at sea level.

This means that the body has to adapt to use less oxygen for normal functioning. If it can’t do this – or if you ascend too fast for the body to make the necessary adaptations, such as making more red blood cells – then you will get altitude sickness, also known as Acute Mountain Sickness or AMS.

It can be fatal, so if you suffer severe symptoms you should descend to a lower altitude where the air pressure is greater and your body gets more oxygen. Indeed, multiple Olympic champion Victoria Pendleton, who was on the mountain at the same time as Melanie, experienced AMS and had to urgently return to base camp despite being in otherwise top physical condition.

On 17 April, Melanie and team arrived at Everest base camp (5,364m) – which is one of five camps with tents and equipment situated progressively higher up the mountain. Rather than heading straight up the mountain though, climbers do ‘rotations’ climbing to camps 1, 2 and sometimes 3, to then return to base camp before a summit push, weather allowing. Although the body can acclimatize to a degree, it will still slowly degrade, especially at very high altitudes above 6000m, so there’s a balance to be struck between acclimatisation and being fresh and strong enough for a summit push.

The first big challenge after base camp is the Khumbu Icefall, essentially where a huge glacier drops off the edge of a cliff “splitting and breaking like a Snickers bar bent in half” as Melanie describes it. There are great house-sized blocks of ice and deep crevasses that must be traversed and it’s here she experienced a minor scare.

“You’re going across a builder’s ladder with crampons on – it’s not very much fun, so you want to get off as quickly as possible, so as I was coming off I did a big step at the end and skipped a rung and my back crampon caught and it flipped me and I went straight into the snow. I had a go pro camera on my rucksack strap and it bruised my ribs quite badly. It’s not a major deal but I can’t put pressure on my left arm even now.”

But otherwise things went quite smoothly from then on in, aside from the general lethargy of being up so high – “everything is just harder, sometimes you get out of breath just getting up out of the tent”.

FINAL PUSH

Melanie and her sherpa, Tenzing, set off from Camp 4 at around 21.00 hours on 20 May for the final push for the summit under the cover of darkness, with head torches showing markers and features along the route such as caches of oxygen bottles.

“The track was really narrow and steep, then suddenly it opened up and flattened out and I thought ‘oh my gosh this must be the summit ridge!’ Dawn was just breaking and I could see the colours on the horizon. I was incredibly lucky in that there was nobody else there – just me and Tenzing – and it was perfectly timed, so we sat and rested and watched the light come up a little and took some photos. I didn’t feel elation – you’re only half way there – and I’m very focused so I was just thinking of the things I needed to do up there and then to get down.” ●

Watch the Science of the Summit video series

► bit.ly/Mel-Everest

PEAK PRACTICE: SCIENCE ON THE MOUNTAINS

Mountaineering really only became established as a sport in the 19th century – with milestones including the first ascent of the iconic Matterhorn in 1865 by English artist Edward Whymper. But for the longest time it was seen as a gentlemanly pursuit, and the use of scientific knowledge in aiding performance was seen as distasteful and even unsporting. That slowly began to change in the 20th century, as climbers tried to go higher and higher, particularly in the Himalayas.

One of the new breed of science-savvy climbers was George Finch (pictured right), a world class mountaineer and chemist at Imperial College London in the 1920s. Based on his research with pressure chambers, Finch became convinced that supplemental oxygen would be essential to scale Everest and so he worked with the RAF at Farnborough to try and adapt equipment used by fighter pilots for climbers. He also made important contributions in nutrition science and notably in clothing – commissioning the first ever feather down suit for climbing, made with hot air balloon cloth (many climbers still favoured traditional sports jackets).

Whilst on the 1922 Everest attempt, he climbed to highest point reached by a human (8320m) – within reach of the summit. Yet he turned back to rescue his partner Geoffrey Bruce (pictured left). Finch’s ideas endured and were progressed by others – including Dr Griffith Pugh, Olympic skier, Army doctor and researcher at the Royal Postgraduate Medical School at Hammersmith Hospital (now part of Imperial). He was part of the successful Everest ascent in 1953, and is widely acknowledged as being a pivotal factor in the success of the trip. His contributions were many and varied but included further refinements to the oxygen apparatus – deducing the optimal flow rate and the suggesting use of sleeping oxygen. He also realised that climbers became dehydrated at altitude due to the loss of moisture from the lungs and needed to drink large quantities of fluids.

High altitude science continues to this day at Imperial and elsewhere. In 2009, Dr Liesel Wandrag (Medicine), spent three months at Everest base camp as part of a team studying the effects of low oxygen (hypoxia) on the body. This work helps us to better understand how patients fare in intensive care units, where hypoxia is also a major factor.



Fusing research and eee-education



Wearable tech is helping to bring research into the electrical and electronic engineering (EEE) curriculum and it's improving learning outcomes. Caroline Brogan reports on staff and students ushering the next digital revolution.



