

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



# Net zero by 2040? It was sub-zero just this week!



Students wrap up indoors on Imperial's South Kensington campus as the College's temporary heating system fails to meet a surge in demand. Rolando Charles for *Felix*

## South Ken campus shivers as temporary heating system fails to meet surge in demand.

**Editor-in-Chief**  
**JAMIE JOHN**

**S**tudents studying for January exams battled chilly conditions this week as the South Kensington campus's temporary heating system failed to meet a surge in demand.

Many were forced to wear coats at their desks, and some struggled to write and type in the cold.

The temporary heating arrangement has been operational for the past few months, as the College transitions to a new boiler system in order to meet its net- [→ READ MORE ON 7](#)

## Cut ties with arms companies, IC urged



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### NEWS



#### President Brady's tidy wages

He earns over nine times the average Imperial employee.

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How a man colouring in the counties of England on a map paved the way for computer-assisted proofs.

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

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

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

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

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

Signed by:  
**JAMIE JOHN**  
Editor-in-Chief

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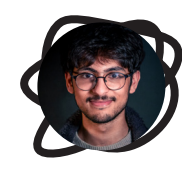
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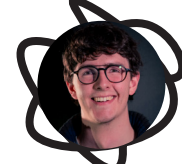
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# JPR Williams: St Mary's alum and Wales rugby legend passes away

**J**ohn Peter Rhys Williams died last week at the age of 74. Williams was an alumnus of St Mary's Hospital Medical School, which merged with Imperial College in 1988.

He represented Wales during its golden era of rugby in the 1970s, and is one of only six Welsh players to have won three Grand Slams. In 1977, he was awarded the MBE for services to rugby.

Williams studied Medicine at St Mary's and qualified as a physician in 1973. He won his first cap for Wales in 1969, aged 19, and continued to play international rugby union. He retired in 1981, having earned 55 caps for Wales, including five as captain.

He pursued his career in medicine, and in 1986, was appointed a consultant in trauma and orthopaedic surgery at the Princess of Wales Hospital, in Mid Glamorgan.

'I spent half my life breaking bones on the rugby field, then the other half putting them back together in the operating theatre,' he wrote in his autobiography.

Williams was also a prolific youth tennis player, winning the 1966 British Junior title at the All-England Lawn Tennis and Croquet Club in

Wimbledon, and beating David Lloyd, who went on to establish the eponymous chain of British health clubs.

Since 2003, an annual varsity match has been played at Imperial in his honour. The JPR Williams Cup is played between Imperial Medicals RFC, the medical school's team, and the Imperial College rugby team, with the winner awarded the JPR Williams Trophy.

Imperial Medicals RFC Club Captain Charlie Norrish said last week:

'As the most distinguished alumnus of our club, we have all been deeply saddened by the news of JPR Williams' death. We are all so proud to have been part of this club and to have had a connection with him through it.

'We will keep both his name and his legacy a strong part of this club, and continue to battle for the JPR Williams Trophy each year in his honour. We will be observing a minute's silence for JPR in our next home fixture against Canterbury, and we hope many will join us in remembering him and his life and work.'

**Right: Williams addresses the crowd at the 2009 JPR Williams Cup rugby match. Ian Gillet for Imperial College London**



# President Hugh Brady earns over 9x the average Imperial employee

## Hugh Brady's salary, tuition fee income increases, and more in Imperial's annual report.

**Editor-in-Chief**  
**JAMIE JOHN**

New Imperial President Hugh Brady earns markedly less than his predecessor Alice Gast – but still over nine times as much as the median employee, according to Imperial's latest annual report. The report also reveals that a rise in the proportion of students paying international fees drove an 8.8% increase in tuition fee income.

Brady saw his total remuneration rise

to £476,000 last academic year, an increase of one-fifth on what he earned in 2021/22, when he was Bristol University's Vice-Chancellor.

His pay and pensions exceeded that of his predecessor Gast by £31,000, but his total remuneration – which prices in the provision of College accommodation – fell £238,000 short of Gast's (see chart below).

Gast lived in a College residence, and the taxable benefit of the accommodation, valued at £153,000, was counted towards her income. Furthermore, Imperial decided to pay the associated tax charge – which amounted to £115,000 – on her behalf, and this was also considered part of her remuneration.

