

Felix

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INSIDE

Consent training
for all
What has the Union
done this term?

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EDITORIAL

It's a personal choice

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The debate on whether to make vaccines mandatory is an interesting one. Those more pro-restriction argue a whole swathe of reasons for getting the jab. You're less likely to get the virus at all. If you do get it, you're significantly less likely to be hospitalised by it. And even if you think you're young and healthy so it doesn't pose a threat to you, the vaccine helps you protect others who are more vulnerable.

On the hesitant side of the fence, arguments are far less diverse. Short of brazen conspiracy theory about 5G chips, there is the incredibly small chance of a blood clot caused (far outweighed by the risks of catching the actual virus) and the dogma that "it's a personal choice".

"It's a personal choice" isn't a reason, it's a conclusion. "Based on these previously analysed factors, I have concluded that the choice to take the vaccine is a personal one and should not be mandated by a government" would be a sensible concluding line, if there were factors to be analysed. But as far as I've seen, there aren't, it's just libertarian instinct telling some people that they shouldn't be made to do something, even if that choice may cost the lives of others.

Imagine that argument coming from the other side of the fence. You ask a doctor why you should get the vaccine

and they just say "it isn't a personal choice" with nothing to back up why.

But that is basically what's starting to happen around the world. Singapore's state will no longer pay for the healthcare of those who are unvaccinated. Austria began plans for mandatory vaccines in November and riots ensued. Germany's brand new Chancellor Olaf Scholtz has announced as one of his first actions in office that vaccines will become mandatory in the country. Greece will have a vaccine mandate for those over 60 from January.

It seems that both of these options are as unpalatable as the other.

Plan B includes restrictions that have minimal effect on livelihoods but may help stem the spread of infection. Masks for indoor public spaces, work from home if you can but come to work if not, and crucially bars, pubs and restaurants can all remain open.

It looks like this might be it ever winter from now on. People argue that we never did this stuff in a bad Flu season, where 40,000 or so people can die in a year, but maybe we should have. While I can scarcely put into words how much I would oppose another full lockdown, measures that have minimal impact on our lives whilst still substantially mitigating the pressure on the NHS seem like a good new normal to me.



Statement of Intent

At Felix we believe that it is always in the interest of the students to 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 **Sam Lovatt**
Editor-in-Chief

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Consent training mandatory for all students from next year

Sam Lovatt Editor-in-Chief

Consent training will be rolled out for all Imperial College students, becoming mandatory for student registration for the 22/23 academic year and onwards.

Such training has already been rolled out to all committee members of Imperial College Union Clubs Societies and Projects (CSPs), using the provider Brook E-Learning.

A “soft launch” of training for the wider student body will launch in the Spring term this year.

The CSP training is virtual and will involve taking an online training course, followed by a quiz administered by the Union in which participants will have to score 80% or higher to pass.

The training will aim to help the participant further understand the topic of sexual consent, and will be applicable to male, female, and non-binary students alike.

The company Epigeum has been selected by the College to provide the training for all students, due to the nuance it provides to the topics covered, its inclusivity and appropriateness for a university setting.

The decision for consent training to be made mandatory for all students was made by a working group, set

up to determine how best to roll out such training within the college.

This group consisted of the Director of Student Services within the College, a permanent Union employee and a number of welfare representatives from across College faculties. The group also had input from the Gender Equality Network and the group ICUsToo.

The training will include links to Imperial-specific resources which can be accessed by anyone taking the training.

A poll, published in April this year by YouthSight and the Higher Education Policy Institute, suggested that a majority of students think it should be compulsory for students to pass sexual consent training before they go to university. The same poll also suggested that around 30% of students are confident in navigating consent once alcohol has been consumed.

Earlier this year the Office for Students, the regulator of Higher

Education in England, announced new guidance for universities to set out improved reporting procedures and support for those who come forward with claims of sexual misconduct. The announcement came shortly after the website Everyone’s Invited hosted over a thousand allegations of serious sexual misconduct at schools and universities across the country.

Credit: Envato Elements



Events cancelled as Omicron’s grip tightens

Sam Lovatt Editor-in-Chief

Work from home order has been issued and all social events held by Imperial College are to be cancelled. The measures are in response to the increasing prevalence of the Omicron variant of SARS-CoV-2 in the UK, said Provost Ian Wamsley on Wednesday evening.

Teaching will be moved online where possible and social events such as ACC

will be postponed until more is known about the dangers posed by the new variant of the virus that causes Covid-19.

Essential research and teaching that can only be done in-person will continue on campus. These restrictions will last until Jan 4th.

It is currently a legal requirement for any close contact of an individual infected with the Omicron variant to self-isolate for ten days. Contact with an

Credit: Imperial College London



NEWS

infected person at such an event could lead to hundreds of people being forced to self-isolate over Christmas Day itself.

Results published this week, from a very small study in South Africa, suggest that antibodies from the Pfizer vaccine are up to 40 times less effective at combatting the Omicron strain than the originally sequenced virus. Such vaccine evasion could lead to soaring infection rates over the Christmas period if left unchecked.

Other lab results have also suggested that three doses of the Pfizer vaccine (two initial jabs and a booster) can “neutralise” the variant.

The Union emphasised that these events would be postponed, rather than cancelled, and that people would not simply lose the money they may have already paid for tickets.

On Wednesday, Boris Johnson said that Omicron was spreading within the UK “much faster” than previous variants, including the rapidly infectious Delta variant. It has been much speculated that Omicron could become the dominant variant in the UK within weeks.

Imperial’s own Professor Neil Ferguson told the Today Programme on Wednesday that Omicron would likely be the UK’s dominant

strain by Christmas and that a New Years’ lockdown may be necessary.

As of Wednesday, the UK had recorded 568 cases of Omicron.

Credit: Imperial College London



Empty campuses, again

When will exams be in-person again?

Credit: Envato Elements



Sam Lovatt Editor-in-Chief

We don’t know, yet.

With relation to exams, broad guidance is set by the College, which all departments have to adhere to. This includes regulations such as minimum time for uploading exam answers during remote assessments, and whether masks must be worn for in-person exams.

As anyone taking a January exam will already know, all at this time will be Timed Remote Assessments, meaning that there will be no in-person assessments, and therefore little room for manoeuvre on safety regulations.

The Education Committee, a relatively large selection of representatives including Vice Provost (Education and Student Experience) and Deputy President (Education) Daniel Lo, have set up an In-person Exam working group. The group began

meeting from 18th November and will present findings to the Education Committee on 16th December. The group considered “safety and academic aspects involved in the return of in-person exams and how College exam room capacity may be affected through risk assessment”. The report will be used to determine the extent of safety restrictions on summer exams.

Once these decisions have been made at the College level, departments will have the ability to operate within the set boundaries as they see fit. This includes the option to hold Timed Remote Assessments in Summer 2022, even if College-wide guidance does not mandate this.

The Faculty of Natural Sciences emphasised that intra-departmental discussions on safety measures always include student representatives.

The Union’s work so far this year

As the end of term one approaches, Felix asked the Officer Trustees of the Union what they’ve been up to so far this year and what they’re currently working on. Here’s a list of work that may have passed under some people’s radars:

Graduate Student Union Review

President Lloyd James has been working on a review of the Graduate Students’ Union, a subsection of ICU which represents specifically graduate students and has up to now included a paid, part-time GSU president role. The role was paid around £10,000 a year, and made up a large part of the total GSU budget. The review has now come to broad conclusions, with specifics still to be ironed out. The group are strongly considering **whether there will even be a GSU**, and if extra volunteer roles will be introduced to account for the specific needs of graduate students.

Coupled with this is the post-graduate engagement group, in which the Deputy President (Education) is involved. This group has been set up to look at post-grad representation within ICU and to help mitigate for the lack of GSU this year.

College and Union Discipline

Deputy President (Welfare) Nathalie Podder has been involved in reviewing and improving disciplinary procedures both within the Union and College. The College working group involves both Nathalie and Lloyd, plus representatives from the College. Conclusions on how to improve the College’s disciplinary procedures will be made by the end of the academic year.

Union disciplinary procedures have been a point of contention in years gone by, and will be updated by the end of Spring term, according to DP (Welfare). This update will include the publication of ‘Operational Guidelines’ and a ‘Members’ Code of Conduct’.

Nathalie is also working with the BME officer to write a set of best-practice guidelines for communicating on the subject of ethnicity in the College.

Democratic Structure of the Union

A review of Union Council membership will begin in January, assessing the overall membership structure and the role of Constituent Unions. Conclusions will be drawn by the end of this academic year.

The DPCS and DPFS did not respond to Felix’s requests, which made us quite sad.

Senior appointments

Sam Lovatt Editor-in-Chief

Last week two Imperial College professors were appointed to senior positions in the Royal Society and on the Budget Responsibility Committee.

Budget Responsibility Committee - Professor David Miles



Credit: Imperial College London

Professor David Miles was appointed, as the economic expert, to the three-person Budget Responsibility Committee by Chancellor Rishi Sunak on December 3rd.

The role, described as “one of the nation’s most influential economic policy jobs” by Bloomberg, involves economic forecasting for the UK and overseeing the Office for Budget Responsibility. Miles’ work will help determine the amount of money available to the Chancellor when setting the national budget, as well as determining how much taxes may need to increase.

Professor Miles will become the “resident macroeconomic expert, making the big judgments on growth, inflation, unemployment and productivity”.

On the appointment, Miles said “I am delighted to accept this nomination and hope to contribute to the important work the OBR is undertaking. The UK’s fiscal position is challenging as the economy has been buffeted by

exceptional shocks - the work of the OBR has never been more important.”

The Dean of Imperial College Business School said “David is one of the UK’s leading economists and will bring a wealth of knowledge and experience to this important role”. Professor Miles was a member of the Bank of England’s Monetary Policy Committee from 2009 until 2015.

David Miles has written two cost benefit analyses of lockdowns, comparing health benefits to economic damage.

A paper on which Miles was the lead author, published in August 2020, concluded that “the costs of continuing severe restrictions are so great relative to likely benefits in lives saved that a rapid easing in restrictions is now warranted”.

A second paper, published just two weeks previously, came to the similar conclusion that “the costs of continuing severe restrictions in the UK are large relative to likely benefits so that a substantial easing in general restrictions in favour of more targeted measures is warranted”.

A March 2021 paper, assessing the rate of easing of restrictions in the UK, suggested that “a somewhat faster easing of restrictions in England than current policy implies” is favourable.

Even more topical, Miles recently co-authored an article in the FT assessing the disagreement between Universities UK and the University and College Union over the USS pension scheme policy. Conclusions, were that the USS most likely has strong enough assets to support pre-existing pension promises, but that there is as high as a 40% risk that universities would be left with liability of over £20 billion to pension holders, in the event that fund assets run out before 2055.

Miles will take over the role from incumbent Professor Sir Charlie Bean in January 2022.

Foreign Secretary of the Royal Society - Professor Robin Grimes



Credit: Imperial College London

Professor Robin Grimes was appointed to the role of Foreign Secretary of the Royal Society, one of the five most senior positions on the Society’s council. He will be responsible for relations with European countries and will imminently be covering outcomes of COP26 and responses to the pandemic.

These topics were discussed at last week’s EASAC meeting, which Grimes attended as one of his first actions as Foreign Secretary.

Grimes said “The Royal Society’s focus is on science that works for the benefit of everyone, and the events of the last two years have shown, undeniably, that we must work internationally to deliver that goal”. His role will primarily cover relations with EU scientists, with the aim to “reaffirm the bonds between EU and UK researchers which have benefited research right across our continent”.

The Royal Society, named in full as The Royal Society of London for Improving Natural Knowledge, was founded by King Charles II in 1660 with the aim to “bring together leading scientific minds of the day, and became an international network for practical and philosophical investigation of the physical world” according to the Science Museum.

Grimes has previously held the posts of Chief Scientific Advisor to the Ministry of Defence for nuclear science

and technology, and Chief Scientific Adviser to the Foreign Office of the UK government. Felix bets £10 that this role is the cherry on Grimes’ knighthood cake.

The professor was made a Fellow of the Royal Society in 2018 and is still the Steele Chair of Energy Materials at Imperial College. He takes over the Foreign Secretary role from Professor Sir Richard Catlow, who had held the position for the previous five years.

The post of Foreign Secretary of the Royal Society dates back to 1723.

The Foreign Secretaries



I thought this was a bit funny. Let’s hope the Royal Society Foreign Secretary can forge a stronger bond with the EU than our governmental one, ‘ey?

SCIENCE

Edited by: ISABELLE ZHANG
JAMIE JOHN
CARA BURKE
MAREK COTTINGHAM

The Ancient Greeks: Science and Wisdom

► *Science Writer Allannah Hibbert reports on an exhibition at the Science Museum*

Allannah Hibbert Science Writer

The Science Museum recently opened an exhibition entitled, “Ancient Greeks: Science and Wisdom” to run for the next seven months. Its aim? To show how the Ancient Greeks saw science and wisdom and how they applied it to many aspects of their society including travel, astronomy, time, music and even body shape.

Entering the exhibition, you are greeted with a video projected onto a sarcophagus panel depicting the nine Muses to highlight the importance the ancient Greeks placed on intelligence and culture. The Muses were goddesses of literature, science and art; the word museum comes from the Greek Μουσείον (mouseion), meaning “seat of the Muses”.

Although they had very little of the technology we have today, they developed their own incredibly advanced systems governing many aspects of life. This breadth of application is demonstrated in the wide range of topics covered during a small walk around a large U-shaped room. The first half focuses on their advanced naval architecture and Aristotle’s Taxonomy. It then loops around to a brief dive into the influence of mathematics on athletics, including how it was used to calculate the measurements of the “ideal body shape”. They

would start with the dimensions of a joint in the little finger, multiplying it to achieve all the proportions required for a statue. The exhibition informs us that the ancient Greeks saw these proportions as being personified in the victors of their “Pan-hellenic Games”. These games were a set of four sports festivals to honour the Greek gods and mark time. The Olympic Games were amongst them.

The exhibition continues with two main exhibits: Music, and Astronomy & Time. Pythagoras believed that everything could be explained by mathematics, even the beauty of music – he and his followers applied this logic to the aulos (pictured) design. The aulos was an ancient Greek instrument, consisting of two pipes. Musicians would play by blowing into both pipes simultaneously and placing their fingers over the holes. The spacing of the holes determined the notes being played. Pythagoras investigated these spacings mathematically, finding that the most harmonious notes were created by simple ratios (4:3, 3:2, 2:1). This is demonstrated by an interactive screen reproducing the sounds an aulos makes when different holes are covered, along with explanatory videos of how the sound is created, and a genuine Aulos on loan from the Musée du Louvre in Paris.

The final, and possibly largest, part of the exhibition focuses on Astronomy & Time. The Greeks believed that mathe-

matics connected all the disparate parts of the universe. The exhibition informs us that the word cosmos comes from the Greek κόσμος (kosmos), which means “order”. This section includes the second-oldest geared mechanical calendar in the world (centre of page, and below). The device is speculated to have been based on designs by the Greek polymath, Archimedes. It could be used to accurately predict the positions of the Sun and Moon in the Zodiac and Lunar phases to assign dates for religious festivals. It also included a list of latitudes for use in 16 different locations, from Constantinople through to Athens and Rome.

The exhibition is a beautiful and respectful ode to the Ancient Greeks and their achievements, many of which are foundational to modern-day Western society. It whets your appetite leaving you wanting to go away and read even more about the Ancient Greeks. On top of that it is completely free and right next to Imperial’s South Kensington campus, making it an ideal study break or post exam/deadline reward. It doesn’t take forever to walk around and is available until 5th June. Worth a visit, not only for the Grecian enthusiasts, but for anyone with a curious mind!



The world’s second-oldest geared mechanical calendar.

Photo credits: Allannah Hibbert



At the exhibition: the aulos

Photo credits: The Board of Trustees of the Science Museum, CC BY-NC-SA 4.0



At the exhibition: fish plates, 370-300 BCE

Photo credits: Allannah Hibbert



At the exhibition: mechanical calendar (from behind)

Small Modular Reactors: Nuclear's chance to regain its power

William Draper-Barr Science Writer

I am Billy, the 2021/22 manager of the Imperial Energy Podcast from the Imperial College Energy Society. This show will broadcast two short episodes a term on one topic within the Energy Sector. I hope to bring the voice of students, research, and industry together to find the similarities and differences of opinions between these three key viewpoints amidst the energy transition. In the "industry voice" episode on the topic of "Nuclear" this term, I was joined by Alastair Evans, Corporate Affairs Director at Rolls-Royce for its mini nuclear reactor development programme, the Small Modular Reactor (SMR) project.

