

First published in 1949, *Felix* is released weekly during term time and is distributed around Imperial's London campuses. All students, staff, and alumni are welcome to contribute to the paper.



KEEP THE CAT FREE | SINCE 1949

Brian Cox visits Imperial to honour Abdus Salam

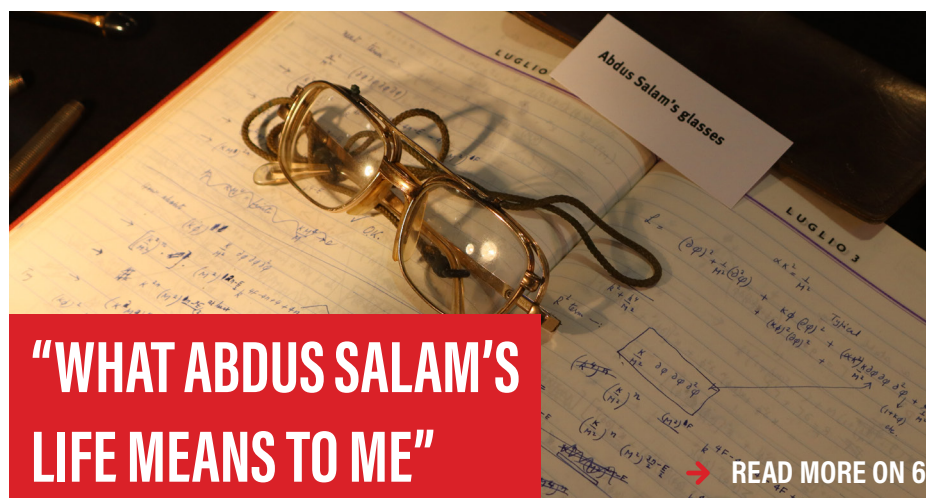


Posing in the Great Hall, left to right: Claudia de Rham, Jerome Gauntlett, Brian Cox, ICTP Director Atish Dabholkar, Daniel Waldram, Provost Ian Walmsley, and President Hugh Brady. Taylor Pomfret for *Felix*

Science Editor TAYLOR POMFRET

Science broadcaster Brian Cox was joined by physicists from around the world at Imperial on Monday, to celebrate the life and work of Abdus Salam, the deceased Pakistani Nobel Laureate and Imperial College professor.

Speaking to a packed auditorium at Imperial's Great Hall and thousands of online viewers, Cox delivered a keynote speech on the [→ READ MORE ON 3](#)



"WHAT ABDUS SALAM'S LIFE MEANS TO ME"

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NEWS

EU tuition fees have risen by 300% since 2021



Applications from the EU to Imperial have fallen by a third.

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OUTSIDE THE BOX

Lula speaks for the trees



Brazilian legislation reforms prompt decrease in the rate of Amazon deforestation.

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Paranoia

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At *Felix*, we believe that it is always in the interest of the students to be in the know. Transparency in the workings of the College and the work of your student representatives is key. Therefore I, the *Felix* Editor, on behalf of the team promise that:

We will, to the best of our ability, tell you the whole truth and nothing but the truth.

We will keep your confidence and will only publish something you say to us if you have explicitly said that we can.

We will work to expose unfairness and discrimination in all forms that it takes at the College.

We will treat fairly any article sent to us, regardless of point of view, and do our best to work with you to prepare it for publication.

Signed by:
JAMIE JOHN
Editor-in-Chief

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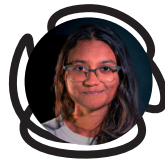
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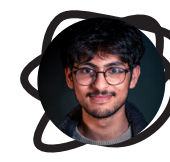
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NEWS

→ FROM P. 1: IMPERIAL CELEBRATES ABDUS SALAM

theme of unification in the Standard Model of Particle Physics.

He was accompanied by Professor Atish Dabholkar, Director of the International Centre of Theoretical Physics, which Salam established in 1964 to nurture research in developing nations.

Last June, Imperial renamed its South Kensington library in honour of Salam, who co-founded its Theoretical Physics research group in 1956.

The name change was part of Imperial's response to the History Group Report, which investigated the College's past, and recommended that Salam and other Imperial scientists from underrepresented backgrounds be 'widely celebrated'.

To accompany Cox's lecture on Monday, the College's Queen's Tower Rooms hosted an exhibition showcasing artefacts from Salam's life. His Nobel Prize medal was on display together with letters of correspondence from Paul Dirac – who was Salam's PhD supervisor – and other notable physicists.

PhD students at Imperial's Theoretical Physics group delivered presentations on topics including Electroweak Baryogenesis, Black Holes and Holograms, and Modified



Cox and others explore the exhibition on Salam in the Queen's Tower Rooms. Neha Yasin for Felix

Gravity.

The winning entries from the Salam Essay Contest were also on display, with Lahore Grammar School's Zimal

Cheema taking home the top prize for his work entitled, *A Turban's Triumph and Tragedy*. Salam himself was a prolific writer, and authored many essays during his lifetime.

Monday's events were a fitting tribute to one of Imperial's greatest scientists



Taylor Pomfret
Science Editor

Abdus Salam joined Imperial's Maths department in 1957, and three years later moved to the Physics department, where he set up the Theoretical Physics group with Paul Matthews.

While at Imperial, in 1979, Salam won the Nobel Prize for Physics together with Sheldon Glashow and Steven Weinberg, for his contribution to the electroweak unification theory, which outlines the unification of the electromagnetic and weak forces.

He became the first Muslim Nobel Laureate in science, but Salam's legacy is often ignored in his home country, because of his Ahmadi Muslim faith.

The Pakistani government has declared

that Ahmadis are not Muslim, and the community faces persecution and discrimination. The word 'Muslim' has been erased from Salam's gravestone in Pakistan.

Imperial's decision to rename the Central Library to the Abdus Salam Library last summer is a poignant tribute to Salam's profound contributions to physics.

He has rightfully earned a place among the many distinguished figures in the College's history. The renaming of the library, and this week's events, ensure that Salam's impact on the field will continue to be celebrated for years to come.

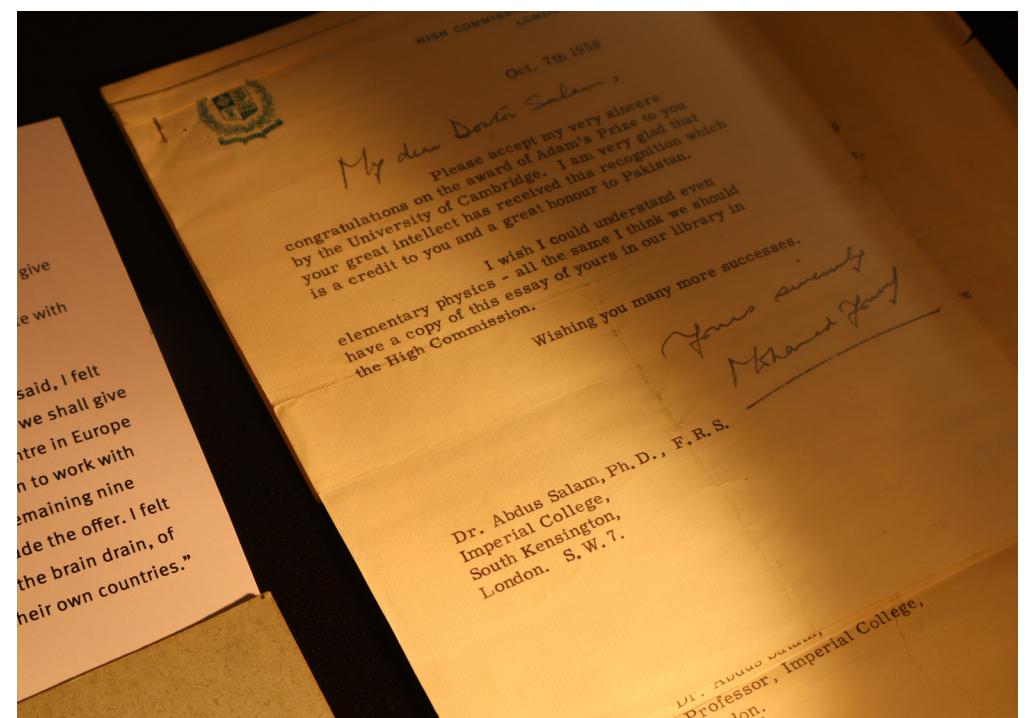
In the Science section this issue, we feature pieces from students who have been inspired by Salam's legacy.

