IMPERIAL

THE MAGAZINE FOR THE IMPERIAL COMMUNITY / SUMMER 2025

GLOBETROTTERS

IMPERIAL'S INTERNATIONAL HUBS WILL OPEN UP A WORLD OF OPPORTUNITY

IMPERIAL

THE MAGAZINE FOR THE IMPERIAL COMMUNITY / **SUMMER 2025**

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DIGEST

PARTNERSHIPS

New centre for future materials

Imperial and Rio Tinto launch $150m partnership to support the energy transition.

Illustration: **Gus Scott**

The global shift to renewable energy generation needs new sustainable techniques and technologies. That's why Imperial and Rio Tinto have launched the Rio Tinto Centre for Future Materials.

Created with a $150 million investment from Rio Tinto over the next ten years, the Centre will connect the world's best researchers with the capability and commitment of industry. Together, they will transform the way materials are sourced, processed, used and recycled to make them more environmentally, economically and socially sustainable.

The UK Government has welcomed the news: its recent Industrial Strategy Green Paper identifies clean energy industries as a key growth-driving sector. "This investment is a major vote of confidence in the UK," said business secretary Jonathan Reynolds.

The Centre's first Grand Challenge will focus on copper. Copper is critical to electricity generation, storage and transmission – but the world needs more in the next ten years than has been mined in the whole of the last century. Researchers will work on how to reduce copper demand, and how to extract it sustainably.

"The Centre will drive cutting edge, industry-facing research that enables new systems-level and blue sky thinking," says Professor Mary Ryan, Vice Provost (Research and Enterprise). "This approach is at the heart of Imperial's strategy." ◆

WRITE TO US

Letters

Join the debate and share your news and views.

Make the connection

As a major contributor to the launch of the Pimlico Connection, a project conceived by Dr Sinclair Goodlad, our lecturer in Sociology, I was delighted to read your piece on outreach (Tomorrow's minds, *Imperial* 57). I appear as the lead student co-author in a scholarly journal of the results of this project after its third year of operations, and I'm thrilled it continues today, 50 years after it was conceived! There is much history to it that is now likely forgotten. The magazine would do a worthwhile service by documenting such a long-running project in an article, including archival photographs and interviews with some key participants over the years.
Professor Asad Abidi (Electrical and Electronic Engineering 1976)

Response from the editors: Thank you Professor Abidi for your contributions to outreach at Imperial! The Outreach at 50 series has been covering just this – you can read more at: www.imperial.ac.uk/be-inspired/schools-outreach/outreach-at-50/

Musical youth

I was at Imperial from 1985 to 1991, and brought my trombone with me. I was in the Imperial College Symphony Orchestra for just about the whole time. For some of that time I ran a brass quintet called Quintessence – with three Imperial and two RCM players – which was decent enough to make a recording, and played several functions for the then rector, Professor Sir Eric Ash, and his wife. During my PhD, I also organised a one-off performance of brass ensemble music in the Great Hall, concluding with the Howarth arrangement of Mussorgsky's Pictures at an Exhibition for brass 16-piece and percussion, again with a mix of Imperial and London music college players. I'm sure there was more, but it was a long time ago!
Tom Yates (Physics 1988, PhD 1991)

In response to your piece on the Imperial Sinfonietta (A high bar, *Imperial* 57), I remember I lost no time in joining the choir and the (then fairly new) Gilbert & Sullivan Society once I joined Imperial, of which I soon became the conductor. This society, forerunner of the present Music Theatre group, initially presented just one show a year. However, an ambitious chairman suggested we also do a summer production, and thus began annual visits to Budleigh Salterton in Devon. At this point, I had already formed a connection with the Royal College of Music next door, and the success of our productions was helped by an influx of RCM students playing alongside the best Imperial instrumentalists. As for me personally, it was obvious that I was going to pursue music as a career, rather than Chemical Engineering. But unlike what I read today, that meant leaving Imperial and joining the RCM. The rest – as they say – is history!
Robin White ARCM GRSM (Chemical Engineering 1966)

I immediately joined the Jazz Club after I started at Imperial. I play modern jazz piano and was a fan of Dave Brubeck in those days. We had groups playing at Saturday night hops, May Balls, World University Service parades and so on. I had a whale of a time, knew heaps of people, and still managed a decent degree!
In 1959 (or was it 1960?!), we carried back both the modern and traditional jazz cups from the London University Jazz Competition. As we had represented the university, we were awarded colours, a first for the Club. (I wore the tie proudly – we did wear ties back then.)
We recorded the winning modern jazz contribution and during the improvisation I remember that one soloist played – and held – a really bum note. Relativistic time has a different meaning when you're performing. It seemed like an age before I played a chord that put it in context, but when you hear the recording it sounds immediate!
Emeritus Professor Stanley Salmons (Physics 1961)

ILLUSTRATION: MIKE LEMANSKI

CONTACT US

Keep up with the latest from Imperial and share your thoughts and news. Please mark your message 'For publication'. Messages may be edited for length.

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For the latest news from Imperial as it happens, and to be a part of the Imperial community, visit our alumni Facebook page and LinkedIn group.

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FROM THE PRESIDENT / PROFESSOR HUGH BRADY

From London to Bengaluru – Imperial's global impact

The importance of Imperial's alumni and supporters is clearer than ever, and you have been essential to the development and ongoing implementation of many of our priorities

Since the last issue of this magazine, we have continued apace to deliver our strategy, Science for Humanity.

Nowhere is this more apparent than in the opening of our four Imperial Global hubs, a cornerstone of our strategic initiatives. In May, we opened our fourth hub in Bengaluru, India, which joins the Imperial Global network of hubs in Accra, San Francisco and Singapore. These hubs build upon long-term collaborations with partners and stakeholders and develop even deeper links with our alumni community around the world.

The role and importance of Imperial's alumni and supporters is clearer than ever, and you have been essential to the development and ongoing implementation of many of our priorities, but particularly Imperial Global. We are keen to continue connecting, sharing and developing partnerships with our alumni so please do get in touch with your local hub or alumni team to find out how to join us on our mission.

In this issue of *Imperial Magazine*, I'm thrilled to share with you more about Imperial Global, and to pass the mic to some of the colleagues delivering impact in the four hubs.

Here on campus in London, we continue to make scientific advances for the benefit of wider society. Our positioning as a STEMB-specialist university places us as key partner for scientific progress, both in terms of economic growth, and in scientific discovery and innovation. Witnessing our South Kensington campus at the launch of the Mayor of London's London Growth Plan felt like a powerful affirmation of our university's place at the heart of progress. The plan strategically positions WestTech London, with Imperial as its heart, as a future powerhouse, set to generate investment, drive economic expansion, and create jobs. A testament to the synergy between academic excellence and economic progress.

In February we were also delighted to host a visit from King Charles III to Imperial's Centre for Injury Studies in White City. Our Centre is a unique hub, under the umbrella of one of our new Schools of Convergence Science, which is bringing together experts from diverse disciplines with a shared mission: to truly understand traumatic injuries. His Majesty's visit powerfully highlights our commitment to addressing a critical global health challenge – a research area in which we are immensely proud to be leading. The King took the opportunity to meet with the dedicated academics and researchers driving this impactful work, including Professor Anthony Bull, Director of the Centre for Paediatric Blast Injury Studies, whose insights were previously shared with our readers in issue 57 of *Imperial Magazine*.

In this issue, you'll learn about even more important, life-changing research happening every day here at Imperial, as well as hearing stories from some of our past and current students. As ever, thank you for your support of Imperial and partnership with our ongoing ambitions and initiatives. ◆

> ***Professor Hugh Brady*** *is President of Imperial College London.*

PHOTOGRAPHY: IMPERIAL COLLEGE LONDON/THOMAS ANGUS. ILLUSTRATION: MIKE LEMANSKI

LEADERSHIP

Schools of Convergence Science leaders announced

Imperial has announced the inaugural Co-Directors for its four new Schools of Convergence Science, created to enhance Imperial's interdisciplinary research capacity, visibility, talent attraction and funding.

Dr Mirabelle Muûls (Convener), Professor Benjamin Barratt, Alyssa Gilbert and Professor Nilay Shah will lead the School of Sustainability, while Dr Anthony Bull (Convener), Professor Iain McNeish, Professor Marisa Miraldo and Professor Faith Osier will lead the School of Health and Technology.

Professor Jonathan Eastwood (Convener), Professor Kin Leung, Professor Julie McCann and Professor Matthew Santer will lead the School of Space, Security and Telecoms, and Professor Alessandra Russo (Convener), Professor Payam Barnaghi, Professor Will Branford and Professor Aldo Faisal will lead the School of Human and Artificial Intelligence.

The Co-Director (Convener) is a rotating role that will act as a visible point of contact for each School.

LIFE SCIENCES

Life sciences boost with Bruntwood SciTech venture

A new £200 million joint venture with property platform Bruntwood SciTech will provide a major boost for Imperial's life sciences capacity at the White City Deep Tech Campus.

The new facility will connect Imperial's world-class research community with deep tech and life sciences businesses. It will deliver exceptional labs and workspaces where deep tech startups, scaleups and global businesses can co-locate, collaborate and grow with Imperial's academics, clinicians and researchers.

Science and Technology Secretary Peter Kyle welcomed the investment in WestTech London – itself a powerful engine for investment, growth and job creation. "This partnership demonstrates the potential that can be unlocked when we combine the expertise of world-leading academics and researchers with the private sector," he said.

42

The Hitchhiker's Guide to the Galaxy says 42 is the answer. But what is the question? For Professor Mohamed Shamji, it's all about finding a lifelong cure for peanut allergies.

Peanut allergies are widespread, increasing in prevalence and potentially deadly. Until now, the focus has been on avoidance; however, not only is this an unreliable strategy – between seven and 14 per cent of allergic individuals are accidentally exposed to peanuts every year – the effect on patients' mental health can be terrible.

"You can't underestimate the impact on people's quality of life and the anxiety it causes, particularly for parents of children with the allergy," says Professor Mohamed Shamji, whose team of researchers at Imperial's National Heart and Lung Institute are working on the creation of what could be a revolutionary vaccine. "The goal of our research is to desensitise patients to the allergen, so that exposure doesn't elicit such a strong reaction, while also introducing immunological tolerance."

The first phase of clinical trials on the vaccine, developed in collaboration with industry partner Allergy Therapeutics, has been encouraging, demonstrating the safety and effectiveness of the technology that Shamji describes as state of the art. Skin-prick tests using the peanut allergen protein encapsulated within a "highly attenuated and very safe" virus-like particle showed that reactivity in patients was flat, while the control yielded the normal expected immune response.

For Professor Shamji, the research ushers in a new way of thinking about serious allergies. "The problem with trying to use traditional immunotherapy to treat a peanut allergy is that whether you administer it over 12 weeks or three years, after you stop, the benefits only last for four weeks," he explains. "Here, our aim is to reset the immune system so that individuals can remain symptom-free for the rest of their lives." If successful, the same principle could be translated for other aggressive intolerances, such as asthma-linked cat allergies. As Professor Shamji says: "Whatever the nature of the allergy, prevention is always better than cure." ◆

> ***Professor Mohamed Shamji*** *is Professor of Immunology and Allergy at the National Heart and Lung Institute in the Faculty of Medicine.*

SOCIETY – ICU CRICKET CLUB

Outside edge

Prepare to be bowled over by Imperial's inclusive and award-winning cricket society.

