Imperial College London

STRATEGY 2015–2020

Imperial College London's mission is to achieve enduring excellence in research and education in science, engineering, medicine and business for the benefit of society.

Contents

President of Imperial College London
Professor Alice P. Gast

Imperial College London: Great discoveries, leading change, collaborating for the better

It is 2015 and we can be confident that in ten years the world will be quite different from today. International relations, social structures and trade patterns will alter. There will be new approaches to dealing with epidemics, shortages of natural resources and environmental crises. New challenges will arise.

Global research-driven universities like Imperial College London have a central role in helping humanity address these changes and challenges by making discoveries, educating leaders and developing innovations that benefit society. Yet these universities will need to change to contribute to this future. In our *Strategy 2015–2020* we set out how Imperial will be a source of new solutions, a contributor to a better future, a trusted partner and a new paradigm of the global university.

Strong foundations for global challenges

We will support an atmosphere and culture that embraces discovery. We will continue to be guided by our mission of achieving enduring excellence in research and education in science, engineering, medicine and business for the benefit of society. We will shrink the time and distance between fundamental discovery and societal benefit. We will provide our students with the knowledge and experiences that equip them for their future roles as leaders. We will have the courage to take risks. We will remain true to our mission.

While we cannot envision all of the challenges ahead, we believe that Imperial can contribute by focusing our research around four themes: discovery and the natural world; engineering novel solutions; health and well-being; and leading the data revolution.

Through these themes, we have allowed ourselves to dream and pose 'what if?' questions that drive our sense of curiosity and adventure and motivate our work. These questions are drawn from existing, growing crises such as antimicrobial resistant bacteria, where there is an acute need for both research and public education. They are also drawn from other looming challenges such as the need for secure, sustainable water, energy and minerals; the impact of environmental and climate change; and the corrosion of materials in our vast, ageing civil infrastructure.

This is an extraordinary time to be part of Imperial. There is a need for our expertise. There is a growing ability to harness data from a wide variety of sources such as genomics or financial markets to improve knowledge, understanding and decision-making. We are in the right place at an essential time.

Great people: staff, students, alumni and friends

Great discoveries begin with great people: talented individuals steeped in the knowledge of their core discipline, confident enough to work on risky, unsolved problems, adept at understanding and working with others from different fields and immersed in an atmosphere of excellence. They are underpinned by talented support staff who put their full energy and passion into their work and our mission. We will make supporting and enabling all these people central to what we do.

Our bright and energetic students are integral to our mission. We will enhance their experiences by embedding their education in cutting-edge research and providing increasing opportunities for them to use their talents in new entrepreneurial, creative and practical ways. The Dyson School of Design Engineering is an example of the way we will nurture the multifaceted talents of our students and develop them into the leaders of the future.

We have a tremendous asset in our highly successful alumni and friends. We will revitalise our relationship with them and encourage them to be a part of the Imperial College London of today and of the future. Their knowledge, expertise and experience will contribute to the intellectual power of the College.

Great partners: collaborations across boundaries

Across the world, people are recognising that the changes and challenges we face require us to work together more effectively. Universities must drive collaboration, work across disciplines and seize opportunities in ways and at a pace unusual for academia. It is the only way that we can solve the world's challenges.

At Imperial we are good at working across disciplines and collaborating. In 2014 three-quarters of our research papers were collaborations with external co-authors from over 140 countries and 6,000 different universities, businesses and other research organisations.

Yet we can be even better and can lead in new areas. We will seek the very best from around the world, sometimes collaborating with our toughest competition in order to create an amazing team. We will ensure that our reward structures provide incentives for sharing, collaborating and building relationships. This means that we will recognise collaboration in our evaluations for promotions and awards and we will advocate to funders and evaluators to support collaborative work.

We will make all of our campuses into dynamic centres of collaboration and innovation. We will bring staff, students, entrepreneurs and industry researchers together in modern purpose-built spaces where ideas can be developed and tested rigorously and where networks can flourish. In White City we are creating a new campus where partnerships working on global challenges transcend departmental boundaries.

Informing, influencing, inspiring

Every day individuals, policy makers and business leaders face questions, the answers to which require an understanding of the natural world, technology, medical advances and business analysis. We can make a tremendous difference by using our expertise and knowledge to provide factual evidence and advice to decision makers in government and business.

In addition, the world is full of people who are naturally curious and enjoy learning. It is important that we excite and inspire the public, from potential new students to eager lifelong learners, by sharing what we do in ways that arouse curiosity, awaken a love of discovery, and broaden the understanding of an increasingly complex world.

Enablers: the way forward

As we embark on this era of change, we hope that each member of the College will seize this opportunity to advocate what we do, be agile and courageous with new ideas and seek out new collaborations. We expect great things of ourselves and of each other. We each have a role to play and contributions to make to Imperial's future.

We will build the financial strength needed for our world-leading work through careful financial management and public, private and philanthropic support. We will make our own investments to pursue the new and the risky. We will support ideas that are potential breakthrough programmes that put us in a leadership position. We will place our bets even if the idea is ahead of its time and has not received outside funding. We will develop the talent we need to contribute in areas that have not yet been fully explored. And we will invite our friends and alumni to invest with us and be a part of these forefront ideas.

Courage

Researchers are courageous. We probe the boundaries of knowledge, we seek discovery and delve into the unknown. We take calculated risks when we know we are onto something important. We find collaborators readily. Individually we already know how to do this. Institutions are more conservative. We will ensure that Imperial creates an environment where researchers can be courageous and push back the boundaries of their fields. We will make working together easy and support judicious risk-taking and collaboration.

The world is changing and Imperial is changing too. We set out this *Strategy 2015–2020* to help guide us in the next few years. We acknowledge that we do not know where the new challenges and opportunities will be. We do know that we have great people and we will build a more agile, adaptive and resilient organisation so that we will be ready for whatever the future holds.

Strategy

Our strategy is built on underpinning **foundations** that make Imperial a great academic institution and talented and inspirational **people** who make up our university community. Our **partners** make our work possible and help us to deliver benefit to society through our research and education. **Enablers** help us to deliver our strategy.

Foundations

- We will continue to specialise in science, engineering, medicine and business. This is the foundation on which we build our future.
- We will maintain world-class core academic disciplines. All research and education must be underpinned by a deep understanding of the fundamentals.
- We will encourage multidisciplinary research. Only by bringing together expertise from different disciplines can we solve today's global challenges.
- We will embed our educational experience in a vibrant, research-led, entrepreneurial environment. By learning alongside researchers who are experts in their fields our students gain the practical, entrepreneurial and intellectual skills to tackle societal problems.