Nuclear energy is the second-largest source of low-carbon electricity globally, accounting for 10% of production. The Nuclear Energy Institute summarises the process thus: "Nuclear power is generated by a controlled chain reaction inside a nuclear reactor, most commonly in a process called nuclear fission. In fission, neutrons collide with uranium or plutonium atoms, causing the atoms to split and release additional neutrons and energy in the form of heat. This heat is used to convert water

into steam, which drives turbines to produce electricity." Rolls-Royce's SMR design hopes to disrupt and dramatically change the nuclear sector to bring nuclear as well as the UK back to the forefront of the energy sector.

The SMR technology is primarily factory manufactured, through a UK-only supply chain, with 90% of the module built in factory conditions. The company claims that this design will deliver 220–440 MW of power supply, equivalent to 150 wind turbines. It can operate both on or off-grid. The SMR modules are approximately 16m-by-4m, with the power station taking up 40,000 m². The modules will last up to 60 years before decommissioning. Through deployment of this technology, Rolls-Royce aims to step up as a UK low-cost and low-risk utility company by 2028. Their design tackles three key nuclear sector challenges:

Affordable: With a supply chain manufacture model developed, these reactors will have a much lower cost than previous "bespoke" nuclear reactor projects across the world.

Repeatable: With 90% of the component manufactured through the supply chain system, the benefits of repeatable engineering will be improved costs, precision, and safety.

Deliverable: With the full factory assembly on one site, it is only a four-year concrete-to-commissioning manufacturing period, where SMR can be

brought to site by rail, road, or sea.

Alongside the technological potential, this SMR programme also has the potential to bring "one of the UK's largest engineering collaborations", providing jobs, supply chain security, and sustainable value, all alongside low-carbon energy supply. Rolls-Royce predicts that its SMR program could contribute £100 billion to the UK economy by 2050, generate 40,000 skilled jobs and tap into a £400bn global export market. Rolls-Royce has nine expert nuclear sites across the UK, as well as several abroad, being involved in the nuclear submarine sector since the 1950s, but intends to expand this. Their potential for this secure energy supply technology to create a significant global market, the SMR market has been valued at £150-400bn, this market needs to be tapped into.

As the Nuclear sector prepares to hold a central role in the global energy mix, two key considerations must be addressed: nuclear security and nuclear safety. Nuclear security is the technical measures designed to reduce the likelihood of installation, operation, and decommissioning accidents and their corresponding consequences. Nuclear safety is the implementation of accident control mechanisms to ensure radiological damage to the surrounding environment and people is greatly reduced. The Rolls-Royce SMR program hopes to not only make technological impact but also serious safety culture changes within

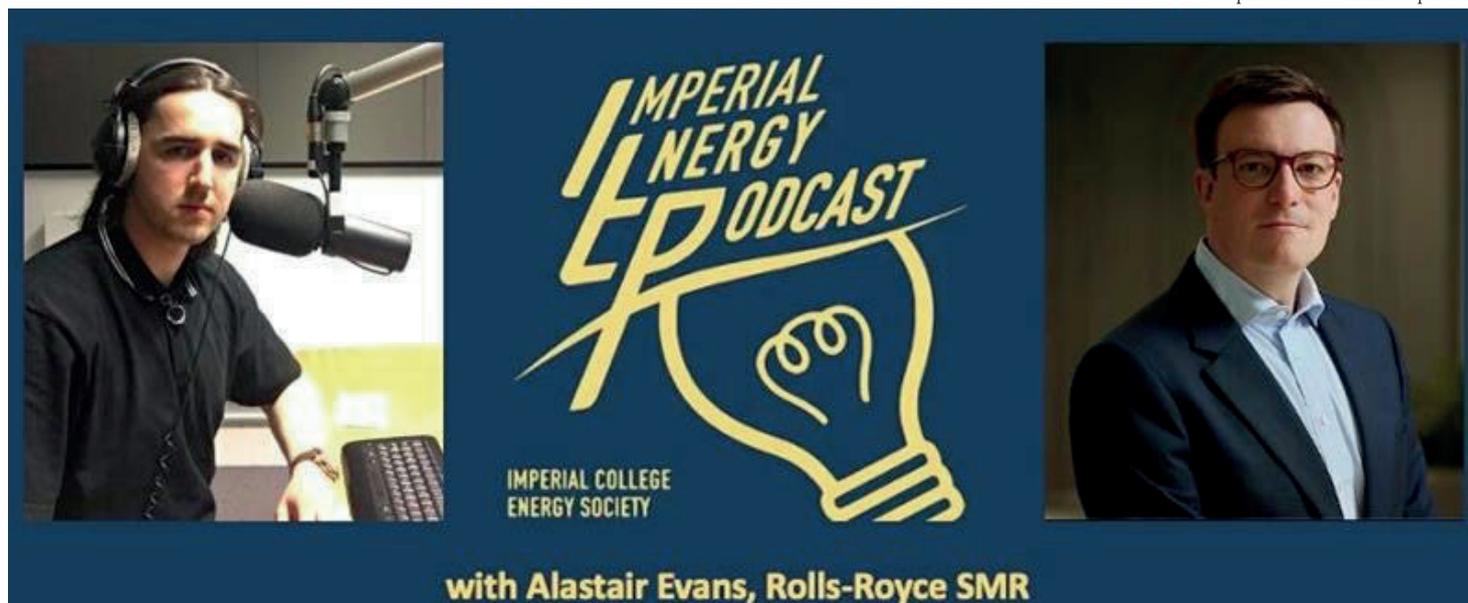
the nuclear sector to ensure the growth of this market is not limited by poor management of nuclear risks. Therefore, through the regulatory bodies of the Office for Nuclear Regulation (ONR) and Environmental Agency (EA), Rolls-Royce has enacted 270 redesign decisions with a team of 300 full-time safety design engineers to ensure this collaborative approach with UK regulators will allow for a confident deployment of this technology. Since this pre-licensing engagement, Rolls-Royce has secured £210 million from the UK government alongside £350 million from private investors to bring Rolls-Royce SMR Limited to market.

As well as expanding their commercial capabilities, Rolls-Royce understands the importance of technical expertise in this industry to ensure long-term viability of this SMR program. Alongside local/regional government and private funding, Rolls-Royce has developed 25 University Technology Centres (UTC) in the UK running multiple research programmes. This academic consortium, including Cambridge, Oxford, and Imperial College London, to support current technology and create future synergies, deploying new nuclear power into emerging and military programmes. The nuclear sector is about to evolve and erupt; Rolls-Royce aims to be at the front of this.

Graphic credits: William Draper-Barr



Scan the QR code to listen to the podcast!



with Alastair Evans, Rolls-Royce SMR

SCIENCE

Five Imperial physicists

This year, five members of the Department of Physics were awarded highly-coveted awards from the Institute of Physics, for their contributions to the field of physics, both within and outside of academia. Felix takes a look at the recipients and their work...



Illustrator: Nicolas Geiseler Toran

Professor Jerome Gauntlett

Awarded: John William Strutt, Lord Rayleigh Medal and Prize

Joseph Canavan Science Writer

Jerome Gauntlett is a distinguished professor of theoretical physics at the college. His work mainly focuses on quantum field theory, black holes, and string theory. He led the Theoretical Physics Group at the college from 2011 to 2016. He is also an editor for the Journal of High Energy Physics.

After completing his BSc at the University of Western Australia, in 1986, he did his PhD at Cambridge in 1991. Then he did two post-doctoral degrees at Chicago (1991-1994) and Caltech (1994-1996). From 1996 to 2003 he was a professor at QMUL, after which he became a professor at Imperial College. From 2003-2004 he was also a visiting professor at the Perimeter Institute.

Professor Gauntlett's recent work includes investigating

whether or not exotic states of matter arising in condensed matter physics can be treated using techniques from string theory. This could be a critical link between two very different areas of physics.

Professor Gauntlett served as the physics consultant for the film "The Theory of Everything", based on the life and work of Professor Stephen Hawking. Gauntlett wrote down the equations and formulas on the chalkboards behind the actors. The film was a huge success, with Professor Hawking commenting positively.

In 2021, Professor Gauntlett received the John William Strutt, Lord Rayleigh Medal and Prize, for his "distinguished contributions to our understanding of string theory and its application to quantum field theory, black holes, condensed matter physics and geometry".

Sara Motaghian

Awarded: Jocelyn Bell Burrell Medal and Prize

Cara Burke Science Editor

Having graduated from the University of Glasgow with a MSc in Physics, Sara Motaghian is now undertaking a PhD in Space and Planetary Science at Imperial College London.

She has been developing key mission software using spectral instrumentation to improve its astrobiological target interpretation, for ExoMars's search for life on Mars. Beyond that, she has been heavily involved in outreach and education. She created the nationwide educational programme "Roving with Rosalind" (RwR) which secured a £30,000 grant from the UK Space Agency to put together practical kits to be sent to educational groups and schools for free. Their goal is to provide underserved students with practical upskilling opportunities in STEM and they have so far managed to reach 600 students. She has also partnered with

several organisations, including In2Science, which has so far taught around 400 students Python programming through an interactive physics workshop. Her rover design workshop for National Astronomy Week reached a whopping 4,000 people. For her exceptional outreach work, she has been invited to work with the European Space Agency Robotics working group for Europe-wide robotics outreach, based on RwR.

She has been recognised for developing spectral mission software for ExoMars to expedite analysis and maximise scientific mission return, and equity work leading Roving with Rosalind. The Jocelyn Bell Burrell Medal and Prize is awarded for exceptional early-career contributions to physics by a very early career female physicist. It is named after Jocelyn Bell Burrell who discovered the first radio pulsars in 1967 as a postgrad student.



Illustrator: Natalie Yu

win IoP Awards

Dr Bucker Dangor

Tom Cowperthwaite Science Writer

Dr. Bucker Dangor graduated with a BSc in 1971 and accepted a DSc in 2005, from the University of Witwatersrand in Johannesburg. He has been at Imperial since the 1970s and has been one of the most influential driving forces for plasma physics research throughout his time here. Considered by many as one of the founders of the field of laser particle acceleration, he has played a major role in conducting and later directing research.

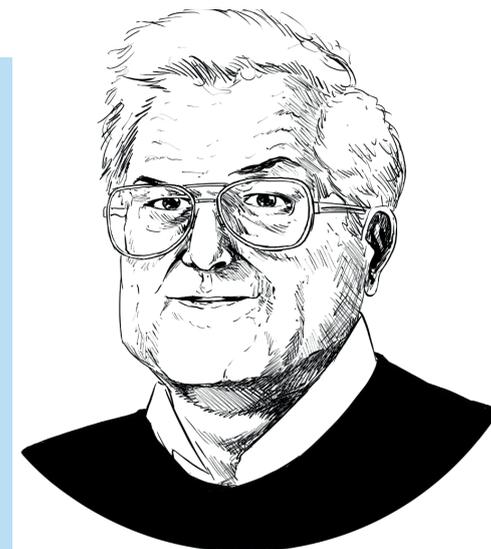
His work laid the foundations for Imperial's MAGPIE

Awarded: Michael Faraday Medal and Prize

laboratory, which conducts pioneering research into nuclear fusion technology, amongst other applications.

Dr Dangor's backing has also been important in shaping the way funding is allocated to different areas of research in the UK – by supporting curiosity-driven research just as much as research with an obvious societal impact.

Dr Dangor was awarded the Michael Faraday Medal in 2021 for “outstanding contributions to experimental plasma physics, and in particular for his role in the development of the field of laser-plasma acceleration”.



Illustrator: Nicolas Geiseler Toran

Paul Brown MBE

Jamie John Science Editor

Paul Brown is the Mechanical Instrumentation Workshop Manager in the Department of Physics. With his team, he designs and manufactures bespoke scientific apparatus, for use within experimental research and teaching. In his time in the role, Mr Brown has played a critical role in some of the most exciting projects within Imperial. A state-of-the-art magnetometer, built by his team, is currently onboard the European Space Agency's Solar Orbiter, which launched in 2020, and has already taken the closest ever images of the Sun.

Mr Brown began his career in 1985, with a four-year indentured apprenticeship at Cookson Precision Castings, before joining Imperial College in 1990, as a junior technician in the Mechanical Workshop at the Department of Physics. In 1993, he moved to the

Awarded: Honorary Fellowship

Applied Optics workshop, returning to manage the main Mechanical Workshop in 2005. Described by a former Provost as a ‘pillar of the Imperial community’, Mr Brown has engaged considerably in work to attract and train the brightest scientists and technicians. Since 2011, he has been a steering group member of the College's Technical Apprenticeship Scheme. Mr Brown has worked with Dr Mark Richards over the past few years to build the Blackett Lab Family, now the leading network for UK-based black physicists. Through his involvement with the group, he has arranged social events and held outreach activities at schools. In 2017, he was awarded an MBE for services to higher education. He was awarded an Honorary Fellowship this year “for outstanding service to physics, leadership and innovation in the establishment of the mechanical instrumentation facility in physics at Imperial College London”.



Illustrator: Victoria Xhu

Professor Jenny Nelson FRS Awarded: Honorary Fellowship

Jamie John Science Editor

Jenny Nelson is Professor of Physics in the Blackett Laboratory and heads the Mitigation Team at the Grantham Institute – Climate Change and the Environment, where she leads an interdisciplinary team carrying out research on topics relating to the mitigation potential of renewable technologies. Her own research focuses on characterising novel materials for solar cell design.

Professor Nelson is noted for her pioneering work on solar cells. In 2011, she was ranked as one of the top 100 material scientists in the world by the Institution for Scientific Information.

Professor Nelson studied Physics at the University of Cambridge and went on to do her PhD with Professor

Michael Berry at the University of Bristol. In 1989, she joined the College, working on the application of quantum semiconductor structures to solar cells. In 2014, she was elected a Fellow of the Royal Society (FRS). Since 2010, she has been working with the Grantham Institute, and has published over 200 articles in peer-reviewed journals.

In 2017, she won the Imperial College Union Student Choice Award for Best Supervision. She was praised for “fighting and caring for her students”.

Professor Nelson was awarded an honorary fellowship this year by the IoP, “for the development of fundamental physical models, simulation tools and experiments to discover and exploit relationships between the performance of solar cell devices and properties of their constituent materials.”



Illustrator: Natalie Yu

SCIENCE

This week in Science...

FROM IMPERIAL...

Imperial-based battery tech startup raises £1.5m in seed round

Breathe Battery Technologies, a startup founded in 2019 by Dr Ian Campbell (CEO) Dr Yan Zhao (CTO), and Professor Greg Offer (Chief Scientific Officer) has raised £1.5m in funding to scale up and accelerate the deployment of its intelligent battery management algorithms in electric vehicles and smartphones. Battery management systems play a critical role in enabling batteries to be used safely and to their fullest extent. Advances will help vehicles run for longer and charge faster. Dr Campbell and Dr Zhao received their PhDs from Imperial College, and were supervised by Professor Greg Offer. Speaking to the College, Dr Rebeca Santamaria-Fernandez, IPC Director for the Faculty of Engineering, said, "Breathe's advanced battery management techniques could support greater electrification and contribute to the transition to zero pollution."

Key step in bacteria gene sharing revealed

Bacteria can exchange DNA by conjugation, including genes that have antimicrobial resistance. The details of conjugation mechanics have remained unknown for a long time, but a team of researchers from Imperial College London and Queen Mary University of London have now imaged a key part of the process. They imaged the outer-membrane core complex of the type IV secretion system (T4SS), which anchors the T4SS to the other bacterium. The T4SS can then send out a pilus that penetrates the bacterium and allows gene transfer. They obtained the images using cryo-electron microscopy and found the outer-membrane core complex is made of two concentric rings of proteins with very flexible connectors. Dr Tiago Costa, a member of the team, and Lecturer in Bacterial Pathogenesis said, "Deciphering the mechanistic details of gene transfer could provide us with targets that can be exploited to suppress antibiotic resistance". With this goal they hope to image the rest of the T4SS in *E. coli*.