Caroline Brogan
COMMUNICATIONS
AND PUBLIC
AFFAIRS

MORE AND MORE OF US ARE COMING to rely upon wearable 'biopresence' technologies to help lose weight, train for events and even sleep better – using specialist devices, smartwatches or just good old 'primitive' mobile phones.

The unsung enabling technology working away behind the scenes in these shiny devices is signal processing – essentially, the taking of raw data from sensors and interpreting patterns and devising rules that can mean something useful to the end user. That's an incredibly challenging task and requires a high level of technical capability, creativity and resourcefulness.

Signal processing as field of study and research actually predates that of computing but in their digital forms the two are now closely related. Imperial has been at the forefront of research and teaching signal processing for over 50 years. Traditionally, students have used analogue data from radar (a field Imperial helped to pioneer in World War II) and digital data from array processing and communications to learn the basics of signal processing.

In the past few years, research and teaching staff in the Department of Electrical and Electronic Engineering (EEE) have sought to bring the course up to date – hopefully paving the way for the next generation of digital entrepreneurs and researchers.

Specifically, Professor Danilo Mandic and colleagues have tested whether using wearable tech in the classroom would enrich student intellectual curiosity and engagement, and perhaps even performance, especially in maths-heavy modules.

MATHS GETS PERSONAL

Professor Mandic and team developed a small biosignal recording device called iAmp that measures students' own electrocardiogram (ECG) traces via small electrodes on the wrist.

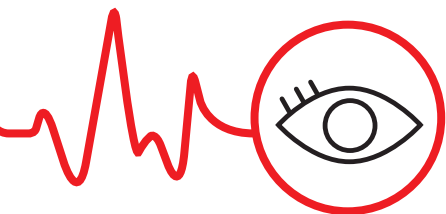
Before the start of the experiments, the students are briefed on the principles of ECG and how cardiac electric potentials are generated by currents in the heart muscle and how potential differences between two points on the body surface are measured.

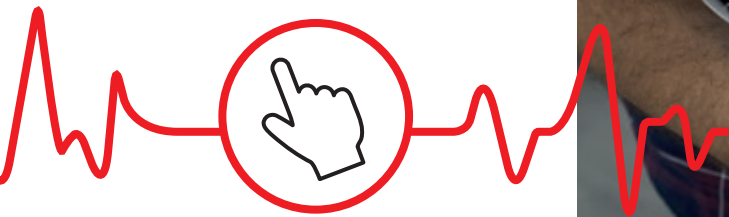
In the data collection stage, the students are required to record their own ECG for a period of 12 minutes while being seated. An accompanying computer app gives onscreen instructions on how and when to gather data, before displaying the measurements.

The students apply the taught complex mathematical concepts of signal estimation to their recorded vital signs and are graded as usual.

At the most basic level of calculations, ECG traces can be used to measure average heart rate. In addition, the activity of the autonomic nervous system, which is related to stress, can be estimated from heart rate variability (HRV), obtained from the time difference between consecutive 'R-peaks' in the ECG.

With a little more mathematical legwork, an ECG trace can be used to obtain the breathing rate of a person through a phenomenon known as respiratory sinus arrhythmia (RSA) – seen by the acceleration of the heart rate during inhalation (breathing in)





YOU FEEL LIKE YOU HAVE OWNERSHIP OVER THE WORK, WE'RE NOT JUST GIVEN GENERIC DATA TO ANALYSE – IT FEELS MORE PERSONAL AND REAL BECAUSE IT'S YOUR OWN DATA.

Ahmad Moniri (PhD student)



and the deceleration of the heart rate during exhalation (breathing out). The overall strength of RSA in an individual can be used to assess cardiovascular health and psychological stress.

Around 450 undergraduate students have been involved in the programme so far, spanning the academic years 2014–2015, 2015–2016, and 2016–2017.

Ahmad Moniri took the practical signal processing modules as an undergraduate last year and is now a PhD student working under the supervision of Professor Mandic.

Commenting on the learning experience he says: “You feel like you have ownership over the work, we’re not just given generic data to analyse – it feels more personal and real because it’s your own data. Also, on a practical level, since you’ve done the acquisition yourself, if there’s something unusual with the data, you can easily relate it to some

event and explain it – say if I moved or my friend was distracting me.”

Ahmad went on to do his final year project of his MEng degree with the Centre for Bio-Inspired Technology, working on rapid DNA-based detection of microorganisms. That convinced him to embark on a career in research – and a little teaching, since he is now helping deliver the signal processing course with supervisor Professor Mandic.

THE BODY AS A UNIQUE DATASET

The researchers gathered feedback on the students’ experiences via Imperial’s student online evaluation system (SOLE). Feedback on the approach has shown that at least 85 percent of the students involved described increased intellectual satisfaction and engagement with the overall approach.

The authors say this could be because students were taught in

a physically meaningful and fun way.

As an additional benefit, the authors say the approach could help keep the curriculum current by syncing it to technological and educational developments.

Co-lead Professor Anthony Constantinides, pioneer of digital signal processing, said engaging students in curiosity-driven learning helped to broaden their perspective on next-generation healthcare.