Partners

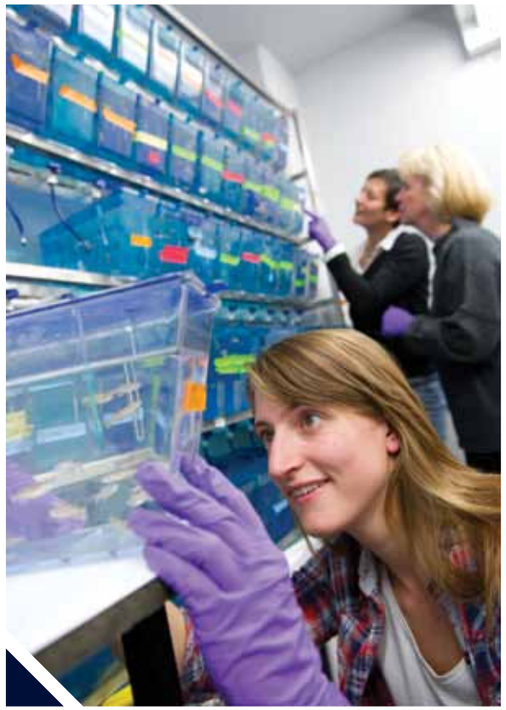
- We will strengthen collaboration with business, academia, and non-profit, healthcare and government institutions across the globe. No university can achieve excellence or realise the full benefits of its work by itself.
- We will inform decision makers to influence policy. Our excellence, breadth of knowledge, connections and London location allow us to bring together and inform key decision makers in governments and industries for the benefit of society.
- We will share the wonder and importance of what we do. Collaboration with the public, schools and our local communities fosters a shared passion for and understanding of our work.

People

- We will build a supportive, inclusive and highly motivated staff community across all disciplines, functions and activities. This will help us to attract and retain the talented and diverse staff we need to achieve our mission.
- We will enrich the student experience. Providing a broad range of activities, services and support for our students beyond their studies helps them to develop wider talents and to be successful.
- We will build strong relationships with our alumni and friends. This lifelong exchange of ideas and support benefits all of us.

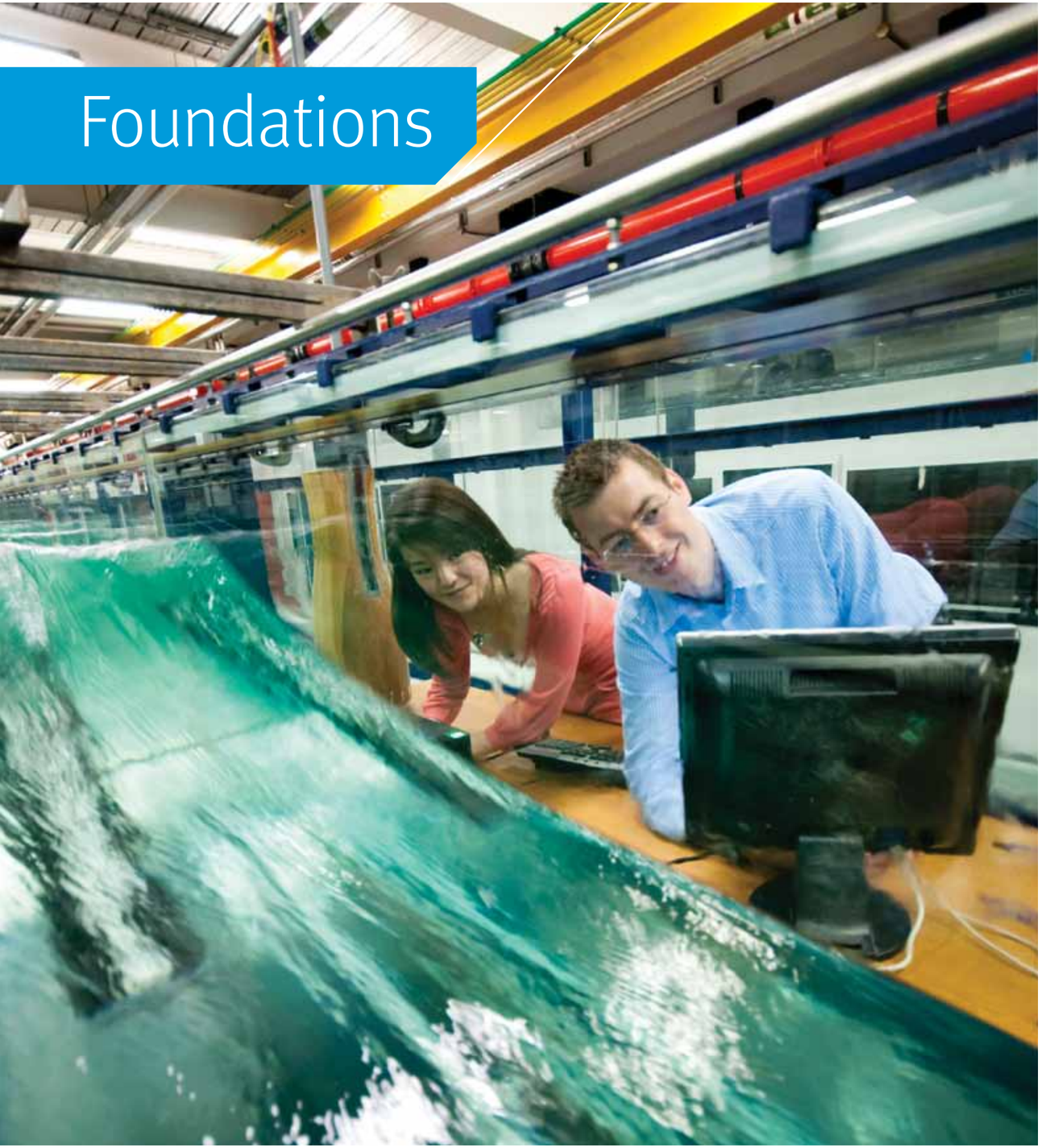
Enablers

- We will strengthen and diversify our revenues. Delivering our mission requires investment in our staff, students and facilities.
- We will provide professional support, consistent processes and appropriate technology for all of our staff and students. The pursuit of excellence in research and education requires excellence in all that we do.
- We will act courageously and innovatively when pursuing new opportunities. We need to take academic and financial risks to sustain excellence in research and education.



Clockwise, from top left: Imperial's Carbon Capture Pilot Plant is the world's most sophisticated of its kind in an academic institution, providing a unique hands-on education experience • Dr Lou Balmer-Millar, Caterpillar's Director of Research and Advanced Engineering, with Provost James Stirling, signing the agreement for the new Caterpillar Innovation & Research Centre, which will be based in the Department of Mechanical Engineering • Imperial's Clinical Phenome Centre brings rapid molecular analysis to the hospital setting, and is funded by the National Institute for Health Research Imperial Biomedical Research Centre and industrial partners including Waters and Bruker • Members of the Dallman Lab, in the Department of Life Sciences, inspect zebrafish, which are being used to investigate inflammatory immune responses.

Foundations



We will maintain world-class core academic disciplines

All research and education must be underpinned by a deep understanding of the fundamentals.

We have tremendous strength in the core disciplines practised by our academic departments. This was demonstrated in the 2014 Research Excellence Framework, an assessment of the quality of research in UK higher education institutions, in which over 90 per cent of the research submitted by Imperial was judged to be world-leading or internationally excellent. This excellence is broadly found across all our disciplines, and applies equally to our research outputs, impact and environment. These strengths provide us with the underpinning capability required to work together across disciplines in order to address global challenges.

97%
of Imperial's research is classed as having 'outstanding' or 'very considerable' impact

ACTIONS IN DETAIL

- We will continue to identify and support new emerging disciplines.
- While recognising that much of our strength in core disciplines derives from the nurturing of talent within the institution, we will be more proactive in identifying opportunities to recruit staff capable of enhancing the quality of our research and education.
- Where necessary, we will seek external advice to advance and sustain parity of excellence across all our core disciplines, a key factor for successful multidisciplinary research and education.