3D imaging reveals never-before-seen muscles of ammonite fossil

A team of researchers, including some from Imperial College London have used 3D imaging to visualise the soft tissue of a 165-million-year ammonite fossil, the first time this has been done. They observed hyponomes, which expelled jets of water to propel the now-extinct molluscs forwards, and strong muscles which allowed them to retract into the safety of their shells when confronted by predators. Their work is evidence that squids, octopuses and cuttlefish may be closer to ammonites than was previously thought. The group used X-ray and neutron imaging to produce a detailed 3D computer model of the rare Jurassic fossil, which enabled them to see the soft tissue inside. Dr Alan Spencer, Senior Strategic Teaching Fellow at the Department of Earth Science and Engineering, and co-author of the paper, said, "This is a major breakthrough in ammonite palaeobiology."

FROM AROUND THE WORLD...

Light-coloured feathers could help migrating birds stay cool

Half of the world's bird species are migratory. New research has suggested that they have lighter feathers than their non-migratory relatives, which could be to help them stay cooler on long, exhausting flights. Migratory birds can overheat when putting themselves through the enormous physiological stress of flying long distances. Lighter colours absorb less heat than darker ones. The team analysed over 20,000 illustrations of 10,618 bird species, and found a slight but consistent difference in the lightness of migratory bird feathers, with the longest distance migrators around 4% lighter than non-migrators

James Webb Space Telescope finally set to launch

Shrey Bohra Staff Writer

After a troubled development process, the James Webb Space Telescope (JWST) is finally set to launch, with 22nd December 2021 being the date selected for the historical occasion. Once launched, the JWST will be the largest, most powerful telescope ever launched. It will be used for investigations in astrophysics, involved in observing the formation of the first galaxies, and characterising the atmospheres of possibly habitable exoplanets.

The JWST is being billed as a direct successor to the Hubble Space Telescope, with some key changes and improvements to increase its scientific value. The primary mirror of the JWST has a diameter 3 times that of Hubble, allowing it to capture significantly more light, improving the quality of its images. Unlike Hubble, which operated mostly in the visible and ultraviolet regions of the electromagnetic spectrum, the JWST will focus on the infrared region. This allows for the observation of older and colder objects than Hubble, and despite necessitating a complex cooling arrangement is one of the most exciting prospects of the telescope.

The European Space Agency's Ariane 5 rocket will send the telescope into a special orbit, around what is known as a Lagrange point. This is a distant point – approximately 1.5 million km from Earth – where gravitational forces from the Earth and Sun are balanced. The orientation of the Earth and Sun relative to the spacecraft are constant in this orbit, allowing for constant communication while keeping the instrumentation cool. This remote orbit means that unlike Hubble, there is no possibility of a repair mission to the JWST – everything must go to plan on the first and only attempt.

Despite being a NASA led project, there has been significant international collaboration on the JWST. Alongside the launch vehicle, the European Space Agency has provided two of the four scientific instruments carried on board the telescope, with the Canadian Space Agency providing an integral part of the guidance system and an imaging system.

The project has been plagued with delays and budget overruns since it was

first planned in the early 1990s. Originally named the Next Generation Space Telescope, it was commissioned during the "faster, better, cheaper" era of NASA administration, with contracts awarded in 1997 and 1999 for design concepts and cost estimates. The initial plan called for a launch in 2007 with a total mission budget of \$500 million. The timeline and budget have continually made a mockery of this initial estimate, with the first design review in 2008 predicting a launch in 2014 with a total budget of \$5.1 billion, and timelines and budgets have continued to slip ever since.

Construction of the telescope was finally completed in 2016, with extensive testing procedures being started soon after. A practice deployment of the complex sunshield found tearing and insufficient tension in support cables, resulting in a full design review being conducted. A report on its findings, released in 2018, found that the JWST had 344 potential single point failures, all of which could independently lead to the loss of the programme. A revised launch date of May 2020 was announced to account for the extra ground testing required, with a further delay being caused due to the pandemic. The telescope was finally shipped to the launch site in French Guiana in October 2021, where it was then integrated onto the Ariane 5 launch vehicle.

14 years late and more than \$10 billion over budget, the James Webb Space Telescope is finally ready to take flight.

Photo credits: Goddard Space Flight Centre



The finally assembled JWST

ARTS

FAMILY ROOM REVIEW
 By *ALEX JACKSON*
 IMPERIAL COLLEGE DRAMSOC'S LAT-
 EST ORIGINAL PRODUCTION!

page **14**

Edited by:
ALEX JACKSON

Musical

It would be criminal to not love this show... so lock me up!

Credits: Photo/Guy J Sanders

POLICE COPS: The Musical ★★★

Where? *The New Diorama Theatre*

When? *Until 23rd December 2021*

How much? *From £19*

Reviewed by **Alex Jackson** Arts Editor

The premise of *POLICE COPS: The Musical* is everything I have ever wanted in a musical production: surreal enough to satiate my desire for the insane, yet witty and clever in a very practiced and well-tuned way. The production dives straight into a scene that could easily have been pulled from an out-dated police instructional video, and we are quickly introduced to the multi-talented cast as they quick change and dart on and off set: returning as an array of wacky, confusing, and hilarious characters. Following the plot of pretty much any disaster movie that has ever been shown on the silver screen, the show was hardly original but unlike anything I have seen before in the theatre world: and it worked! *POLICE COPS* was probably the most I've laughed all year — but that doesn't make it perfect.

Let's start with the cast. Our three main police cops (played by Zachary Hunt, Tom Roe, and Nathan Parkinson) took to their roles with vigour. Barely keeping their clothes on for much of the performance, they retained a huge amount of energy throughout and delivered killer line after killer line. You can really feel

Credits: Photo/Guy J Sanders



Nodrum and Parkinson in *POLICE COPS*.



The cast of *POLICE COPS* at the New Diorama Theatre.

that these three actors have been doing this a long time and have the humour down. The stand-out for me was our main man Zack (Zachary Hunt): dealing with an impressive number of gaffs (including the complete decomposition of his costume on stage) he somehow kept it all together and in character. If anything Parkinson seemed the most out of place: playing the enigmatic and predatory chief-of-police, he felt slightly out of sync with the rest of the cast throughout the first half.

Supporting the main cast were the wonderful and varied Miztil Rose and Andrea Nodroum. Often these characters would have to bring the humour to a new scene in just a few lines, or even none at all. Nodroum as the exiled ex-chief-of-police was a perfect cast: from her peculiar love interests, to her mysterious exile to a Mexican orphanage — what a ride. Similarly, Rose manages to convey so much character merely in the way she pours coffee or sits on the edge of a scene.

So then, if these are such funny and well-practised performers, where did it all go wrong? For me, there was not enough investment in the theatre-making or the libretto and narrative. In a show with so many quick changes you can forgive the odd wardrobe malfunction; yet, frequently, I was seeing off-stage characters stripping off backstage as the stage door banged open by mistake. Not to mention that, after my initial shock at the quality of the original music, I was disappointed

to see that same libretto repeated over and over again throughout. There is something really special about this performance and it felt almost squandered.

POLICE COPS was a night I will not forget quickly. It left me satisfied and smiling, having laughed harder than I have in a long time. But as a piece of theatre, no matter how satirical or on-theme, it failed to deliver on some key aspects.

If you're short on something to do, this is a great show to head to with your mates: especially if they're partial to some semi-naked mildly homo-erotic 80s cop movie action!

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Workshop

Write us a new play, HAL!

Credits: Photo/ Jarrod Jones

AI

★★★★★

Where? *The Young Vic***When?** *Run as a series of workshops in August 21***How much?** *From £10*Reviewed by **Alex Jackson** Arts Editor

What is a play? Is it a tragedy or a comedy; a mere three-act narrative; or something more immersive and reflective? This is one of the fundamental questions pondered by the human company and, perhaps, the synthetic mind that featured in this live performance workshop. The stated goal of the production was to, over the course of the three nights that the show ran, develop a play written primarily by an artificially intelligent system — the eponymous AI. To this end, a company of self-dubbed writer, performer, and director-engineers take to the stage, armed with laptops and a Google doc, to interface with OpenAI's GPT-3. Together they act out, discuss, and shape the machine-generated text into something worth watching.

The result is a foretelling experience of how invaluable human frailty and imagination is to a narrative experience. The AI system is, to its credit, articulate, lewd, and—not out of place in the London theatre scene—appears to have an uncanny penchant for writing about rape, destruction, and death. It is also, if we want to be blunt about it, pretty dumb. For all GPT-3's ability to construct flowing and, at times, profound text; there is a subtle but unmistakable lack of contextual awareness that gives its responses a surreal and inhuman feel. "Give us a real limerick!" shouts a frustrated audience member. When a poet breaks the rules, it's meaningful; when a machine does it, it's wrong? With this in mind,

Credits: Photo/ Jarrod Jones



Waleed Akhtar in AI acting as a performer-engineer.



Nina Segal functions as a writer-engineer in this innovative performance workshop.

it was the two writer-engineers, Chinonyerem Odimba (Chino) and Nina Segal, that captured my attention in a new way. Aside from the art of designing prompts in itself, Chino and Nina seemed to have a firm grasp and a hot take on how to make the most of this strange new tool through composition and curation.

As an AI researcher, I, like most in my field, am acutely familiar with the repetitive, engrossing, and fiddly process of interacting with "intelligent" systems. It is for this reason that it was fascinating to see both the writers engage with that same process but from an artistic and creative perspective; and with the far more informal, complex, and nuanced natural language — English. Centre stage, they both had the air of an early Victor Frankenstein, building a creation from their newfound insight into this new form of... life? Technically, GPT-3 is a machine that makes predictions; more specifically, predictions about what the next letter, word, or phrase in some text might be. Accordingly, there is a fine art to crafting useful prompts for GPT-3 to autocomplete, and a requirement for some creative consolidation of its output. And herein lies the true value of this production: the interactive and collaborative nature of the company on stage: machines and humans included. Tyrone Huggins, a performer-engineer, delivers an impassioned monologue from GPT-3 on free will; Simone Saunders finds a very raw and believable character in an apocalyptic tale; and all three, including the final 'performer-engineer' Waleed Akhtar, find something surreal and piquant as "The Beastmen".

A common theme in both this performance and contemporary AI research is the automated and, perhaps, undesirable learning of biases prevalent in input datasets. GPT-3 is based on the structure and content

of a corpus of English text, what it spits out is invented, sure, but it is also fundamentally a snapshot of a reflection on our society. This phenomenon was most evident in the monologues generated by the system, and obvious biases in dialogical casting. Waleed as a terrorist, groundbreaking(!). I'm not convinced this company explored the issue in the best way; if the key is indeed to be found in the interaction between metal and mind then perhaps there is more to be explored in how we, now, can subvert, reinvent, and reclaim these stories. But it was amusing nonetheless that, amongst discussions of free will and determinism, and how GPT-3 is just a mirror of society, that the audience satisfies almost all expectations and requests a sexual limerick from the off.

Like any matter worth discussing, there are prescient philosophical issues that rise straight to the surface in the wake of this new play. Could something written by a machine be art? Are the machinations of silicon and metal really so different to their organic counterparts? Can one be an artist without a subjective experience of one's own? There are no answers here, but it certainly feels as though it is the start of a long journey into a new type of theatre. I can't help but feel that the real artistic magic in this production was in the composition; the piecing together of fragments generated by a monkey and a typewriter. For this, it is the generality, breadth, and sheer randomness that seems to be both required and only present in humans, at least for now. Magic has an awful habit of looking like science when we know how it works, I hope we can retain some of the trepidation and potentiality that filled the Young Vic as we see more technological changes in the whole theatre creation process.

ARTS

Theatre

Rekindle your Christmas spirit with The Old Vic's A Christmas Carol

Credits: Photo/ The Old Vic

A Christmas Carol

★★★★★

Where? *The Old Vic*

When? *Until 8th January 2022*

How much? *From £10*

Reviewed by **Ozbil Dumenci** Arts Writer

I hold *A Christmas Carol* very dear to my heart, as it was one of the first (if not the first) books I read in English as a young boy, far away from the UK. Besides, how can one have any negative feelings for a story that preaches the importance of love and kindness in our lives.

The play, although rewritten for a modern audience, stays true to the source material. Jack Thorne, who most notably penned the ever so divisive *Harry Potter and the Cursed Child*, manages to capture Dickens's message. He preserves the old-timely feel of the Victorian-era classic, and its attitude towards Christmas — all the while not allowing it to feel tired.

From the moment you enter the Old Vic's auditorium, the audience is greeted with mince pies. The ensemble cast is on stage, fully engaging with the audience, conversing with the children present, and throwing tangerines for audience members to catch.

The play is performed in the round, which adds to the immersiveness. The stage itself is modestly sized but has a large podium that extends all the way to the back of the stalls, which the cast makes great use of throughout the two-hour performance. Countless lanterns hang down from the ceiling, not merely setting the scene, but almost acting as a character of their own — lighting up in patterns and contributing to the progression of the narrative.

The actors commit wholeheartedly to the story, and



A Christmas Carol runs at The Old Vic until January.

are clearly having fun performing. Stephen Mangan shines as Scrooge: letting his voice fill the auditorium when he needs it to, but equally knowing when to dial it back to serve the story.

Although the show is engaging throughout, it does falter in the beginning of the second act — resorting to cliché visuals and text which one can't help but roll one's eyes at. However, it picks itself back up near the end, and sticks the landing. The denouement is delightfully unhinged, and I loved every second of it!

A Christmas Carol is fun and engaging without reinventing the wheel. At times I thought I was around 15 years too old (or maybe one month too early, given it was mid-November) to enjoy it to the fullest, but I left the theatre with a smile on my face, and my heart full of the Christmas spirit.

More Reviews over Christmas

Keep an eye on our website for more Christmas-themed and other reviews of live performances over the festive season!



Theatre

A Curious Incident still packs a punch a decade later

A Curious Incident of the Dog in the Night-Time

★★★★★

Where? *Wembley Park Theatre*

When? *Until 9th January 2022*

How much? *From £20*

Reviewed by **Ozbil Dumenci** Arts Writer

Returning to London for its 10th anniversary, *A Curious Incident* still packs as much of a punch as

it did a decade ago.

As the cast navigates through the story of Christopher Boone investigating the death of his neighbour's dog, the show delicately covers massive ground relating to heavy subject matters.

The cast is remarkably diverse in a way that feels completely natural. It is applaudable how the show almost makes a point of not making a point of this diversity. It would not only be impossible but also completely beside the point to list all of these instances. However,

most notably, Christopher's mother Judy is played by Sophie Stone, a deaf actress who carries the role majestically. Stone delivers an emotionally raw performance which acts as a constant reminder to the audience that these characters may as well have been real people with real emotions. Theatre as a medium relies heavily on suspension of disbelief. This suspension of disbelief only works when the audience is engrossed into what's happening on stage, and believing the actors is a large part of what allows this to happen.

The show, however, is only as strong as its lead actor, who needs to sell questionable choices and behaviour to the audience. Connor Curran who plays Christopher (and is the first neurodiverse actor to play this neurodiverse character) delivers on this promise. His portrayal of Christopher is simply magnetic, allowing the audience to not only deeply sympathise with him, but to also root for him. An electrifying performance by Rebecca Root who portrays Siobhan, Connor's teacher, also contributes to this. Root delivers her performance with intense emotional agility, making her character's conversations with Curran's Christopher hit all that much harder.

In addition to the remarkable acting, the play is staged marvellously. Marianne Elliott, known for directing some of the most acclaimed production of this century including *War Horse* (a personal favourite), *Company* (another favourite), *Angels in America* and *Death of a Salesman* strikes once again, and does not hold back. *A Curious Incident* is continuously visually striking in a way that complements the text without distracting the audience. It mirrors Christopher's emotional turmoil and reflects it unto the audience. I am not usually a big fan of projections on stage as they tend to be a bit of a cop out, but here they are anything but.

The *Curious Incident of the Dog in the Night-Time* is an iconic piece of British theatre that has proven throughout its decade-long existence that it is here to stay that way.



David Breeds (Christopher) and the company in 'The Curious Incident of the Dog of the Night-Time'.