Professors Mandic and Constantinides both comment: “We continue to bring research into the classroom, which is now not only feasible but could potentially trigger a paradigm shift in teaching. We hope to inspire students and educators to further enhance the curriculum with relevant real-world examples like wearable health.” ●

Professor Mandic’s group is supported by funding from EPSRC, DSTL, Rosetrees Trust and British Horseracing Foundation.

RESEARCH NOTES

MARCH – JUNE 2018

Deans, dinosaurs and developments
in understanding our immune system



MEDICINE

A healthy lead

Leading HIV expert and Director of Imperial's AHSC Professor Jonathan Weber has been appointed Dean of the Faculty of Medicine, having been Acting Dean since October 2017. A clinician by training, Professor Weber began working on HIV in 1982. He leads the UK HIV Vaccine Consortium, a Wellcome Trust-funded collaboration. Since 2001, he has been running active research projects in Uganda, Tanzania, Mozambique and South Africa.

► **FULL STORY:** bit.ly/reporter307-

\$20



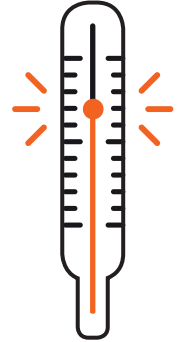
Cost of a simple blood test method developed by Imperial researchers that could help diagnose thousands of patients with hepatitis B in need of treatment in some of Africa's poorest regions. Current tests cost around \$100–500.

► **FULL STORY:** bit.ly/reporter307-blood

1.5°C

The upper limit for global temperature increase we need to stay within to avoid the worst consequences global warming (as agreed in the Paris climate talks back in 2015). A new Imperial study shows how to achieve this while at the same time raising living standards in developing countries.

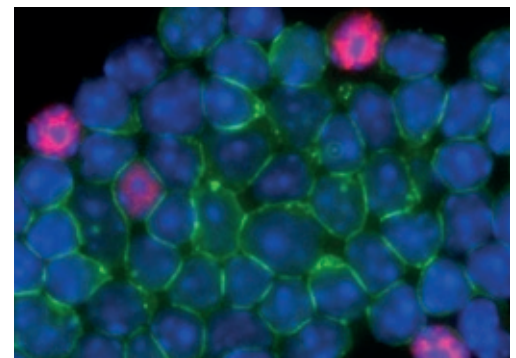
► **FULL STORY:**
bit.ly/reporter307-temp



COLLEGE

Africa seed fund

Imperial and the Massachusetts Institute of Technology (MIT) are launching a search for collaborating institutions in Africa. The two universities have launched a seed fund for 'blue-skies' research, with a regional focus on Africa. With this seed fund, researchers and educators at Imperial and MIT aim to help kick-start early-stage and 'blue skies' research ideas that might not otherwise be pursued.



NATURAL SCIENCES

T-cell tracker

Scientists are unveiling how our immune system works – and malfunctions – thanks to an innovative technology that tracks immune cells. As immune cells travel and work all around the body, they have been incredibly difficult to track and understand in the past. Now, following a five-year study, researchers at Imperial have developed a technology that could change this.

► **FULL STORY:** bit.ly/reporter307-tracker

ENGINEERING

Life finds a way

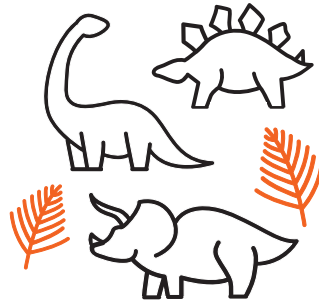
The asteroid that created the Chicxulub crater 66 million years ago triggered a mass extinction that killed more than three quarters of life on Earth and wiped out the dinosaurs. Yet, within 30,000 years of impact, Mexico’s Chicxulub crater fostered a thriving ecosystem – a much faster recovery than previously thought possible. A team of researchers, including Imperial scientists drilled into the 180-km-wide crater and brought up 800 metres of rocks. These harboured geological scars from the impact as well as thousands of microscopic fossils.

► **FULL STORY:** bit.ly/reporter307-crater

£48 million

Theoretical cost per year of powering a dinosaur theme park. A team of Imperial physicists helped out a leading UK energy provider E.ON in a lighthearted piece of research timed with the release of the latest dino blockbuster, Jurassic World: Fallen Kingdom.

► **FULL STORY:** bit.ly/reporter307-dino



THE ASTEROID THAT KILLED THE DINOSAURS RATHER IRONICALLY LEFT AN EDEN FOR FURTHER LIFE TO THRIVE.

Professor Joanna Morgan (Department of Earth Science & Engineering), who co-led the Chicxulub team (left, top)

The newly-refurbished Central Biomedical Services (CBS) animal research facility in South Kensington will help researchers best apply the principles of the 3Rs (reduce, refine, replace).



COMMENT



The digital teaching assembly

Katie Stripe is co-creator of IMPLEMnT – a digital platform that seeks to help and empower teachers. A recipient of the Excellence Fund for Learning and Teaching Innovation, she hopes to expand the breadth of her online community.