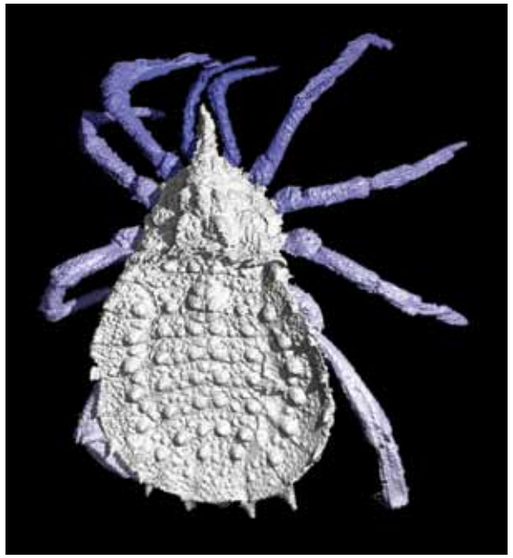
CASE STUDY 01

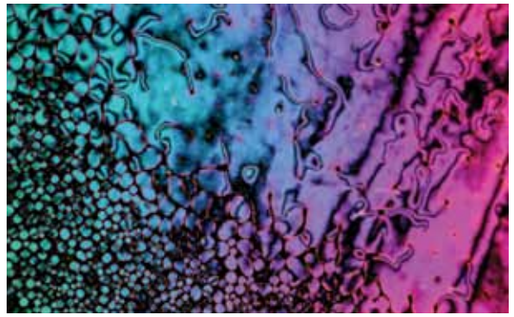
Fundamental physics: searching for dark matter

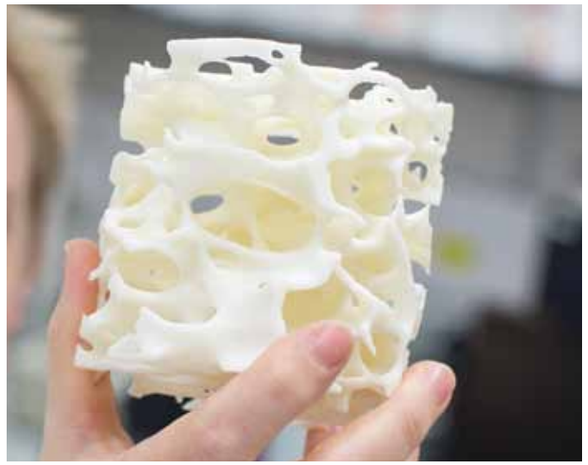
Dark matter is an invisible form of matter that physicists believe makes up about a quarter of the energy density of the universe. Its presence is inferred from its gravitational effects on visible matter, radiation, and the large-scale structure of the universe, but its existence has never been confirmed directly. Its composition is a mystery, leading to the intriguing possibility of hitherto undiscovered physics.

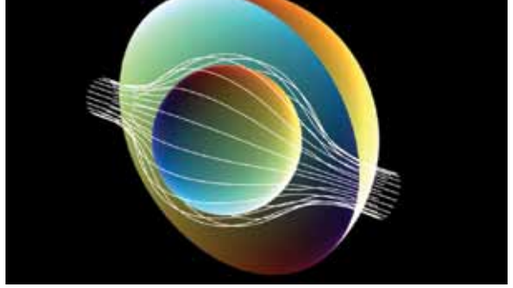
Scientists at Imperial are among those leading the search for dark matter using a variety of approaches. For example, the Large Underground Xenon experiment, located 1.5km underground in South Dakota, allows researchers to look for tiny and extremely rare flashes of light that would indicate a collision between a dark matter particle and a normal matter particle. Scientists also use the Large Hadron Collider at CERN to search for dark matter particles that might be produced in collisions within the particle accelerator. The precision measurements generated at CERN and elsewhere provide opportunities to look for the influence of dark matter, while researchers also examine cosmological data to understand the influence and properties of dark matter.

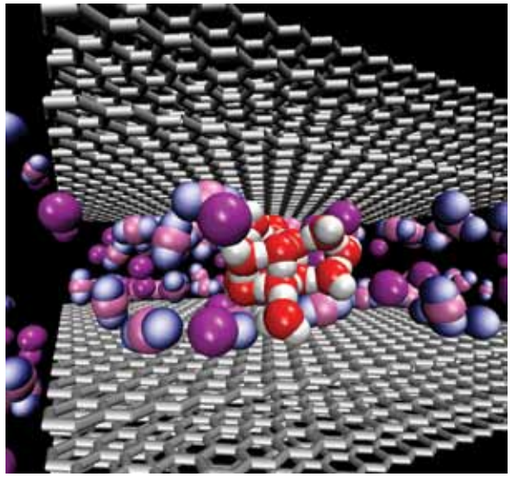
For Professor Jordan Nash, Head of the Department of Physics, the discovery of dark matter would help answer some of the most significant outstanding questions about the nature of our universe. As he notes, "Imperial researchers have real influence in and understanding of this fundamental science, thanks to our excellence across different academic disciplines and our ability to bring together teams working on these different searches."

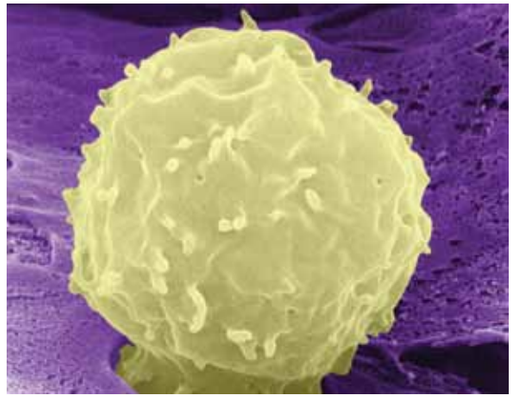












Clockwise, from top left: 3D computer models of fossilised *Eophrynus prestvicii*, which is closely related to modern-day spiders, created by researchers in the Department of Earth Science and Engineering • Polarising microscopy image of liquid crystal nematic phases by a Department of Chemistry undergraduate student • Foamed gel-derived bioactive glass (the first 3D porous scaffold made from bioactive glass) from the Department of Materials • A stem cell emerging from rat bone marrow, part of the National Heart & Lung Institute's work on a treatment to help repair heart attack damage or broken bones • A Department of Chemical Engineering study of a water (red-white) nano-cluster absorbed on a graphite pore • Electromagnetic waves being bent around an object using a cloaking material. Research into metamaterials, which are being developed for use in invisibility cloaking, has been spearheaded by Imperial's Department of Physics.

We will encourage multidisciplinary research

Only by bringing together expertise from different disciplines can we solve today's global challenges.

The global challenges of today and the future are complex. We can only hope to address them through collaboration between disciplines and with partners. While we cannot anticipate all the challenges ahead, the College is well placed to contribute across four key areas: discovery and the natural world; engineering novel solutions; health and well-being; and leading the data revolution.

Lift this page to find out more about how we will meet each of these challenges.