Words: **Peter Watts** / Photography: **Angela Moore**

If you dream of treading the hallowed turf at the 'home of cricket', then ICU Cricket, Imperial's all-conquering cricket society, is the club for you. "We run trials every October in the nets at Lord's," says President Suhas Arun (Computing, Fourth Year), "and it's a chance for everybody to see the facilities and hopefully have an amazing experience."

The society runs three men's teams and a women's XI, with indoor matches and informal Sunday club friendlies, ensuring that everybody can get their fix of leather on willow all year round. "A real sense of community has been developed by the society in the last few years," says Arun. "It's well structured, with weekly socials, training once or twice a week and fixtures for all abilities, so it's easy to get involved."

This was recognised at the 2024 Union awards when the Cricket Society came out on top. "We were also nominated for BUCS national sports club of the year in 2022 and finished in the top four, which was amazing," says Mithun Padmanabhan (Mechanical Engineering, Fourth Year), the society Vice-Chair. "Imperial isn't always immediately recognised for its sports, so to be known as one of the best university sports clubs in the country is a great accomplishment."

With outdoor cricket confined to the ten weeks of summer term, the Cricket Society needs to innovate to retain interest during the winter months, with activities both on and off the pitch. The season starts in October with trials, followed by indoor cricket every Friday evening at the South Kensington Campus. As well as the society's informal league, the first XI compete in the BUCS Indoor National Championships, and reached the National Finals in the past two seasons.

Our socials are quite unique as we have a lot of non-drinking members – we tailor activities to everybody

Winter usually includes a team-building domestic tour to a city such as Cardiff, Liverpool or Leeds, with weekly socials to develop those bonds even further. This includes an annual game of Pub Cricket – a pub crawl in which freshers are asked to wear at least one piece of cricket equipment. But don't worry: if Pub Cricket isn't the game for you, the society has plenty of others you can try. "Our socials are quite unique for a sports society as we have a lot of non-drinking members," says Arun. "We try and tailor the social to everybody and do activities such as using a batting simulator, or bowling or mini golf. We want to do activities that will appeal to more people."

This sense of inclusivity has seen the women's XI gain prominence, winning their league last year and attracting so much interest that there's talk of fielding a second XI. In the three men's teams there is a good mix of standards, from a first team that includes internationals and county players to a third XI that might include those who haven't padded up for years.

With pitches at the Imperial sports ground in Harlington and the promise of a European tour – previous trips have included Croatia and Spain – it's no surprise that cricket at Imperial is thriving, and not just for the players. "During the summer, it can be very easy to persuade your friends to come to watch a match," says Padmanabhan. "It's a nice break during exam season. You can get a bit of sunlight and see friends while we try and score some runs. And if I've got out early, I can sit in the sun with my friends and relax." ◆

Below from left Issy Docherty (Maths, Second Year); Deep Shah (Mechanical Engineering, Third Year); Sidhanth Sureshkumar (Computing, Fourth Year); Suhas Arun (Computing, Fourth Year); and Adam Hussain (Physics, Fourth Year).



EDUCATION – PROFESSOR PETER TODD, DEAN OF IMPERIAL BUSINESS SCHOOL

The uncertainty principle: how a strong culture and values can help businesses prepare for the unknown

To live in 2025 is to live with uncertainty. AI, tech and climate change are all affecting how we do business – and creating market and geopolitical uncertainty. But how do we build resilient organisations while still staying true to our business's values?

As educators, we need to give our students the tools and techniques to manage uncertainty – principally collaboration and being able to think effectively. For example, how do you think through making decisions? Part of it is technical – you need business and data analytics, you need to understand finance and operations, so you can harness your information.

But resilience is really about people – if you can't predict what's going to happen, you have to adapt, so you need to bring teams together and empower them to make decisions. If you're always waiting for the top-down decision, the world will pass you by. You need to be able to respond in real time.

I'm hearing more students say they want to create a job, not look for one

This means your overarching strategic plan may be quickly out of date, so what sits under it? Culture and values. You have to bring people together in a culture. Values are easy when things are going well but you need to be able to stand by them when things get tough. I would say culture beats strategy every time.

The traditional view of businesses is that they are there to make money and maximise value for shareholders, but I think we are moving towards an idea of a more sustainable prosperity: the idea that businesses need to generate wealth for society, and provide opportunities for advancement for a wider group of people. This means harnessing equality and diversity. For example, at Imperial we have students from around 150 countries – every time we get more diverse, we get better. If you want to innovate, you need different perspectives and different approaches. Increasingly I'm hearing students say they want to create a job, not look for one.

So does this require a different kind of teaching? We're building in project-based, experiential learning on top of the deeper learning of the classroom, but mainly it's about providing opportunities for students to come together.

Take the Enterprise Lab, where we use structured, theoretical frameworks to gather people from different backgrounds and disciplines to see what they can build together. It's not just about business education, it's about exposure to the science at Imperial and seeing where we can add value, encouraging questions that might help avoid unintended consequences.

What we are looking for are well-rounded students on the technical and business side, so we are planning more combined undergrad courses, but building resilience is also about ongoing learning, so executive education and online courses are important.

I'd say my own approach to strategy is 'convergent'. Since I joined Imperial, I've been talking to people and looking for the thematic crossovers – climate change and healthcare are prime examples. It's not necessarily about bringing in new things, it's about harnessing strengths we already have, making sure we're structuring activities and academic programmes around the themes. As is making sure data science is at the heart of our courses – information is the core of research after all, and education is all about harnessing information to enable an effective response to whatever happens tomorrow. ◆

> ***Professor Peter Todd*** *joined Imperial Business School as Dean in September 2024.*

INTERVIEW: MEGAN WELFORD

IMPERIAL INNOVATES

A rich environment

Universities have confidence baked in, says spinout investor and entrepreneur Alastair Kilgour.

Words: **Frances Hedges**

What do all entrepreneurs have in common? For Alastair Kilgour (MSc Management Science 1981), the answer is confidence. "For some people, it's innate, while others learn it – but either way, it's important for success," says Kilgour, who co-founded the investment company Parkwalk Advisors in 2009. "For me, self-belief came from being at Imperial. What I gained during my degree gave me the edge in the workplace."

Recently named the winner of Imperial's Alumni Entrepreneur Award 2025, Kilgour's first degree was in biochemistry, but after a year in industry he realised it was not for him. And so he came to Imperial, in his words, "to pivot"; the Management Science postgraduate qualification offered a fast track to a career in business. "Professor Sam Eilon, who ran the course, had good links into the finance sector, so I thought it would be a great way to get onto a big company's trainee scheme," he recalls.

And so it proved: in 1981, Kilgour was offered a position at a City stockbroker, where, against a backdrop of economic growth in the wake of the 1970s recession, he found himself "in the right place at the right time". The technological know-how he brought from Imperial – "I'd taken a computer science module, which was very unusual in those days" – combined with his scientific nous, made him a valuable resource, and his progression was rapid. Opportunities at rival brokers followed, leading eventually to his role as Head of European Capital Markets at Lazard.

It was the financial crisis of 2008 that prompted Kilgour, in partnership with his former Lazard colleague Moray Wright, to set up a new business. Having lived through a previous crash, the pair knew the government would be keen to incentivise economic activity, and they decided to take advantage of this. "I felt there needed to be a way for companies with lots of intangible assets, such as in tech or pharmaceuticals, to borrow money against their potential sales growth," explains Kilgour. To fill the gaps in his knowledge, he returned to Imperial, this time enrolling himself in a course on valuing intellectual property. "That experience confirmed to me that this was an area worth investing in."

Their focus was on university spinouts – companies set up to harness the potential benefits of academic research. "Universities are a pool for creativity and talent," says Kilgour, "but it can be challenging to value the output of their research departments. My goal was to establish a new UK asset class that would, over time, create its own track record and have a legacy beyond my involvement."

Parkwalk Advisors now supports spinouts from top academic institutions to the tune of £50 million a year, using money invested under the government's Enterprise Investment Scheme. Imperial is, he says, particularly well-placed to attract funding, because its diverse student and academic body means that a global outlook goes hand in hand with technological innovation, and also because of its strong emphasis on entrepreneurialism. "The best, most disruptive ideas coming out of universities aren't just from one professor or team – they're the result of multidisciplinary thinking," he points out. "And Imperial is great at encouraging that." Alumni can now personally invest in the fruits of such thinking, thanks to the Imperial College Enterprise Funds, a seed investment scheme managed by Parkwalk Advisors.

As an entrepreneur enabling the next generation of creative thinkers, Kilgour is proud to be passing the torch. "Any business starts with an idea, but quite quickly you realise the challenges of getting there," he says. "I'm happy to do all I can to help people down that road." ◆

> ***Find out more at*** *parkwalkadvisors.com*

Right: Alastair Kilgour, co-founder of Parkwalk Advisors.

The best, most disruptive ideas coming out of universities aren't just from one professor or team – they're the result of multidisciplinary thinking

PHOTO: ©ZUTE LIGHTFOOT

IN BRIEF

Google AI research
Google's unreleased AI co-scientist system has the potential to 'supercharge' science, Imperial researchers say. The system was asked to explore a topic that Professor José Penadés and his team had been pondering for over ten years. It proposed the same hypothesis they arrived at, in a fraction of the time.

LA wildfires
Human-caused climate change made the ferocious LA wildfires more likely, research from Imperial's World Weather Attribution has found. It shows that factors linked to climate change – reduced rainfall, dried vegetation, and increasing overlap between flammable drought conditions and Santa Ana winds up to 100 miles per hour – all contributed to the fires.

ARIA funding
Four new Imperial projects are aiming to deliver breakthroughs that could help to treat patients with devastating brain disorders – thanks to almost £15 million in funding from the Advanced Research and Invention Agency (ARIA). The projects include investigations into restoring damaged brain circuits and a new way to deliver drugs to targeted brain regions.

OVERHEARD ON CAMPUS

Command Suite: *the system set up to streamline communication and co-ordination for His Majesty The King's visit to Imperial's Centre for Injury Studies, to witness cutting edge trauma injury research.*

Punk and emo: *the scientific names of newly analysed 'rebellious' fossils. They're not like other fossils, y'know. They're, like, complex and adaptable, man. And they're challenging the establishment view that early molluscs are, like, really basic and primitive.*

Solar Orbiter: *the European Space Agency spacecraft currently out in space studying the Sun, with a magnometer designed and built by an Imperial team. It's been five years since launch, so happy birthday, Solar Orbiter! Don't fly too close…*

GOING GLOBAL

Imperial's four new international hubs bring great minds together to tackle the world's most complex problems.

Words: **Lucy Jolin** / Illustrations: **Karan Singh**

The collaboration with **NTU Singapore** will enable scientists to rapidly scale new breakthroughs and technology to societal benefit and commercialisation in Southeast Asia.

A brilliant mathematician in Accra. An environmentalist banker in Singapore. A dazzling technologist in San Francisco. A climate scientist in Bengaluru. An expert engineer in London. Alone, they can achieve great things. But together? Anything is possible. Which is where Imperial Global comes in: a global network creating spaces, structures and relationships to enable the world's greatest minds to grapple with the greatest challenges.

"From pandemics to global warming and pollution, all these challenges cross borders," says Michael McTernan, Director of the International Relations Office. "They can't be tackled in isolation. And Imperial's internationalism is one of our community's greatest strengths: our academics work across 192 countries, and our staff, students and alumni come from all over the world. They are doing amazing things, and if we can leverage this network, then we can make a greater impact."