Katie Stripe
E-LEARNING
TECHNOLOGIST,
NATIONAL HEART
& LUNG INSTITUTE

Katie co-led on the IMPLEMnT project – a digital platform incorporating a toolkit to empower teachers to create original resources that support blended learning. In 2017, the project was granted two years' support from the Excellence Fund for Learning and Teaching Innovation. IMPLEMnT aspires to help anyone in a teaching role – be that a lecturer, doctor, lab demonstrator or any one of the huge variety of educators we have at Imperial – to make informed decisions about which technologies are most appropriate for the type of teaching they are providing.



I HOPE

**IMPLEMnT WILL
GROW AND
ALLOW PEOPLE
TO SHARE IDEAS
AND PROVIDE
SUPPORT AND A
SAFETY NET FOR
EACH OTHER.**

IN A RECENT WORKSHOP FOR THE IMPLEMnT project discussing the different technologies available to us and how we use them, one comment stuck with me, 'too much choice'. We, as educators, are working in a world where technology is an expectation from our students and from those who will employ them as graduates. This means we have a duty to introduce technology into our learning spaces and it is the challenge of our generation of teachers to figure out how to most effectively do that and really understand when digital tools stop being just technology and start being 'educational technology'.

In the previous issue of *Reporter*, Giskin Day spoke about trying to move away from paternalism in medicine, starting by eschewing phraseology such as 'getting patients to do this' and 'making students do that'. But I worry that we are now seeing phrases like 'getting academics to do more...' creeping into our lexicon, especially when it comes to adding technology to our classrooms.

Without a doubt there are pockets of excellent digital teaching across Imperial but there are also black holes which educators fall. IMPLEMnT was the brain child of two people working on the academic shop floor, myself and Dr James Moss, Senior Physiology Teaching Fellow in NHLI. It became apparent to us that

we have lots of tools and lots of support but there is a disconnect between the two and all the support in the world doesn't stop some of the tools being time consuming to use and prohibitively difficult to the untrained. IMPLEMnT is growing to fill that gap.

I think what it actually boils down to is offering our frontline educators an opportunity to choose their own path to digital empowerment. We are in danger of forcing technology into the classrooms without pedagogical backing and alienating educators by mandating change without the safety net of being able to 'fall forward'. Experimentation can be a risky business when we are beholden to student satisfaction surveys and exam results.

IMPLEMnT has already begun to build a digital teaching community and I hope that will grow and allow people from across the College in all aspects of education delivery to share ideas and provide support and a safety net for each other. I also hope that, through collaboration, we will be able to build a tool that can help educators negotiate the myriad options available to them and select appropriate tools for the classrooms and start to build up their own individual banks of educational technologies. While we can provide the specifications for different tools, the way in which they are put together for delivery is as unique to that person as the way they make their tea. That is what we should be encouraging - allowing people to construct a digital learning outcome that works for them and their students."



Discover more about the project or share ideas and suggestions with the team via the website or Twitter:

- ▶ www.implemntproject.com
- ▶ [@implemntproject](https://twitter.com/implemntproject)

TEACHING NOTES

Imperial inventors come together for 'Summer of Hack'

Imperial College Advanced Hackspace is launching a summer-long programme of activities for hackers, makers and innovators across the College. My Summer of Hack, which will run from 3 July to the 29 September 2018, will offer a host of opportunities for the Imperial community to turn their innovative ideas into a reality – including grants, hacker-in-residence opportunities, and an exciting new competition. Professor Oscar Ces, co-director of Imperial College Advanced Hackspace, said: “Imperial College Advanced Hackspace is a hotbed of creativity and innovation, where hackers, inventors and entrepreneurs from across all corners of the College come together to turn their ideas into a reality. This summer is the perfect opportunity to get involved.”



MILESTONE FOR MEDICS

Second year medical students have celebrated an important milestone in the development of the new MBBS curriculum by holding a Festival of Science at the College's South Kensington Campus. The event, on 26 June, marked the completion of the new Clinical Research and Innovation (CRI) module where students in the MBBS programme undertake three-week research experiences from a wide range of clinically related options.

Experiences ranged from health and community care in remote and deprived regions, links between health and mobile technology, virtual reality, through to lab-based work and students sequencing their own DNA.

CRI module lead, Dr Sohag Saleh, said: “The module is a great opportunity for students to get out of the lecture hall and experience both science and medicine in new and unfamiliar settings. It teaches science and research at its core, but in the much broader context of the importance of research in meeting the healthcare needs of society, and how the students can play a role in that in the future.”

Support for fellows

The Teaching Fellows Development Fund has been established to support Teaching Fellows and Learning Technologists in the Faculties and Business School in pursuing development opportunities. Staff can apply to the Fund to support attendance at conferences and courses or to fund travel to visit other institutions. Funding is available throughout the year and up to £3k per person per financial year (1 August –31 July) can be requested. The minimum requestable sum is £250.