ACTIONS IN DETAIL

- We will review and refocus our research programmes on a regular basis as global challenges emerge and evolve. We will promote a dynamic exchange of ideas and staff between our core disciplines and these multidisciplinary themes.
- We will develop multidisciplinary hubs at our White City Campus focused on global challenges starting with the Michael Uren Biomedical Engineering Research Hub. These hubs will be configured to encourage close team working and serendipitous encounters. The buildings will be designed to be adaptable so that new global challenges can be accommodated.

CASE STUDY 02

The Michael Uren Biomedical Engineering Research Hub

In 2014, Imperial announced a gift of £40 million from Michael Uren OBE and his foundation. With this unprecedented sum, the College is constructing the Michael Uren Biomedical Engineering Research Hub at its White City Campus. This will house life-changing research into new and affordable medical technology, helping people affected by a diverse range of medical conditions.

When complete, the Hub will serve as a showcase for a vibrant, multidisciplinary approach to research and enterprise, both within the College and across the sector. Its design will allow Imperial's world-class engineers, scientists and clinicians to work together in the new space and facilities alongside innovative spin-out companies. The Hub will also incorporate clinical areas, providing patients with direct access to innovations in healthcare. It will open up new opportunities for the College's Institute for Biomedical Engineering, established in 2004, which is already renowned for its pioneering advances in medical technology achieved by drawing together expertise from across disciplinary boundaries.

Engineering expertise is increasingly important for addressing global health and well-being challenges, with the development of new devices and techniques helping to restore the quality of life of patients at a sustainable cost. Mr Uren said: "Today we have the opportunity to transcend the traditional boundaries between engineering and medicine, in a way that simply wasn't possible when I joined Imperial in 1940. The discoveries made here will generate vast social, medical and economic benefits. I am thrilled that Imperial is leading the way."

IMPERIAL'S core strengths and our emphasis on multidisciplinarity and collaboration mean that we are ideally placed to address some of the greatest challenges the world will face in the next five years. Four challenges that will shape our multidisciplinary research are outlined here, together with topical examples of 'what if?' questions that drive us to pursue the most challenging and difficult research and motivate us to work together in new and different ways.

Global challenges

Health and well-being

WE AIM to improve the health of all in society in the UK and worldwide. This requires both the creation and improvement of treatments and prevention strategies, and the delivery of high quality, low cost, sustainable healthcare. We will work to create fundamental new insights into the way our genes and our environments interact, and use this knowledge to deliver individualised healthcare for every stage of life.

What if...

...we could eliminate the threat of infection caused by antimicrobial resistance?

...we could predict and prevent illness right across the life course?

...we could measurably reduce the burden of chronic disease?

...we could deliver an affordable healthcare model adjustable to all global conditions?

Discovery and the natural world

WE AIM to understand better the structure and evolution of the universe, and especially the part of it that we inhabit. Our core strengths in science and engineering provide a foundation for this curiosity-driven research and enable us to acquire knowledge and develop transformational technologies that can have profound societal impact.

What if...

...we could identify the unknown 95 per cent of the universe?

...we could quantify and mitigate the impact of environmental and climate change?

...we could deliver water, energy and minerals that are secure, sustainable and affordable?

...we could understand the physiological mechanisms which influence how humans make decisions about their needs and wants?

Engineering novel solutions

WE AIM to drive innovation to create a more sustainable world for future generations. We will build on our core strengths in engineering and science to advance understanding and develop technologies that will achieve this.

What if...

...we could recover heat energy and store it for later use?

...we could manage our environment in real time using advanced sensors and data analytics?

...we could decentralise manufacturing to be located in our homes and neighbourhoods?

...we could prevent the corrosion of metals?

...we could develop a carbon negative built environment?

...we could create business models that lead to further investment in renewable energy?

Leading the data revolution

WE AIM to harness the power of ever increasing amounts of data to transform how society thinks about and uses information. We will lead scholarly inquiry into the production, analysis, use and sharing of data and become the academic partner of choice for data science.

What if...

...we could measure everything?

...we could improve our understanding of natural laws through exploring new or large data sets?

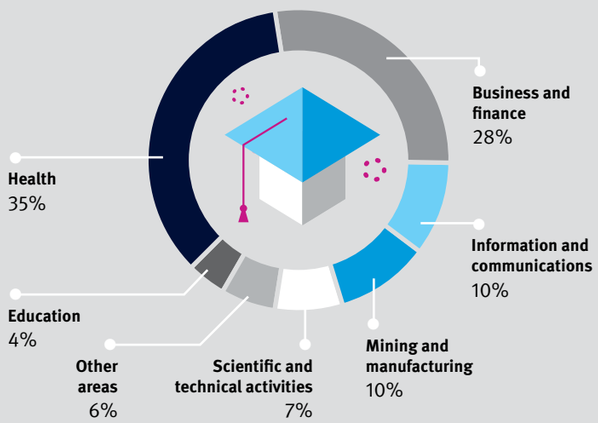
...we could use data to make humans better decision makers?

...we could predict and avoid financial crises associated with overheating of the economy?

THERE WILL BE research problems that address more than one of these global challenge themes, and there will be important multidisciplinary research areas that do not naturally fit into any of them. The global challenges will themselves evolve and change with time. Our focus on excellent foundations, people, partners and enablers is designed to ensure that we will always be well placed to address the big questions and challenges of the future.

CAREERS

Career destinations of home/EU undergraduates who graduated in 2014



Clockwise, from top left: MAGPIE (Mega Ampere Generator for Plasma Implosion Experiments) is a pulsed power generator used for experiments by the Plasma Physics group • A team of civil engineering students take part in Constructionarium, a hands-on construction experience which translates theory and classroom skills into real engineering • A student gives a presentation at the Institute of Global Health Innovation's annual Student Challenges Competition, a platform for students to showcase their global health research ideas and win prize money to develop them further.

We will embed our educational experience in a vibrant, research-led, entrepreneurial environment

By learning alongside researchers who are experts in their fields our students gain the practical, entrepreneurial and intellectual skills to tackle societal problems.

The education we offer is shaped by our research and delivered in a learning environment that challenges our students to excel and broadens their horizons. The quality of an Imperial education is evidenced by the success of our graduates in employment both inside and outside academia. We aim to be a destination of choice for the most talented students from across the globe and to produce graduates who are the first choice for employers.

ACTIONS IN DETAIL

- We will develop an innovative, research-led curriculum that enables our students to engage actively with research in their disciplines and across disciplinary boundaries.
- We will provide opportunities for our students to develop and apply entrepreneurial and creative thinking.
- We will continually enhance our teaching. In particular, we will make timely and useful assessment and feedback a central part of our approach.
- We will be at the forefront of the development of new ways of learning, and will recognise staff who deliver excellence and innovation in education practice and student support.
- We will define a framework for excellence in research supervision and the qualities expected from supervisors.

CASE STUDY 03

Dyson School of Design Engineering

A donation of £12 million from the James Dyson Foundation has made possible the launch of the Dyson School of Design Engineering, which will educate a new generation of design engineers and technology leaders.

Its focus will be the fusion of design thinking with engineering thinking and practice, within a culture of innovation and enterprise. The School will offer an undergraduate MEng degree in Design Engineering from October 2015, using a curriculum developed with industry. The School will also offer Imperial's existing postgraduate programmes in Innovation Design Engineering and Global Innovation Design, both run through a collaboration with the Royal College of Art which has spanned over 30 years.