A key strand of Imperial's Science for Humanity strategy, Imperial Global currently has hubs in the USA, Singapore, India and Ghana. Each hub is different, focusing on that area's particular strengths and needs. But all are strengthening the Imperial network, inviting in new collaborators, bringing Imperial's work to the world, and more of the world to the university's work. And every member of the Imperial community is invited.

➔ SINGAPORE

As an epidemiologist, Professor Azra Ghani, Academic Director for Imperial Global Singapore, has seen the power of the scientific network at first hand. "During the early stages of the pandemic, we were able to share information in a very open way that was not achievable at the political level," she says. Now, Imperial Global Singapore is harnessing that same desire to work together and make things better.

"At a time when some countries are starting to look inwards, it feels very different here in Singapore," she says. "We want Imperial Global Singapore to look at the broader direction of travel. Absolutely, we're doing the ▶

Imperial Global USA will enhance Imperial's collaboration with US academic and industrial partners, and support the growing US alumni network and student recruitment opportunities.

science and publishing the papers – all of which is, of course, incredibly strong in Singapore. But we're also thinking: what does this science mean for the world? How can it benefit society?"

Imperial Global Singapore opened in January 2024 in the beating heart of Singapore's research and innovation ecosystem: the National Research Foundation's Campus for Research Excellence and Technological Enterprise. And its first research programme, IN-CYPHER, is already up and running. A S$20 million collaboration with Nanyang Technological University (NTU), IN-CYPHER is focused on improving the security of medical devices and health data. The programme harnesses Imperial's expertise in this area to establish Singapore as a global leader in health cybersecurity and AI for healthcare.

Glenn Neo is Director of Innovation and Capabilities Enablement at Synapxe, the national health tech agency that creates intelligent technological solutions to improve health, and is keenly aware of the security risk around medical devices that store vast amounts of personal data. "When I read the synopsis of what Imperial and NTU were trying to do, I was blown away," he says. Following a meeting with Professor Anil Bharath, director of IN-CYPHER, and Professor Liu Yang of Nanyang Technological University, he joined IN-CYPHER's board.

"I was very impressed by Professor Bharath's level of conviction and aspiration in wanting to move the needle in this space," says Neo. "It was so great to see that there is a clear thought leader, someone who is committed to the cause. Knowing that there is a real demand for this technology and that we need to figure out how to do this better, being involved and adding value was a no-brainer." "Scientists tend to have an automatic desire to work with the right people, regardless of where they are," says Ghani. "Imperial Global builds a cultural understanding of different systems and different approaches, and that diversity of views also has a direct impact on the science. By bringing those different perspectives together, I think we can achieve so much more."

At a time when some countries are starting to look inwards, it feels very different here

← SAN FRANCISCO, USA

Silicon Valley: a red-hot hub of innovation, commercial technology creation and scaling expertise. And the perfect place for Imperial Global USA to have its home, says Daniel Doulton (Engineering 1993, MBA 1993), CEO of Solaris Suborbital. "Imperial is such a powerhouse, particularly in terms of translating science into technologies that become cornerstone elements that transform markets and industries. For that, a presence in Silicon Valley is symbiotic and crucial."

Since Imperial Global USA's launch in November, Programme Director Cole Harry has been criss-crossing the Bay Area, meeting with industry, alumni, foundations, government bodies and other universities with the goal of identifying points of collaboration to develop partnerships. "There is massive interest in the work of Imperial researchers in Silicon Valley. In a short amount of time, we've been able to build connections to industry and academia that will form the basis of significant future partnerships," he says.

Indeed, Imperial Global USA has identified seven academic themes where the university excels and that dovetail with the Bay Area science ecosystem: human and artificial intelligence; advanced materials and cleantech; health technologies; space and satellite technologies; deep tech entrepreneurship; engineering biology for health and environment; and biotech. Each has their own Academic Theme Lead who will support networks and partnerships. ▶

And some of those partnerships are already live: the new $150 million Rio Tinto Centre for Future Materials, led by Imperial and supported by UC Berkeley, aims to develop a sustainable model to produce materials that help the transition from fossil fuels to renewable energy; while the Children's Hospital of Orange County, a paediatric healthcare system in California, is partnering with Imperial to drive AI in paediatric care.

Imperial Global USA is also playing a pivotal role in supporting startups and spinouts founded by Imperial alumni, reaching new investors and potential partners. For example, the Enterprise Lab recently led an Imperial Global USA venture trek that helped health tech company OSSTEC boost its investment to £2 million.

And along with creating partnerships and research opportunities, Imperial Global USA is also serving as a hub for Imperial alumni in the Bay Area. "Being able to access Imperial expertise here is hugely informative for what I'm doing in my professional work," says Doulton. "It means I hear about the latest cutting-edge developments and can also connect with key people who are in those areas of science and technology."

University ecosystems have allowed Silicon Valley's extraordinary culture of innovation to flourish, Harry points out. "I think the role Imperial plays in London is very similar to the role that Stanford and UC Berkeley play in the Bay Area. Having stronger ties to this ecosystem will help Imperial and London develop scientific collaboration – a transatlantic partnership that will be crucial to solving the biggest issues that we face. Having a physical presence here is core to that."

➔ ACCRA, GHANA

"Science is always done better when we are closer to where the question is: it helps us think better about the questions we are trying to answer and how we interpret our findings," says Professor Majid Ezzati, Academic Director for Imperial Global Ghana. The hub already has a growing network of African partners in government, civil society, development and universities. Now, it's aiming to foster the co-creation of research, education and innovation programmes which both solve the continent's particular challenges and shed new light on scientific questions worldwide.

Questions like: why are some diseases such as sickle cell disease more prevalent in Africa than anywhere else, and how can people with the disease be treated? And how might the dust blown from the Sahara Desert that travels hundreds of miles affect the respiratory health of everyone who breathes it in? Ezzati is clear that the answers to these questions are best investigated locally, but sees other benefits too.

"For example, I'd love to see a programme around digital technologies that can bypass the bottlenecks in health improvement," he says. "Imperial is extremely strong in this area. This could be a larger programme where medicine, engineering, natural sciences and businesses interact, to ask how Africa could become a place for device innovation in the same way that South Asia has become a frontrunner in vaccine manufacturing."

And programmes like this are already happening. "During the pandemic, approximately 30 per cent of the African population had access to at least one dose of vaccine. In rich countries, on average 70 per cent of the population was fully vaccinated with multiple doses, and in some cases, spare doses of vaccines were actually discarded," says Professor Faith Osier, Co-Director of the School of Convergence Science for Health & Technology. "This inequity in access to vaccines underpins the drive to manufacture vaccines locally in Africa." ▶

The hub in **Ghana** builds on a growing network of African partners in university, government and civil society to support the co-creation of research, education and innovation programmes.

It's a two-way knowledge bridge to share expertise and propel industry forward

Imperial Global India will drive high-impact science and technology programmes with academic, industrial and innovation partners.

PHOTOS: ALAMY

Osier is now working towards enabling vaccine manufacturing in multiple African countries, including Ghana. “The projects are African-led academic-industry partnerships with a bottom-up strategy for vaccine development, bringing together interdisciplinary skillsets to establish ground-breaking services on the continent. We strongly believe that health and technology can turn the challenges Africa faces into opportunities for businesses that can improve lives.”

She hopes that Imperial Global Ghana will help to coalesce like-minded partners around projects like these. “It will help to build a community of entrepreneurs and visionaries who see the incredible opportunities Africa offers in the health and technology innovation space. The African population is set to grow to 2.5 billion by 2050. Investing in businesses in Africa now is a no-brainer.”

← BENGALURU, INDIA

Accelerators, startups, unicorns: India is buzzing with talent and innovation right now. And Professor Sanjeev Gupta and Dr Elena Dieckmann, Imperial Global India’s joint Academic Directors, can’t wait to start making the most of it.

“India is such an exciting country at the moment,” says Gupta. “And Imperial Global India is all about building partnerships with universities, businesses and companies throughout India to share knowledge and innovation between India and the UK. It’s an exciting opportunity for Imperial to learn about India – and India to learn about Imperial.”

Imperial has a long history of collaboration with Indian institutes and researchers, typified by its current partnerships with the Indian Institute of Science. The new hub in Bengaluru – opened in May and established as a liaison office – will focus on creating even more research collaborations in three areas: emerging technology, climate science and healthcare. This could include telecommunications, critical minerals, semiconductors, AI, quantum, biotechnology and advanced materials.

It will aim to strengthen existing industrial collaborations – such as Imperial’s current partnership with Tata Steel – and create new ones with industry and policy makers. And it will encourage a free flow of students and experts between the two countries, sharing ideas, talent, knowledge and experience for the good of humanity.

“I think it’s highly enriching for our students to actually go to India and experience the country at first hand,” says Dieckmann. “There is so much we can learn from India – for example, they have massively rolled out AI digitalisation across society. Indian researchers and entrepreneurs are phenomenal in translating ideas from the lab into the real world.”

Both Gupta and Dieckmann are looking forward to exploring how Imperial Global India’s research and partnerships will help to solve the big questions that resonate with their own specialisms. Gupta is an Earth sciences expert with a particular interest in sustainability, while Dieckmann’s expertise lies in biomaterials and the circular economy. Both have experience of working with Indian institutes and researchers.

“Imperial Global India will be a two-way knowledge bridge to share our experiences and expertise in tackling grand challenge problems and propelling industry forward for common good,” says Gupta. “We want to bring together all our different partnerships with institutions around the world to try and collectively tackle these major problems that the world faces.”◆

HOW TO BUILD AN INNOVATOR

Bright ideas? Imperial students are full of them. But what does it take to get that concept from Mac to market?

Words: **Peter Watts** / Photography: **David Vintiner**

Every great business starts with an idea. It could be an individual moment of inspiration, or a concept hashed out by a group in a lab, classroom or coffee shop, but that initial idea is the origin story of every successful company, from tiny startups to world-leading unicorns. But turning that idea into a sustainable business requires the support of an innovation ecosystem, something that young entrepreneurs at Imperial have right on their doorstep.

"Being able to bounce ideas around in a place where a lot of people are thinking about science and entrepreneurship is incredibly helpful," says Cai Linton (MEng Bioengineering 2022), co-founder of Multus. His company has developed a sustainable and affordable alternative to the growth medium used to feed the cells used for things such as cultivated meat and medicine.

"There are facilities we can access, we can talk to professors who have often set up companies themselves, and we can use areas like Hackspace in White City," says Linton. "That keeps us here and creates a sustainable ecosystem." ▶

On the up
Team Marigold (from left): Maria Guerrero Jimenez (Physics, Second Year); Leo Kremer (Design Engineering, Second Year); Mele Gadzama (Physics, Second Year).

Colin's legacy for the next generation

Why alumnus Colin Chapman chose to leave a legacy for future generations at Imperial College London.

For Colin Chapman (Mining, 1958), studying at Imperial was a life-shaping experience. "Dad often talked about his time at the Royal School of Mines," says his son, Mike. "In a sense, it defined him as the person he became. He made friends for life and attended reunions with his classmates every chance he got."

Imperial set the stage for a successful global career as a mining engineer. Through his work, Colin travelled extensively, managing mining projects in countries including Uganda, Guyana, Indonesia, Canada, Brazil and Suriname. "Mining was a lifestyle for Dad," says Mike. "He was recognised as a leader in the sector, and implemented techniques that are widely used today."