► **COMPLETE THE APPLICATION FORM:** bit.ly/reporter307-form



SOME YEARS AGO A STUDENT TOLD ME THAT 'CREATIVITY IS IMAGINATION WITH RESPONSIBILITY'. I CONTINUE TO TREASURE AND USE THIS DEFINITION. THE WORLD IS FULL OF CHALLENGES AND OPPORTUNITIES – CREATIVITY OFFERS POTENTIAL TO TACKLE THESE WITH BRIGHT NEW IDEAS.

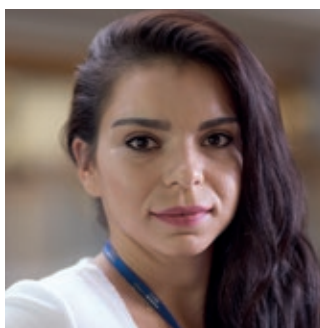
Professor Peter Childs, Head of the School of Design Engineering, discusses the College's newest MOOC (massive open online course) 'Creative Thinking: Techniques and Tools for Success' on the EdX platform.

Every kind of (Imperial) people

The ‘Imperial People’ campaign launched this spring with the aim to shine a light on underrepresented areas of the College and give a better sense of how the College ticks. Imperial People are featured on the large digital screen at the South Kensington Campus main entrance, across social media and on a dedicated blog. Our latest stars are a group of Post Doc researchers.

WHAT IS A POST DOC?

Postdoctoral researcher is a position that comes after a PhD doctorate degree. It is a fixed-term contract, typically funded through a grant awarded to a Principal Investigator of a research project. After completing a postdoctoral position, researchers can apply for a fellowship which provides funding directly to them and their research: A successful fellowship will put a researcher in a good position to apply for long-term faculty positions, such as a lectureship. Many postdocs also ultimately pursue careers outside of academia – such as in industry, publishing and research administration.



Dr Ceyda Oksel,
RESEARCH ASSOCIATE IN
STATISTICAL MACHINE
LEARNING, MEDICINE

I received an MSc and PhD degree from Leeds University, where I spent six months as a postdoctoral research fellow there investigating the application of

computational approaches to the prediction of the biological effects of nanomaterials. In 2017, I joined Imperial as post-doctoral research associate, and I’m currently working as part of a multidisciplinary research team consisting of data scientists, statisticians and clinicians with an interest in implementing machine learning models to understand the progression of asthma and allergic diseases from childhood to adulthood. I’m a departmental representative for postdocs facilitating communication between postdocs across departments, and a staff supporter providing confidential assistance to all Imperial staff. I’m also acting as a personal tutor for a group of first year students studying Medicine, and as a scientific mentor to high school students undertaking British Science Association CREST Awards. I’m also involved in outreach work designed to help academically-talented disadvantaged students achieve their potential through the Social Mobility Foundation.



Dr Eyal Neuman,
RESEARCH ASSOCIATE
(RESEARCH
FELLOWSHIP IN
QUANT FINANCE),
MATHEMATICS

I completed my master’s in operations research and my PhD in probability and

stochastic processes at the Technion (Israel Institute of Technology), before going on to postdoctoral positions at Hong Kong University of Science Technology, and the University of Rochester in New York.

Since 2016, I’ve been a Research Fellow in the Capital Fund Management (CFM)-Imperial Institute of Quantitative Finance. My research focuses on market microstructure. Modern financial markets involve a range of participants who place buy and sell orders across a wide spectrum of time scales – from pension funds that rebalance their portfolio on an annual basis to automated market-making algorithms and high frequency trading firms that submit several thousands of orders per second. In our research we use mathematical tools, mostly from probability theory and stochastic analysis, to model the behaviour of these different types of market participants, who are all interacting with each other. This way we can investigate occurrences of ‘flash crashes’, for example.





Dr Daniel Ainalis
RESEARCH ASSOCIATE, CIVIL AND ENVIRONMENTAL ENGINEERING

I completed my undergraduate degree and PhD in Mechanical Engineering at Victoria University in Melbourne, focussing on heavy goods vehicle dynamics. Following a slightly different postdoc position in Belgium, I wanted to return to working on sustainable freight and the opportunity at Imperial to work at two leading laboratories within the Centre for Transport Studies (Transport & Environment Laboratory, Transport Systems and Logistics) was simply too good to pass up! I am working with leading researchers on a variety of projects related to improving the sustainability and performance of transport.

One of the research projects I am currently working on is focused on evaluating the economic and environmental benefits of Kinetic Energy Recovery Systems (KERS) for heavy goods vehicles as part of an InnovateUK funded project. Globally, transport is a major contributor to greenhouse gas emissions and in order to mitigate climate change, action must be taken to improve the sustainability of transportation.