Within the School, there is particular expertise in the fields of engineering product development; autonomous systems and manufacturing; industrial design; and human factors. What does this mean for students? An education grounded in the fundamentals of engineering science, with an accompanying emphasis on design thinking, creative problem-solving and management and communication skills. Students will also gain experience to support them in the workplace, with undergraduates undertaking a six-month industrial placement and developing entrepreneurial skills through a bespoke module.

For Sir James Dyson, speaking at the School's launch, the breadth of skills that design engineers at Imperial will acquire is what will set them apart and allow them to tackle the societal challenges of the future. "We want to create engineers who are bold and commercially astute. They will use their skills, nurtured in the School, to develop future technology that will catalyse Britain's economic growth."

People

We will build a supportive, inclusive and highly motivated staff community across all disciplines, functions and activities

This will help us to attract and retain the talented and diverse staff we need to achieve our mission.

We need to harness our collective strength to deliver our mission. This requires a supportive and considerate community based on diversity, mutual respect and a commitment to excellence. The framework of Imperial Expectations guides the behaviour of all our staff.

9
Number of Imperial campuses in London and south east England

ACTIONS IN DETAIL

- We will provide opportunities for staff to progress their careers at the College.
- We will create an environment which is respectful and collaborative and has a zero tolerance approach to bullying and harassment.
- We will share more broadly the impact and achievements of our staff across all disciplines, functions and activities so that their work and contribution to our mission is recognised and celebrated.
- We will be proactive in our promotion of inclusiveness and diversity.
- We will be mindful of the need to promote good mental health and a healthy work-life balance.

CASE STUDY 04

Athena SWAN

The Athena SWAN Charter was established in 2005 to encourage commitment to advancing the careers of women in science, technology, engineering, mathematics and medicine within the UK higher education and research sectors. Imperial's work to promote the values of the Charter through the recruitment, retention and promotion of women has fostered a supportive culture which benefits the community as a whole.

Imperial was one of the founding members of the Athena SWAN Charter, and the College received an institutional Silver award in 2006 in recognition of its commitment to the Charter's key principles. Since then, departments across the College have been recognised with awards ranging from Bronze to Gold as they have implemented initiatives designed to ensure a level playing field for all staff and a supportive work environment. Examples of initiatives that have contributed to the College's success include an annual Athena SWAN Lecture at the School of Public Health and the appointment of a Tutor for Women in the Department of Materials, who has a remit to provide dedicated support for female researchers, postgraduate and undergraduate students.

The Department of Chemistry was awarded a Gold award in April 2013, one of only seven departments in the country to receive this accolade. Professor Tom Welton, speaking at the time of the award, emphasised the ongoing nature of the Athena SWAN process. "The Gold award not only recognises the progress that we are making in transforming the Department's working environment, it also provides impetus to help drive the next phase forward."

131

NATIONALITIES

Number of nationalities represented among our undergraduate and postgraduate students in 2014–15

Clockwise, from top left: Winners of a Dragons' Den-style event, hosted by the Centre for Doctoral Training at Imperial's Institute of Chemical Biology, where doctoral students pitched their business ideas to a panel of judges • Jezebel, a 1916 Dennis 'N' Type fire engine, is one of Imperial's oldest mascots • Imperial students cleaning up Deen City Farm's pond as part of National Student Volunteering Week • Rowers from the Imperial College Boat Club, one of the most successful student rowing clubs in the country.

We will enrich the student experience

Providing a broad range of activities, services and support for our students beyond their studies helps them to develop wider talents and to be successful.

The services and experiences available to our students will be shaped by them through our partnership with Imperial College Union. We aim to provide a portfolio of inclusive activities and services to support and develop the breadth of talent in our student body and to celebrate the diversity of our students.

ACTIONS IN DETAIL

- We will recognise students as key stakeholders and consult them on the decisions that directly affect them.
- We will prioritise the mental well-being of the student body, recognising this as both a moral imperative and a prerequisite of academic success.
- We will work with employers and our network of alumni to prepare our students for their careers after graduation.
- We will continue to enhance our portfolio of student support services.
- We will engage students at all points of their time at Imperial so that they feel part of a prestigious community and become engaged alumni.

CASE STUDY 05

Imperial College Union societies

Imperial College Union's student activities programme provides students with hundreds of opportunities to learn new skills, make friends and broaden their horizons. The programme is an integral part of the student experience at the College.

With over 55 per cent of students joining one of Imperial's 340 clubs and societies, thousands of students take part in activities from Kung Fu to knitting, and Drama Society to dodgeball. Engaging with activities allows students to build capabilities and support networks outside of academia that help them excel through their College journey and beyond. Involvement in activities is documented through Imperial Plus, a formal programme for recognising and celebrating the skills that students develop through their involvement in a wide range of volunteering roles inside and outside of the College community. Students reflect on the value of these skills and receive a certificate acknowledging the time they have invested. The recognition of the personal development that comes with participation in activities or leading clubs allows students to recognise and celebrate the links between this development and their employability and future successes.

Abi de Bruin, Imperial College Union Deputy President (Clubs & Societies) in 2014–15, notes the long term impact that the Union's support for student activities can have. "Student activities at Imperial are yet another way that our students achieve above and beyond the ordinary, developing skills that prepare them for life after College."

Clockwise, from top left: Current Business School students discuss their experiences with an Imperial alumna and 1851 Circle member • A researcher explains froth flotation to an alumnus at the annual Donor Thank You event • A visiting alumna discusses start-up technology being developed in the Imperial Incubator • The Imperial College Alumni Association of India hosts an event for alumni and business leaders in Kolkata • An alumnus attending the Alumni Weekend meets a current student at the Imperial Festival.

We will build strong relationships with our alumni and friends

This lifelong exchange of ideas and support benefits all of us.

Imperial's 170,000 alumni comprise a powerful global network. We count as friends many more people who share a common interest in our mission and support our work. Our alumni and friends are advocates for the College, role models for our students, employers of our graduates, and sources of support and inspiration for our academic work. We have a substantial opportunity to create a more vibrant and engaged community of alumni and friends which is motivated to contribute to and participate in Imperial's continuing success.

ACTIONS IN DETAIL

- We will create a programme of services, activities and communications for our alumni and friends tailored to their experiences and interests.
- We will revitalise our relationship with our alumni and friends and seek their support in delivering our academic mission and building Imperial's global reputation.

CASE STUDY 06

Imperial College Alumni Association of Hong Kong

With deep and strong links to Imperial, the Imperial College Alumni Association of Hong Kong is a powerful example of the benefits of mutual engagement.

Since 1982 the Association has organised a packed programme of activities for alumni living in Hong Kong, including departure drinks, guest speakers and social activities. It has hosted travelling Imperial academics and professional staff, including high-profile visits from College leadership.

The group also forges connections with Imperial's Chinese and Hong Kong student communities through its flagship student mentoring scheme. The scheme allows students to continue their education beyond the core curriculum. Current students stood alongside the group at the 2015 Alumni Weekend, marking the first time an international alumni association had been represented at this annual event.

Peter Choy, Chairman of the Association in 2014-2015, affirms its role in strengthening Imperial's international reputation and alumni community. "We aim to build a better and stronger network between alumni, students and university representatives, and we're proud to be part of the Imperial community", he says.