Neha Yasin reflects on how Salam's life fills her – a fellow Pakistani Ahmadi Muslim – with pride and hope for her own career in science.

Anubha Bal celebrates Salam's work by exploring the electroweak theory, and explaining its link to the elusive 'Theory

of Everything' that physicists continue to search for.

Turn to page 6 to read their thoughts.



A letter sent by the High Commissioner for Pakistan in London in 1959, congratulating Salam on winning a prize, on display as part of Monday's exhibition. Taylor Pomfret for Felix

World Bank President's brother appointed Imperial Council Chair

Editor-in-Chief
JAMIE JOHN

Vindi (Manvinder) Banga, a veteran executive who spent three decades at Unilever, and has held roles at M&S, GlaxoSmithKline, Thomson Reuters, and Maruti Suzuki, has been appointed Chair of Imperial College Council.

Banga, whose younger brother Ajay is World Bank President and former Mastercard chair, will begin at Imperial on 1st April this year.

Banga holds a degree in mechanical engineering from the prestigious Indian Institute of Technology and an MBA from the Indian Institute of Management.

He is a partner at US private equity firm CD&R, which orchestrated a leveraged buyout of Morrisons in 2021. The deal piled £6.1 billion of debt onto the British grocery chain, which subsequently posted losses of £1.5 billion.

Vindi has sat on the board of Morrisons since the takeover, which was described by a loan fund manager talking to the *Financial Times* as 'the biggest fiasco since the Boots LBO [in 2007].'

Banga has several existing affiliations with educational institutions around the world, and said he looks 'forward to supporting Imperial in this next phase of its journey as it seeks to leverage its excellence in research and education in science, engineering, medicine and

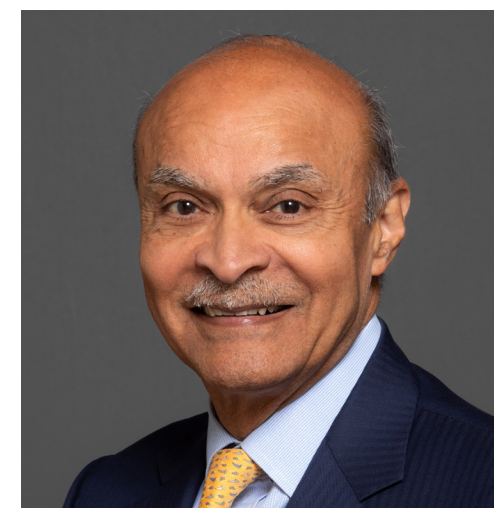
business to the benefit of our wider society.'

He replaces John Allan, whose term ended in December 2023. Allan stepped back from his role as chair in April last year after facing unsubstantiated allegations of inappropriate behaviour towards women – which he vehemently denies – but returned to his post three months later to see out the remainder of his term.

College Council is the governing and executive body of Imperial. It meets five times a year to set the College's strategic direction, and oversee its finance, property, investments, and general business.

The Council Chair cannot be an employee, student or honorary status-

holder at the College, and does not receive any payments for the role, other than reimbursements of expenses.



Vindi Banga, the new Council Chair. Imperial College London

Water supply restored to Hammersmith buildings after two-week outage

Editor-in-Chief
JAMIE JOHN

Running water was restored to two buildings on Imperial's Hammersmith campus on Tuesday, after a two-week outage forced the buildings to close.

The fracture of an external mains water pipe meant that the Commonwealth Building and Wolfson Education Centre had been without water since 16th January.

'I am very grateful for everyone's patience and understanding during this unfortunate incident,' said Dr Chris Watkins, apologising for the disruption.

He thanked the College, Imperial NHS Estates, and contractors, 'who have worked extremely hard to resolve

problems, often during inhospitable hours.'

Meanwhile COO Robert Kerse issued a second apology to all College members over the ongoing issues with the heating system on Imperial's South Kensington campus.

The campus is updating its heating network to achieve net-zero targets, but its temporary system has failed to meet demand, causing low indoor temperatures.

In the Sir Ernst Chain Building, temperatures have fallen below 10°C, causing illness and disrupting experimental work.

'Thank you for your patience while we address these issues,' said Kerst, urging people to report low temperatures to the Customer Services Centre.



Entrance to the Commonwealth Building on Imperial's Hammersmith campus. Thomas Angus for Imperial College London

EU students shun Imperial after 300% post-Brexit tuition fee rise

fee rise

The fee-status changes have yet to dent Imperial's tuition fee earnings.



Thomas Angus for Imperial College London

Editor-in-Chief
JAMIE JOHN

EU applications to Imperial's undergraduate programmes have fallen by a third since 2020, following a steep hike in tuition fees.

In the past, EU nationals paid the same fees as Home students. But under post-Brexit reforms, those who started courses in 2021/22 or later have been charged at significantly higher overseas-student rates.

An EU student who started at Imperial in 2021 will pay four times as much as an equivalent student who started a year earlier.

In 2021/22, the year in which the reforms took effect, the College reported a 55% drop in EU-student enrolment.

The fee-status changes have yet to dent Imperial's total tuition fee earnings, which have risen by 19% since 2020/21 and accounted for just over a third of total income in the university's most recent annual report.

In the last academic year, the College reaped a net gain from the reforms. 2023 UCAS undergraduate data revealed a slight uptick in EU applications to the university,

after two consecutive years of decline. Imperial reported that the fee-status changes had driven an increase in the proportion of students paying international fees.

'Overall student numbers only grew by 1% last year, so most of the increase in tuition income was a result of fee rate increases [for international students] and the change in mix between home and overseas students.'

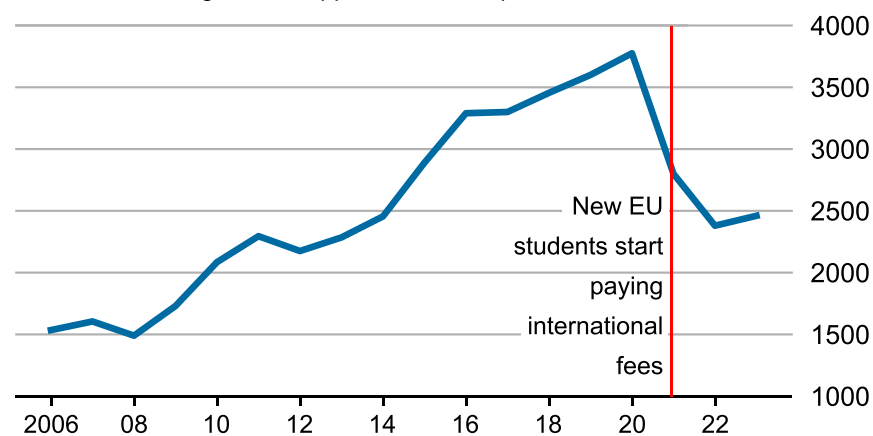
Across the UK university sector, fees from overseas students subsidise those of Home students, which have been capped for a decade, and fixed at £9,250 since 2017.