Dr Christine Evers,
EPSRC RESEARCH FELLOW, ELECTRICAL AND ELECTRONIC ENGINEERING

Since completing my BSc and PhD in Bremen, Germany, and Edinburgh, Scotland, I've worked in both academia and industry. Currently, I'm EPSRC Fellow in the EEE Department and my main research interests are in acoustic signal processing, speech processing and audio. Sound is of key importance in everyday life. Being able to capture, process, store and transmit sound has been pivotal to telecommunications and entertainment for many years. Now we're increasingly looking at equipping robots and autonomous machines with the ability to understand and adapt to the surrounding acoustic environment.

By analysing the acoustic scene, a three-dimensional map of the environment can be created, and used to identify sounds or recognise the intent of speech signal.

Although I've been working in this field for several years, I'm always amazed that new research questions bubble to the surface, requiring new ideas and, eventually, signal processing algorithms to address them.



Dr Mattias Björnmalm,
MARIE SKŁODOWSKA-CURIE INDIVIDUAL FELLOW, MATERIALS

After completing a BSc and MSc at Lund University and KTH Royal Institute of Technology in Sweden, I did my PhD research at the University of Melbourne in Australia.

I am currently a Marie Skłodowska-Curie Research Fellow at Imperial, where I lead the EU-funded research project qBionano. In our research, we explore the biological interactions of nanoengineered materials. Nanomaterials are widely expected to help usher in the future of medicine – for example by helping us detect and diagnose disease earlier, and by enabling new types of treatments. However, what works well under well-controlled conditions in the lab doesn't always work so well when exposed to real-life, biological and medical environments. So, trying to understand how 'bio' and 'nano' works together – bio-nano interactions – is the main focus of our research.

This project is the first research project I've led independently as a Research Fellow, and learning how to handle the different aspects of a modern research environment has been challenging (for example, lots of admin and paperwork!).

LONG SERVICE

Staff featured in this column have given many years of service to the College. Staff listed celebrate anniversaries during the period 01 March – 31 June 2018. The data are supplied by HR and correct at the time of going to press

30 YEARS

- Terence Carder, Maintenance Technician (Mechanically biased), Estates Division
- Dr Patricia Cover, Clinical Scientist, Department of Medicine
- Professor John Dear, Professor of Mechanical Engineering, Department of Mechanical Engineering
- Gail Hallissey, Facilities Co-ordinator, Business School
- Kay Hancox, Outreach and Recruitment Manager, Department of Electrical and Electronic Engineering
- Professor Athanassios Manikas, Professor of Communications and Array Processing, Department of Electrical and Electronic Engineering
- Simon Mann, Senior Technician, Teaching, Department of Chemistry
- Dr Michael Joseph McGarvey, Reader in Molecular Virology, Department of Medicine
- Dr Elizabeth Skelton, Research Associate, Department of Mathematics

- Jane Alison Thompson-Ambrose, PA to CFO, Finance Directors and Departmental Administrator, Finance Division
- Professor Peter Tyrer, Emeritus Professor in Community Psychiatry – Clinical, Department of Medicine
- Professor Sir Magdi Yacoub, Professor of Cardiothoracic Surgery, National Heart & Lung Institute

40 YEARS

- Pim Amrit, Departmental Services and Safety Manager, Department of Chemical Engineering
- Dr Raad Issa, Professor of Practice (Computational Fluid Dynamics), Department of Mechanical Engineering
- Dr Rodney Rivers, Emeritus Reader, Department of Medicine

SPOTLIGHT

PIM AMRIT
40 YEARS

“ I believe I must be one of the few technical staff remaining who have worked their way up, through the grades. I was taken on as a junior lab technician in 1978, working in the nuclear technology group. We essentially had a lead-lined nuclear bunker – purpose-built for the use of Cobalt-60 radiation sources - where the experiments took place. This bunker has since been decommissioned but the room remains as a reminder of those days. I then moved to the



HONOURS

MEDICINE

Excellence in patient care

Imperial’s National Neonatal Research Database (NNRD) team have received the Royal College of Physicians’ (RCP’s) Excellence in Patient Care Innovation Award 2018. The NNRD receives clinical data from all neonatal units across England, Scotland and Wales, and makes this information available to support and improve health services, patient care and research. At present, the database holds the details of nearly one million babies and their care history, and is used by a number of different bodies including the NHS, Public Health England and the Department of Health. The database is maintained and managed by the Neonatal Data Analysis Unit (NDAU) at Imperial College London and Chelsea and Westminster NHS Foundation Trust.



COLLEGE

Action for change

The College’s Active Bystander training programme has won an ‘Excellence in HR’ award at the 2018 Universities Human Resources (UHR) Awards. The UHR Awards celebrate the most exceptional initiatives and projects in Higher Education Human Resources. Imperial’s Active Bystander programme triumphed in the Organisational Development and Culture Change category. Active Bystander training helps staff speak out and address issues around bullying, harassment, ‘micro-aggressions’ and ‘micro-inequities.’ The Faculty of Engineering began delivering the training programme in July 2017. Over 1,500 staff have now attended the Active Bystander training, and the College hopes to increase this figure to 3,000.





undergraduate teaching labs, then to the research labs – stepping into my present role in 2001.