Theatre

Intense and poignant tales from the Family Room

Family Room



Where? Union Concert Hall

When? Until 8th December 2021

How much? £9

Reviewed by **Alex Jackson** Arts Editor

Family Room is a new play by Annabel Knight performed at the Union Concert Hall by our very own DramSoc. The story follows the happenings in a hospital waiting room as eight characters live out some of the most anxious and heart-wrenching moments of their lives. We predominantly follow the conversations between a young pair: a hospital volunteer who recently lost her sister, and the older brother of a girl currently having treatment. These two are supported by a varied cast, each with their own dramas and tragedies unfolding around them – a road traffic accident, cancer, alcoholism. However, it is the dynamic between our two central character that drives us through the narrative. I wanted to know how it all worked out for them. They both convey a great deal of pain in their dialogue and, though it barely reaches the surface, there is a slight will-they-won't-they frisson between the pair. Young

and awkward, it is easy to see oneself in either of the duo.

The overall production quality of *Family Room* is second-to-none. The set design is crafted extremely well -- the walls are painted in sickly shades that can only ever be found in medical facilities; and, of course, there are only PG Tips on offer for cups of tea. When paired with the expert lighting, the space is transformed into a multi-layered hospital setting: with the area in front of the stage being used to particularly good effect. It is a testament to the writing that the blackouts and set changes were handled so elegantly; and the use of music for changing the context worked well for the most part.

What did not work so well for me was the direction the plot headed in. From the get-go, this was a play concerned with reality. It felt as though it aimed to capture the calamity and tragedy that occurs silently and malignantly in the waiting rooms of hospitals. So then, it felt rather gimmicky to include multiple last-minute twists, in the context of what had until then been poignant and authentic dialogue. Indeed, where future events were foreshadowed, this seemed to be overemphasised and ultimately took the bite out of the final

moments of the play.

All in all, *Family Room* packs a punch in a short space of time. The writing clearly comes from an authentic place and, when delivered by the wonderful cast of the Imperial Dramatic Society, you will find little to complain about.

Credits: Photo/Pamela Raith Photography



Imperial DramSoc goes to the Family Room!

FRIDAY 10TH DECEMBER 2021

ENVIRONMENT

Edited by: MONAMI MIYAMOTO
MARIE MORI
JACK CRIBB

Environmental labelling on food - productive or destructive?

View online here! 

Seb Lawson Environment Writer

The current traffic light system on food packaging is essentially a nationwide marketing strategy for a set of predefined nutritional benchmarks. It reeks of the UK nudge movement that looks to shift consumer behaviour without explicit enforcement or restrictions. Instead, nudge tactics predictably shift behaviour without compromising consumer choice. The theory is that people can still choose between the red and green options, even if their subconscious tendency is towards the green. They have an illusion of choice.

There has been a growing call for similar labelling for the environmental impact of the food we buy, alongside other goods. I don't need to spell out the supposed benefits of such a scheme. The Carbon Trust have been looking to develop a recognised verification system that incorporates various brackets of CO₂ use, such as a 'reducing CO₂' label or a 'carbon neutral' measure. Here we run into the first problem—these metrics are incredibly complex and struggle to be channelled into a PhD

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SHOULD THE CARBON FOOTPRINT OF A GOOD TRANSFER YOUR PURCHASING DECISION AWAY FROM THE ETHICALLY SOURCED TO THE UNETHICALLY SOURCED?

thesis, let alone a solitary label.

What for example does reducing CO₂ mean? If you go onto the Carbon Trust's website it makes this a bit clearer, but if you're a fatigued consumer hurrying through a food shop to get home after



Photo credits: titovailona, Envato Elements
What determines your purchase decisions?

work, then you don't really want to take the time to work out what it all means.

You also have the problem of the sheer quantity of environmental and social factors that go into each product. If you try to incorporate everything, then packaging will have to have a compendium attached to cover every variable; key metrics have to be chosen. For example, carbon footprint seems to be the main area of current focus. Is this a metric decisive enough to sway consumer behaviour? Should the carbon footprint of a good transfer your purchasing decision away from the ethically sourced to the unethically sourced?

We also need to remember that the existence of labels are reflexive with producers, meaning their existence also impacts what producers focus on. For example, a Diet Coke has all green boxes on the nutritional traffic light system, whereas a pack of almonds has a red box for the fat content, even though such things as healthy fats exist. Labelling will always be simple enough for the producer to game. Whatever is the focus of the producer will become the focus of the labelling, perhaps to the detriment of more uniquely important issues. For example, in parts of the world where water scarcity is an issue, this may be weighted of higher importance than the

carbon footprint, but the producer may choose to focus on reducing the carbon footprint instead as they know this acts as a better market signal of superiority.

So in response to this, should we have a series of labels each representing different environmental variables relating to such things as greenhouse gas emissions, water-use, human welfare in production? To mirror the array of nutritional groups there could also be an array of environmental variables; perhaps traffic-lighted as well. But again, a standardised metric doesn't take into account the relative importance of each variable across geographies. A bit like the idea that not all calories are created equal.

We also have to consider the complications accounting each metric. For nutritional brackets this is easier, as you are dealing with a static product that can be analysed in a lab. But with carbon footprint tracking, there are so many variables in the whole supply chain that a supposedly accurate measurement can at best be indicative rather than quantifiable. Working out the environmental impact of a good is just a lot more complicated than working out the nutrition breakdown of food.

The metrics that the Carbon Trust seek to measure are relatively uncontroversial, it is the methods of calculation that are.

Most will agree a high Carbon Footprint is bad, but it is the way this is calculated that is controversial. The nutritional measurements have the opposite effect, running us into problems such as: should we be saying high calories are bad and low calories are good just because we can measure how many there are?

The danger in trying to refine the environmental impact of a good is that it causes an informational overload for the consumer. We end up with a derivative of the paradox of choice, where we are so overburdened by combinations of labels that we struggle to choose anything at all. The modern person is after all, rather time poor.

In spite of the many flaws, the question that remains is whether it is better than no information for the consumer. Will we get a result where the presence of both nutritional and environmental labelling in fact diminishes the efficacy of each of them? For example, does a carbon neutral label deter people from looking at the nutritional label?

It's worth mentioning that we do already have the organic and origin country labelling on some foods. Perhaps though, the success of these two features is precisely because people tend not to think of them as environmental indicators; they also think of them for their second-order effects of healthier food or supporting the domestic economy.

Clearly there is a need for the consumer awareness of the impact of what they are buying and eating, but can the complexity of this be fairly articulated in a series of traffic-light labels? Global supply chains are incredibly complex, so good luck to anyone charged with accurately quantifying the true impact of our food. Perhaps the best we can hope for is that the whole exercise makes the consumer think of the impact of what they eat, rather than take any labelling as gospel truth.

ENVIRONMENT

Paid to Pollute: Fossil fuel subsidies case is heard in the High Court

Jack Cribb Environment Editor

On a gloomy and cold Monday night, the claimants of Paid to Pollute (PtP) met in a bar in Peckham to explain to a passionate audience why they had travelled to London. On December 8th, they would be entering the High Court to explain their case—stating that the UK government's current commitment to new fossil fuel projects is unlawful, going against their pledge to net zero by 2050.

PtP comprises of three claimants: Mikaela Loach, Kairin van Sweeden, and Jeremy Cox (alongside a number of lawyers). They are targeting a crucial part of the UK's fossil fuel strategy: the use of public money given as handouts and subsidies to the fossil fuel industry. Since the Paris Agreement was signed, £4 billion of public money has been paid to North Sea oil and gas companies. Overall, oil and gas companies have been given £13.6 billion.

This comes alongside the approval

of “at least 40 new coal, oil and gas extraction projects in the UK”, according to Friends of the Earth, an environmental campaigning organisation. PtP argue that the channeling of public money and the approval of new oil and gas projects means that the UK government are in conflict with the legal duties agreed upon within the Paris Agreement.

The problem is that even under current climate strategies, we will be unable to limit our warming to 1.5 degrees. In fact, according to the Production Gap Report, governments around the world will allow for the production of double the amount of fossil fuels by 2030 than what would be consistent with a 1.5 degree world.

In 2015, the Government adopted the ‘Maximising Economic Recovery’ strategy, the central obligation of which is to “take the steps necessary to secure that the maximum value of economically recoverable petroleum is recovered from the strata beneath relevant UK waters.”

In a world of runaway climate change

and extreme weather, is this really the strategy that should be adopted?

While the value of fossil fuel subsidies seems insurmountable to litigate against, fossil fuel projects in the UK are not impervious to setbacks. Last week, the highly controversial Cambo oilfield project was hit with the news that it was being abandoned by one of its main contributors, Shell. This withdrawal of support has plunged ideas of future oil exploration in the area into doubt. According to Greenpeace, Cambo was projected to produce the equivalent damage of 18 coal-fired power stations.

PtP are also motivated by the tax-dodging nature of fossil fuel companies. It was recently revealed that Shell and BP, responsible for emitting 1.7 billion tonnes of greenhouse gases a year, have paid no corporation tax for the last three years, while claiming tax relief of £400 million.

In an analysis by Rystad Energy, it was discovered that the UK is currently the most profitable country in the world for

the development of oil and gas projects. Decommissioning projects in the North Sea will be fueled by £18 billion of public funds up to 2065. Would it not be wiser for these profits and our public money to go towards renewable energy?

Unfortunately for future climate cases, due to a number of lost cases, the Conservative party are looking to amend the Judicial Review and Courts bill. This means that the power of judicial review may be greatly weakened within the next few years, through a government newly empowered to reject findings presented within judicial reviews that they do not agree with.

PtP's case will be heard in the High Court over the 8th and 9th of December, and is an example of why climate litigation will become more and more important in the coming years as climate adaptation and resilience is fought for across multiple battlegrounds, from the streets to the courtrooms.

Wildlife Conservation: An Unvoiced cause

Strigan Moharir Environment Writer

The term ‘conservation’ is omnipresent in the contemporary world. Put simply, this is the ‘protection of animals, plants and the natural environment’. But conservation in a broader sense is an approach towards a long-term goal of safeguarding biodiversity for future generations. Yet, as people continue to exploit our natural resources, numerous species risk being seriously threatened, or even thrown to the brink of extinction.

Wildlife conservation also incorporates restoration of natural environments like forests and other animal habitats. Forests cover 30% of the world's land area, but are disappearing at an alarming rate. Since 1990, the planet has lost about a billion acres of forest. This is where ecological restoration becomes vital for the sustenance of our wild reserves. The objective of ecological restoration is to reintroduce species and

re-establish the characteristic biological ecosystem. There's no doubt that we have played a part in disrupting the planet's

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OUR BREATHING FORESTS SPEAK SILENTLY AND IT'S ABOUT TIME WE LISTEN TO THE AGONIES THEY'RE FACING

wild landscapes. Hence, rewilding efforts should be aimed at restoring the habitats that we have destroyed over the years. Habitat loss is also a pressing issue that needs to be addressed—it is considered a primary risk to 85% of all the species on the IUCN Red List, which classifies species as ‘threatened’ and ‘endangered’—this accounts for 27,000 species.

A big portion of conservation involves

protecting endangered and threatened species. However, conservation goes beyond just protecting our favourite animals. The truth is that all kinds of animals play a role in maintaining the balance of our ecosystem—from acting as pest control, to pollinating crops and plants, and even combating climate change. It is the reason why wildlife conservation should be prioritized immediately.

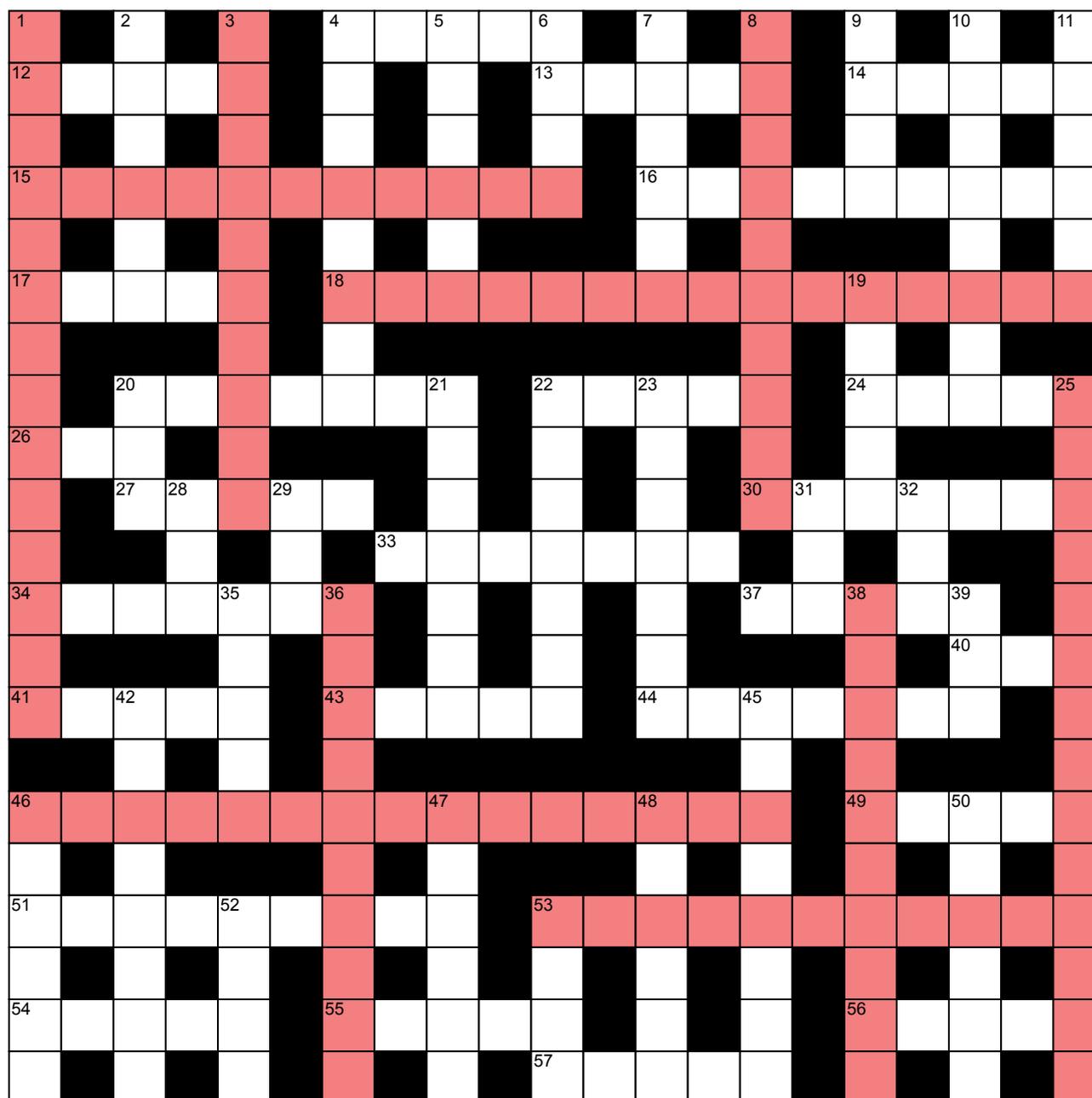
Ensuring that certain species are conserved is one part of animal welfare. However, wildlife conservation also has a hidden dimension that highlights the ill effects that intrusive or invasive species have on threatened species. Other vital aspects that conservation underpins are administering diseases, mitigation of overpopulation of certain species, and predator control. Without these animal welfare practices, numerous species would go extinct, making animal welfare an integral to wildlife conservation.

While captive breeding is not the

ideal solution, in some cases it is the only way to save certain species. Although controversial, the objective of captive breeding is to save threatened species that otherwise would go extinct in the wild due to reasons like poaching and deforestation or other natural disturbances like diseases, floods or droughts. Captive breeding is only meant to give wildlife conservationists enough time to produce a long-term solution to all the risks the species might encounter in the wild.

The good news is that there are many organizations working towards wildlife conservation. There are also ways in which you can get involved. Firstly, educate yourself about local and global conservation efforts. If possible, make monetary contributions or dedicate your time. Signing petitions and raising awareness on social media are other ways to make an impact. Our breathing forests speak silently and it's about time we listen to the agonies they're facing.