The Russell Group - a consortium of which Imperial is a member - estimates that its universities make an average loss of £2,500 a year on Home students. The figure for Imperial is likely to be higher because it primarily offers science, medicine, and engineering degrees, which are more expensive to run.

Keep an eye out for our next data piece, in which we will chart how the number of non-EU applications to Imperial has varied over the years.

Applications to Imperial from the EU have slumped in the wake of 2021 Brexit reforms

Number of undergraduate applications to Imperial from the EU

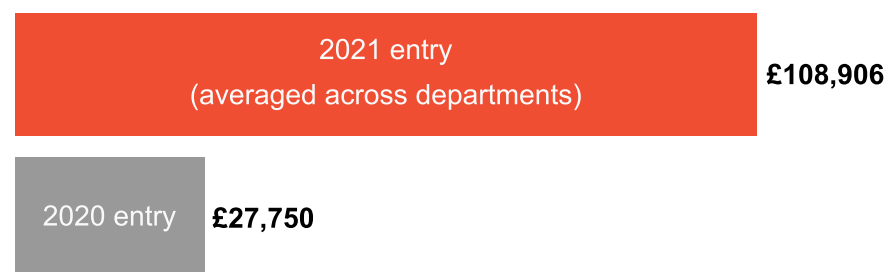


Felix

UCAS 'main stream' applications only. Does not include clearing
Source: UCAS undergraduate end-of-cycle data 2023

EU undergrads at Imperial now pay four times as much as they did before 2021

Total tuition fees paid by third year of degree, 2021 vs 2020 entry



Felix

Source: Felix analysis of Imperial College London fees

SCIENCE

Celebrating the life of Abdus Salam

A personal reflection on Abdus Salam's journey – from overcoming adversity to inspiring inclusivity.

Science Writer
NEHA YASIN

When I first expressed an interest in pursuing physics in high school, my parents' eyes flashed a glint of recognition that surprised me at first.

But while they knew little about what it meant to actually study Physics, they certainly knew all about the renowned physicist Dr Abdus Salam, as I soon found out.

Not only was he the first Muslim Nobel Prize-winning scientist, but he was also a Pakistani Ahmadi Muslim – just like me.

Born on 29th January 1926 in what is now Pakistan, Salam's journey was marked by challenges – from growing up in a small town, in a home without electricity, to the discrimination and threat of violence he faced in his own country, as a member of the Ahmadiyya Muslim community. In fact, to this day, the word 'Muslim' remains whited out, erased from his gravestone in Rabwah, Pakistan by local authorities.

Salam was reliant on scholarships for his further education, including his studies at Cambridge – in fact, a copy of his application was available to view during Monday's exhibition (see this issue's cover story on page 1).

Despite everything, his relentless pursuit of curiosity, intellect, and excellence lead him to rise above societal prejudices, transcend borders and impact the global scientific community.

Salam took great steps within his lifetime to develop a more inclusive environment in science. No-



Portrait of Abdus Salam in the Queens Tower Exhibition.
Taylor Pomfret for Felix

tably, he established the International Centre for Theoretical Physics (ICTP) in Trieste, Italy. The ICTP became a crucible for nurturing scientific talent from developing nations, embodying Salam's belief that the pursuit of knowledge should be a universal and accessible endeavour.

A booklet from 1966, in which Abdus Salam outlines his reasons for founding the centre, was also on display at Monday's exhibition.,



His story fills me with a sense of pride and honour for his achievements, as an individual and a member of our community.

Beyond the realms of academia, Salam's commitment to diversity and scientific diplomacy was exemplified by his work with the United Nations, including chairing a UNESCO advisory panel in 1981.

Abdus Salam's story resonates with me deeply, in a manner I have not felt elsewhere in the physics community. It triggers a whole host of feelings I find hard to describe. For one, his story fills me with awe at just how much can be achieved by one person, in one lifetime.



Abdus Salam's tape collection of Quranic verses.
Neha Yasin for Felix

It also fills me with a sense of pride and honour for his achievements, as an individual and as a member of my community. Salam acknowledged and showed off his religion and culture proudly, wearing traditional garb as he received the Nobel Prize, and crediting the Quran as the font of his inspiration and achievements.

In touching recognition of this, his personal copy of the Quran and a set of his regularly-used Quranic tapes were displayed at Imperial's exhibition. For Salam, religion and science were interlinked and totally compatible.

Salam's story gives me hope and inspiration for a successful career in science of my own, and gratitude for being able to have him as a role model.

However, I also feel a sense of sorrow, as there is so more to be done to fully achieve what Salam set out to do. While the benefits of diversity were acknowledged in Monday's lecture, a more comprehensive discussion is needed on how this will be achieved. I still see a lack of people like me around and I know that many of my peers continue to feel out of place at Imperial.

May Abdus Salam's legacy continue to inspire us to foster a world where diversity is embedded in every lab, lecture hall and aspect of living. The exchange of perspectives and collective knowledge can only enrich our scientific understanding of the world, and propel scientific inquiry and advancement. I am excited to see all that physics has yet to offer.

Abdus Salam's Nobel work: Electroweak unification theory

Unifying forces and unifying humanity: Abdus Salam's legacy in bridging physics and the natural forces.

Science Writer
ANUBHA BAL

In both research and advocacy, Abdus Salam's achievements are nothing short of extraordinary. He spent a great portion of his life creating opportunities for physicists in the global South, and the questions he posed about the fundamental forces of nature continue to motivate theoretical physicists.

Today, contemporary science is still very much in pursuit of a 'Theory of Everything': an all-encompassing framework that unifies gravity with the other three fundamental forces.

The Standard Model postulates that there are four fundamental forces of nature: gravitational, electromagnetic, strong and weak.

Gravity is the weakest of the four, and the most intuitive. It is long (infinite) range and is responsible for keeping us on the ground. It is hypothesised that this force is propagated by an elementary particle called a graviton, although the particle itself has yet to be observed.

The electromagnetic force is propagated by the photon (particulate light), and includes both electricity and magnetism. In fact, these two concepts are entwined in what we call an electromagnetic field.

The strong force holds together the quarks, the tiny building blocks of protons and neutrons, while the weak force governs the interactions of the particles in an atom. It is also responsible for so-called beta decay – the mechanism by which a proton turns into a neutron. Quantum field theory provides the mathematical basis to describe the behaviour of these forces.

The unification of electromagnetism, known as the 'second great unification', was the work of Scottish physicist James Clerk Maxwell, and it revolutionised

our understanding of electricity, magnetism, and light. The unification theory that Abdus Salam contributed to concerned the electromagnetic force and the weak nuclear force at high energies.

A vital concept in physics is symmetry. Symmetries of a system can be described by 'symmetry groups', which contain all of the transformations that one can apply to a physical system while leaving all its elementary properties the same. An example of a transformation is a rotation.

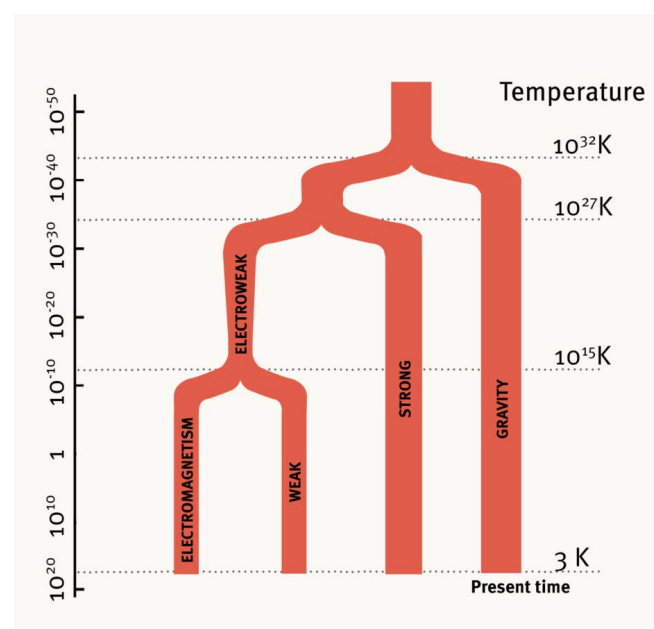
Salam, John Ward, and Sheldon Lee Glashow had predicted the existence of W^+ , W^- , and Z bosons, which are force carriers, but the requirement that these had finite mass posed a problem: fundamental symmetries would be broken.