I manage all of our brilliant technical professional staff, including those from the mechanical workshop and electronics services as well as general technicians. I also oversee safety for the Department, running of the stores, maintenance of the buildings,

refurbishments and large building projects. What makes this job a pleasure for me is the quality of the technical staff – they really go the extra mile. A lot of the equipment in the Department is custom built, in-house, and they contribute significantly to that.

ENGINEERING

Stately recognition

Chemical Engineering PhD student Shiqi Wang has received an Outstanding Achievement Award from Chinese Government. The award for 'Outstanding Self-financed Students Abroad 2017' was set up by the China Scholarship Council in 2003 and recognises the academic excellence of students completing their PhD studies overseas. Shiqi Wang was one of 27 PhD students in the UK to receive an award this year, for her interdisciplinary PhD project.



IN MEMORIAM

Professor Leon Lucy



Professor Leon Lucy, Visiting Professor in the Department of Physics died on 7 May 2018, aged 79 years. His friend and colleague Professor Andrew Jaffe (Physics), pays tribute.

Leon got his PhD in the early 1960s at the University of Manchester, and after postdoctoral positions in Europe and the US, worked at Columbia University and the European Southern Observatory over the years, before coming to Imperial. He made significant contributions to the study of the evolution of stars, understanding in particular how they lose mass over the course of their evolution, and how very close binary stars interact and evolve inside their common envelope of hot gas.

Perhaps most importantly, early in his career Leon realised how useful computers could be in astrophysics. He made two major methodological contributions to astrophysical simulations. First, he realised that by simulating randomised trajectories of single particles, he could take into account more physical processes that occur inside stars. This is now called "Monte Carlo Radiative Transfer" (scientists often use the term "Monte Carlo" – after the European gambling capital – for techniques using random numbers). He also invented the technique now called smoothed-particle hydrodynamics which models gases and fluids as aggregates of pseudo-particles, now applied to models of stars, galaxies, and the large scale structure of the Universe, as well as many uses outside of astrophysics.

Leon's other major numerical contributions comprise advanced techniques for interpreting the complicated astronomical data we get from our telescopes. In this realm, he was most famous for developing the methods, now known as Lucy-Richardson deconvolution, that were used for correcting the distorted images from the malfunctioning Hubble Space Telescope, before NASA was able to send a team of astronauts to install correcting lenses in the early 1990s.

For all of this work Leon was awarded the Gold Medal of the Royal Astronomical Society in 2000. Since then, Leon kept working on data analysis and stellar astrophysics – even during his illness, he asked me to help organise the submission and editing of what turned out to be his final papers, on extracting information on binary-star orbits and the statistics of testing scientific models (a subject dear to my heart).

Until the end of last year, Leon was a regular presence here at Imperial, always ready to contribute an occasionally curmudgeonly but always insightful comment on the science (and sociology) of nearly any topic in astrophysics. We hope that we will be able to appropriately memorialise his life and work here at Imperial and elsewhere. He is survived by his wife and daughter. He will be missed.



REVIEW

Rainbow City

IMPERIAL AT PRIDE 2018

Imperial staff and postgraduate students marched among a sea of rainbow flags at the Pride in London parade in July.

Imperial joined 30,000 people from 472 different organisations in what festival organisers have called the ‘most diverse’ parade ever.

Imperial 600, the College’s LGBTQ+ network for staff and postgraduate students, co-ordinated the College’s entry into the parade. The Imperial cohort, made up of 29 people, marched alongside counterpart networks from King’s College London and University College London.

Caz Ulley, co-Chair of Imperial 600, said: “It always surprises me when thousands of people cheer us on at the Pride in London parade. We could see how much our involvement meant to Imperial students, staff and alumni who were watching as we heard screams of delight when we passed by. This is why it is so important that the College takes part in Pride in London, especially as we welcome students and staff from all over the world, including those countries where it is illegal to be gay.”



This year’s theme, Pride Matters, recognised that ‘Pride’ means different things to different people, whether it be protest, a symbol of freedom or a platform for diversity.

Dan Hdidouan, a PhD student in the Centre for Environmental Policy, recently featured in the College’s LGBTSTEM Day campaign on social media and also took part in the Pride in London parade. He said:

“Pride and the parade was an incredible experience. I used to be defensive and insecure about my sexuality. It’s liberating being honest with yourself and others, and it’s fun doing it with amazing people at Imperial.

I wanted to march to continue passing this message of pride in who we are, pride in acceptance of myself and others – it’s a lesson worth sharing.”

Professor Stephen Curry, Assistant Provost (Equality, Diversity and Inclusion), also marched alongside colleagues at the Pride parade. He said: “The celebration and challenge that Pride represents echoes Imperial’s desire to create a more diverse and inclusive environment for everyone at the College. By marching in the parade we are sending a message to staff and students at Imperial who are part of the LGBTQ+ community: you are welcome here.”