Shaping the next generation

His life experiences made Colin a strong advocate for the power of education, and he made regular donations to support Imperial students. Then, when he died in 2024, he left a generous gift in his will to help fund much-needed scholarships for our future engineers.

"Dad would be so pleased to know that his gift will help to give a bright student the same opportunities he had," says Mike. "He believed that there was no greater investment than education. His hope would be that this gift will help shape the next generation of mining engineers."

> **People who leave a gift in their will make an incredible difference. They make possible the futures that many people deserve but, without financial support, would never have.**
>
> Martin Lupton, Vice-Dean (Education), Faculty of Medicine

Will you leave your legacy for the next generation?

A gift in your will can give students of all backgrounds the chance to thrive at Imperial. You can also play your part in research breakthroughs that tackle some of the world's biggest global challenges. For more information on leaving a gift in your will, get in touch with our legacy team, on **+44 (0)20 7594 9330** or email **giving@imperial.ac.uk**

imperial.ac.uk/giving/legacy/

Our prototype was held together by duct tape – but it worked!

For many Imperial undergraduates with a bright idea, the journey begins by engaging with one of the university's wealth of entrepreneurial support offerings. One of these, a competition, is the Faculty of Natural Sciences Make-A-Difference (FoNS-MAD). It gives successful entrants eight weeks of lab time with a mentor, not to mention a final prize of £7,000. Multus won the competition in 2019, giving it valuable experience, a provable concept and a healthy amount of cash to spend on materials.

An earlier FoNS-MAD champion was Matoha, which won the competition in 2017 with a device that identifies different types of plastic for recycling. While preparing for the final, Matoha's founders realised they weren't just having fun, they were building a business. Their devices are now sold to companies in 45 countries to help with recycling.

"A lot of plastics look the same, but a yoghurt cup can be made from three different types of plastic," explains co-founder Dr Martin Holicky (Chemistry 2019, MRes 2020, PhD 2024). "We had the idea of creating a device like a supermarket scanner that can instantly identify the ▶

composition of an item, and over eight weeks we developed our prototype to present at the final. It was held together with duct tape but it worked. We now have a range of other devices for fabrics and are working on one for carpets, but we wouldn't be here at all without FoNS-MAD." Holicky has since "paid it forward" by signing the Imperial Entrepreneurs' Pledge in support of the next generation of innovators.

The competition originated at a staff away day, when members of faculty noted that undergraduates weren't participating in Imperial's innovation and entrepreneurship initiatives. With the support of academics and alumni (all of whom are both scientists and entrepreneurs), the competition has grown in scope and scale, nurturing prospective talent through workshops and matchmaking services so entrepreneurs can share plans and find teammates, and then providing mentors and advisers as the competition progresses.

Students initially submit an outline proposal, explaining how their invention will benefit society and what they would do with an eight-week lab placement. "We got 30 outline proposals this year, which we whittled down to about ten who submitted a more detailed proposal," explains Rebecca Middleton, Director of Education and Student Experience, who has run FoNS-MAD since its inception ten years ago.

"We then pick between four and six to complete the fully funded lab placement. They are given a bursary, a consumables fund, a supervisor and a mentor. We support all the finalists to enter other competitions and act as a feeder to entrepreneurship programmes such as the Venture Catalyst Challenge, WE Innovate and the other services available at the Enterprise Lab."

THE BEST PLACE TO BE

Several FoNS-MAD finalists have become successful businesses, often continuing their progress with the support of these other Imperial services. The latest winners, Team Marigold, are still in the early stages of that journey. The team – Leo Kremer (Design Engineering, Second Year), Maria Guerrero Jimenez (Physics, Second Year) and Mele Gadzama (Physics, Second Year) – invented a way of eliminating triggering noises for people with misophonia, a condition where people experience profound discomfort when they hear sounds such as chewing or coughing.

"Our original idea was noise-cancelling headphones, but experts told us this would be very hard to do," explains Kremer. "We then looked at applying our technology to video. We talked to people with misophonia who said an online solution would be very helpful as they often choose to move to online for things like lectures as it allows them to avoid triggering sounds, but they still encounter them when they watch videos."

During eight weeks in the lab, Team Marigold developed a program that could analyse, identify and remove the sound of coughing from video. Over the next few years, they intend to develop the concept further with the support of Imperial. Like many other FoNS-MAD winners, their next step will be the Enterprise Lab in South Kensington, a dedicated support service for students, staff and alumni who want to develop ideas and expand networks.

"If you are a student with an entrepreneurial idea, the Enterprise Lab is the place to be," says Graham Hewson, Head of Incubation and Prototyping Spaces. "They have mentors who can work with students, they organise venture treks to meet alumni, they run idea surgeries and they have experts who can help tease out an idea to find the market potential."

In fact, the Enterprise Lab oftens sends students to Hewson, who runs the Advanced Hackspace and the White City Incubator. The Advanced Hackspace is a shared workspace with advanced tools and machinery for students to use on personal projects. It hosts the Hackstarter, a competition where each finalist is given £500 to develop a prototype. "Multus started at Hackspace," says Hewson, "and it's really interesting to see how far that £500 can go."

BUILDING A COMMUNITY

The White City Incubator offers lab space for staff- and student-founded businesses, as well as external startups that want to work with Imperial. Companies stay for a maximum of three years and become part of an entrepreneurial community through events such as Sip And Solve, where founders share their current challenges with other companies in the lab.

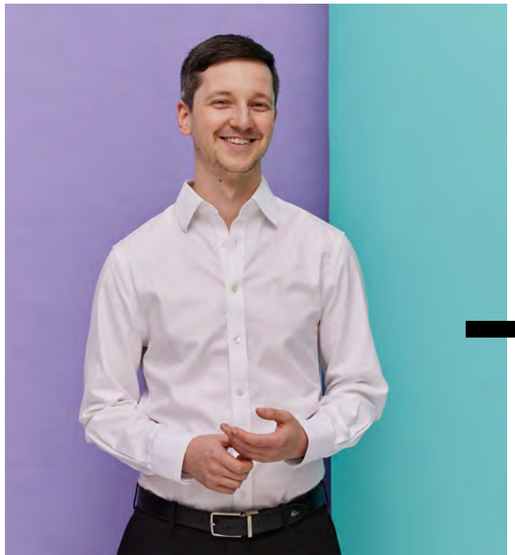
While Imperial students can usually find a professor to answer scientific questions, the Incubator provides access to more elusive marketing, legal and financial experts – essential for anybody building a company. "The feedback we get is that people miss that community when they graduate," says Hewson. "They all know each other and share experiences and information."

It's been a huge success. Since 2016, the Incubator has hosted 59 companies that raised £622 million in investment and created more than 640 jobs. Of the companies that graduated to independent spaces in Imperial's Scale Space and I-HUB, more than 80 per cent were still around after three years.

Multus is one of those graduates of the Imperial ecosystem. Having utilised the Advanced Hackspace, FoNS-MAD, Enterprise Lab and the Incubator, the company remains on the White City Campus at Wood Lane's I-HUB. That allows it to give something back to Imperial, through things like internships for Imperial students and meeting FoNS-MAD entrants to offer advice and inspiration. It's part of an innovation feedback, allowing successful alumni to support the next generation of entrepreneurs.

"Why do we do it?" says Middleton. "We do it because our students are awesome. They are super-intelligent and so creative, and we get to encourage that innovation by creating an opportunity beyond their studies. What they manage to achieve during FoNS-MAD really blows me away. This is the bit of my job I love the best." ◆

> ***The Imperial Enterprise*** *LinkedIn page is a great way to keep up to date with developments across the Enterprise ecosystem, from startups and spinouts to technologies and consultancy projects. Visit the page at bit.ly/ic-enterprise-linkedin*



GRAHAM HEWSON PHOTO: TEMPEST PHOTOGRAPHY

Cai Linton, Multus
Developing affordable growth media products for the meat industry.

The feedback we get is that people miss that Incubator community when they graduate

Rebecca Middleton
Director of Education and Student Experience, Faculty of Natural Sciences.

Graham Hewson
Head of Incubation and Prototyping Spaces and head of Hackspace and White City Incubator.

Dr Martin Holicky
Co-founder of Matoha, winner of the FoNS-MAD competition in 2017.

Doing it for the kids

What does childhood really look like in the 21st century? An ongoing study is taking a new approach to finding out – by hearing from children themselves.

Words: **Abi Millar** / Illustrations: **Holy Moly**

Let's face it, we slay, and that's on periodt. We don't mean to flex, but we reckon our rizz ate, no cap, because we're in our brat era, and it hits different. So don't be salty, just prepare to be gagged, as there's low-key so much tea to spill.

If you can follow any of that – and aura points if you can, but I guess IYKYK – you're likely a member of Gen Z, arguably one of the most misunderstood sections of our society. Until now. Because instead of research that is done *on* or *to* youngsters, an ongoing project, the Study of Cognition, Adolescents and Mobile Phones (SCAMP), is working *with* them. And the results are revealing.

The groundbreaking study is being driven by The Mohn Centre for Children's Health and Wellbeing, established thanks to a transformational gift from Dame Marit Mohn (MSc Chemical Engineering and Chemical Technology 1973). But can children really be co-creators of research? What does a project look like when you're collaborating with a group of 16- and 17-year-olds? And what do young people themselves think of it all?

"I feel like something's got to change in research, and it needs to be a two-way street," says Professor Mireille Toledano, Director of the Mohn Centre and Principal Investigator of SCAMP. "People give to us in our research study, but we've got to give back to them. We're collaborating together, we're engaging with one another, and they are co-creating from the very beginning all the way through the research cycle."

SCAMP is a cohort study that started in 2014 – beginning with simple questions to around 7,000 Year 7 students from 39 schools across Greater London. Since then, researchers have followed up with the students every two years, collecting a dizzying amount of information about their digital technology use, demographics, brain function and mental and physical health. Today, they are ▶

working with more than 11,000 young people from 55 schools, and plan to keep the study going on an indefinite basis.

"Ultimately, we're doing this research because we want young people and parents to be able to make better-informed choices around how they use mobile phones," says Dr Rachel Smith, Research Fellow in Population Child Health, who worked on the project alongside Dr Steven Shen, Dr Lan Cheng, Jerry Bryan, Dr Rhiannon Thompson and Nicole Curtis. "If we can get good evidence from the environment they live in now, everyone can be better informed."

As well as boasting the largest dataset in the world around young people's mobile phone use, SCAMP is notable for its breadth of scope. And as the study develops, it's possible to ask a much wider set of questions beyond mobile phone use, to ask about air pollution, noise pollution and exposure to green space.

But what makes it really special is the way it engages with its research subjects. The Mohn Centre is a transdisciplinary research centre that addresses childhood health challenges in urban environments. Here, young people are seen not just as passive study participants, but as research co-creators in their own right.

However, this isn't always easy to accomplish – at least not in the representative way one might hope. As Toledano notes, the young people who volunteer to take part typically come from higher socioeconomic backgrounds. That leaves whole pockets of society who don't get their voices heard in research.

To address this, the Mohn Centre focuses heavily on community engagement. It works with a range of local organisations, with a view to breaking down the barriers to wider involvement. These include Nova New Opportunities, a charity that supports families local to White City.

"If you've got an issue that affects young people, it's only through working with young people that you can understand whether what you're doing is relevant," says Matthew Barnett, head of Nova's Family Programme. "If young people aren't fully involved in what they do, it's very disempowering, and it doesn't lead to the most meaningful outcomes."