In 1968, Salam, in collaboration with Steven Weinberg, presented a resolution to this issue. They suggested merging electromagnetism and the weak force into a unified electroweak field, characterised by four massless bosons. The symmetry of this electroweak field is disrupted at low temperatures by the Higgs field, which imparts mass to particles upon interaction with it.

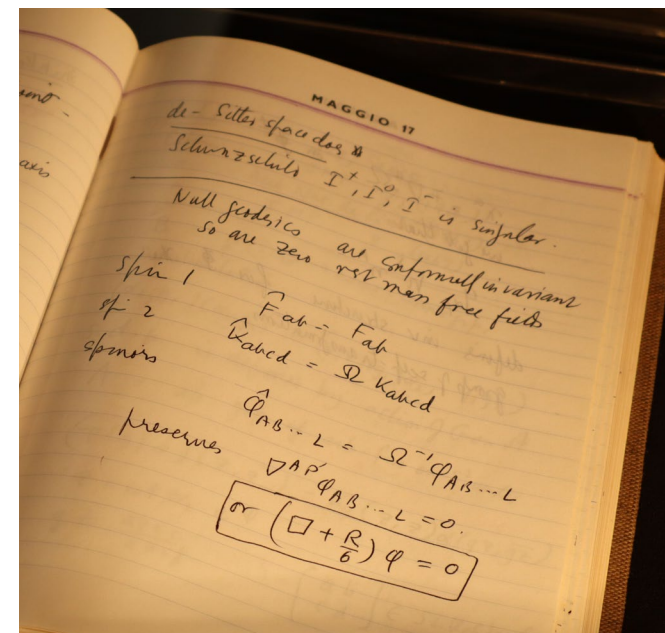
In its initial stages, the Universe was intensely hot but gradually cooled. Salam and his collaborators suggested that the breaking of electroweak symmetry took place at temperatures lower than 10^{15} Kelvin (1 followed by 15 zeros!), approximately one trillionth of a second after the Big Bang. Eleven years after discovering their solution in 1979, Abdus Salam,

Steven Weinberg, and Sheldon Lee Glashow were awarded the Nobel Prize in Physics for their contribution to the elegant story of the fundamental forces, a prize that Salam generously donated towards the establishment of scholarships for physicists from underrepresented countries.

We celebrate Abdus Salam's contribution to physics, and his efforts to make physics accessible to those outside of the western world.



Schematic of Unification, at high temperatures a Grand Unified Field Theory posits the unification of all four natural forces. Abdus Salam Exhibition, Imperial College London



Top: Excerpt from Salam's notebook on null geodesics. Bottom: Salam's 1979 Nobel Prize medal. Taylor Pomfret for Felix

ENVIRONMENT

'Deer' Imperial, Why not go vegan?

Felix investigates what vegan Imperial students think about food availability and sustainability on campus.

Environment Editor
SIMRAN PATEL

As part of Imperial's Sustainable Food and Drink Policy, beef will soon be replaced by wild culled venison starting at Queens Tower Rooms and SCR Restaurant. According to Imperial's Sustainable Food and Drink Policy, the amount of beef served at College catering outlets has already reduced by 47% since 2017. Taste Imperial plan to reduce it further by 35% every year until no beef is served in 2025-26. Moving to venison forms part of this plan, but vegans at Imperial wonder why Imperial is not replacing beef with more plant-based food. Ironically, the switch from beef to venison was announced during Veganuary.

Beef and dairy are the two largest sources of carbon emissions in an average British person's diet. Cattle farming emits around 65 kilograms of carbon dioxide equivalent (tCO_{2e}) for every kilogram of beef. Venison or deer meat, is a lean meat hailed as a sustainable al-

Environment Writer
OSCAR MITCHAM

ternative to beef. Not only does venison emit 38% less carbon dioxide equivalent than beef, but killing a wild deer prevents its future emissions. However, the UK slaughters more cows each year than our whole deer population – so replacing beef with venison is not feasible nationwide.

Venison is also more sustainable than beef because deer are culled to control their population. There are at least 1.5 million deer in the UK – a 1000 year high – partly because climate change has made winters warm enough for more deer to survive. Since humans drove the natural predators of deer extinct, humans must now act as their predators to maintain ecosystem balance. Reforestation Scotland cites deer overpopulation and overgrazing as the biggest threat to their reforestation efforts. In theory, Taste Imperial is moving from serving animals killed especially to feed people



Veganuary may be over, but these dishes recommended by vegan Imperial students will never go out of fashion. Envato Elements

to serving animals that are killed anyway to preserve ecosystems.

Notably, Taste Imperial will still be serving animals.

Vegan Imperial students argue that since plant-based food is healthier, better for the planet, and more ethical than any kind of meat, Imperial should be replacing beef with vegan proteins like tofu and lentils.

Is vegan food better for the planet?

According to an Intergovernmental Panel on Climate Change report, food accounts for 21-37% of global emissions. The same report was the first to analyse demand-side reductions, concluding that changes we make to our diets can have a bigger impact than any other end use sector. In fact, a 2020 study by Michael Clark and colleagues showed that humanity will spend our carbon budgets for 1.5°C and over two-thirds of our 2.0°C budget on food alone with our current diets.

Raising animals emits much more

than their transport, retail, or packaging. Beef emits about 20 times more carbon than tofu and about 150 times more than root vegetables according to a 2018 study. A 2020 study by Kim and colleagues found that going vegan in the UK, where the average person emits about 2 tCO_{2e} per year, can reduce someone's emissions from food by 80%. The UK sits at 13th in the world for per capita food emissions, giving us a real reason to change quickly. Being a well-respected institution, Imperial and its students could lead the country in changing diets.

The UN Food and Agriculture Organisation reported that 77% of agricultural land globally is used to raise or feed livestock, even though it produces only 18% of global calories and 37% of global protein supply. This makes reducing meat and dairy consumption one of the most feasible and impactful ways of addressing deforestation, feeding a growing population, and improving biodiversity.

According to both the American and British Dietetic Associations, vegan diets support healthy living at every age

and life stage, so there is no reason to worry about eating more plants. Red meat – including venison – is a Class 2A carcinogen, so should not be eaten in excessive amounts anyway.

Imperial from the vegan perspective

Despite the benefits of going plant-based, vegans are a minority of students on campus. Felix surveyed students who are vegan or participated in Veganuary this year what they think about Imperial's catering. 16 students and one recent graduate filled in the survey.

Overall, students felt neutral about the availability and positively about the taste of vegan food on campus. Plantworks received very positive reviews for both availability and taste. Students commended how more vegan cakes are being served on South Kensington and Charing Cross campuses than before, and how Silwood Park serves delicious fake fish and chips. The lowest rated outlets for vegan food were Library Cafe and Neo Pizza and Pasta for both taste and availability.