Partners

We will strengthen collaboration with business, academia, and non-profit, healthcare and government institutions across the globe

No university can achieve excellence or realise the full benefits of its work by itself.

Collaboration with external partners is positively correlated with academic excellence; many of our most productive academics are also actively involved with external organisations. However, effective collaboration is resource-intensive. We must be rigorous in choosing new opportunities that are distinctive, beneficial to all partners, and characterised by a great working relationship.

64%
*of Imperial's research publications in 2014 were co-authored with international collaborators**

ACTIONS IN DETAIL

- We will strengthen the support available to our College community to find appropriate partners and establish valuable collaborations, and underpin this through our ethical principles of engagement.
- We will recognise and reward collaboration as an essential part of our activities.
- We will focus on broadening participation in collaboration, particularly among groups in the College community with talent and potential but currently underrepresented in collaborative activities, such as early career academics and students.

** Data source: Web of Science. This data is reproduced under a licence from Thomson Reuters. You may not copy or redistribute this data in whole or in part without the written consent of the Science business of Thomson Reuters.*

CASE STUDY 07

Advanced Business Analytics collaboration with KPMG

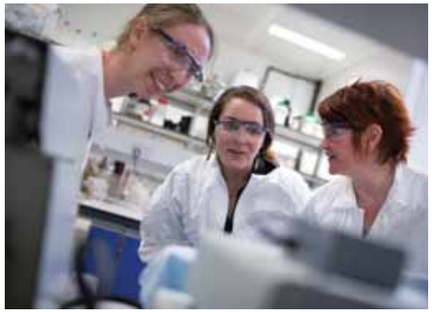
In 2014, the College launched a major collaboration with KPMG in the field of business analytics. The KPMG Centre for Advanced Business Analytics at Imperial brings together some of the world's leading data scientists and business scholars with KPMG's world-class professional service practitioners.

Business analytics is concerned with developing new methods for solving important problems in business. The Centre builds on the establishment of the Data Science Institute in 2013, which conducts research on the foundations of data science. The Centre has a dual focus on research and impact, developing theories, methods and technologies that have the potential to identify opportunities, risks or social change that affect business. The Centre's emphasis on fostering engagement with government and industry will ensure that new methods can be subjected to early uses, thereby enhancing the relevance of its research.

Researchers work across five basic disciplines in business: economics, operations, organisation behaviour, marketing and strategy, and health management. Across all five areas, a unifying goal will be to help UK businesses gain a competitive edge in a global marketplace and to provide early indications of disruptive opportunities and threats in organisations and markets. Simon Collins, KPMG UK Chairman, commented, "Our collaboration with Imperial is about developing the people and skills to use that data to drive new industries and new services. It is immensely exciting for the UK economy and we are very proud to be leading in this crucial area."

5 CHIEF SCIENTIFIC ADVISERS

Number of current advisers to government departments who have worked or studied at Imperial.



Clockwise, from top left: Imperial's green aviation research draws together aerospace innovations from across the College, acting as a conduit for new collaborations between Imperial and the aviation industry • The Grantham Institute's vast range of climate and environment-related work includes studies in the field of glaciology and research into the Antarctic ice sheet • PhD students with Dr Tina van de Flierdt in the general geochemistry laboratory of the Mass Spectrometry and Isotope Geochemistry (MAGIC) facilities • A neurologist tests a breakthrough treatment for multiple sclerosis sufferers on a patient as part of a clinical trial run by Imperial researchers in the multiple sclerosis clinic at Charing Cross Hospital • The President of the Republic of Korea, Park Geun-hye, visited Imperial to mark a series of agreements between the institution and Korean universities.

We will inform decision makers to influence policy

Our excellence, breadth of knowledge, global connections and London location allow us to bring together and inform key decision makers in governments and industries for the benefit of society.

Research undertaken at Imperial informs debates on the issues that matter to global society. Global collaborations and alumni around the world allow us to access key decision makers. The density of world-class universities, teaching hospitals and scientific institutions in London makes it easier to build relationships with excellent partners.

ACTIONS IN DETAIL

- We will substantially increase our involvement in advising governments and industries on key policy areas such as science and innovation, education, health, energy and the environment, using alumni relationships, professional contacts and opportunities to bring key decision makers to the College.
- We will work with stakeholder groups including technology user groups, social networks and patient communities to help make our work relevant to the needs of society.
- We will be proactive in publicising examples, evidence and case studies from our research.

CASE STUDY 08

School of Public Health

Global influenza pandemics during the twentieth century resulted in millions of deaths. Imperial research, which models the effects of intervention on the spread of pandemics, is helping to ensure that we see a very different pattern in the twenty-first century.

In 2009, the outbreak of the H1N1 pandemic (widely known as swine flu) led to Imperial academics working in collaboration with the World Health Organisation (WHO) and multiple national governments to collect data on the virus' transmission and severity in real time. Their analysis of these data, which suggested that the pandemic's severity was only moderate in comparison with previous pandemics, informed public policy decisions in the UK to pull back from use of economically costly interventions (such as reactive school closure) and focus on targeted use of vaccination. The research also informed pandemic planning in Europe and the USA and it continues to have a lasting impact, for example on the WHO guidance for Pandemic Influenza Risk Management (2013).

Overall, this research has not only enhanced policy makers' understanding of pandemics, but has also given them the tools to manage public health crises and develop informed plans to minimise the health and economic impact of future pandemics.

700+

SCHOOLS

Number of schools the Outreach Office worked with in 2013–14

Clockwise, from top left: Each year, the Imperial Festival attracts thousands of members of the public and alumni visitors, who descend on the South Kensington Campus to enjoy free interactives, workshops, research tours, talks and performances • A scientist explains an installation at The Heart & Lung Repair Shop, an interactive pop-up which was created by Imperial's National Heart & Lung Institute in Hammersmith's Kings Mall in 2014 • Members of the public take part in the Open Air Laboratories' (OPAL's) tree health survey • Professor Lord Robert Winston speaking to a group of visiting students from East London Science School.

We will share the wonder and importance of what we do

Collaboration with the public, schools and our local communities fosters a shared passion for and understanding of our work.

We are committed to inspiring the scientists, engineers and medical professionals of the future by raising aspirations and supporting learning across all age groups. Through harnessing the creativity and passion of Imperial's people and engaging with our partners, we will create further opportunities to nurture the innate curiosity and desire to learn in the public and young people. Our actions will support a continued flow of diverse and talented students from across the world into the College, promote public engagement with science, and help our university to be sensitive to the interests and needs of the public and our local communities.

ACTIONS IN DETAIL

- We will create shared spaces for discovery and learning by working with schools and local communities.
- We will use digital technology to ensure that our research and education reaches a wide and varied audience.
- We will expand our reach to prospective students nationally and globally to inspire and attract the brightest students, regardless of their backgrounds.
- We will create a broad and collaborative outreach learning experience focused on global challenges and opportunities in science, engineering, and medicine.
- We will engage with and learn from the public, schools and local communities to improve our interactions with them.
- We will continue to deliver a wide range of events and activities for the public such as our annual festival and public lectures.

CASE STUDY 09

Reach Out CPD

Imperial is supporting primary school teachers across the UK to inspire students about science through a continuing professional development resource. Launched in October 2014, Reach Out CPD is a web-based programme which provides teachers with resources and ideas to engage primary school children in the wonder of science.