Nova has worked with the Mohn Centre on various initiatives, not least a series of short films in which young people documented their views about the urban environment. "This was a good way of seeing the area through the eyes of the children who live there," says Barnett. "The subjects the young people talked about were very similar to the issues we're hearing day to day. They were very concerned about litter or the lack of greenery, or things looking dirty or broken."

They also voiced concerns about phone addiction and the online environment. More often than not, they are critical of excessive phone use. "We might expect young people would be very defensive of their smartphones. But in the consultations we have held, that isn't really the case," he says.

As the SCAMP study progresses, we can expect to see more consensus around these themes. Already, the study has returned several important findings, including that social media use is associated with increased behavioural problems and lower health-related quality of life, but the latter only in girls. Another is that screentime before bed may put adolescents at risk of poor sleep. ▶

It feels like something's got to change, and it needs to be a two-way street. So instead of research that is done *on* or *to* youngsters, SCAMP is working *with* them

THE WORD ON THE STREET

Ate:
Did something really well.

Beef:
Having drama or a feud with someone.

Beggy:
Someone who is too eager to gain attention, approval, or material benefits from others.

Brat:
Courtesy of Charli XCX – going against the grain or doing the unexpected; a resistance to all things curated and conventional.

Flex:
To brag (or flex your metaphorical muscles).

Gagged:
Shocked, amazed.

Goblin mode:
Unapologetically self-indulgent or lazy behaviour.

Hits different:
Really good in a unique special way.

IYKYK:
If you know you know (often for inside jokes).

We might expect young people would be defensive of their smartphones, but that really isn't the case

"The nuance here is if people are using phones or watching TV in a room with a light on, they're more likely to get insufficient sleep, but the risk increases massively if they're doing that activity in the dark," says Smith.

There are many more research angles remaining to be probed. Mia Ward and David Fierros are A-level students at Chislehurst & Sidcup Grammar School in south-east London. Together with six of their peers, they took part in the SCAMP Research Challenge – a new wave of the SCAMP study that enables students to lead the research effort in their schools. They were trained to design projects, develop research questions, and collect and analyse data.

"We came up with a research question to study, then we set out to apply that and collected biometric data from other people in our school," says Ward. "In our case, we decided to look at how the internet and social media affect people's emotional abilities and eating habits."

The data collection procedure was rigorous – "we collected urine samples, for the greater good," laughs Fierros – and Ward says that keeping everyone organised was a lot to handle. But while remaining honest about the challenges, both students wax lyrical about the benefits. "I'd definitely recommend it, especially to anyone planning on studying psychology or biology at university," says Ward. "It's really interesting to take part in research that could go on to be published, especially because our findings may affect us directly."

SCAMP researchers, including Thompson and Curtis, are now working with a new set of student teams to co-design an intervention for young people's mental health. The research questions are directly based on the students' experiences – an exciting and innovative feature – and there's a mutual benefit to the arrangement, in that the students have something valuable to add to their CVs.

"Especially since COVID, schools have got a lot going on, and teachers are very busy," says Smith. "We try to have a reciprocal approach – at a basic level that might be compensating people for their time in the form of a voucher, but we might also give young people experiences that can enhance their skills and careers."

side from SCAMP, the Mohn Centre is working on several projects investigating how policy decisions affect young people – for instance, how does the two-child benefit cap affect their mental and physical health? It has also set up a training programme, helping other Imperial researchers involve young people in a far more hands-on way.

"People have said to us that that's given them the confidence to get young people directly involved in their work as advisers, which I think is really fantastic," says Toledano.

In doing so, the Mohn Centre could make a real difference to research protocols. Few scientists have the facility to treat their young subjects as anything more than subjects. But as the SCAMP study demonstrates, truly engaging them can enrich the work and provide a wealth of new ideas and insights. It can also spark new passions among the young people themselves.

"Social media affects our age group and younger the most," says Ward, "we're the ones who are most frequently on social media and the people who are developing new social media. A lot of the existing research was designed by adults, which really biases studies. But nobody understands what teenagers deal with better than teenagers." ◆

CONTINUED

Low-key:
Used casually to play down emotions or opinions ("I'm low-key not their biggest fan").

No cap:
No lie (sometimes used sarcastically). The opposite of cap (a lie).

Periodt:
Used at the end of a statement to emphasise a point.

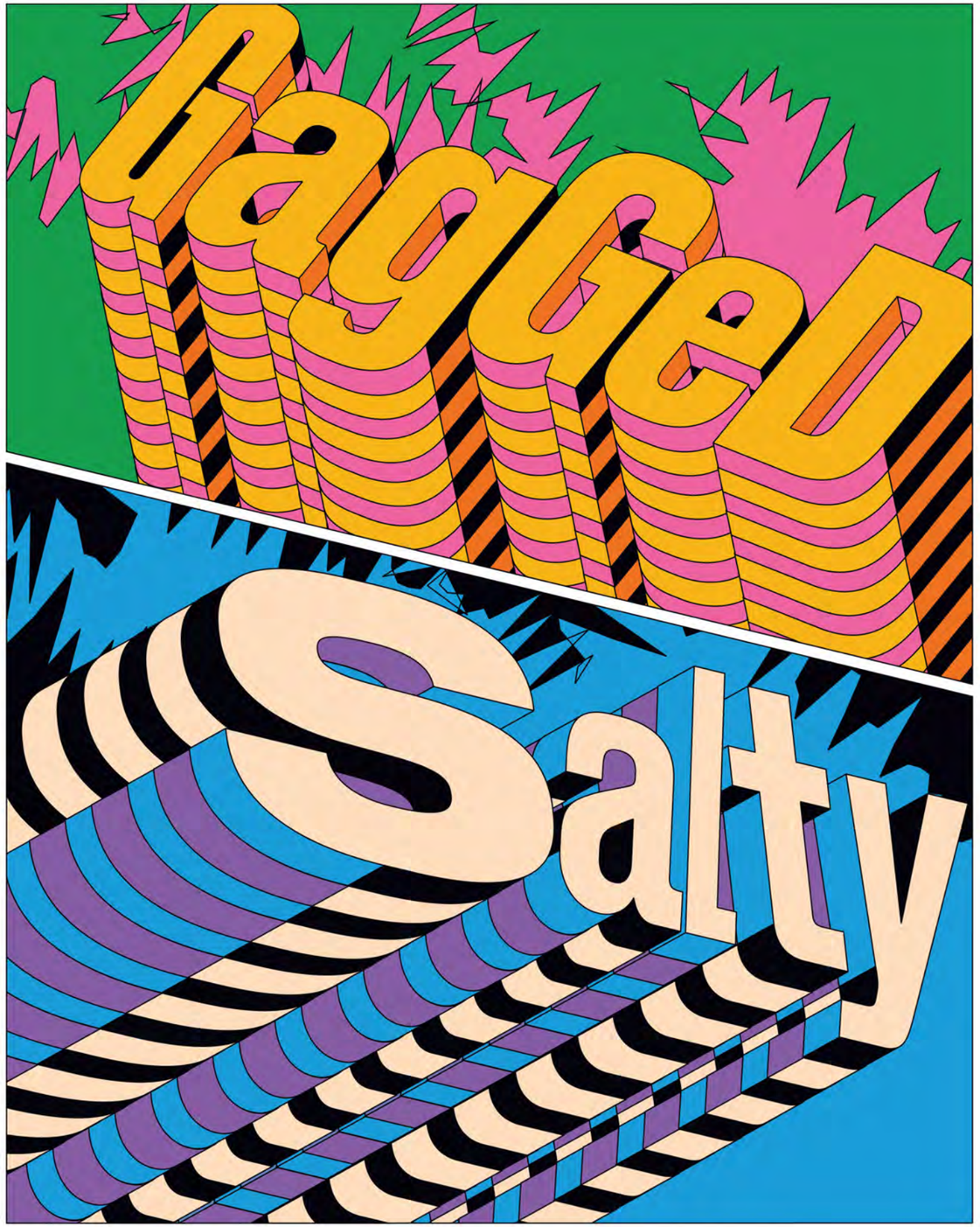
Pushing P:
Used when something is going great.

Rizz:
Short for charisma, the ability to charm or attract someone.

Slay:
Something impressive or someone who performed very well.

Salty:
To be jealous.

Tea:
Drama or gossip (telling your friends the tea is called "spilling the tea").



Worlds away Imperial Gaming and Esports' Freya Stewart (MSci Chemistry 2024; currently studying towards her PhD) and Jeremy Mazauric (Chemical Engineering, Fourth Year) playing Mario Kart World.

GAMING

PLAYING FOR KEEPS

Gaming has always been at the heart of the Imperial experience, and here's why.

Words: **Anna Fielding** / Photography: **Orlando Gili**

R

eady player one: as the racing car revs its engines on the starting grid, waiting for the final light to go out, there's a palpable buzz among the gamers. Controls in hand, adrenaline coursing, each virtual driver is in their happy place, ready to take on their rivals around the challenging track for a chance of glory – the thrill of winning a race without actually having to leave the comfort of their homes.

But this time there is a higher prize at stake: the chance to transform a life, not in the virtual world but in reality; to offer a medically impaired patient the chance of a better life. The world of gaming is now entering a whole new dimension, and at the centre of it is Cogitat, an Imperial startup that is making the most of the gaming culture that's embedded at the university, and which reaches far beyond its natural realm.

Cogitat's software creates an interface between the brain and a computer, allowing users to control the machine using only their minds. How have they developed their groundbreaking products? By playing games, of course.

"Games help us to gather the brainwave data we need to train our algorithms," says co-founder Dimitrios Adamos, an Honorary Senior Research Fellow. "We wrote our own games because we wanted to collect the data in real-world circumstances." The aim was to gather the right kind of information – brain responses that occurred in natural settings as opposed to an artificially created set-up in a lab.

"We bring people in to play games – racing games or robot games, for example," says Adamos. "And we stage these games specifically so that the underlying dynamics of the brain are carefully aligned. We leverage that as an engineering tool to be able to pick up the parts that we want from the brain processes and then model them in the AI algorithms."

From there, the company has been exploring medical applications of their virtual reality environment, starting with games that could help stroke patients recover hand movement by training with a mind-controlled VR hand. Their software is designed to work with a range of external devices, and they have also made use of machine learning to train their software, making it easier and faster for users to get started.

"Thinking about moving your hand and actually moving your hand are done in quite a personal, specific fashion," says Cogitat's other co-founder Stefanos Zafeiriou, Professor of Machine Learning and Computer Vision. "So we had to gather a lot of data to train an algorithm tailored to a specific person. It wasn't generalised." Zafeiriou and his team have used state-of-the-art machine learning algorithms and gathered huge amounts of data to try and overcome this hurdle. "What we try to achieve, and to a certain extent have shown, is that it is possible to create a general decoder that can be applied to a large amount of the population."

Motivation can be a problem for people who have no movement, says Zafeiriou. But exercises performed using Cogitat's software help to rebuild neural pathways, and it's possible for patients to see they are accomplishing something at a much earlier point. "You may need some positive feedback and the gamified version is there to help," he says.

It's a worthy endeavour, but both Adamos and Zafeiriou stress that, like many people at Imperial, gaming is in their blood. "I've been a gamer for as long as I can remember," says Zafeiriou, "starting with arcade games and moving on to Game Boy and beyond, all the way to VR."