Like the food being served, Imperial's Sustainable Food and Drink Policy was met with mixed reviews. Most



Beef and dairy form the two largest components of the carbon emissions from an average British person's diet.

respondents applauded the decisions to stop charging extra for non-dairy milks and to phase out beef by 2025-26. Replacing beef with venison received less praise. Some students used words like “tragic” and “ridiculous”, while another asked Taste Imperial “what were they thinking”. 35% of students recognised that venison

is the best of the meat options but said they would prefer plant-based food. For example, a fourth-year computing student called venison “a necessary evil”. Taste Imperial also pledged that any livestock served would meet Red Tractor Assured Standards and any fish would be Marine Stewardship Council certified. 70% of respondents were sceptical of at least one of these certifications – for reasons including being “difficult to fact check”, “horrible conditions” at certified farms, and the criteria not being robust enough.

In response, Jane Neary, Director of Campus Operations, said: “Imperial has taken positive steps in recent years to improve the availability of vegan food on our campuses, as shown through the successful launch of Plantworks, the increase in plant-based alternatives across our campuses, and our commitment to make all non-dairy milks available at no extra charge.

“As a large institution, we need to cater for those who wish to continue eating meat. Whilst there are certain ‘red lines’ for us - not least the continued serving of beef - there are other areas where we instead will prioritise an alternative that is more sustainable. The serving of venison, for example, is a pragmatic choice given its considerably reduced carbon footprint.”

Student Union Environment & Sustainability Forum gives vegans a voice

On 25th January, Deputy President (Finance and Services) Stephanie Yeung hosted representatives from Plant-Based Universities (PBU) Imperial for a vegan-themed Environment & Sustainability Forum. Representatives explained that PBU is a student-led initiative aiming for universities across the UK and Europe to have 100% plant-based catering. They thought it was “hypocritical” for universities to research the health and environmental benefits of plant-based food while serving meat on campus. Founded in 2021, the campaign has successfully convinced eight student unions in the UK to tran-

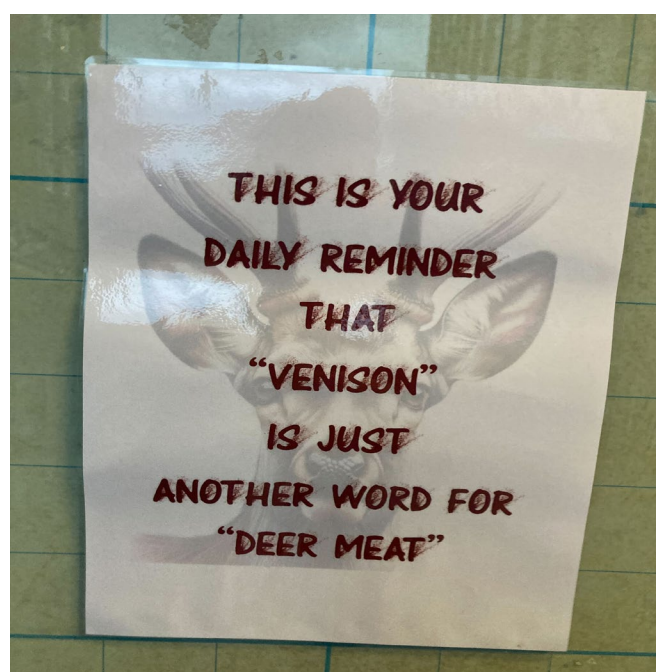
sition to 100% plant-based catering. 42 Imperial academics have signed a PBU open letter along with other academics, politicians, campaigners, and public figures.

The Environment & Sustainability Forum discussed



Some students used words like “tragic” and “ridiculous”, while another asked Taste Imperial “what were they thinking”?

four challenges PBU Imperial faces when convincing students that there should only be vegan catering on campus. The first challenge is showing that vegan food tastes as good as food containing meat and dairy. To tackle this, the survey also asked respondents for the best dish they made during Veganuary. Responses included tofu stir fries, Indian curries, and soups. 10 of the 12 dish suggestions did not mention plant-based meat or cheese alternatives. The second challenge PBU faces is eliminating the bias that meat-eaters have against food labelled as ‘vegan’, which could be solved by removing the label from vegan food or making vegan food the default. Thirdly, meat-eaters are concerned that they will not get enough protein from a vegan diet. To dispel this myth, students at the forum shared examples of body-builders and elite athletes who are vegan. The trickiest challenge PBU Imperial faces is convincing international students from countries where meat, fish, and dairy are an integral part of their culture that they do not need to buy them on campus. Imperial is proud of its reputation for both sustainability and internationalism, so PBU Imperial hopes to talk to a diverse range of students about how a vegan menu could honour their cultures.



Posters appearing to express discontent for the move from beef to venison have been spotted on Sherfield Walkway. Simran Patel



A Veganuary-themed Environment & Sustainability Forum was held last week. Guess how much of the catering was vegan! Simran Patel

The rate of deforestation in the Brazilian sector of the Amazon rainforest reportedly decreased by 50% between 2022 and 2023, according to two corroborated sets of data from the country's National Institute for Space Research (INPE) and non-governmental organisation Imazon. Since 2012, Brazil's Amazon deforestation levels have seen an increase under the presidencies of Jair Bolsonaro, Michel Temer, and Dilma Rousseff, and reached a 12-year high in 2021, despite Bolsonaro's pledge to end the practice.

The Amazon rainforest is valuable to the entire planet, being home to a diverse range of species, some of which remain undiscovered or unidentified. It is a vital ecosystem for Brazil, and the other countries that it spans, as it provides valuable natural commodities like rubber and timber as well as regulating the local climate. It also used to be one of the Earth's largest carbon sinks, but, in recent years, the rainforest has been altered

from a sink to a source of carbon emissions from wildfires and exploitation of deforested land. The greatest drivers of the Amazon's deforestation are the demand for beef – leading to land clearance for cattle pasture – and for timber, mainly from wealthy countries such as the UK, US, and China.

President Luiz Lula da Silva, who was sworn in on 1st January 2023, is a vocal environmentalist, and has pushed Brazil towards greater sustainability and net-zero commitments through several policies rolled out in the past year. Lula's government is strengthening monitoring of forest loss and regrowth, and of illegal forest-degrading activity, through more-robust satellite imaging and data collection. This will be enhanced by law-enforcement initiatives, including improved on-the-ground tracing of criminal activity, identification of financial activity that could be linked to ille-

Lula speaks for the trees

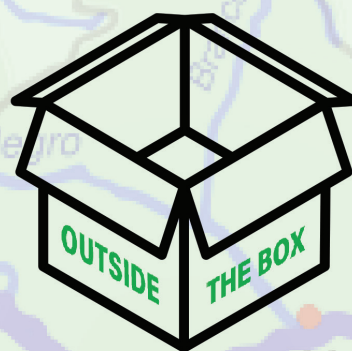
gal trade and logging, and implementation of the Rural Environmental Registry (CAR) for enforcing good forest management. CAR ensures that local people and communities have the right to own their land and encourages efficient and sustainable management of this land.

Economic policies are also a big part of Lula's conservation plans. Local forest management and conservation efforts will be incentivised through subsidies and direct payments. Ecotourism will be encouraged,

although it should be ensured that the funds raised from it will be channelled directly back into local communities and sustainability initiatives. Improvements to product tracing and certification systems will also aim to ensure that the country's exports are being sourced from sustainable practices. This somewhat aligns with the European Union Deforestation-Free Regulation (EUDR), established in May 2023. A primary aspect of the EUDR is a ban on imported products sourced from land that was deforested or degraded – natural forests converted into

plantations or other wooded land – after 31st December 2020.

Brazil has put in a bid for its city Belem to host the COP30 climate conference in late 2025, which could be a landmark event both for examining the trade routes that drive deforestation and for strengthening policies on global forest preservation and management. The environmental policy changes that Lula has made since his inauguration, and the seemingly related decrease in deforestation, are a great example of what can be achieved by a change in leadership, especially when strong governmental and public support exists.