Reach Out CPD, developed in partnership with science teaching resource Tigtag, features films of Imperial academics who shine a light on some of the latest advances in science and present imaginative ideas to bring science to life in the classroom. As a free programme, accessible online anywhere and at any time to all 200,000 primary teachers in the UK, it aims to remove the barriers of time and cost which are cited by teachers as challenges to participation in professional development.

According to Professor Maggie Dallman, Associate Provost (Academic Partnerships), schools, like universities, should be places where curiosity is sparked and nurtured. She adds, "At Imperial we have long been committed to stimulating engagement with science across society. Through Reach Out CPD we hope to provide a resource that will support primary teachers to do their work – if we can help give children scientific skills so they ask the right questions of society and make the right connections to solve problems, we will be making a very long term impact."

Enablers

We will strengthen and diversify our revenues

Delivering our mission requires investment in our staff, students and facilities.

Financial sustainability is essential to ensuring that we are able to maintain and develop a world-class research and education environment and have the flexibility to invest in the opportunities of our choice.

£855M
Imperial's revenue in 2013–14

ACTIONS IN DETAIL

- We will dedicate over one-third of the space at our White City Campus to diversifying our income.
- We will seek philanthropic investment to strengthen our research and education.
- We will manage the College Endowment to generate a steady return and we will grow the number of endowed scholarships, professorships and chairs.

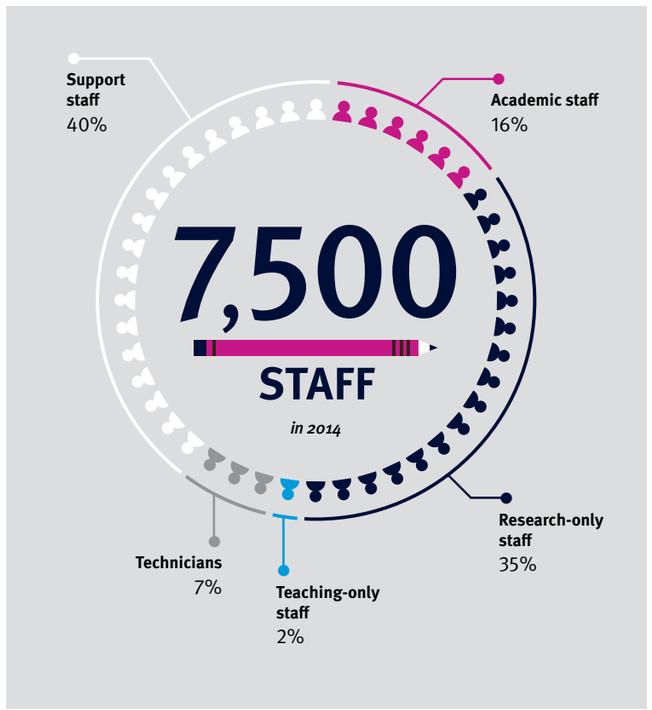
CASE STUDY 10

Brevan Howard Centre for Financial Analysis

In 2014, Imperial College Business School established the Brevan Howard Centre for Financial Analysis thanks to a gift of £20.1 million, one of the most generous in UK business education history, from Brevan Howard, a leading hedge fund co-founded by Imperial alumnus Alan Howard (MEng, Chemical Engineering & Chemical Technology, 1986). Research at the Centre aims to help understand and prevent financial crises.

The Centre brings together academics, policy makers and practitioners, and is led by Professors Franklin Allen and Douglas Gale, two of the world's foremost experts in financial contagion, market behaviour and risk. Research at the Centre is designed to support better policy-making in finance around the world. Initial research priorities include financial stability and regulation; financial structure; and the role of financial economics in non-profit activities.

At the Centre's launch, Professor G. 'Anand' Anandalingam, Dean of Imperial College Business School, noted that "Franklin Allen and Douglas Gale are genuine pioneers in our understanding of systemic risk, corporate governance and interbank liquidity." Alan Howard, whose vision and support made the Centre possible, said: "It is a pleasure to support my alma mater in this way, and an honour to be able to contribute to Imperial's continued excellence."



Clockwise, from top left: A PhD student from the Department of Medicine studying multiple sclerosis inspects a rodent cage with an animal technologist • Academic tutor Dr Lorraine Craig talks to an undergraduate student as part of the College's comprehensive system of academic and pastoral care • National barista champion Pari Nepal is part of the dedicated team from Campus Services • Staff involved with the apprenticeship scheme to train technicians for the Faculty of Engineering and Department of Physics.

We will provide professional support, consistent processes and appropriate technology for all of our staff and students

The pursuit of excellence in research and education requires excellence in all that we do.

Everyone in the university, irrespective of discipline, function or activity, has a role to play in helping Imperial to deliver its mission. Excellent research and education must be underpinned by a professional team focused on ensuring that our academics and students have the time, support and resources they need to deliver their very best.

ACTIONS IN DETAIL

- We will promote a culture where all who show a commitment to excellence are recognised and given respect, whatever their role or field.
- We will empower staff at all levels to deliver change for the better.
- We will design and implement consistent processes which minimise time wasted, support academic excellence and encourage collaboration.
- We will continue to invest in the technology needed to support our mission.
- We will achieve the highest standards of safety.

CASE STUDY 11

Operational Excellence

Operational Excellence (OE) was launched in 2014 to enhance the high quality support needed by staff and students at a world-class university. By providing members of the community with the tools and methods to analyse the systems and processes they use with colleagues across the College, it aims to identify duplicated efforts and inefficient processes and design more effective solutions.

One area of work relates to how student information is managed across the student life cycle at the College, from a prospective student's first enquiry to their engagement with our alumni network. A pilot scheme within this programme relates to admissions processes, and specifically the process by which applicants for undergraduate degrees in Medicine are assigned dates and times for admissions interviews. The introduction of an online system allowing candidates to select their own interview slots has proved to save considerable time for applicants and staff, with fewer requests for rescheduling and a greater percentage of students responding within the two-week deadline.

For staff, involvement in Operational Excellence is an opportunity to engage with colleagues and reflect on working practices. Rebecca Middleton, Education Coordinator in the Faculty of Natural Sciences, said: "I think that the process has been incredibly useful and should be rolled out to all areas within the College. It's not often people take the time, or are 'brave' enough to step back and seriously consider how and why they do things in the way that they do."

Clockwise, from top left: Imperial aims to capitalise on its position as one of the UK's leading centres for aerial robotics research with the development of a new state-of-the-art laboratory at its South Kensington Campus • The Qatar Carbonates and Carbon Storage Research Centre is a ten-year collaboration, jointly funded by Qatar Petroleum and Shell and with additional support from Qatar Science & Technology Park • A researcher inspects a petri dish in the laboratory of SynbiCITE, a pioneering Innovation and Knowledge Centre dedicated to promoting the adoption and use of synthetic biology by industry • A member of Imperial's Musculoskeletal (MSk) Lab tests technology being developed for use in hip-replacement surgery. The MSk Lab sits within the Department of Surgery and Cancer and is based at Imperial's Charing Cross Campus.

We will act courageously and innovatively when pursuing new opportunities

We need to take academic and financial risks to sustain excellence in research and education.