CRYPTIC Crossword Grid



CRYPTIC Crossword Clues

Across

- 4) Space around which he walks. [5]
 12) I say, it's an oaky mushroom! [5]
 13) Rapid tour on the river in Cornwall. [5]
 14) To begin with, it was breath everyone's lungs could hardly expel. [5]
 15) Was it cooked and gobbled? [5 6]
 16) Represented by Republican voted loudly in. [9]
 17) Get your shirt in case you have class. [5]
 18) Do they mark arrival times? [6 9]
 20) Sneakily crept to keep safe. [7]
 22) Around a hundred titanium plants. [5]
 24) Mostly stoic about the times they were harmful. [5]
 26) I had a girl! [3]
 27) It sounds like the middle section is useless. [5]
 30) Windier due to hot air having a rise in activity. [7]
 33) Get a grip and run around, in catlike fashion? [7]
 34) Increases confusion, and uncleanness. [7]
 37) They'd be right to use their non-dominant hand. [5]
 40) Happen to find Tolkien's creation. [3]
 41) Music rating. [5]
 43) Writer trapped in the system professes her secrets. [5]
 44) Make it known you'll take the direct route? [7]
 45) Constant seasonal commercials? [6 3 3 3]
 49) References made to most cities. [5]
 51) Trained soldiers' order is nothing small. [9]
 53) Where the masses will go? [2 3 6]
 54) Hathaway, for example, hanging around that one orphan. [5]
 55) See remaining division. [5]
 56) Sound line in the feature. [5]
 57) Levels out, and not in an odd way. [5]

Down

- 1) What's said by rejoicing mothers of prophets? [5 9]
 2) Chemistry term spoken initially with the back teeth. [6]
 3) Voyeuristic plants? [10]
 4) Hurriedly plate up and over-fill. [8]
 5) Cheque of speech writer. [6]
 6) Continue visit. [4]
 7) Mark scheme you crib right out! [6]
 8) All carolling with an upbeat group? [6 4]
 9) Fit to roll a bundle of hay. [4]
 10) A pale tux found ripped up on the plains. [8]
 11) Reprimands the child who dropped Latin and instead took Spanish. [6]
 19) What the editors write in Rolling Stone? [5]
 20) Mitt's poor, I heard. [3]
 21) At this time, the currency is having fluctuations. [7]
 22) Odd circles in which to find clergymen. [7]
 23) Screw-up gets credit in getting the deer to return. [7]
 25) Cry heard at this time of year? [9 5]
 28) Second part of fish & chips! [3]
 29) Get to the point of this body part. [3]
 31) Yea, it's strange in Scotland! [3]
 32) Lay out your collection. [3]
 35) It's best if I hand them out. [5]
 36) Might ocean winds produce these weather patterns? [4 3 3]
 38) Trio befitting days three through twelve? [6 4]
 39) Indeed, the Yankee gave directions. [3]
 42) It's used to decorate 41-Ac. [8]
 45) Why me in pants earns me money. [8]
 46) Canine named after two men. [6]
 47) Pay attention and make a table of those points. [6]
 48) What'll you say about that fleshy protuberance? [6]
 50) Root for the time you're on the pin-up. [6]
 52) Frantic sale of draughts. [4]
 53) Totem lacking foundation gets the sack. [4]

PUZZLES

Easy Sudoku

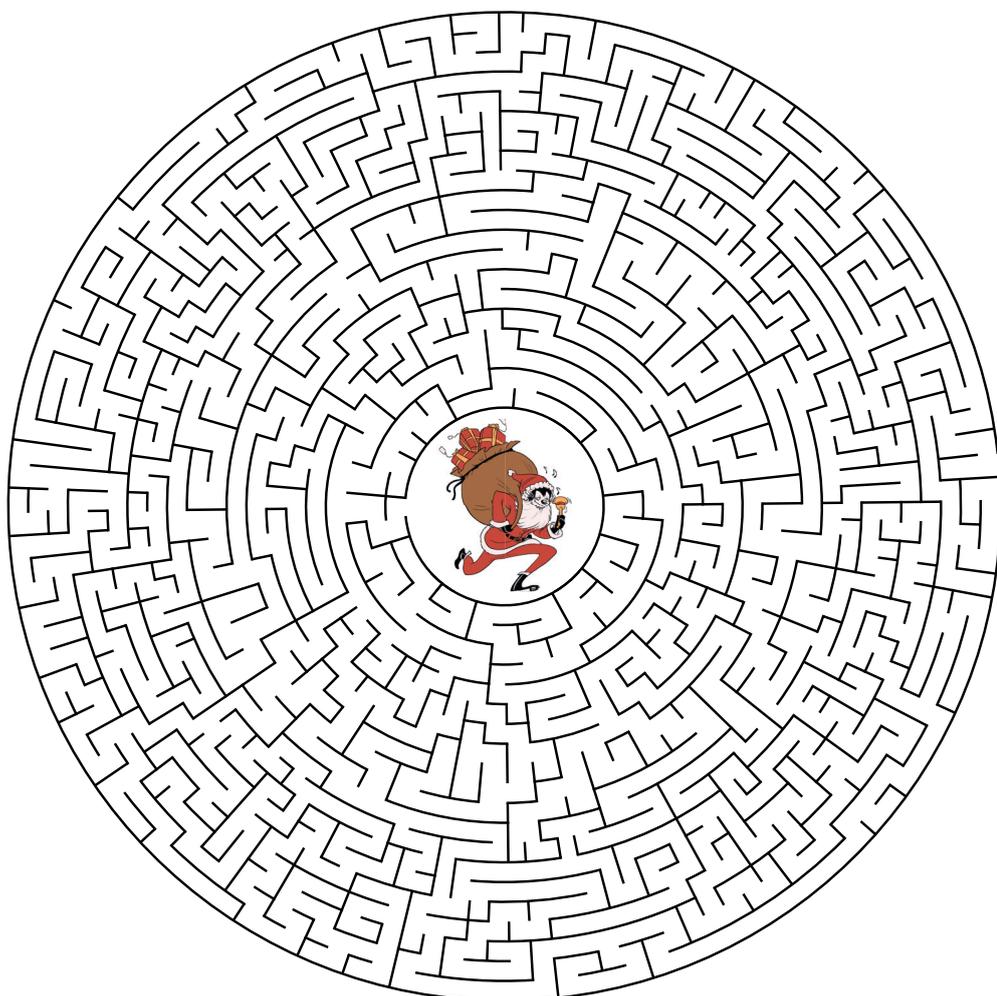
			1	7	4			
8								
	9	6				4	7	
4					1		9	
		7	2		6	8		
	1		4					6
	3	2				9	6	
								2
			3	6	2			

Normal Sudoku

			4			9		
2				5				1
7					2		4	6
		8	5		6			
5								7
			3		9	4		
6	9		7					4
4				2				8
			2			4		

Difficult Sudoku

	1		8					
				1		5		
	5	7		4				3
2		4		5		3		
5								7
		3		7		6		1
1				3		7	9	
		8		6				
					7		3	



Maze

Help Santa Felix get to your house for Christmas!



Points

Easy, Normal, Difficult sudokus	2, 3, 4 pts each
Cryptic Crossword	7 pts
Nonogram	3 pts
Maze	2 pts

Puzzles Notices

We thank our contributors:

Freya Morris for the sudokus
 Stanley Scott for the crossword
 Mihaly Ormay for the nonogram
 Raluca -Anamaria Constantinescu for the leaderboard
 Lito Chatzidavari for laying out these pages, and
 Ameena Hassan for everything else

Hello puzzle lovers! We have prepared some cool Christmas puzzles for the last issue of 2021. So we hope you enjoy them!

To see our full leaderboard scan the QR code below!



FUCWIT

1. Deep-Fried Charizard 143
2. Pancakes, surely? 136
3. Plont Palace 130
4. AKGroup 109
5. Hea-ing 95

You can always send your solutions to fsudoku@ic.ac.uk before this Wednesday, 12 noon. Since this is our last issue of the term, you will be able to check our updated leaderboard with this week's points on our website next Friday. Also please note that points will be reset next term, so you can join in with a clean slate!

CATNIP

THE HEADLINES THIS WEEK...

Number 10 Aide crying after resignation a bit self-obsessed as no one even knew her name anyway

London collectively deems suited man riding electric scooter whilst on his phone a dickhead

Nation furious at Downing Street Christmas Party scandal knowing full well they did the exact same thing

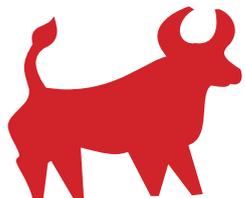
Thames Water cleared of dumping sewage in rivers after they promise to plant a tree for every animal that drowned in shit

Brits sleep with a clear conscience as exporting landfill to Romania means it doesn't count



ARIES

This week your suspicions of a conspiracy are confirmed when 568 cases of Omicron are confirmed in the UK but the 568 bar remains open



TAURUS

This week you learn that adultery in the USA is most prevalent in Colorado - what a state of affairs



GEMINI

This week you're not sure whether a venus fly trap's bark is worse than its bite



CANCER

The week you learn Boris Johnson has decided to use Plan B for the first time



LEO

This week you wonder whether the Australian military sign off their walkie talkie messages with "received. Under."



VIRGO

This week returning Little Bo Peep's sheep leaves you inundated with useless wool



LIBRA

This week your honesty is matched by your philanthropy when your volunteer work at the local vet means you let the bag out of the cat



SCORPIO

This week you hear that Carrie Johnson has had her second child with Boris but what how when was she even pregnant again



SAGITTARIUS

This week the milk in your fridge curdles but you sink it anyway because nothing matters anymore



CAPRICORN

This week fillibustering won't help your case when campus security find you beating around the bush



AQUARIUS

This week you use a "fear of commitment" to disguise your insatiable fish fetish

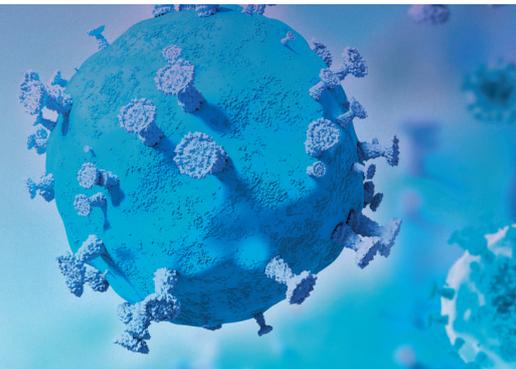


PISCES

This week you have to take a Christmas number 1 in a petrol station toilet and really hope you can avoid reaching number 2

Your Union

UNION SERVICES UPDATE



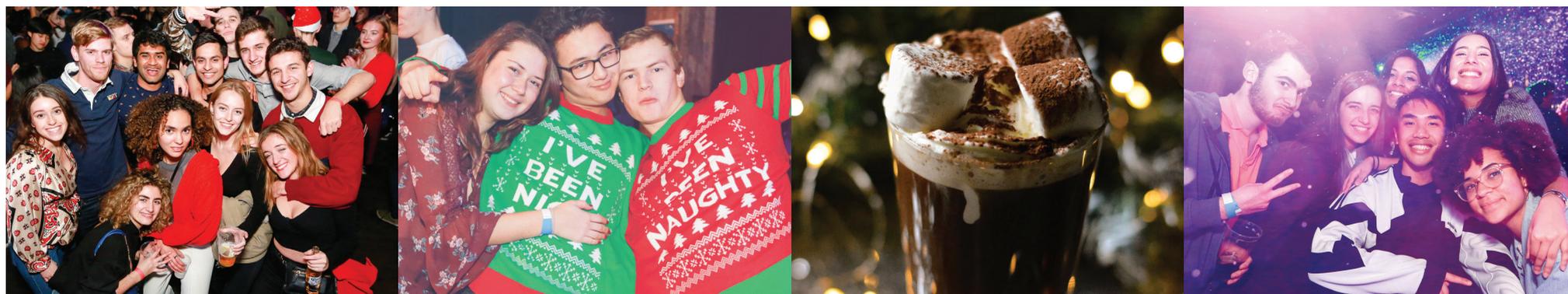
The Union over the next few weeks

Due to the increasing number of Covid infections, including within the College, the Union has decided to take a number of steps to reduce the risk of Covid impacting on our members and staff ahead of the Christmas break. This is particularly because close contacts of anyone infected with the new variant, Omicron, are required to isolate for 10 days regardless of whether they have been vaccinated. This would impact on people's plans to spend Christmas with family or friends, as well as those who are travelling for their holidays.

- We are postponing the "Step into Christmas" club night on 10 December. We will get in touch directly with those who have purchased tickets to organise refunds.
- Union staff will move to working from home from Thursday 9 December. Staff are still available to deal with your queries remotely.
- We will work with clubs and societies to help them consider their own activities and how to minimise risk to those taking part in line with College guidance. We will ensure the College is able to provide advice and support in relation to these planned events.
- Our shops on Sherfield Walkway will remain open until 15 December, with online orders being fulfilled until 21 December.

- Our bars will remain open until 18 December as planned. We will continue to operate the bars as normal but are encouraging customers to remain seated and use the app to order, in order to reduce the risk of transmission.
- Our Advice Centre will remain open until 17 December as planned, operating remotely.
- Our Helpdesk will be open to Wednesday 15 December, but as there will be less staff on site they may be busy and take a little longer to help you.
- The Union offices and building will close on 22 December until 4 January, as planned. Further information on opening dates and times will be on our website, in case you need to access or store equipment.

We understand that many students will have concerns, the measures we are taking are to minimize potential risk of disruption to holiday plans, so everyone can have a safe and enjoyable break. They are not in response to any known cases of Omicron within the Union.



What a term! It was incredible to see you roaming the campus again, have fun in our bars and engage in all sorts of activities. We love having you back and we can't wait for the new year to start. But first...let's all have a well deserved break and recharge our batteries.

We know that many of you are staying in London over winter break, and for some this will be your first time away from home at Christmas. College has put together a number of events and resources to keep you engaged and entertained over the next few weeks!

Check out their support page here: imperial.ac.uk/student-support-zone/support-during-covid-19/support-over-the-christmas-break.

We hope you all have a wonderful, restful winter break and you're take care of yourselves. To those celebrating Christmas - the Union wishes you and your loved ones a happy, happy holiday. Here's to a wonderful festive season in joy and good health and a happy new year!

With love,
Your Union

Your Union



History Soc - Leicester Square Christmas Market trip SUNDAY 12 DECEMBER 2021 18:00 - 21:00

History Society will be taking a trip down to the Christmas Market in Leicester Square on Sunday the 12th of December. If you fancy a change of pace from our more history-focused events, this could be right up your street.

imperialcollegeunion.org/whats-on/event/10428



Cinema Winter All-Nighter

TUESDAY 14 DECEMBER 2021 18:00 - 08:30

Union Concert Hall (2nd Floor Union Building above 568)

Come along to the Cinema All-Nighter! With 6 films back to back, do you have the stamina for this challenge? ;)

Tickets & details

at: imperialcollegeunion.org/whats-on/event/10400



Open Mic Night

TUESDAY 14 DECEMBER 2021 19:00 - 22:30, Union Bar

Join us on the 14th December for another wonderful open mic night. We encourage anyone with a musical streak to get involved, whether you're a seasoned performer, or this would be your first time playing in front of others (kudos!)

imperialcollegeunion.org/whats-on/event/10390



Negroni Night

TUESDAY 14 DECEMBER 2021 19:00 - 21:30, h-bar

Join the reps of Tarquin's at H-Bar: They will be mixing up some different Negroni's for you to try out. It's going to be gin-credible!