WITH ZANNA BUCKLAND

material, containing less embodied carbon than steel and concrete do.

Mass timber refers to various categories of large wood panels that are engineered to be used in structural applications; these consist of timber veneers (thin layers) that are laminated in such a way as to give them high load-bearing potential. Use of the material is becoming particularly prevalent in Scandinavian, US, and Canadian building projects.

The benefits of mass timber products are extensive; first and foremost, growing the source trees mean that carbon is actually consumed during their production. The material

is much lighter relative to its strength than steel is, and tests have found it to have good fire and earthquake resistance, as well as naturally being visually attractive.

Despite these advantages, there is an ongoing debate as to whether timber-based structures are in fact more sustainable than typical steel and concrete buildings. Although the embodied carbon from production is much lower, the timber is only truly sustainable if sourced from forests that can be swiftly regenerated. There is a concern that increasing demand for mass timber as a construction material could become a fresh driver of deforestation. Furthermore, difficulties in fulfilling structural safety factors and fire-safety

testing in local building development approval procedures, which are currently more tailored to assessment of steel and concrete materials, poses a significant barrier to the use of mass timber in taller buildings. The Ascent in Milwaukee, Wisconsin, standing at just under 87 metres, is the tallest mass timber structure to date.

As with all innovative solutions for improving sustainability, it will take time for mass timber to gain traction in the fast-paced world of construction. To facilitate this, a rapid response from urban development authorities will be necessary to update building codes and land-use policies so that developers can be free to make the switch if they so choose.

Timber tailor soldier spy

The built-environment and construction industry is currently one of the top three greenhouse gas (GHG)-emitting sectors in the world, accounting for nearly 40% of global emissions. Around 25% of this comes from what is called 'embodied carbon' – emissions generated by the extraction and processing of raw materials for manufacturing or construction. It is most often discussed in the context of

building development when estimating the carbon footprint of materials such as steel and concrete.

Steel and concrete are both carbon-intensive materials, and a huge amount of them are produced for construction use. Steel and cement production each account for around 8% of global GHG emissions. Mass timber has recently gained popularity in large-scale construction projects as a more sustainable

ARTS

Dido & Aeneas

Led by lions, played by cubs. A King's Opera Society production.

Arts Writer

CALUM DRYSDALE

Thought to have originally been written for a girls' school, King's College London's Opera Society's rendition of *Dido and Aeneas* was the epitome of student drama. Stunning performances jostled with wincingly bad moments to produce an uneven but enjoyable, and ultimately impressive endeavour.

Opera, I find, benefits from impressive surroundings. The lacquered wood and soaring ceilings of the King's chapel did a lot to alleviate the ridiculousness of a man in breeches.

Hollywood's tentpole funding structure uses crowd-pleasing mega hits to compensate for the more daring and artistic works unlikely to generate returns. King's Opera Society can be pleased by the fact that they seem to have a cast full of tentpoles. Ella Frost as Dido, Beatrice Tinsley as First Woman, and Ellie Blewit as the Sorceress were extraordinarily good in a way that was both shocking and immensely gratifying. They showed complete mastery of their roles and I can only hope that I will get to see more of them on the stage.

This is not to slander the indie darlings of the rest of the cast and chorus, who did not seem cowed by the towering talent of their leading ladies, and who managed to make the most of the awkward, multi-layered stage at the front of the chapel. Director Mya Kelln should give herself a pat on the back for having managed to fit a lot of people into not a large amount of space, without ever appearing congested, not to mention having secured a



Dido & Aeneas, final scene Jasmine Newton-Rae

fantastic set of costumes.

Strangely, by comparison, the orchestra's performance made one suspect that they were a collection of random passers-by who had had instruments thrust into their hands. Thankfully, their duff notes and dud pacing did not totally draw attention away from the main event.

A notable shout out to Imperial student Peter Costello in the role of Witch, and former Imperial student Gilbert Jackson who both played the organ and was impressive in the role of Aeneas. If I ever need a man to carry a suitcase for me, I will know who to call.

This was a tour de force from a confident and purposeful society, which has both the ambition and the know-how to pull off big productions. I wish them the best in their next projects.



Dido & Aeneas, act one Jasmine Newton-Rae

A message from the writer...

Despite the seeming eclecticism of many young people's taste in music, it is notable that opera has not been able to make a similar breakthrough achieved by genres as diverse as Ethiopian jazz and ambient music. Arts Council England has found that only around 4% of adults have ever been to an opera, and that number is steadily decreasing over time.

There are two reasons for this, I believe. Firstly, anyone trying to listen to opera music on their phone will miss much of what makes the experience so enjoyable. Opera is a visual medium as much as a musical one. Is it any surprise that opera music can feel silly if experienced without the story told through the usually impressive staging and necessary subtitles? The great arias only make sense in the context of a great love story.

The second reason is the stubborn notion that opera is for the stuffy. This is an idea that is at odds with the very determined work done by many passionate for the art. The Royal Opera House in London for example offers a very generous youth ticket subsidy for 16-25 year olds, with fantastic tickets for only £30 pounds. This is in addition to the numerous other fantastic opportunities to experience this art form, such as the King's College Opera Society. I encourage you to make a resolution this year to attend an opera and make up your own mind.

Romeo & Juliet

A review of Imperial DramSoc's production.

Arts Editor
GILBERT JACKSON

Shakespeare's *Romeo and Juliet* is a play that needs neither introduction nor explanations: so engrained it is in the public consciousness, that often we recite its lines, and hold it as the exemplar depiction of defying tradition and honour for the pursuit of love. DramSoc's production certainly delivered both quality acting and staging, as well as bringing marvellous innovations to the centuries-old play.

While I was hesitant about the setting being 1960s Brighton during the clash of mods and rockers – after all, it is in 'fair Verona that we lay our scene' – my hesitations were laid to rest as the setting did not detract from the play itself. Instead, it added a bold new colour palette, especially where staging and costuming were concerned, and so hearty praise must be given to Director Jonah McCleod along with the production crew for their brilliant stylistic choices.

Playing the role of Romeo was Jack Finnis, whose impeccable delivery, attention to metre and emphasis, emotional detail, and sheer reverence for the play was a shining beacon and paragon of tasteful acting which deserves much acclaim. Charlotte Andrews was equally brilliant in her role as his infatuated, star-crossed lover, and was a magnetic personality on stage, captivating not just her on-stage partner but the audience as well. However, much applause should be given to Molly Clifford in the role of the Nurse. While I personally believe that the 'low-class, no-filter maid with the thick Northern accent' is a trope done to death, Molly Clifford is nonetheless a fine actress who brought radiance, humour, and dominance to the stage.

Elana Todd-Miller and Omar Tahir were in the roles of Benvolio and Mercutio respectively, and were fine actors, bringing much lyricism to their lines which highlighted the poetic nature of the play. However, at times it felt like the characters had swapped roles, leaving the audience in a state of confusion: rather than being a kind-hearted and pacifist soul, Benvolio at times was snarky, forlorn, and sarcastic; instead of being spritely and (as the character's name implies) mercurial, Mercutio was soft and gentle.

Billy Gregory in the role of Tybalt brought the necessary components to make the headstrong and trig-

ger-happy boy an interesting character to observe on stage, but he was on the brink of turning the character into a comical spectacle: the unnecessary raspy voice and peculiar finger-waving were bordering on the cartoonish. Finally, Siddharta Adaikalaraj in the role of Friar Lawrence gave us a wonderful display of acting professionalism. The frankly appalling behaviour from the audience during the entirety of the play did not waver his commendable acting, and he maintained the utmost stoic demeanour.