As the frontiers of knowledge cannot be predicted, agility and flexibility are integral attributes for success. This means that Imperial must take risks: academic risk through starting new areas of research, before we know whether funding or acclaim will follow; and financial risk, in order to achieve the returns we need to fund our mission.

ACTIONS IN DETAIL

- We will adjust our processes so that we can make swift informed decisions to seize opportunities and both start and stop new initiatives.
- We will invest funds to pursue the new and risky.
- We will support ideas which are potential breakthrough programmes that put us in a leadership position, even if these ideas have not yet received outside funding.

CASE STUDY 12

A new campus at White City

Since 2009, the College has purchased nearly 25 acres of land in White City. White City Campus provides the College with the opportunity achieve its ambitions and do things differently: develop new partnerships, support new areas of research, diversify revenue streams and give students entrepreneurial experiences. It allows the College to unlock existing areas for refurbishment and provide options for much-needed academic space.

Over the next 15 years, the College will create an innovation district at White City, which will bring together the College's academic community, businesses, entrepreneurs and academic partners to address global challenges as well as creating high-quality jobs and economic growth.

In close proximity to Hammersmith Hospital, the northern section of White City Campus will locate multidisciplinary activity focused on health and wellbeing. Academic hubs will foster research in molecular sciences, biomedical engineering and public health. A Translation and Innovation Hub will co-locate laboratories with major technology partners, new start-ups and fast-growth technology companies. Master-planning is underway for the rest of the site, with plans including further hubs for academic research, education and translation, community and commercial facilities, and housing.

Excellence

What does excellence look like?

Implementing this strategy will allow us to sustain and renew the areas in which we are already excellent, and help us to achieve excellence in the areas in which we have the opportunity to improve.

We will review on an annual basis our progress towards achieving these markers of excellence.

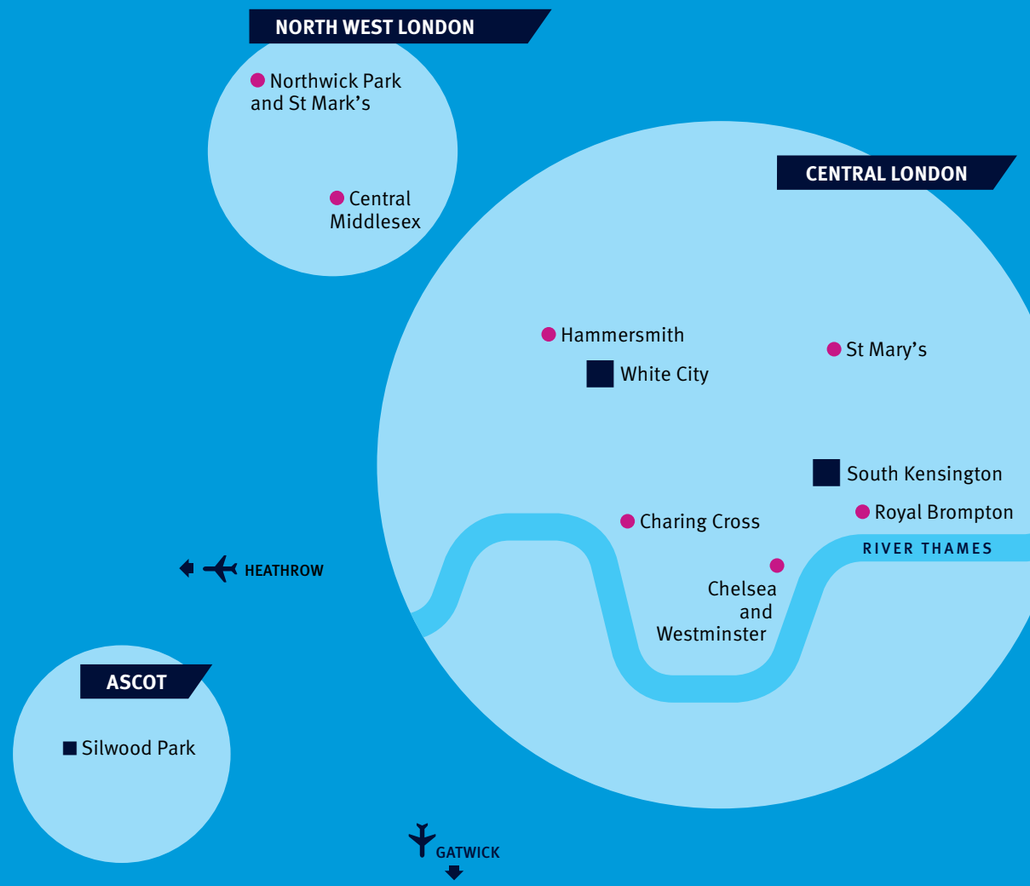
Foundations	What does excellence look like?
We will maintain world-class core academic disciplines.	• We are consistently rated in the top three in the UK and the top ten in the world in all disciplines.
We will encourage multidisciplinary research.	• Our multidisciplinary work leads to breakthrough advances in global challenge areas.
We will embed our educational experience in a vibrant, research-led, entrepreneurial environment.	• All of our students are given the opportunity to engage with research and researchers as part of their studies.

People	What does excellence look like?
We will build a supportive, inclusive and highly motivated staff community across all disciplines, functions and activities.	• Staff surveys show that our staff feel they are part of a supportive, inclusive and highly motivated community across all disciplines, functions and activities. • We are recognised externally as an employer of choice.
We will enrich the student experience.	• We are rated in the top quartile of key national student experience surveys. • We are regarded as a university of choice for employers. • We attract outstanding students from across the world.
We will build strong relationships with our alumni and friends.	• We have a large, motivated and engaged community of alumni and friends attending events, volunteering and supporting the College. • 15 per cent of our alumni are donors.

Partners	What does excellence look like?
We will strengthen collaboration with business, academia, and non-profit, healthcare and government institutions across the globe.	• We are regarded as the partner of choice across sectors. • Our collaborations produce unique advances that we could not have achieved alone. • 30 per cent of our research funding comes from industry.
We will inform decision makers to influence policy.	• Our influence is evident and recognised through citations from government, corporate and medical decision makers.
We will share the wonder and importance of what we do.	• People of all ages and backgrounds regard Imperial as a reliable resource for scientific learning and understanding. • We are cited by schools as the exemplar of Science, Technology, Engineering and Mathematics (STEM) outreach.

Enablers	What does excellence look like?
We will strengthen and diversify our revenues.	• Our financial position gives us the flexibility to invest in research and education opportunities as they emerge, irrespective of the external environment. • Our Endowment grows through above-market investment yields and through additional gifts in perpetuity. • Philanthropy makes an important contribution to our annual budget.
We will provide professional support, consistent processes and appropriate technology for all of our staff and students.	• Academic staff spend no more than ten per cent of their time on administrative activities. • All support teams are rated as good or excellent by their customers.
We will act courageously and innovatively when pursuing new opportunities.	• We have launched initiatives which have subsequently led to outside support.

Our campuses



NOTE:
● *Indicates hospital campuses*

Principal photography: Imperial College London. Additional photography: p11 Maximilien Brice/CERN; p24 Lee Kong Chian School of Medicine, Nanyang Technological University; p28 East London Science School (Professor Lord Robert Winston)

www.imperial.ac.uk/strategy