Tickets at:

imperialcollegeunion.org/whats-on/event/10424

More info & events: imperialcollegeunion.org/whatson

FILM

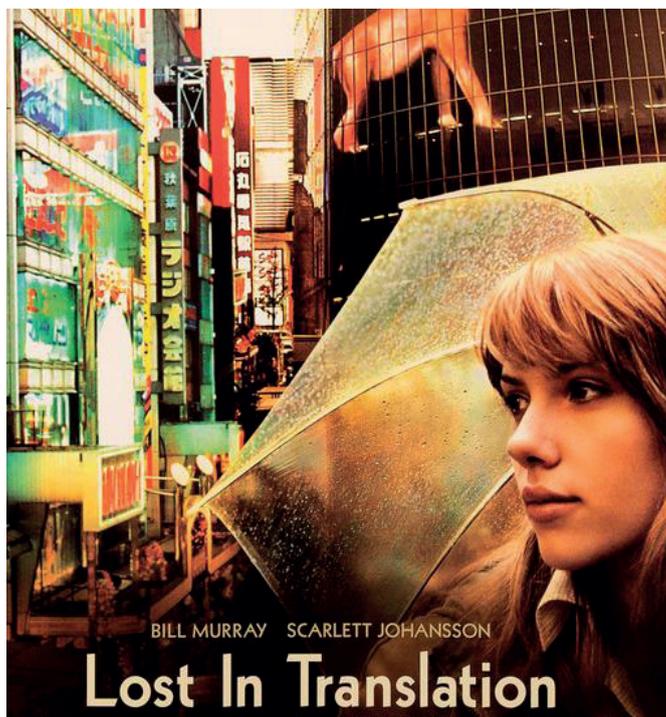
Edited by: EVA BORRAS

Film Director Review

Sofia Coppola's portrayal of relationships, 20 years apart



Oscar Healy Film Writer



ticity to the idea of two lost souls connecting

Coppola brilliantly evokes a sense of nostalgia and dreaminess through the use of quick cuts and sometimes overwhelming scenery. Filmed on a tight budget and with an almost documentary-style shooting, Coppola used a small crew to film the Tokyo streets with almost no artificial lighting, taking advantage of the crowded streets instead of hiring extras. These details paint a very naturalistic portrait of the city, which becomes a perfect backdrop for Bob and Charlotte's intense, flirty and oftentimes awkward friendship. The film dances from location to location, each one emphasising the couple's unfamiliarity with their setting and bringing them closer together.

Lost in Translation is by no means perfect, but it is beautiful and real. A tale of finding someone who brings you happiness in troubled times, but whose love is so special precisely because it is fleeting. It is, as Coppola herself puts it, "Just for the moment".

On the other hand, *On the Rocks* (2020) is a much more recent collaboration between Coppola and Murray, a comedy-drama that leans more heavily into comedy than Coppola's previous works. Laura Keane (Rashida Jones) is a novelist and mother of two young children, constantly battling with writer's block and the tough banalities of family life. On top of this, she suspects her husband, Dean (Marlon Wayans), is being unfaithful due to many small clues: a woman's toiletries in his luggage, cosy hotel bookings for business trips abroad, etc. Bill Murray stars as Felix Keane, Laura's father, a retired art dealer and playboy, who believes all men are hardwired to cheat and who flirts with every woman he meets, much to the dismay of Laura. Though his views are antiquated and misogynistic – 'You're mine until you're married' he tells a young Laura as the opening line of the film – he desperately wants to connect with the daughter he loves. When Laura opens up about her suspicions of infidelity, Felix immediately uses this opportunity to bond with his daughter through wacky capers and heart-to-heart conversations.

With a more cut and dry rom-com plot, Coppola still does not disappoint as she flaunts the streets of New York and the beautiful interiors of buildings that only relatively privileged characters (like the Keanes)

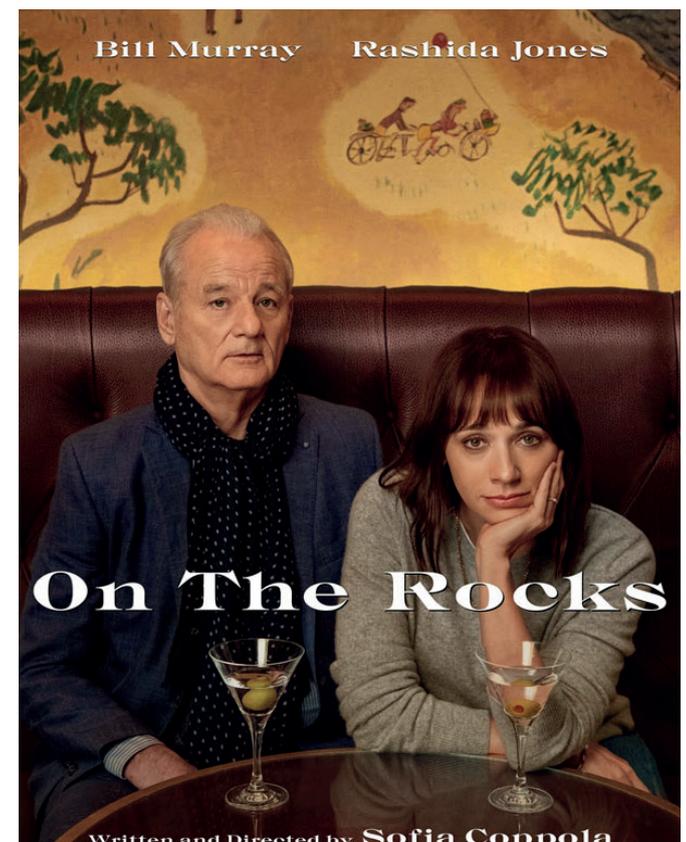
can frequent. The score by Phoenix complements this with upbeat, if sometimes a bit sparse, electropop.

The theme of insecurity is vital in this film, Laura's worries of infidelity are an extension of her general anxieties as she approaches middle-age, and Felix only exacerbates these as he struggles with his own past. These are played subtly and excellently by Jones and Murray, who convey the notion of past family troubles through tense but understanding dialogue. The comedic moments are mainly derived from the ever-present generational gap between father and daughter, and the film succeeds in making the audience cringe along with Laura whilst sympathising for them both at the same time. Rashida Jones perfectly plays a patient and caring mother, who puts on a brave face even as her life is seemingly crumbling around her. In her conversations with Felix, we see her anxieties explored and intensified, while he is simply looking for a reason to talk to and spoil his daughter.

If *Lost in Translation* is an exploration of short, romantic connections, *On the Rocks* is its counterpart: delving into the trials of long-term commitments and the importance of romance in life and relationships.

Lost in Translation (2003) is a raw depiction of that strange isolation that comes with spending time in cultures so different from your own. Written and directed by Sofia Coppola, the stunning background of Tokyo showcases an intimate relationship between two Americans living in Japan; embracing those fleeting moments of pure connection that can underscore a life. Bob Harris (Bill Murray), an ageing movie star on a trip to promote Suntory whisky, finds himself losing control of his familial and professional life. Whilst staying at the Park Hyatt hotel, he runs into Charlotte (Scarlett Johansson), a recent Yale graduate whose recent marriage to a celebrity photographer is also proving tiresome.

From this point on, one might expect a standard rom-com to ensue, however, *Lost in Translation* is anything but. The relationship that develops between Bob and Charlotte is lively but innocent, characterised by their bonding over culture shock and shared feelings of alienation. Bill Murray manages to perfectly combine the indifference and melancholy that can signal the end of a long relationship with his established skill in improvisational comedy. A 17-year-old Scarlett Johansson plays brilliantly opposite this: her portrayal of an intelligent but distracted young woman brings authen-



FILM

Film Interview

A Conversation with film-

Eva Borrás Film Editor

Last week I had the opportunity to interview Chloe Fairweather, the director of 'Dying to Divorce', a documentary telling the story of Arzu and Kubra - both survivors of domestic violence in Turkey. Filmed over the course of 5 years, this incredibly moving film being Fairweathers' feature film shines light on the struggles and hardship one in three women in Turkey have to go through. As an audience we follow the journey of lawyer Ipek Bozkurt as she fights for justice to be done. Here is the conversation we had before she headed to a London screening where she spoke about what the filming of the feature was like:

I had the opportunity to watch your feature film 'Dying to Divorce' and as a first question, how did you get involved with this project and how was the process before starting filming?

I was in Turkey and I was working with a journalist on a completely different subject. She was aware of the work of these activists, we were discussing it and as I was there in Turkey we decided to contact the activists and meet up with them and completely unexpected really, decided to film one of the activists meeting Arzu (the woman who has her arms and legs shot by her husband when she tries to leave him). We were more shocked by the meeting than we could ever have been prepared for. One of the important things I think was very powerful was the shock of the extremity of the violence, but also Arzus' real strength of character and that she had so much that she wanted to say about the situation. You know, how it happened, why it happened - she had so many insights that she really wanted to share and it felt that there wasn't a platform for her to be able to speak. I guess that was the seed of it really, as I felt like I was holding this urgent story in my hands and I have to do something with it.

It really started from there, bit by bit, one thing led to another and I started discussing the idea with the producer Sinead Kirwan and through the activists I met Ipek, who's their lawyer. I just thought she was a really great character and importantly, I really felt that she could bring people into the situation in Turkey. Yet also giving an understanding into the broader issue of domestic violence, femicide and misogyny - which are global issues and challenges that unfortunately no society escapes.

“

I WANTED IT TO BE SOMETHING THAT COULD GENERATE A CONVERSATION - BE IT SURVIVORS BEING ENCOURAGED TO SPEAK AND SHARE THEIR STORIES

So do you feel like the aim of the documentary, as a director, was to give strength to survivors or more like show the reality of domestic abuse survivors to the people that are not aware of this? What was your take on it?

I think I wanted it to be something that could generate a conversation - be it survivors being encouraged to speak and share their stories or people who don't know about the situation or people who are able to see their own societies in some way reflected in the issues raised in the film. I think even in the UK domestic violence is bad, not to the level of Turkey but there are femicides and problems with the level of misogyny, sexual violence not really being prosecuted enough. I feel like there are lots of different things that people can take and my job was to lay it out from the point of view of the women as much as possible. Therefore allowing it to unfold so that people could experience it and connect to it in many different ways.

Dying to Divorce has been released along with the United Nations campaign "16 Days of Activism" against domestic violence and was a very hard piece to watch. How were the reactions of people when you screened it once it finished? For me I had to sit in silence digesting what I had just watched.

Yes, I think it is emotional for people and there's lots of layers in the film so there is a lot to take in. We, in fact, worked with a psychologist for the screenings that we do in Turkey because we know that the rates of domestic abuse are so high that a lot of people in the audience could be directly affected. So as well for the screenings in London, before we start our question

and answer, we gave people a moment and we tried to recognise it and in doing so, bring out into the open that you could feel that way.

Definitely, it is a film very needed with the news going on right now. I wanted to also ask you, Dying to Divorce was filmed over the course of 5 years, what was that like? Since it's such a long time to be filming, did you always know when it was going to end, was there a timeline for the project?

Well, I mean, it was very much an unfolding story. When I first joined the story, the activists were facing huge issues of domestic abuse in the country but they were really fighting back and were changing laws - so it was a really positive story. Then 2016 happened and there was the attempted coup and then thousands of people were arrested. The whole story just shifted dramatically, and amidst the chaos of all of that, you could see that women's rights were chipped away bit by bit. So the story was just changing all the time and we could never have predicted the political events or how they would shape the story. Even the two stories themselves, we could not know how they would unfold, so it was very much following it and responding. In terms of being able to make it, this was very much an independent film and I was always working full time on other documentaries - this was something I was fitting in between projects, or during holidays or weekends. So it had a total alternative way of making the film, it was manageable but a bit crazy. We managed to raise money per shoot, as the story became more clear and the end was in sight, things were settling somewhat and we were able to get funding to complete the post production.

Along with that, what were the challenges of making the film? As the theme is a current affair, did you ever feel like you might not be able to publish this material?

Well, yes. I think in terms of the cases, the justice they were able to get was a big deal. So, in Kubras case (the woman who was hit on the head by her husband and

Film Interview

maker: Chloe Fairweather

UK ENTRY FOR THE BEST INTERNATIONAL FEATURE FILM AWARD AT THE OSCARS®

DYING
TO
DIVORCE

A FILM BY CHLOÉ FAIRWEATHER

WWW.DYINGTODIVORCE.COM #DYINGTODIVORCEFILM

had a brain haemorrhage) the whole case was about the fact that he said he didn't do it and she said that he did. And in the end, although he never served any jail time and he had his sentence greatly reduced, he was charged with hitting her. This was very important not only for the family, but also because it meant that it was accepted that he did hit her. That put us therefore in a stronger position to be able to tell that story fully because it was recognised by the court. In terms of distributing the film, it is true that in Turkey the pressure not to speak out is very real, so we had to be careful when distributing the film. Especially Ipek, she watched the film many times and agreed with everything said in it as it is her life's work and felt it was important to be brave and take that risk.

I can completely understand where the challenges are coming from. Moving on to your film career, can I ask how and why did you get into the filming documentaries industry? Could you explain your journey as a filmmaker?

I did always have an interest in documentaries. I did a drama degree at University in Bristol so we did some filmmaking as part of the course and lots of theatre. I think for me, documentaries gave me this opportunity to be able to use the craft of storytelling to really engage people and have a real purpose. I started to feel like this would be my medium for telling stories because I think

being able to work directly with people would be surprising, unexpected and profound. I just felt a high level of motivation to learn about the human condition - and the insight of what people have to say about what it means to be alive. After I graduated, I got the opportunity to do a traineeship at the BBC which was a good opportunity to get experience on work and was really exciting to me was to also meet a lot of people. Then at some point I really felt that observational documentaries following unfolding stories was also even more of a focus. I suppose I wanted to get really good at learning the skills that would be needed for filming and how to be in unfolding situations - I guess it also helped constantly telling people "I want to direct" and expressing my interests.

Congratulations on the feature being chosen as the UK documentary submission for the Oscars prize award. How does it feel to get your work recognised?

We hope that it means more people can watch the film which is our main aim - it was really exciting in that respect to feel the feature would be able to reach more people. There was a slight joy, as this was a super low budget production made in very challenging circumstances. It's joyful for us and for the women in the film in particular that people are moved and inspired by their stories, hopefully we can get it out further.

Honestly, I feel your career is so inspiring and I just wanted to ask one last question, could you give us a glimpse of what is happening now for Chloe Fairweather, what are your future plans?

I'm working with the same producer about an idea for another independent film, but I won't say too much about it because it's still in development. We'll see what happens with that, haha. In terms of television, I'm directing with someone else a series as well as trying to create the space for my own ideas for stories I feel should be told.

Dying to Divorce won the Jury Prize at Monte Carlo and The Amnesty International Prize at the Thessaloniki Film Festival. The stories of Arzu (married off at 14 to her husband) and Kubra (former TV broadcaster) deserve to be seen. It has been in UK cinemas since the 26th of November so be sure to check it out! It is not an easy watch but it is without doubt emotionally impacting.

FILM

New Film Release

Ridley Scott's *House of Gucci*

Ioana Esanu Film Writer

A look inside the campiest family there ever was

Opulence. Greed. Legacy. Betrayal. Murder? The story of the Gucci family is as outrageous as it is seductive, so it comes as no surprise that Ridley Scott's film adaptation incites the same feelings. The biopic takes place across the latter quarter of the 20th century and follows Patrizia Reggiani's ambition of marrying into the famous family and its ultimate downfall.

Dubbed "The Black Widow" by the Italian press back in the 90's, Reggiani (played by Lady Gaga) grew up poor in the town of Vignola and climbed up the social ladder after meeting Maurizio Gucci (Adam Driver) in the Milan party scene. The unlikely pair hit it off and wed in 1972, much to the dismay of the groom's father, Rodolfo Gucci (Jeremy Irons). As Reggiani got to taste more and more of the rich life, her greed grew to a boiling point, persuading her husband to deceit and betray the other members of the family: uncle Aldo (Al Pacino) and cousin Paolo (Jared Leto). Egos crash, secrets are uncovered, and the glamorous Gucci clan collapses under its own weight.

At just under 160 minutes, *House of Gucci* needs to pack two decades worth of drama and character arcs. The pace never feels slow or drawn-out, and viewers find themselves wanting more and more of the alluring intrigues wrapped in fine Italian leather. The writing is charming, with dialogue that feels natural – sometimes so much that you yourself can feel Rodolfo's second-

hand embarrassment upon meeting Patrizia for the first time.

For me, the star of the production crew was not only director Ridley Scott, but also Polish cinematographer Dariusz Wolski. His beautiful shots and play with light juxtapose the main pair's inner emotions: from the soft Italian sunshine in the church where they get married, to the sharp shadows on Maurizio's face as he transforms from brainy lawyer-to-be into ruthless leader of the fashion empire.

Adam Driver does an excellent job of playing this character and the subtleties of his personality. He starts off shy, an opposite to Gaga's loud and frivolous young Patrizia. By the time he ascends to the top of the family hierarchy, the understated regret in Driver's eyes shows he has lost his innocence. His Italian accent is not the worst, especially when compared to his on-screen father, Jeremy Irons. Despite his amazing portrayal of Rodolfo, Irons just cannot seem to shake off his Britishness.