Final mentions must be made also to the choreographers, who put together an exceptional spectacle during the Capulet banquet scene. Packed with of-the-era dancing, it goes to show that such feats of ingenuity are what allow the audience to be fully immersed in a play's setting. Truly this was a wonderful and refreshing performance from DramSoc, the sheer amount of talent on display was breathtaking. The production and staging teams may rest easy knowing that all their hard work has paid off and yielded a fabulous production.



Romeo and Juliet wedding scene Gavin Xie



Final scene Gavin Xie

Manon

A review of the ROH's performance.

Arts Writer

CHARLOTTE E. PROBSTEL

The timeless dilemma between true love and riches is not unknown to the general public, and it never seems as if the female lead could ever have both. While iconic pairs such as Jack and Rose in the 1997 film *Titanic* may be the most popular example, Kenneth MacMillan's ballet adaptation of the 1731 novel *Manon Lescaut* masterfully delves into the struggle women faced in the 18th century, torn between marrying above their social class, and following their hearts.

The ballet's first act unfolds with Manon's brother, Lescaut, mediating her introduction to the affluent Monsieur G.M. of Paris. She, posed as a prize possession to many wealthy older men, unexpectedly falls in love with young Grioux. Initially perceived as mere physical attraction, their connection is strained by a confrontation with Manon's protective brother. Act 2 begins with an intense game of cards at a party, during which it is revealed that Grioux is double-dealing G.M., and he is forced to escape. Manon follows, and the first character – whom I shall not reveal – is killed in a swift motion. Manon and Grioux escape to another country in Act 3, posing as a married couple and hiding from the police. Manon is taken as a personal prisoner by the gaoler, who attempts to convince her to live with him. Another murder triggers Manon and Grioux to flee a second time into the swamps. The story ends tragically, with the two lovers in embrace.

The beauty of this ballet lies deep within its meticulous choice of costume, choreography, and setting. Without dialogue, the audience has to guess and feel the storyline. The beginning of Act 1 was cryptic, as one tries to find Manon in her white costume in the flock of brown-black dresses, instantly shining the spotlight on our female lead. Bold stripes of red and purple helped distinguish Monsieur G.M. from the other wealthy men, all dressed in black, and Grioux, dressed in beige.

The choreography becomes the silent narrator, unveiling the complex relationships between characters as we see them embrace. Manon dances effortlessly with Grioux, while her intimate scene with Monsieur G.M. requires the aid of his assistant, representing his



Charlotte E. Probstel

inability to satisfy her by himself. Manon embraces her brother as her only family, always in his proximity for protection. It does not take too much interpretation to understand the storyline by observing body language.

The backdrops changed twice per act. With a total of six scenes, the audience travels from the courtyard, to Manon's bedroom, to an upper-class party, to the port, the gaoler's office, and finally in the swamps. Without excessively relying on props, the cast skillfully occupied the stage, placing the spotlight on the interactions between characters. The decision to maintain a classical setting, rather than modernising the ballet, enhanced its timeless appeal.

The night ended after three excellent hours of music, dance, and raw emotion. The Royal Opera House is truly a magnificent place, with great seating in the upper amphitheatre, and a vibrant atmosphere during intervals provided by their snacks and drinks. Guests are allowed to pre-order drinks to avoid long queues during intervals, adding to the overall enjoyment of the evening.

A message from the editor...

Having lots of reviews for our section is always a wonderful sight to see. However, to make these features a regular on the section, we are always looking for more writers to make the dream a reality. If you love art, theatre, opera, ballet etc. then perhaps consider writing for the arts section! We take reviews, opinion pieces and educational pieces!

To write for us please email at arts.felix@ic.ac.uk

PHOTOGRAPHY

Paranoia

In the midst of your life, fear is your only companion

Head Photographer
ROLANDO CHARLES

This week's winning photo truly blew me away. This masterpiece of a shot by Mike, communicates the primal feeling of paranoia through an unholy, yet very real image.

Imagine this: you're sitting on the tube, as Londoners often do, and you begin to wonder where you'd end up if you were to just... stay on the train, miss your stop, and then drive past the terminal. The depot, right? Surely, the train must end up *somewhere*? Somewhere in the back of your mind, doubt starts to whisper into your ear. "What if it doesn't? What if instead, it just...". The voice stops and the passing thought leaves as soon as it came, never to show its ugly head again. You go back to reading your book, watching your video, or scrolling social media; but this time with an eerie feeling and a shiver down your spine – the only remnants of what just occurred to you.

Lots of stories revolve around paranoia; not knowing what is coming up ahead. An iconic example springs to mind: *Dylan Dog & Martin Mystere - Last stop: the nightmare!* (1990), an Italian comic book featuring the paranormal investigator Dylan Dog. This is a recommended read for fans of horror and psychological thrillers, as it delves into the human psyche and behaviour, highlighting the abnormal within a beautifully narrated background of supernatural activities.

The fear of the unknown is not only profusely represented in visual media – think of *Alien* (1979) directed by Ridley Scott or *It Comes At Night* (2019) directed by Trey Edwards Shults.

In real life, a fixed path is a reassuring feeling until you start to ask yourself what happens beyond those off-beaten paths. What lies beyond our day-to-day? What's after death? What will I do after university? What to do when I get off work? The doubts can devour you from the inside out, and yet you can't quite pinpoint

the feeling. It's not fear, and it's not regret. It might simply be the paranoia of having chosen the wrong path; a feeling that can never truly be settled. Choosing a direction in life must indeed be the bane of human existence.

I think we like to be told what and when to do things because surrendering control is an escape from the paranoia of having to choose every single day. 19th-century Danish philosopher Søren Kierkegaard paraphrased it nicely as: 'No matter what you choose, you'll regret everything' in his novel *Either/Or*. I find the timeless quote timeless groundbreaking, if you consider that he was the first existentialist to inquire the meaning of life.

Finally, we return to Mike's incredible picture. Look into it and try to extrapolate anything except for the general context – you know for a fact that the ski lift terminates somewhere, but from this image alone you

can't determine exactly where. You're on a track, and yet you have no clue where you're really going. *Frozen Solitude* beautifully depicts the worst of both worlds. The monochromatic environment amplifies the liminal nature of the space – cold and solitary – as human existence often is.

Scan the QR code to submit for the next theme 'Moby Dick':



Frozen Solitude Mike Buzadji

PUZZLES

Puzzles Editor
STANLEY SCOTT

CROSSWORD

1	2	3	4	5	6	7	8	9	10	11	12	13
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SUDOKU