And of course there's no harm in gaming for gaming's sake, as four other members of the Imperial community, Mark Morris, Chris Delay and John Knottenbelt (all MEng Computing 2001), and Thomas Arundel (MEng Electrical Engineering 2001) can attest. The four co-founded Introversion Software, and their latest game is The Last Starship, a 2D space construction ▶

I've been a gamer for as long as I can remember, starting with arcade games, moving on to Game Boy, all the way to VR

Get on board
Imperial Tabletop Gaming Society's Sean Jang (Aeronautical Engineering, First Year); Martin Godet (Physics, Third Year) Aurelia Zuchanke (MSc Quantum Fields and Fundamental Forces); Michael Porat (MEng Materials Science and Engineering, First Year); and Sukhmit Singh (MSc Applied Computational Science and Engineering) playing Ticket to Ride.

All in the hands Martin Godet (Physics, Third Year); Otto Pilbrow (Mechanical Engineering, Second Year); Ash Robson (Aeronautical Engineering, Third Year); and Sukhmit Singh (MSc Applied Computational Science and Engineering) playing Pucket.

and simulation game. But despite being set hundreds of miles from Earth, its origins have humbler roots: as part of the celebrated culture of gaming at Imperial.

"My housemate Tom and I were going out and drinking and running around London and having lots of fun," says Morris. "We'd get home and Chris, who we also lived with, would be in his room, eerily lit by the light of his monitor, coding away." Things changed when they discovered a university competition with a £10,000 prize. "We realised quite quickly that an entertainment company idea like ours wasn't what they were looking for, but it is what pulled us all together and made us create a business plan and a pitch. We didn't even submit in the end, but dangling that little carrot in front of us caused us to take the first step."

[redacted]

rom those inauspicious beginnings, the quartet have since released six internationally successful games and, in 2016, won a BAFTA Game Award for their release Prison Architect. It's a long way from that late-night glowing screen, but it doesn't feel that way to Introversion's directors. "I still think about it, because that's still us," says Morris. "We've conquered those divisions of space and time to stay friends throughout all of this."

And that shared enjoyment is what makes gaming so special. "There's a lot to be said for playing games for the sake of just playing games," says Dr Francesco Salerno (MRes Physics 2017, PhD Chemistry 2021), who now teaches an evening course each term called Abstract Strategy Games: History, Maths and Game Design. Salerno is fascinated by strategy, and has worked on various science outreach programmes using games to create interest. Nonetheless, he is quite certain that the main point of engaging with a game should be to play. "I think people shouldn't be afraid of focusing on the fun rather than the accomplishment it brings them."

For current students, the culture of games is strong. Giles Beaven (Chemistry, Fourth Year) was initially attracted to the university's Tabletop Gaming Society because it didn't require an intense commitment. "It was a chill thing I could do on a Monday night, just relax and play boardgames with people." That was in his first year. He is now somewhat more committed, having been the society's chair for two years.

Together, the group decide on games of varying complexity, from quick 30-minute games to five-hour strategy fests. "It can teach you quite a bit about group work and planning," says Beaven. The society also pools funds to buy more expensive multiplayer games. A current favourite is called Blood On The Cocktail, which Beaven describes as full of "*Traitors*-style betrayal". Nonetheless, they're a welcoming crowd, he says, "and we've had lots of good people come and then make good friends. One of the best ways of getting to know someone is by playing a game with them."

Jeremy Mazauric (Chemical Engineering, Fourth Year) and Freya Stewart (MSci Chemistry 2024; currently studying towards her PhD) run Imperial's Gaming and Esports club, one of the biggest gaming societies among UK universities. They also stress the social aspect. "The idea of playing with people that I knew and I could actually meet in person was really appealing," says Stewart, adding that the bursary she received relieved her of a huge amount of added pressure. The club competes in university leagues for different games, such as Counter-Strike 2 and League of Legends.

"You do learn about communicating efficiently and concisely when things are getting quite intense, and a lot about working under pressure," says Stewart. "You get a better mentality about overcoming challenges," adds Mazauric. "You're never going to win all of the time, so you get more resilient and used to setbacks."

For fun, for friendship, for a higher purpose: playing games has always been the Imperial way, a core part of the student experience. So gather your friends, roll the dice and press 'play'. The challenge has been set and it's – literally – game on. ◆

One of the best ways of getting to know someone is by playing a game with them

DATASET – DR ARUNASHIS SAU, NATIONAL HEART AND LUNG INSTITUTE

An AI revolution: predicting disease before it strikes

Context Prevention or cure? Early detection of disease is a cornerstone of modern healthcare – and technology such as electrocardiograms (ECGs) allow us to treat symptoms before they take uncontrollable, devastating hold. But imagine how much more effective treatment could be if that same tech could map our body's future and predict the specific diseases that will strike, before we even get them. By applying AI to ECG results, one Imperial academic reckons he can achieve exactly that.

Background ECGs have been around for a century and have already saved countless lives by detecting heart attacks and irregular heartbeats. But, says Dr Arunashis Sau, the process is rudimentary. "A clinician looks at a print-out of an ECG and decides if it's abnormal or not – but a clinician's interpretation depends on their individual level of knowledge and experience. Applying AI to read ECG results has many advantages – not least that it can find changes so subtle that even the most experienced human could not pick them up. My work suggests we can go one step further, using that data to predict what diseases you could get in the future."

Methodology Sau, a cardiologist and Academic Clinical Lecturer at Imperial's National Heart and Lung Institute, is using AI and machine learning trained on gathered datasets from more than a million primary care and hospital patients on four continents. His first model – called the AI-ECG risk estimator – used an AI neural network to predict when patients were likely to die. "Neural networks have millions of connections and parameters, allowing them to link together subtle changes in different parts of the ECG in a way humans could never do," he says. "Without AI we could not have got here."

Results Sau's AI model accurately forecasts the risk of a patient's death in the ten years following the ECG in 78 per cent of cases – and those it got wrong included unpredictable deaths, such as accidents. "We then applied the model more specifically to predict future health risks such as heart attacks, heart failure and heart rhythm problems," he adds. "We did a lot of extremely detailed analysis, including imaging, genetics and other variables, and found AI was in part identifying something to do with the biological age of the patient. They might be 30, 40 or 50, but if they had certain adverse features causing them to age more quickly it could identify that through extremely subtle changes related to heart structure and function."

Outcome "This will not just predict diseases related to the heart but those outside it, such as high blood pressure, diabetes and kidney disease," says Sau. "The goal is to be able to run this model on any ECG done anywhere in the world. A major benefit will be opportunistic detection and screening. When we identify someone with heart disease in clinical practice or hospital, often it's at quite a late stage. Picking it up early can revolutionise someone's life and trajectory – but this model detects the risk earlier still, before it even happens." ◆

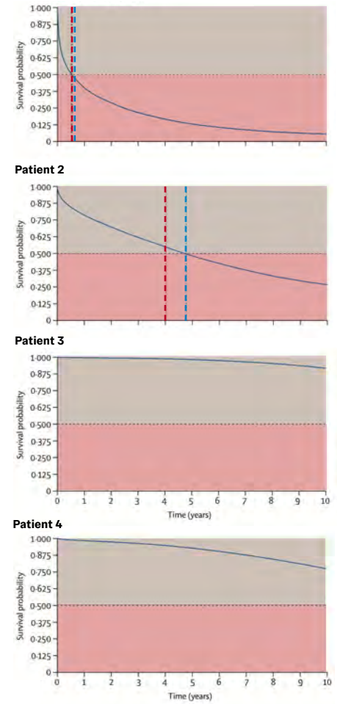
WORDS: PETER TAYLOR-WHIFFEN

> ***Dr Arunashis Sau*** *is Academic Clinical Lecturer at the National Heart and Lung Institute (NHLI). To find out more about the NHLI and its work to improve cardiac, vascular and respiratory health through research and education, visit imperial.ac.uk/nhli*

EXAMPLE PATIENT-SPECIFIC SURVIVAL PREDICTIONS
The AI-ECG risk estimation (AIRE) platform can accurately forecast, from a single ECG, short-term and long-term mortality risk. Two examples are shown for patients who died during the follow-up period (Patients 1 and 2), and two examples are shown of patients who survived (Patients 3 and 4).

Dashed blue lines indicate the AIRE-predicted date of death.

Dashed red lines indicate the actual date of death.



This page:
Chemical Kitchen students at work.

Left (in white shirt):
Luke Delmas.

Opposite page:
Jakub Radzikowski.

PHOTOGRAPHY: IMPERIAL COLLEGE LONDON/THOMAS ANGUS

ADVENTURES IN... CHEMICAL KITCHEN

Cooking up a storm

Proteins, glorious proteins. Chemical Kitchen explores the crossover between kitchen and lab.

Words: **Frances Hedges**

Is this a laboratory… or a kitchen? As a group of chemistry students pore over their scales and sieves – testing, observing and documenting as they go, albeit in aprons rather than lab coats – you'd be forgiven for being confused. Welcome to Chemical Kitchen, a way of giving first-year chemists an introduction to lab work… via professional cooking.

The brainchild of a collaborative working group that included two Imperial professors (Alan Spivey and Roger Kneebone) and the chef Jozef Youssef, who specialises in molecular gastronomy, the concept was first mooted in 2019. Then came the challenge of turning its foundational principles – which centred on the idea of transdisciplinary study – into a practical curriculum. And that's where PhD chemist Dr Luke Delmas (MRes Chemistry 2015, PhD 2019) and Dr Jakub Radzikowski, a molecular biologist and Cordon Bleu-trained chef, came in.

"I'd done some teaching already at Imperial, so I had a good understanding of what undergraduates might struggle with and where we could help ease their transition into first-year chemistry," explains Delmas. Meanwhile, Radzikowski's experience at fine dining restaurants had given him a clear sense of the connections between the culinary and scientific worlds. "The way of working in a professional kitchen is very similar to the techniques used in a laboratory setting," he says.

At the core of the course are a set of cookery challenges that closely resemble real chemistry experiments – including one in which students are tasked with making ricotta cheese. "In a synthetic chemistry practical, you might take two powders, dissolve them, mix them and then get another crystalline powder precipitating from the liquid that you then dry and weigh," says Radzikowski. "For ricotta, you take milk, dissolve citric acid in water, combine it with the milk, filter out the precipitate – which is the cheese – and finally dry and weigh it."

Another experiment sees participants cook an egg, extract the yolk and deep-fry it in breadcrumbs. The goal? To test out which variables, including temperature and cooking time, result in the perfect soft yolk – and then carefully record these findings. "As much as what we do is about execution, it's also about planning and note-taking," adds Radzikowski. "Students need to know how to logically construct a process to test out a hypothesis, and then document it properly for use in future iterations."

Students learn how to construct a process to test a hypothesis

Delmas agrees that the strength of the module lies in the transferable skills it offers undergraduates. "A common misconception is that the course is about looking at, say, the chemistry of carbohydrates or the structure of proteins," he observes. "In fact, we're teaching no chemistry! It's all about the professional practice of making food and how teams organise themselves in that context. We're training students in risk assessment and making a plan for how to operate safely." Additionally, in an age when young people are less likely than ever to be proficient in manual techniques, there are benefits to be drawn from the dexterity and precision required for culinary success. "The fun comes naturally – but we do make sure it's balanced with a carefully thought out approach to learning."