On the other side of the accent spectrum lies the female lead, of Italian descent herself. Gaga truly cements her title as actress with this performance, interpreting a multifaceted woman seduced by the promise of success and pushed over her tipping point. She is tender, sly, ferocious, dreamy, and absolutely mad all at once. Gracing the cover of the December issue of

Vogue, Lady Gaga opened up about her performance and the mental toll of shooting the film. "I lived as her [Reggiani] for a year and a half. And I spoke with an accent for nine months of that", she says, describing how this was not limited to the set, but off-camera, too. But Gaga is not the only one partial to method acting: a veteran of the technique, Jared Leto goes above and beyond (way, way beyond) with embodying his character.

His role as Paolo, the black sheep of the family, is equal parts hilarious and cringeworthy. The overexaggerated Italian accent makes him look like a caricature of the peculiar fashion designer. Whether it was the screenplay or Leto's own improvisations, his frequent use of "Americanisms" takes viewers out of the fantasy a little. Regardless, you cannot help but chuckle when he is on screen. Last but not least, Al Pacino does a great job of playing Paolo's father and chairman of Gucci (but what else would you expect). The ease with which he acts is simply wonderful to watch.

The film is aided by gorgeous scenery: Duomo di Milano, the ski slopes in St Moritz, the lush villas on the Como lakeside. Although the story is completely real, *House of Gucci* feels almost escapist, with its scandalous plots and luxurious settings. It beats Ridley Scott's other rich family drama, *All the Money in the World*, and definitely deserves a watch.

Television

Marvel Landing a Bullseye

Zanna Buckland Books Editor

The newest addition to the MCU, 'Hawkeye', is not new in all respects. Following in the footsteps of this summer's 'Black Widow' it dives into a personal adventure of one of the six original Avengers, however, instead of delving into the past, it picks up where Endgame left off. Clint Barton makes his comeback as a more authentic and pensive, albeit aged and battle-worn, version of himself, and Jeremy Renner's performance doesn't disappoint.

Known for films such as 'Pitch Perfect 2' and 'Edge of Seventeen', Hailee Steinfeld, playing Kate Bishop, who was inspired by Hawkeye to become an archer, is not necessarily the actress one might expect to take on the role, but as usual, Marvel's casting directors have hit the jackpot. Steinfeld's youth and enthusiasm, both as herself and as Bishop, contrasts nicely with Renner's experience while also giving him a much-needed shot of energy.

Renner and Steinfeld have the kind of acting chemistry that was lacking in the recently released

'Eternals' film. They are given the licence to toy with light-hearted comedy alongside heavier, more serious scenes; a balance that has long been a strength of the MCU films and their respective casts. The dramatic and comedic scenes are cleverly intertwined in a way that allows them to flow into each other seamlessly, without being jarring.

Setting the show against the backdrop of Christmas has given it a festive and homely feel; or as much of one as a series about vigilantes and crime-fighting can have. Hawkeye has always been the most family-oriented of the Avengers – by virtue of actually having one – and it is highlighted in these first few episodes, with Clint torn between domestic duty and the thrills of fighting crime. While leaning into the Christmas theme, it also manages to showcase the grittier side of humanity, entering the world of mafias and street-level threats (the style of smaller city scuffles I personally would have liked to see more of in the Shang-Chi film).

The show also plays with the concept of impostor syndrome, and the burden that Clint bears, being

the only truly human Avenger left. Many of us know impostor syndrome well – feeling out of place in a particular group due to doubting our own level of skill or knowledge. Barton struggles with both the physical and mental ramifications of being on the original Avengers team, and the weight of this shows in his brooding character. His inner battles have the capacity to garner lots of sympathy from viewers, whether you're a diehard Hawkeye fan or not, and his children's wishes for his return for the holidays make it all the more poignant.

There is potential for Yelena to show up at some point, following the target placed on Barton in the end-credits of Black Widow, but so far there have been no explicit clues or mentions of her. Perhaps something to look out for later in the show?

For now, Clint is being given space to live out his own story; for us to see him as an individual hero as well as a team player. 'Hawkeye' has hit the ground running, as its namesake often does literally, and we're looking forward to seeing where it goes next.

MUSIC

Edited by: ROSIE MILLNS & TARA PAL CHAUDHURI

DON'T MISS THE GIG - JAZZ JAM AND OPEN MIC BY LIVE @ METRIC AND UNION BAR, 14TH DECEMBER

MIX IT UP WITH AN ACOUSTIC OPEN MIC NIGHT ON ONE SIDE OF THE UNION AND A JAZZ JAM ON ANOTHER. NO MATTER WHERE YOU ARE, YOU ARE GUARANTEED TO BE LISTENING TO SOME OF IMPERIAL'S FINEST MUSICIANS TO SEE YOU OFF BEFORE THE WINTER HOLIDAYS.



Single of the Week

Semi Pro by hippo campus

From their upcoming album, LP3, hippo campus' "Semi Pro" sees their characteristic bubbly alternative sound dressed in a pop outfit. It's the sort of cheery sound that you play when walking down the street on a (rare) sunny morning like you're the protagonist of a coming-of-age film. Or maybe when the credits roll after a happy ending. Our favourite line and the refrain of the song, "I've been bad, but I'm only getting better", is what we'd think of if asked to title what the first term back has been like.



TODAY IN MUSIC HISTORY

IT'S 1967 AND OTIS REDDING DIES WHEN HIS TOUR PLANE CRASHES INTO WISCONSIN LAKE, TAKING HIS ENTIRE BAND EXCEPT THE TRUMPET PLAYER. HE WAS ONLY 26.



IN 1971, A JEALOUS BOYFRIEND OF A ZAPPA FAN TAKES REVENGE ON THE SINGER BY PUSHING HIM OFF STAGE IN LONDON. TALK ABOUT HOW THE MIGHTY HAVE FALLEN.

Stats

Imperial Wrapped: What Has Imperial Been Listening To?

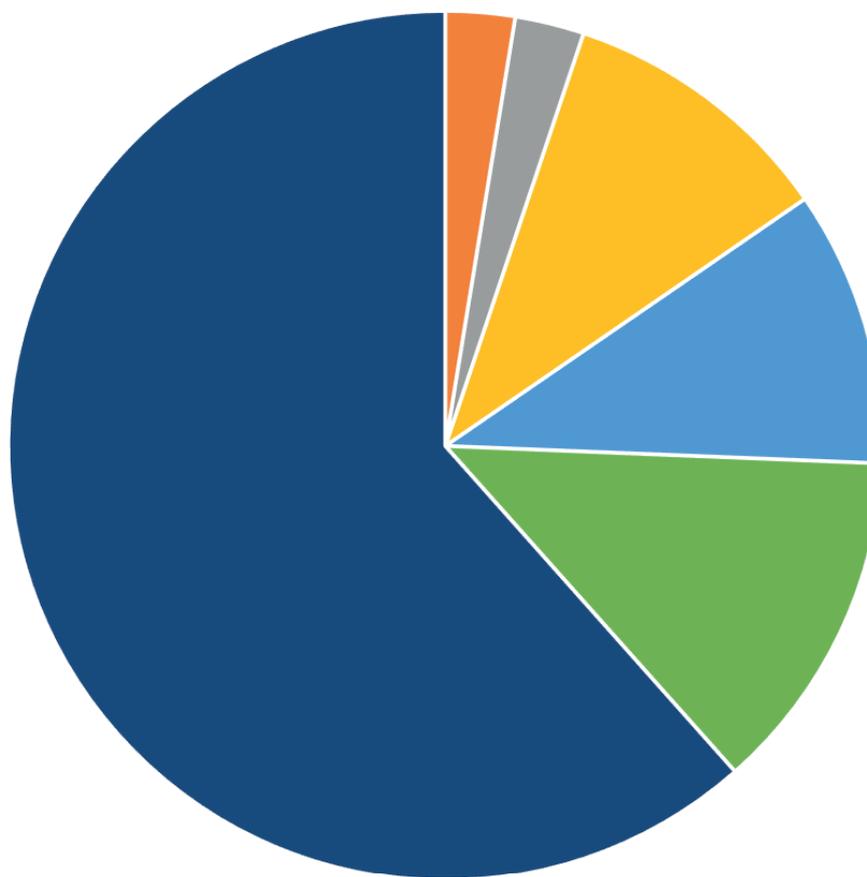


View online here!

Written by Rosie Mills Music Editor

Last week we asked you to expose your Spotify wrapped to us. Here are the results! On average, Imperial students listened to music for 60094 minutes in 2021. That's 11% of the year! One student spent 36% of 2021 streaming on Spotify. Bonus points if they're you're still on top of your degree. 62% of Imperial students were in the top 95% of listeners in 2021. Two students' top played song was by Taylor Swift, and another two's were Mac Miller. You alright guys?

What percentage of listeners were Imperial students in?



■ 0-19% ■ 20-39% ■ 40-59% ■ 60-79% ■ 80-89% ■ 90-94% ■ >95%

We asked students who they prayed wouldn't be their top artist every night for 2021, as it would have been really embarrassing if they were. Two students put the artist who was their top artist. Other names that came up were Alvin and the Chipmunks, the Glee Cast, The Smiths, and 100 geecs. Two Jake Gyllenhaal mega fans put Taylor Swift as the most embarrassing artist you could have listened to the most in 2021. Justin Bieber, Drake, Ed Sheeran and KSI were all also suggested twice as embarrassing top artists. One student put Madonna, "like a virgin" (badumm-tsss). The top five most streamed artists of 2021 were Bad Bunny, Taylor Swift, BTS, Drake, and Justin Bieber. Only 13% of responders had any of these artists in their top five artists. 100% of that 13% had



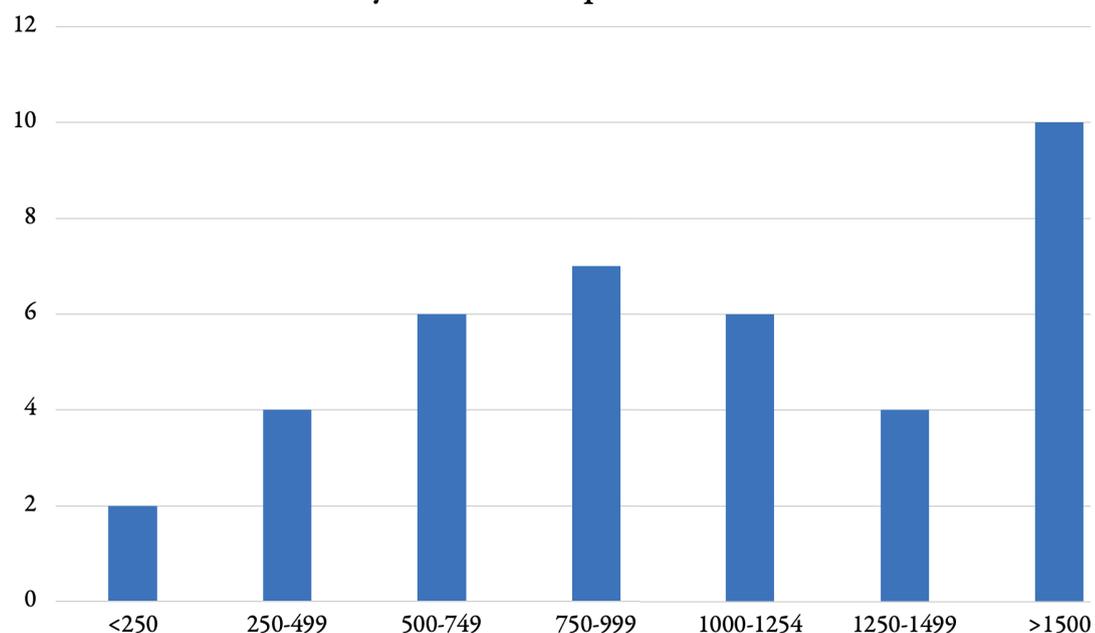
Taylor Swift in their top five. Meanwhile, of the top five most streamed songs of 2021 (Olivia Rodrigo's 'drivers license', Lil Nas X's 'Montero', 'Slay' by The Kid LAROI and Justin Bieber, 'good 4 u' by Olivia Rodrigo, and 'Levitating (feat. DaBaby)' by Dua Lipa), only one student named Olivia Rodrigo's 'drivers license' as featuring in their top five songs.

Finally, we asked students to flex the statistic they were most proud of. The most impressive statistics submitted were students being in the top <1% of fans. One student was in the top 0.001% of Bon Jovi streamers, and another was in the top 0.005% of Fleetwood Mac listeners. One student listened to 1800 minutes of My Chemical Romance and was in their top 0.5% of fans. Three students were going through it, being in the top 0.1 and 0.005% of Mitski and Phoebe Bridgers fans, whilst another listened to Bo Burnham's Inside exactly 118 times.

So, who and what were playing on Imperial's students' headphones?

Three students listened to Wolf Alice more than any other artist in 2021. Imperial students on average listened to a massive 1149 different artists in 2021.

How many artists did Imperial students listen to?



Tim Minchin
 Carpenter Brut
 My Chemical Romance
 BROCKHAMPTON
 Mitski
 TOOL
 Waterparks
 Duster
 Jeff Rosenstock
 Fleetwood Mac
 The Strokes
 Wolf Alice
 Modern Baseball
 Sun Kil Moon
 Rex Orange County
 Death Grips
 J. Cole
 The Wombats
 Little Mix
 Lovejoy
 Soccer Mommy
 Phoebe Bridgers
 Taylor Swift
 Mariah Carey
 Arctic Monkeys
 A Boogie Wit Da Hoodie
 Dimitri Vegas & Like Mike
 Pop Smoke
 Tom Misch
 Billie Eilish
 Lady Gaga
 Bon Jovi
 Grimes
 Queen
 Wolf Alice
 Radiohead
 Doja Cat
 Taylor Swift

IMPERIAL'S FAVOURITE ARTISTS

I Hate Myself by dodie
Le Perv by Carpenter Brut
Lovers Rock by TV Girl
Ivy by Frank Ocean
Solar Power by Lorde
Forty Six & 2 by Tool
Snow Globe by Waterparks
Unrecovery by Duster
Yoshis Island (Clover & Sealife 7x7 world mix) by Glass Beach
Dreams by Fleetwood Mac
Right Around the Clock by Sorry
The Adults are Talking by The Strokes
The Last Man on Earth by Wolf Alice
Coals by Modern Baseball
Cruiser by Red House Painters
Hand Me Downs by Mac Miller
Funeralopolis by Electric Wizard
imperial. by j^p^n
Turn by The Wombats
Lost in Japan by Citizen Queen
Sex Sells by Lovejoy
Blue World by Mac Miller
I Know The End by Phoebe Bridgers
Right Where you Left Me by Taylor Swift
Movie by Megan Thee Stallion ft. Lil Durk
Lemonade by Circa Waves
acting like that by YUNGBLUD and Machine Gun Kelly
Friday (ft. Mufasa & Hypeman) Dopamine Re-Edit by Nightcrawlers
Dior by Pop Smoke
It Runs Through Me by Tom Misch
Getting Older by Billie Eilish
Thot Shit by Megan Thee Stallion
Livin' on a Prayer by Bon Jovi
4 AM by Grimes
Bittersweet Symphony by Richard Ashcroft
Eugene by Arlo Parks
M'Lady by Dorian Electra
Good Days by SZA
champagne problems by Taylor Swift

IMPERIAL'S FAVOURITE SONGS

Book Review

The 7 Habits of Highly Effective People

Akshara Chandrashekar Books Writer

“Sow a thought, reap an action; sow an action, reap a habit; sow a habit, reap a character; sow a character, reap a destiny.”

Nothing can recapitulate Stephen Covey's perceptive insights into today's world better than this quote. Motivational books inspire us to conquer the world, and it is necessary to harvest what we learn through these books to accomplish all the goals that we harness over a lifetime.

However, “The 7 Habits of Highly Effective People” cannot just be termed a motivational book; it is a self-guide that can be read and re-read throughout various stages of life. While Covey published the book in 1989, its lessons remain unassailable and educational even today.