REVIEW

Blair on care

LORD DARZI REVIEW OF HEALTH AND SOCIAL CARE: INTERIM REPORT PANEL EVENT, 28 JUNE 2018

Former Prime Minister Tony Blair voiced support for Lord Darzi’s calls to reform the NHS during a visit to Imperial in July. The former Prime Minister made the comments during an event to present the final Lord Darzi Review of Health and Care, which sets out a number of key reforms needed to maintain the NHS for the coming decade and beyond.

Speaking on a panel during the event, Mr Blair said: “The challenge for the NHS is to stay true to its principles but be

under a constant state of change and modernization.” The report, authored by Professor the Lord Darzi of Denham and published last month, called for a raft of changes including the ‘radical simplification’ of the structure of the NHS and free social care at the point of need, as well as setting out a proposed settlement for long-term funding.

► **FULL STORY:** bit.ly/reporter307-blair



Coming up in South Kensington

Now is the perfect time to explore unique events and exhibitions given by some of our neighbouring institutions along Exhibition Road.

► SIGN UP FOR A EVENTS FULL LISTING: www.imperial.ac.uk/whats-on

UNTIL 29 SEPTEMBER 2018

My summer of hack

Imperial College Advanced Hackspace is launching a summer-long programme of activities for hackers, makers and innovators across the College. There will be Summer Boost Grants of up to £500 for staff and students wishing to develop an idea and Level Up! – a summer-long hackathon with selected teams will be given up to £1000 to make their ideas.

South Kensington Campus and Invention Rooms, White City

UNTIL NOVEMBER 2018

IVF: 6 Million Babies Later

The Science Museum is holding a free special exhibition exploring the remarkable story of in vitro fertilisation (IVF) from the opposition and immense challenges faced by early pioneers to the latest research today – coinciding with the 40th anniversary of the 'miraculous' birth of Louise Brown.

Science Museum, Exhibition Road, Level 1, Who Am I? gallery,



UNTIL 4 NOVEMBER 2018

The future starts here

The V&A is hosting a special ticketed exhibition exploring the power of design in shaping the world of tomorrow. From smart appliances to satellites, artificial intelligence to internet culture, this exhibition will bring together more than 100 objects as a landscape of possibilities for the near future.

V&A Museum, Exhibition Road, £16



UNTIL 6 JANUARY 2019

Life in the dark

This new exhibition at the Natural History Museum, which is free for under 16s, invites visitors to enter the worlds of nocturnal animals and discover how they find their way around their environment, hunt, mate and evade predators – with highlights including a underwater bioluminescent display.

Natural History Museum, Exhibition Road, £11.50 advance adult ticket (free for under 16).

HIGHLIGHTS



07 SEPTEMBER, 09.00–18.00

Sir Derek Barton Centenary Symposium

This Imperial symposium commemorates the centenary of the birth of Imperial chemist and Nobel Laureate Sir Derek H.R. Barton, whose work continues to impact both academic and industrial research and development in the 21st century. Outstanding organic chemists from around the world will present plenary lectures, including Imperial's Professor Ed Tate (above).

Lecture Theatre G16, Sir Alexander Fleming Building, South Kensington Campus



12 SEPTEMBER 2018, 18.00–21.30

The world's first 3D printed metal bridge

Dr Craig Buchanan, Research Associate in the Department of Civil and Environmental Engineering, will provide an overview of the work being undertaken for the testing, simulation and design of the MX3D Bridge – the world's first 3D printed metal bridge.

Skidmore, Owings & Merrill Inc (SOM), The Broadgate Tower, 20 Primrose Street, EC2A 2EW



Imperial Enterprise Lab
Launch Weekend

DEVELOP AN ENTREPRENEURIAL MINDSET AND LAUNCH SOMETHING NEW

Kick off the year with a weekend full of inspirational speakers, entrepreneurial challenges and the chance to start something awesome.

Find out more
bit.ly/imperiallaunchweekend



Imperial College London

Grantham Institute
A decade of difference
Grantham Institute's tenth anniversary year

Royal College of Art
Postgraduate Art & Design

Grantham Art Prize

Enter this competition to inspire and motivate people to act on climate change

PRIZES £700 to produce your artwork
A chance to exhibit your work nationally

WHO CAN ENTER? All staff and students at Imperial and students at the RCA

DEADLINE 24 August 2018

INTRODUCTORY EVENT 17:00–19:00 | 11 July
Imperial College main entrance

Find out more and register:
bit.ly/GranthamArtPrize_11July2018
#GranthamArtPrize



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Karaoke
F1
Chess
Holiday
Dancing
Concerts
Wine Tasting

MeetUp Imperial

Welcome to **MeetUp Imperial**

A new staff social networking group, a place where people with similar interests can meet.

If you are looking for someone to go with to an exhibition, a concert or any other social event, you can post a message here and you will find someone who is interested in the same event.

If you have tickets to an event and have no one to go with, post a message and wait for people to reply.

It's easy to use—you can contact people by replying to their posts or by sending them a private message.

www.yammer.com/ic.ac.uk/#/groups/suggested

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