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Medium

Hard

Extra hard

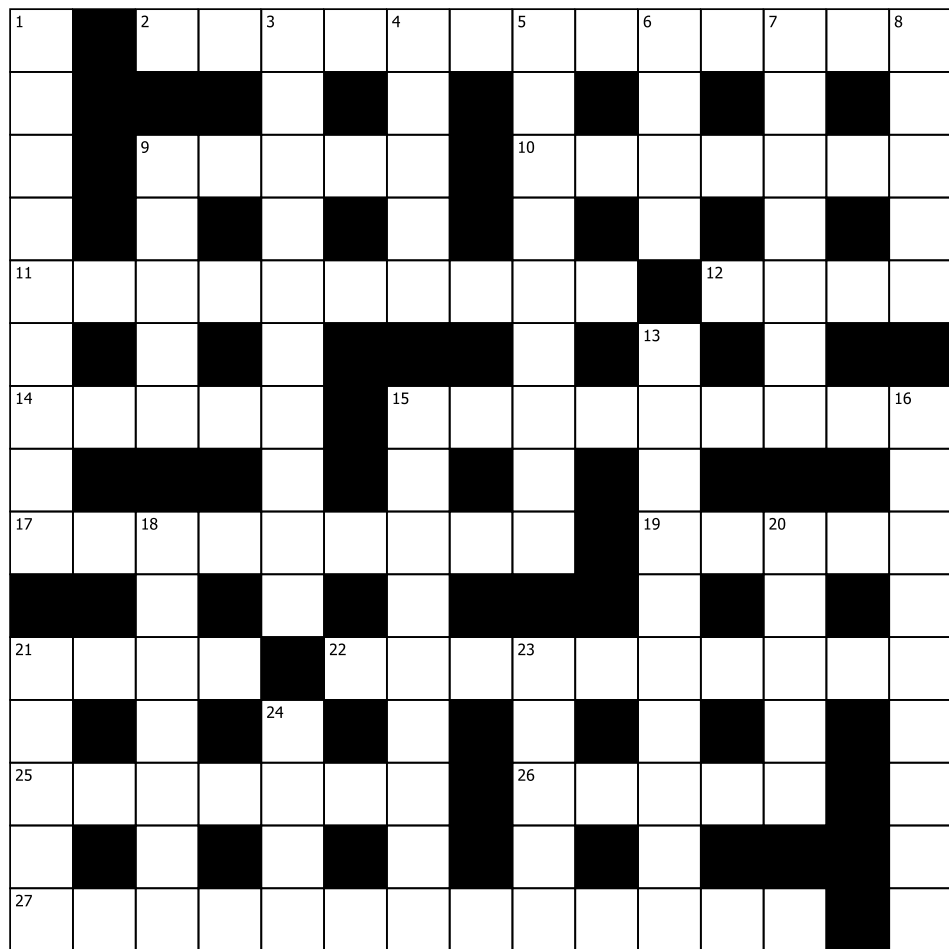
Across

- Antarctic waters named for discoverer. [4 3]
- Wacky. [7]
- Whole. [2 3]
- Sleazy one. [9]
- Tenuous connection. [7]
- Nineteenth century English queen, to the Portuguese. [7]
- Moss and Upton, e.g. [5]
- Gujarati city. [5]
- Pejorative for an English person. [3]
- Tablets. [5]
- Thanks, to the Yorkshireman. [3]
- In cooking instructions, it might require the lower temperature. [3 4]
- 'Not for all the ___ in China'. [3]
- 15 Across synonym. [6]
- It'll do! [4 4]
- Author Potter, for short. [3]
- Fox-like. [3]
- Award. [8]
- Class of ancient Greek young man. [6]
- La ___, song by Charles Trenet later covered in English by Bobby Darin. [3]
- In unison. [2 5]
- Singer Smith of *Unholy*. [3]
- Colours, as glass. [5]
- The centre of Terry Pratchett's *Discworld*. [3]
- Super follower. [5]
- Gives out cards. [5]
- Remove, as a crease. [4 3]
- In water. [7]
- There's a famous one at Halicarnassus. [9]
- Where the fight takes place. [5]
- Having gotten inheritance. [7]
- Old president of Russia. [7]

Down

- Military strategy board game. [4]
- Able to be drawn. [2 3]
- Organise. [4 3]
- Village in County Kerry with Irish name *An tSnaidhm*. [5]
- What Stanley does with the crosswords. [4]
- Barbecue waste receptacle. [3 3]
- Clams, oysters, etc. [8]
- French term of endearment. [3]
- Receives, as profit. [4]
- With regard to. [5]
- Talk over. [7]
- Pen names. [7]
- Many a wooden floor component. [4]
- Beauty competition. [7]
- Abbreviation for where you likely live. [3]
- Non-flowering, as a plant. [7]
- Kind of fish. [5]
- Cautionary tale. [5]
- In physics, one of two main semiconductors. [1-4]
- On a cruise, e.g. [2 3]
- Got into a hospital. [8]
- Cutting poetic devices. [7]
- Lose in a particular casino game. [4 3]
- Barcode acronym. [3]
- Makes one side the other. [7]
- Raunchy. [6]
- Clever clogs' society. [5]
- It can be brave or broken. [5]
- Russian pancake. [5]
- US coin denomination. [4]
- Ginger or turmeric, e.g. [4]
- Twofold. [4]
- Read quickly. [4]
- Diminutive suffix. [3]

CRYPTIC CROSSWORD



GROUPING GRID

How-to

For fans of *Only Connect!* These sixteen clues can be placed into four groups of four, each with a connecting feature. To solve the puzzle, write these groups and their connections below! An example can be seen in last week's solutions.

attractive	Ali	Mediterranean	pex
Caspian	Albert	tringle	cute
Regent	Dead	charming	Red
beautiful	liner	Consort	gorgeous

Connections

1.

2.

3.

4.

Across

- Calm, as I kept on stealing people? [13]
- Old pro at her first chat show. [5]
- At last, even ground agreed to be tread. [7]
- Chapatis rise non-uniformly at the eastern restaurant. [10]
- Rat out American dish. [4]
- Take out a bean to make Japanese food. [5]
- City holding back the evil-doer? [9]
- He's known for being snappy! [9]
- Section of famous letter for the rice product. [5]
- A thousand annoy the captain. [4]
- Fire ICBM to a mob! [6 4]
- Bulkhead with hot gas at the bottom. [7]
- Mixed-up, heartless kid has a drink and becomes a killing machine. [5]
- Regretting trying to reverse on your bike. [4-9]

Down

- Play ocarina, be out of breath! [9]
- Grey station? [5 5]
- Oddly, no resentment for this lake. [5]
- Ordering religious headdress at church not coming back in great quantity. [6 3]
- Object to some of an Uno game. [4]
- Predicted month of first reduction in unrest. [9]
- Susy takes a penny covered in soap. [5]
- Many times out of ten? [5]
- Pasta with cooked liver, lime and creamy topping. [10]
- Played once more with the striker among the tall grass. [9]
- I hear he beats up the paper carriers! [9]
- How stupid! No memory when returning to university! [7]
- Notice large bird outside. [5]
- Bake a weird meat dish. [5]
- The Arabic sea previously was a prized possession. [5]
- Drone on this instrument. [4]

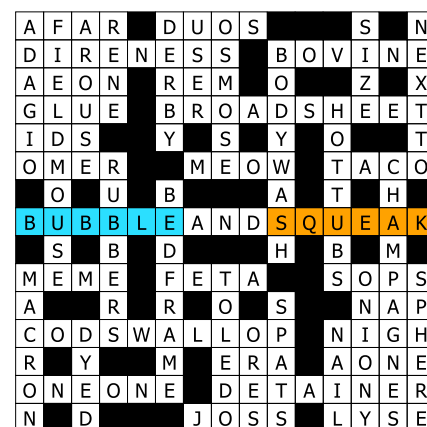
Puzzle Editor's Note

Dearest puzzlers,
 This week, there's no special theme to the regular crossword, so do enjoy this rather more relaxed grid. I hope you found last week's *bubble and squeak* theme as delightful as I did. Congratulations to all those who didn't have any clues *leftover*...
 Still a new addition, the grouping grid is also making a return in this issue. If it proves popular, I'll make it a mainstay – at least until Victoria Coren Mitchell send a cease and desist. So do let us know if you're enjoying the puzzles (or indeed if you're not), by emailing us at puzzles.felix@ic.ac.uk. Happy crossing, completing and connecting!

- Stanley

Last week's solutions

Out of the Frying Pan



Cryptic



Grouping Grid

devil	monkey	chappie	Nando's	cheeky things
scramble	fry	poach	boil	ways to cook eggs
bar	moat	grain	cram	modes of transport with wrong first letters
frenzy	hubbub	riot	din	synonyms for 'frenzy'