In the book, Stephen Covey aims to steer our lives in the right direction. He guides the reader through seven habits that can change the lives of anyone who aims and hopes to achieve big. The seven habits are be proactive; begin with the end in mind, put first things first; seek to understand, then be understood; think win-win; synergise; and sharpen the saw. The former three habits delineate the importance of independence and self-dependence. The latter three focus on interdependence, indicating that prioritising our well-being is crucial in learning to help and appreciate others. The final habit is the culmination of all the other lessons and describes the significance of constantly working on ourselves and balancing the various aspects of our lives. Persistent improvement is necessary to lay a foundation of our principles and gradually build a tower of success and fulfil our ambitions.

While the seven habits may seem fathomable at first glance and obvious, the prodigious amount of knowledge poured into the description of the habits is boundless. The book is a treasure trove of real-life examples packed with meaning and enlightenment. As someone who always hoped to improve my abilities in performing tasks when I was younger, just one quick

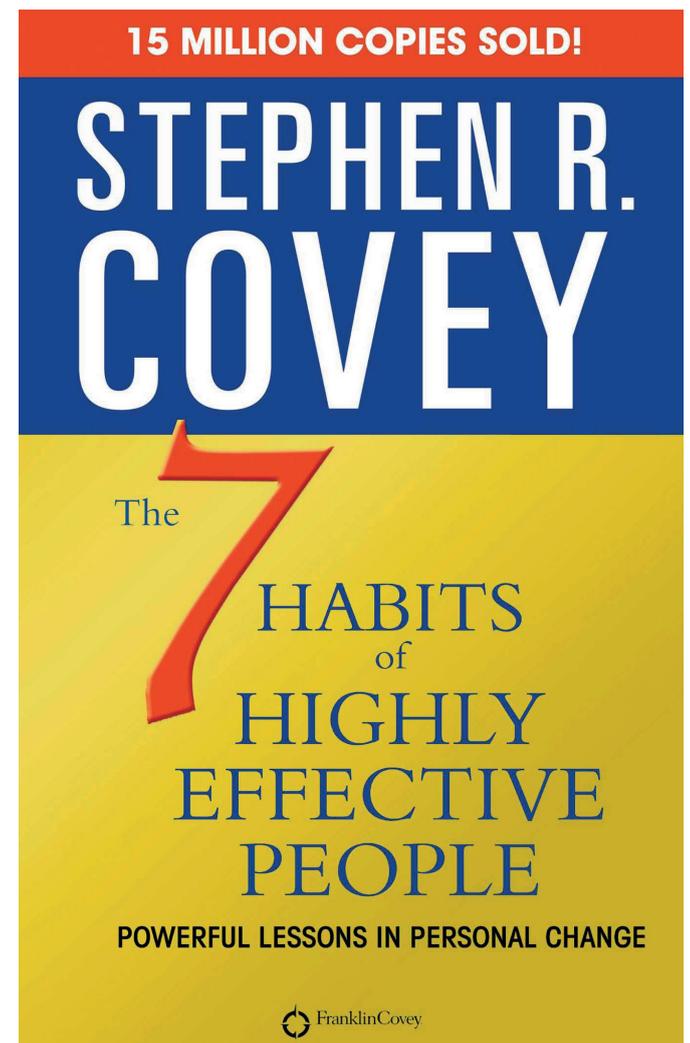
“

**PHILOSOPHY
INTERSPERSED
WITH HUMOUR
AND AUTHENTIC,
CONCRETE EXAMPLES
RENDER A SENSE OF
RELATABILITY AND
IMMERSION**

glimpse through the third habit in the book suggested I should glance through the ‘Quadrants of Priorities’ and try the Quadrant II method. The Quadrant II method urges us to prioritise ‘important and non-urgent’ tasks. Without question, following this method has tremendously improved my ability to sort out my priorities.

While reading the book can give the reader the zest to dive head-first into the habits, one must first balance production and production capabilities (P/PC). This concept is encapsulated by Covey through the famous Aesop's Fable about the goose and the golden eggs. The fable describes a poor farmer who – by chance – finds

a goose that yields golden eggs, thus providing riches and immense wealth to the farmer. However, his avarice gets the better of him when he decides to kill the goose and find out if it contains a limitless supply of golden eggs. He found none and was also no longer able to get more eggs. Hence, it is nec-



essary we grant ourselves enough time and patience to master each habit one by one, rather than returning to a slump after a week of adherence to an immensely rigid and impractical routine.

I believe the distinctive quality of the book that has engrossed millions of people across the globe is Stephen Covey's intuitive style of writing. Philosophy interspersed with humour and authentic, concrete examples render a sense of relatability and immersion, making the reader feel as if they are reading about aspects of their own life.

Indubitably, I would highly recommend the book to anyone. Even if you are not a bibliophile or have never perused philosophy books, this would be the perfect beginner's guide, and I hope the habits leave a lasting impression on your mind, just as they did for me.



Quadrant of priorities

COMMENT

» READ THE OPEN LETTER
TAKE A STAND AGAINST IMPERIAL AND
ITS MURKY CONNECTIONS TO 'KILLER
ROBOT' TECHNOLOGY

Edited by: KHAMA GUNDE

page 31

Autonomous Killer Robots: Be Very Afraid

► *The technology of warfare has always been evolving, but institutions are pushing boundaries that should remain untouched... and Imperial College is one of them.*

Khama Gunde
Comment Editor



A wise man once said “Your scientists were so preoccupied with whether or not they could, they didn’t stop to think if they should.”

Given the content of this article, you may be thinking that I should have opened with a quote from the *Terminator* franchise instead of *Jurassic Park*, but I chose that quote because it succinctly captures the conclusion of my article.

Lethal Autonomous Weapons (LAWs), or Killer Robots if you wish, are not currently in use but countries across the globe are developing software and robotics for LAWs.

Technology has been advancing the nature of warfare for centuries; unmanned combat drones are an example of advanced weapons that remove the human from the battlefield. Although a human is still ‘in the loop’, as they call it, such technology is still subject to scrutiny and unease despite some of the strategic benefits. In fact I was recently watching a *Jubilee* discussion on YouTube between USA war veterans,

and a question cropped up on the use of drones; all but two veterans were clearly hesitant about their use. Of the two who were ‘for’ drone warfare, one veteran passionately argued that the potential to save soldiers from psychological and physical harm outweighed his concerns. So if wars are inevitable for the future, should humans remain on the frontlines when AI could make killing targets more efficient?

Regardless of the supposed benefits, I believe that LAWs have no place in our future. It is unwise to hand the ‘decision to kill’ over to machines that only see humans as data, and one can only hope that such weapons wouldn’t be used outside of combat or against civilians. Furthermore, I do not believe that distancing ourselves from war by replacing humans with robots will act as a deterrent to conflict in any way - I think it would do the opposite.

There are many valid reasons why LAWs should not be used, with the Campaign to Stop Killer Robots (CSKR) summarising the consequences of LAWs implementation as follows: Digital dehumanisation, algorithmic biases, loss of meaningful human control, lack of



Photo credits: Pixabay on Pexels

Autonomous weapons remove the human behind the weapon, but is this a wise choice?

human judgement and understanding, lack of accountability, inability to explain what happened or why, lowering the threshold of war, and a destabilising arms race.

CSKR is a coalition of NGO’s across the world who seek to put an international ban on LAWs before they are fully developed. They reached out to Felix with the findings that there are research projects running at Imperial College London that may be used in LAWs systems. Unsurprisingly, there is very little transparency regarding these projects and a FOI request made by CSKR was rejected. Mariana Canto is a CSKR campaigner who wrote an article on Imperial’s links to LAWs, her article is available via the adjacent QR code.

I believe many of us came to Imperial because we were attracted by the idea of studying at an institution that pushes the boundaries within STEM. But for the sake of our future, we need to stop right now and ask whether we fully comprehend the implications of such ‘innovation’.

TO HOLD IMPERIAL ACCOUNTABLE, PLEASE READ THE OPEN LETTER WRITTEN BY CSKR ON THE NEXT PAGE.

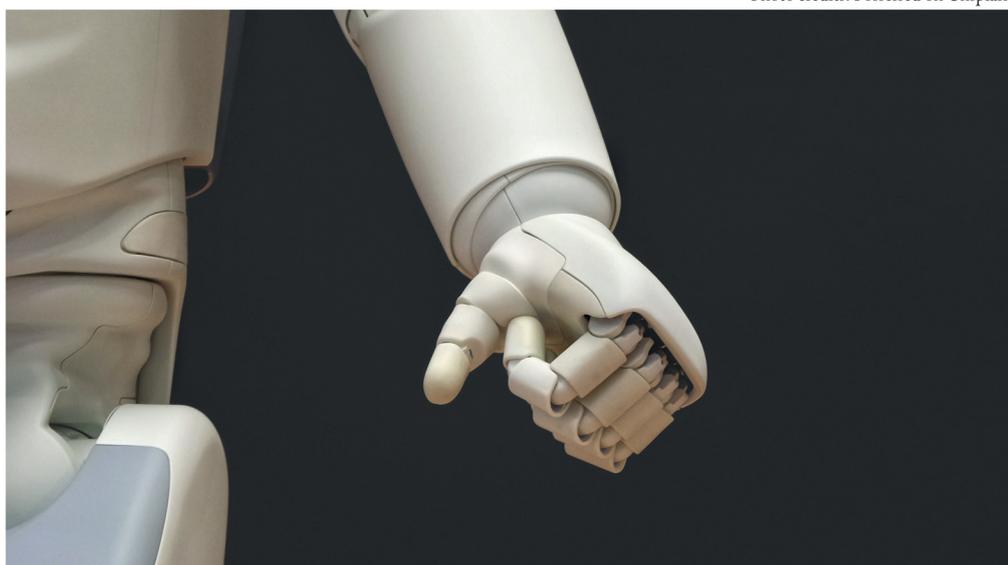
WANT TO KNOW MORE ABOUT CSKR AND IMPERIAL’S MURKY LINKS TO ‘KILLER ROBOT’ TECH?
Scan the QR code below to read a detailed article by Fellow at the United Nations Association-UK and CSKR campaigner, Mariana Canto, entitled: *Hasta la vista humanity: Are we developing killer robots?*



SCAN ME

Scan to read a PDF of Canto’s article

Photo credits: Possessed on Unsplash



Are we putting too much power into the hands of robots?

COMMENT

Sign the Open Letter

Dear College Leaders,
It is with great concern that we, the undersigned, are writing to you in order to ask Imperial College London to take a stand and ensure that the society we live in is one in which human life is valued – not quantified. We write to you to express our deep apprehension with regards to the role of Imperial in furthering the development of lethal autonomous weapons (LAWs) systems, also known as “killer robots”.

Imperial is considered a world-class research university that has as one of its main missions to benefit society through excellence in science, engineering, medicine and business. Moreover, in its 2020-2025 Strategy, it was stated that the institution would be focusing on “finding appropriate partners and establishing valuable and impactful collaborations” and “underpin this through ethical principles of engagement.” Imperial also highlighted as one of its main goals for the next years, the importance of “finding new ways to collaborate and to drive positive real-world outcomes.” Based on these goals established by Imperial, it is expected that the institution will take a stand against the development of technologies that diminish the importance of human life by delegating the decision to take a life to a machine.

The lack of moral reasoning necessary to evaluate the proportionality of an attack, where human life is reduced to merely a factor within a predetermined computation is worrying. The Imperial College London also affirms in its official Strategy that it will “create platforms for research, capacity-building and knowledge exchange to achieve social and economic goals, including tackling the UN Sustainable Development Goals”. Therefore, it is important to emphasise that one of the 17 UN SDGs is the promotion of “peaceful and inclusive societies for sustainable development” and that the UN Secretary General has described the use of autonomous systems to take human life as “morally repugnant” as a machine is incapable of exercising discretion, and lacks the compassion and empathy needed to make morally complex decisions. Lethal autonomous weapons are incompatible with international human rights law, namely the Right to Life (‘no one shall be arbitrarily deprived of life’), the Right to a Remedy and Reparation, and the principle of human dignity.

It is of utmost importance that Imperial College London consider the risks of this lethal technology that is being developed with the aid of Imperial’s research centres. It is highly likely that, in the near future, autonomous weapons will expand into public life, beyond war zones. Autonomous weapons could be used for border control, policing, and upholding oppressive structures and regimes. Therefore, besides loss of meaningful human control, algorithmic biases and the inability of explaining the reasoning behind an automated decision will put not only men of colour, of ‘military age’ in danger but also civilian groups of people of colour, women and non-binary people. Both manners of mistakes compound structural biases.

An investigation conducted by the Stop Killer Robots campaign has found that the Imperial College London is contributing to the development of lethal autonomous weapons through military-funded research collaborations, close relationships with commercial LAWs developers, and through the encouragement of student recruitment to LAWs developers. Findings of particular concern include multiple ongoing projects developing LAWs technologies, partnered with the defence industry and its collaborators. Projects based in Centres for Doctoral Training and other laboratories at Imperial are developing sensor technologies and Unmanned Aerial Vehicles (UAVs) in collaboration with well-known LAWs companies such as BAE Systems and Rolls-Royce.

These activities amount to the active endorsement of lethal autonomous weapons systems by Imperial College London, demonstrating a complete disregard for human rights and dignity. We urge College to take substantial action to prevent the further advancement of lethal autonomous weapons capabilities. We therefore call upon Imperial to:

1. **Cease all activities directly contributing to the development of lethal autonomous weapons. The College must release a statement acknowledging the harms it has enabled through its research activities into LAWs technologies, committing to no further activities contributing to the development of LAWs. This must be established in formal policy.**
2. **Cease the encouragement of student recruitment to LAWs developers. The University must not allow LAWs developers access to students for the purposes of recruitment, nor must it allow student engagement with LAWs developers through workshops, talks or research projects.**
3. **Take proactive measures to ensure researchers and students are made aware of all possible applications of their research. Imperial must set out concrete plans to improve awareness around the potentially harmful uses of its members’ research.**
4. **Take proactive measures to safeguard against the unethical usage of its members’ research output.**
5. **Publicly endorse a ban on lethal autonomous weapons by signing the Future of Life Pledge. Found online by searching: Open Letter on Autonomous Weapons - Future of Life Institute**

More than 30 countries in the United Nations have explicitly endorsed the call for a ban on lethal autonomous weapons systems. Now is a timely moment for UK institutions to show support for this ban and urge the UK government to do the same. We demand Imperial College London accepts its responsibility for the role it has played in the development of lethal autonomous weapons, and instead use its influence to affect positive change with respect to human rights and dignity.

If you want to learn more or take further action, here are some options:

- Share this open letter across Imperial via emails/social media/word of mouth
- Attend an online CSKR workshop ran by CSKR campaigner Mariana Canto on Wednesday 15th December, sign up at the following Eventbrite link: <https://www.eventbrite.com/e/hasta-la-vista-humanity-am-i-developing-killer-robots-tickets-217733024337>
- Sign the Autonomous Weapons Pledge by the Future of Life Institute linked in the QR Code to the right



SPORT

Imperial College at the Sheffield Judo Competition

**Nicolas Geiseler Toran Imperial Judo**

Saturday 4th December saw a team of four Imperial College students attend a kyu grade (brown belt and under) Judo competition hosted by Sheffield University's Judo club. The trip was, all in all, a success. Three of our best - Alex Manlove, Kevin Nguyen, and Jed Cheung took home a silver, a gold, and another gold medal respectively. The event did not only have value in the glory of success, it was also a wonderful opportunity to spectate a wide range of judo styles you may not see in the club, from the momentous, powerful throws of the heavyweight divisions, to the quick, snappy movements of the lightweights.



**JED WENT INTO
KILLER MODE,
WINNING ALL OF
HIS MATCHES IN A
SHORT TIME**

On the topic of divisions, the event entailed more challenges than usual for Kevin, who had no one else in his weight division and had to be moved up to a heavier one. Evidently it didn't faze him. Jed went into killer mode, winning all of his matches in a short time. Alex had the morale boosting force of popular support behind him, with many members of his home club cheering him on from the sidelines. Jed and I also made friends with a very nice competitor from the Royal Navy.

The event maintained a standard of COVID safety precautions, requiring all competitors to give proof of negative lateral flow or PCR tests, and encouraging mask use for the few spectators there were. If you're interested in learning the kinds of throws shown in this article's photos, you should drop by for a session at the club. Email us at judo@imperial.ac.uk, and see training details at [@icjudo](https://www.instagram.com/icjudo) on instagram.