Delmas and Radzikowski report that the majority of their students approach the course with enthusiasm and emerge from it with a greater awareness of their own strengths and weaknesses. "Most of the undergraduates who come to the kitchen really enjoy what they're doing," says Radzikowski. "But the true learning begins when we ask them to reflect on what they've achieved."

Their feedback has helped give rise to a number of successful offshoots from the project, including in-person and remote courses for medical students and those pursuing a qualification in executive education. "What excites me is this idea of teaching by metaphor," says Delmas. "What can we learn about teamwork from a football coach? What can nurses learn about patient care from service at a three-Michelin star restaurant?" The possibilities are endless, agrees Radzikowski. "If there's a learning gap that's hard to address, we can develop an idea to solve it," he says. "All we need is curiosity." ◆

> ***Find out more*** *about what's on the Chemical Kitchen menu at imperial.ac.uk/chemical-kitchen*

Now is the time to act on antimicrobial resistance

The landscape

Humankind has always battled against disease – and over the centuries we have achieved remarkable success in eradicating and containing some of the world's deadliest infections. One of the single most significant breakthroughs was Alexander Fleming's discovery of the antibiotic penicillin in 1928, which won him a Nobel Prize and, much more importantly, revolutionised medicine.

However, infectious diseases mutate and evolve – with deadly effect. Around five million people die every year because of bacterial antimicrobial resistance, a human crisis that last year prompted the United Nations to set a target to reduce this figure by ten per cent by 2030. It is vital for us to constantly build on and share our knowledge in humans' perennial battle to stay healthy.

The challenge

Overuse and misuse of antimicrobial drugs such as antibiotics have enabled micro-organisms to develop resistance to them – and this is accelerating. It means previously treatable common infections and infected injuries may once again become life-threatening, increasing the risk of spreading resistance, and making cures more challenging and expensive.

"A vital part of minimising and mitigating the dangers of antibiotic resistance is the prevention of infections to start with," says Professor Alison Holmes from Imperial's Department of Infectious Diseases. "It is not just ensuring availability of effective treatment – patients, particularly, must be protected from any antibiotic-resistant infections during treatment or surgery."

The solution

This is not just a medical issue, but a global societal one needing a societal solution. Imperial has therefore launched The Fleming Initiative, with Holmes as its inaugural director, to bring together research, behaviour change, public engagement and policy to keep antimicrobials working. Its fulcrum will be the Fleming Centre, a public space due to open in 2028 at St Mary's Hospital in Paddington – the very site where Fleming made his game-changing discovery 100 years ago.

The collaboration

"The Fleming Initiative will focus on five areas to bring people together for targeted action in 2025," says Holmes. "The first is education – how to embed this knowledge into primary and secondary schools' curricula right across the world. The second is diagnostics, the third is surveillance and use of data, and the fourth is around global shared learning regarding national action plans and policy. The last area is around developing global fellowships and exchange programmes to maintain and encourage the spread of this knowledge, and sustain talent and expertise."

The Fleming Initiative will bring people together for targeted action: this is a global societal issue

The Fleming Centre will develop pioneering collaborative research and innovative policy solutions – but also be a social space encouraging the public in to engage and learn. "It needs to be open, friendly and welcoming," says Holmes. "It's crucial people understand what we're doing, why we're doing it and how they can be involved. It's about public health and society's important role, so it's vital the public are engaged. And although this is on Imperial's doorstep, it's a global facility – we all have a responsibility to each other. Philanthropy and partnerships will play a critical role too, not only in supporting research, but in helping people to get involved."

The future

"The aim is that everyone – patients, families, the general public, health professionals, researchers, education leaders and policy makers – all understand why this is so important," says Holmes. "I want to look back in years to come and say that The Fleming Initiative and the Fleming Centre made society healthier, made healthcare safer, food security better, and life expectancy longer. But more than that – hopefully we've created a much more equitable world in terms of access to effective antimicrobials and improved the health of people around the world." ◆

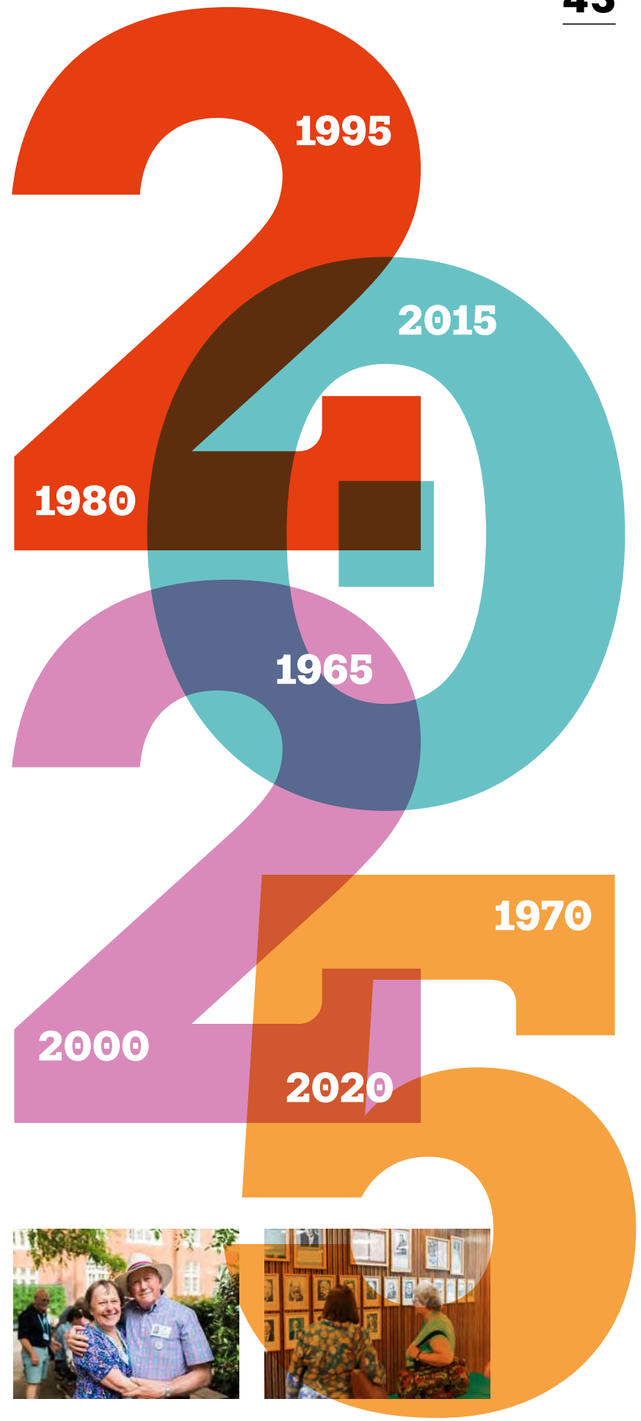
> ***To find out more*** *about the work behind The Fleming Initiative, visit fleminginitiative.org*

WORDS: PETER TAYLOR-WHIFFEN

ALUMNI LIFE

A chance to reconnect

Reunions are a great way to tap into the Imperial community, so what are you waiting for?



Did you finish your Imperial studies in a year ending in 5 or 0? If so, congratulations on your milestone anniversary. It's the perfect excuse to reconnect with the friends you made along the way – and we'd love to help you celebrate your lifelong connection with the university.

This year, we've helped to organise 34 reunions so far, with more than 1,000 alumni and guests attending. We know that making a reunion happen – either in person or online – might seem a little daunting, which is why we offer free and tailored support.

If you've lost touch over the years, we can help you reach out to your classmates by searching our alumni database. Due to data protection laws, we can't release alumni contact information – but we can send an invitation message out on your behalf.

Perhaps you'd like to come back to campus? You might want to visit your old department, enjoy a meal with your group on campus, or meet up in the Student Union bar. Just let us know, and we'll advise on accommodation, venues and events, and organise departmental visits.

Even if you're not planning a reunion, you can still celebrate your milestone anniversary with a free commemorative pin badge and souvenir postcard pack, which will be posted to you. Just let us know your current postal address and which badge you'd like to receive – we'll take care of the rest!

And, of course, you're always connected with the Imperial community when you join Plexus. Our free online community ensures your journey with Imperial doesn't end at graduation, and lets you connect with fellow graduates, advance your career, continue learning, and leave your mark on the Imperial community. ◆

> ***Get in touch:*** *Whether you're celebrating five or 55 years since graduation, our team is here to help make your reunion happen. Drop us an email at reunions@imperial.ac.uk and request your free commemorative gift pack, containing a commemorative pin and souvenir postcards to be posted to you wherever you are in the world, now.*

WORDS: LUCY JOLIN. PHOTOS: @T.SCHMECHEL

A WORKING LIFE

Image conscious

Dr Wareed Alenaini wants to transform the way we use imaging data – and save lives in the process.

Interview: **Megan Welford**

A big catalyst for my professional drive was losing my beloved father to a cancer that was diagnosed far too late. It gave real purpose to the research I'd been doing at Imperial into the use of non-invasive technologies in the early detection of diseases, and specifically bioimaging. Now, my company Twinn Health aims to add an average of 20 years to a person's lifespan by spotting signs of disease at the first opportunity, before symptoms appear.

The problem with existing technologies, such as MRI, is their relative inaccessibility: an MRI scan is expensive, but that's not because of the equipment – it's the doctor's time spent reviewing the 150 or so images each scan produces to find the thing they are looking for. The fact is that when you do an MRI it's usually for a particular diagnosis – kidney stones, for example – and the rest of the data is discarded, which is such a waste.

Instead, our AI technology reviews the entire body scan and, using things like heat imagery and analysis of the texture of organs and the cell location within the organ, gives a person's risk score for a range of diseases. The idea is to build a platform that can not only connect multiple stakeholders, but also provide additional value from the current assets that every hospital has – and is going to waste.

These images are in every archive and are massively valuable, yet nobody's getting any value out of them. Our bioimaging technology has many benefits – it increases the accuracy of metabolic assessment, reduces variations between individual physicians, improves clinical management decision-making and saves healthcare providers costs from late diagnosis. Our mission is to unlock the true potential of imaging data to improve health outcomes and prevent multiple diseases with a single MRI scan.

More generally, I'm driven by a desire to extend the time people get to spend with their loved ones, something that comes from being part of a close family myself. My mom brought up seven children while working full time as a high school principal back home

We aim to add 20 years to a person's lifespan by spotting disease before symptoms appear

in Saudi Arabia, and that is a huge inspiration to me. It helps me stay focused, as does exercise and keeping fit, which helps to keep my energy up.

I also like to travel, because it exposes me to new ideas, industry trends and potential partnerships. For instance, I met my co-founder Chris Mosedale at a venture capital meet-up in London, where we talked non-stop about commercialising, something I'm delighted to say we've now achieved.

It's also incredibly gratifying to me that our achievements have been acknowledged – in February we won the Saudi Biotech Pitchfest award at Hevolution Foundation's Global Healthspan Summit, and picked up a cash award from the King Abdullah University for Sciences and Technology's startup accelerator, Taqadam.

On a personal level, winning Imperial's Emerging Alumni Leader Award 2024 was incredibly special because, for a girl from a small village in Saudi Arabia, getting that award proves that hard work pays off. Twinn Health is a company founded on values, and every advance we make is a reminder of our commitment to help people enjoy long, healthy lives. ◆

> ***Dr Wareed Alenaini*** *(MRes Chemistry 2014) is the founder of biotechnology company Twinn Health and winner of Imperial's Emerging Alumni Leader Award 2024.*

Right:
Dr Wareed Alenaini.

Below from top:
A 3D MRI of abdominal fat, used to predict risks like diabetes and heart disease years before symptoms appear; side-view MRI showing the precise distribution of fat around vital organs; 3D view of foot bones.

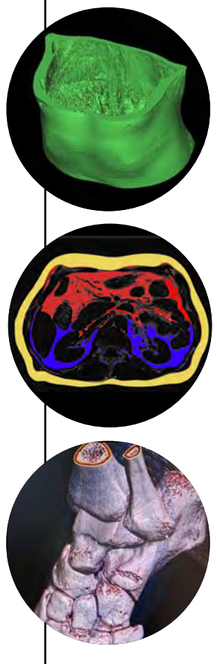
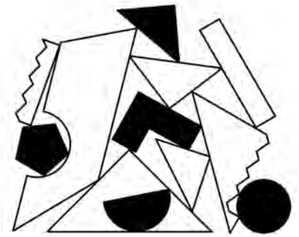


ILLUSTRATION: MIKE LEMANSKI. PHOTO: JAMES TYE



PUZZLES

Test your brain power

Test your skills with questions created by the Imperial Quiz Society to put University Challenge 2025-26 hopefuls through their paces. Good luck!

HARD What short noun links all of the following: a quote by Alexander Pope that names E.M. Forster's first novel; iron pyrite; and an allegory about a ship in Plato's *The Republic*?

HARDER Found in blood plasma, which family of non-glycosylated proteins help maintain osmotic pressure and transport substances? Clue: the name comes from the Latin for "egg white".

FIENDISH Prussian blue is formed when an iron (II) ion is complexed to six of what anion? It is composed of a carbon atom triple bonded to a nitrogen atom.

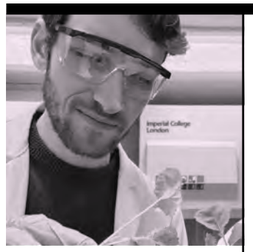
With thanks to the Imperial Quiz Society.

> ***Find the answers on our website at:***
imperial.ac.uk/be-inspired/magazine/issue-58/brain-power

FOR ISSUE 57 SOLUTIONS:
imperial.ac.uk/be-inspired/magazine/issue-57/brain-power

Salt of the earth

From the ground up: meet the amazing Imperial alumni working on down-to-earth solutions to improve our soil – and our planet.



FRANKLIN KECK
MRes Life Sciences 2019 and CEO of RemePhy, which cleans up contaminated soil by transferring genetically modified bacteria into plants, enabling them to extract metals from the earth.

How did you first get started?
A. During my Master's, I attended a lecture by Professor Karen Polizzi, whose husband, Professor Jason Hallett, had gotten a patent for the separation of plant biomass from heavy metals. They needed a biologist's expertise to tackle the next step, so after my Master's I began a PhD investigating how to extract heavy metals from contaminated soil by means of plants. I exploited the natural symbiosis between plants and soil bacteria for this. My work identified the genes within a plant, and its bacterial endophytes, that can bind heavy metals and enhance the health of a plant growing in stressful conditions through hormonal regulation.

How does it work?
A. The bacteria draws the metal up through the plant, taking the toxins it contains out of the earth. Contaminated soil is a global issue, particularly on land historically used for mining and construction. Cleaning it can make land fit for numerous purposes, including housing, agriculture and rewilding.

Why did you decide to launch the company when you did?
A. I worked in a startup and attended meetings about funding and research during my Master's, which gave me that spark. With Karen's help, I filed my own patent, covering my species of bacteria with the genes cloned in and its movement into a plant. Imperial is so conducive to sharing ideas and learning from each other, and in December 2024 it helped me spin RemePhy out from the university and into the world.

What would you like RemePhy to achieve over the next few years?
A. I like the potential for circularity – separating metals from biomass and looping it all back into industry. I hope it will change our relationship to our planet. Our climatic catastrophes are rooted in how we've treated the planet. It's important to understand this and adapt how we live. For me it's not about money, it's being able to do something for our planet that benefits all of us.

DR ANGELA DE MANZANOS GUINOT
MRes Chemistry 2012, PhD 2016 and founder of FA Bio, which uses tech to discover agricultural inputs to regenerate soils.

Why did you come to Imperial?
A. Biotech was my first degree, in Valencia, but Imperial offered an MRes and PhD different from everywhere else. I fell in love with London, the university and the programme – the focus on crop protection, sustainability and that it was multidisciplinary.

How did your business begin at Imperial?
A. My fellow student Kerry O'Donnelly Weaver and I developed the SporSenZ, a handheld tool that samples microbes active in crops' rhizosphere (root surroundings). It collects micro-organisms – pathogens and 'beneficials', natural predators that destroy pathogens and boost crop production – and shows how they interact with a specific crop in a specific field. We then began analysing the unique microbial content of soil, using microbes to discover natural, sustainable bio-products to maximise crop yield.

How did Imperial accelerate your business?
A. We launched the SporSenZ in a business called FungiAlert and won Imperial's Venture Catalyst Challenge and ICB CDT Den competitions. But Imperial supported in other ways too. We were invited to high-level discussions between academia, industry, policy makers and farmers, helping us understand the challenges from different perspectives. We learned communication, teamwork and leadership – all vital business skills.

How has the company moved on?
A. In 2021, we rebranded as FA Bio to reflect our two complementary activities: FA BioLab studies soils to build microbial libraries associated with different crops – around 5,000 SporSenZ kits have been used in Europe, Africa and America; and FA BioAg uses DNA sequencing to study samples and find microbial active ingredients to create natural biofungicides and biofertilisers.

What are your lasting memories of Imperial?
A. A network of brilliant people who taught me so much. I made lifelong friends – including the man who became my husband!

INTERVIEWS: PETER TAYLOR-WHIFFEN

ALEX PARK
MSc Innovation Design Engineering 2023 and co-founder of Biofonic, which develops below-ground acoustic sensors with AI and machine learning to help land management.

Why did you choose Imperial?
A. Because of the Innovation Design Engineering programme. Imperial's course is a dual Master's jointly run with the Royal College of Art, and uniquely combines engineering and deep tech with design and creative strategy.

How did Imperial inspire your passion for soil technology?
A. I'd previously worked in medtech so was already fascinated by how sensors and machine learning can reveal unknown things. Our final year group thesis team members explored vertical farming, robotics and food waste, and it wasn't until we spoke to regenerative farmers that we learned just how shockingly mysterious soil is – it's the least understood ecosystem on the planet. So I started looking for indicators for whole system soil health. Earthworms are a great indicator of that health, so we buried a microphone to listen to them and realised just how noisy the soil is! We have since developed an ultra-sensitive acoustic sensor with machine learning to identify different species and provide ongoing monitoring of multiple soil health factors.

When did you realise this could be a business?
A. We knew straightaway that we had something patentable, but our participation in programmes like VCC and The Greenhouse – Undaunted's accelerator programme – have helped us to apply rigour and structure towards assessing our commercial viability. We have since won funding for our early-stage R&D from Innovate UK and Defra with our academic partners at Harper Adams University and SRUC, and we'll be trialling our technology at Riverford Organic Farms this year.

How has Imperial helped make this happen?
A. Imperial has an amazing network of researchers doing the most insane stuff, and it helped develop my blue sky thinking. It's collaborative, too – people are so open to sharing their knowledge and experience. We'd chat with researchers all across the university, and we still receive support from Imperial researchers who continue to advise on our work at Biofonic. Imperial's way of thinking and doing is a different level of cutting edge.

MY IMPERIAL

Home comforts

Punnapa 'Rose' Yoswaris *(MSc Climate Change, Management and Finance)* on finding a taste of Thailand in Hammersmith.

Interview: **Frances Hedges** / Photography: **Angela Moore**

My go-to destination for Thai cooking and dining is Hammersmith, which is a short bus ride away from my home in west London. My first stop is always the Sriracha Supermarket, an Asian grocery store that sells all the ingredients I need to make Thai food at home. I'll pick up some green curry paste, fish sauce and various curry powders. Afterwards, I like to grab a bubble tea from Heytea on King Street – my favourite is the signature Bobo Milk Tea – and drink it while I wander around the nearby shopping centre.

My very first experience of dining out in London was at Hammersmith's Khun Pakin Thai, an excellent local restaurant. Last summer, before I'd started my Master's, I made contact with an alumna of the course; she's Thai, like me, so she took me out to dinner there. Since then, I've been back often – sometimes on a weekday evening, if it's been a long day and I need something to boost my energy after class, and sometimes at weekends with friends. It serves really authentic Thai food: I'll usually order the Thai spicy salad, because it's hard to find a good version elsewhere in London, or the Tom Yum Goong – hot and sour soup with prawns.

A super market
Punnapa 'Rose' Yoswaris photographed at Sriracha Supermarket in Hammersmith.

I've also been to Khun Pakin Thai with friends from Imperial's Thai Society. We have a big social gathering about once a term, and recently about 40 of us went for dinner there. The Society is a fantastic way to connect with people studying different subjects and hear about what they're doing, especially since there's only one other Thai student taking the same course as me.

But actually, what I love the most about Imperial is the diversity of the students, because it means we can all share new experiences. I've made friends with an Indonesian classmate from the course, and the two of us are determined to make the most of London life. This spring, we walked around the city chasing the blossom trees as they burst into flower. There were lots of photos to take, but most importantly, it was a lovely way to spend time together. ◆

My favourite is the Bobo Milk Tea – I drink it while I wander around the nearby shopping centre

IMPERIAL

Get connected

Our events are free and open to all, so whether you are looking to get hands-on with experiments or find out the most recent advances in science, our programme has something for you.

Sir Ernst Chain Lecture 2025: A tale of two antibodies
Wednesday 2 July, 17.30
South Kensington Campus

Join Sir Gregory Winter, Winner of the 2018 Nobel Prize in Chemistry, for the Sir Ernst Chain Lecture 2025 as he reveals the journey from monoclonal antibodies to game-changing pharmaceutical drugs.
bit.ly/ErnstChain25

Natural Sciences Showcase 2025
Thursday 11 September
South Kensington Campus


Professor Richard Craster

Join a full day of presentations and stimulating discussions with the academics and prize-winning PhD students in the Faculty of Natural Sciences and find out about the Faculty's innovative work. Everyone is welcome, please register before 9 September 2025 via
bit.ly/NatSci25

Imperial Lates
South Kensington Campus


Imperial Lates

Imperial Lates will return this autumn with more fun, social and free post-work events where visitors can interact with the latest scientific developments at Imperial, centred around an engaging theme for each evening.
imperial.ac.uk/be-inspired/lates

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Imperial inaugurals

Celebrate our newest Professors as they share insights from pioneering research across Science, Technology, Engineering, Medicine, and Business. Engage with groundbreaking ideas, ask questions, and connect with experts. Imperial Inaugurals are open to all and free to attend.
bit.ly/ImperialInaugurals

Wednesday 1 October

To eat or not to eat
Professor Dasha Nicholls, Department of Brain Sciences

Wednesday 22 October

Building mathematical Lego
Professor David Ham, Department of Mathematics

Wednesday 12 November

Getting real about net zero
Professor Niall Mac Dowell, Centre for Environmental Policy

Wednesday 26 November

When dreamers meet realists
Professor Anne ter Wal, Department of Management and Entrepreneurship

Wednesday 7 January

Life-saving AI: Dream or reality?
Professor Ben Glocker, Department of Computing


Professor Ben Glocker