Gast's income consistently made national headlines during her tenure as President. It came under increased scrutiny when an independent report found that she had bullied members of Imperial staff, and 'contributed to a culture' that involved 'favouritism', 'exclusion', and 'the making of disparaging comments about others'.

Brady has elected to live outside of College accommodation. He receives a hous-

ing allowance of £76,000, but this falls far short of the College residence provision that Gast received.

### Interest rate hikes grew Imperial's cash balance

CFO Dr Tony Lawrence writes that the College is 'maintaining a sound financial position'.

'Our research order book has never been larger and our courses remain in high demand.'

The College benefited from interest rate hikes: nearly all of its debt is on fixed-rate terms, and the higher rates meant that its cash balances grew more than it had anticipated.

Lawrence says, however, that 'the rise in inflation that drove [rates] higher in the first place has been unwelcome and challenging to manage'. He acknowledges that 'higher prices adversely impacted the cost of living of all our staff and students, and led to a jump in our operating costs.'

income from home student fees – which are capped at £9,250 – fell by £4.7m. But it says that 'this was more than offset by the £33.3m of additional tuition fee income from overseas students'.

The total student population grew by only 1%, meaning that the rise in income is largely a consequence of fee increases levied on international students, and an increase in the proportion of students paying international fees.

EU students once paid home fees, but those who started in 2021/22 have been charged international fees – which are at the discretion of individual universities, and have risen dramatically in recent years.

Students from China are still the largest group aside from home students, continuing to represent one in every five Imperial students.

And hostile government rhetoric and policy (see bottom of page

6) only began in May

2023, so did not

affect Imperial's

overseas student

figures for

2022/23. The num-

ber of Indian

students surged by

17.5% to 832,

though Indians

still comprise only

3.5% of the student

population.

The report says

Imperial is contin-

uing its 'efforts to

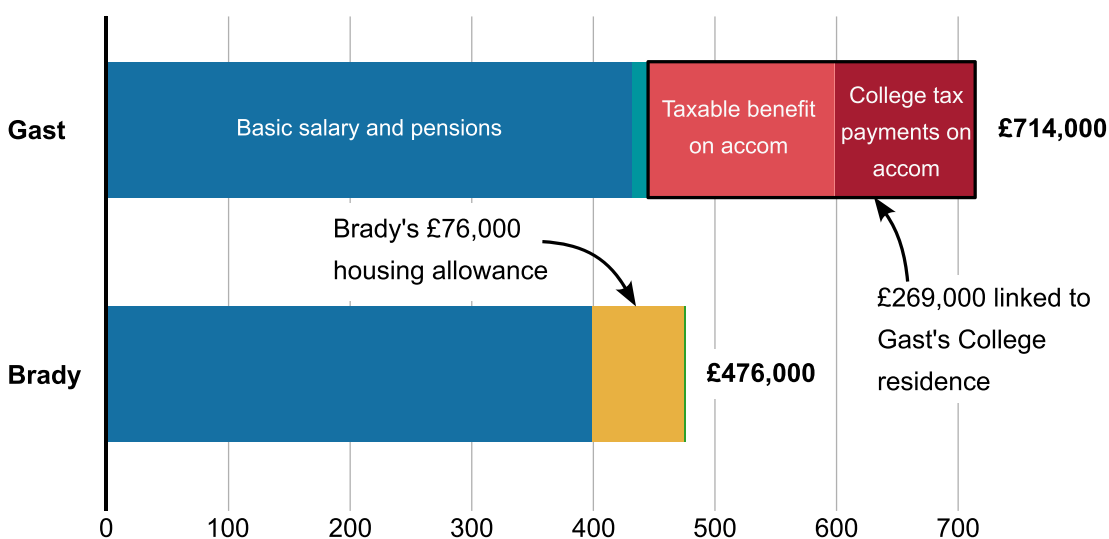
diversify overseas

student body to

reduce the reliance on individual markets.' The remark comes in the wake of several reports, including one from England's higher education regulator that warns UK universities' 'over-reliance' on tuition fees from China is a 'vulnerability'.

### Hugh Brady's decision to live outside of College accommodation keeps his income well below Alice Gast's

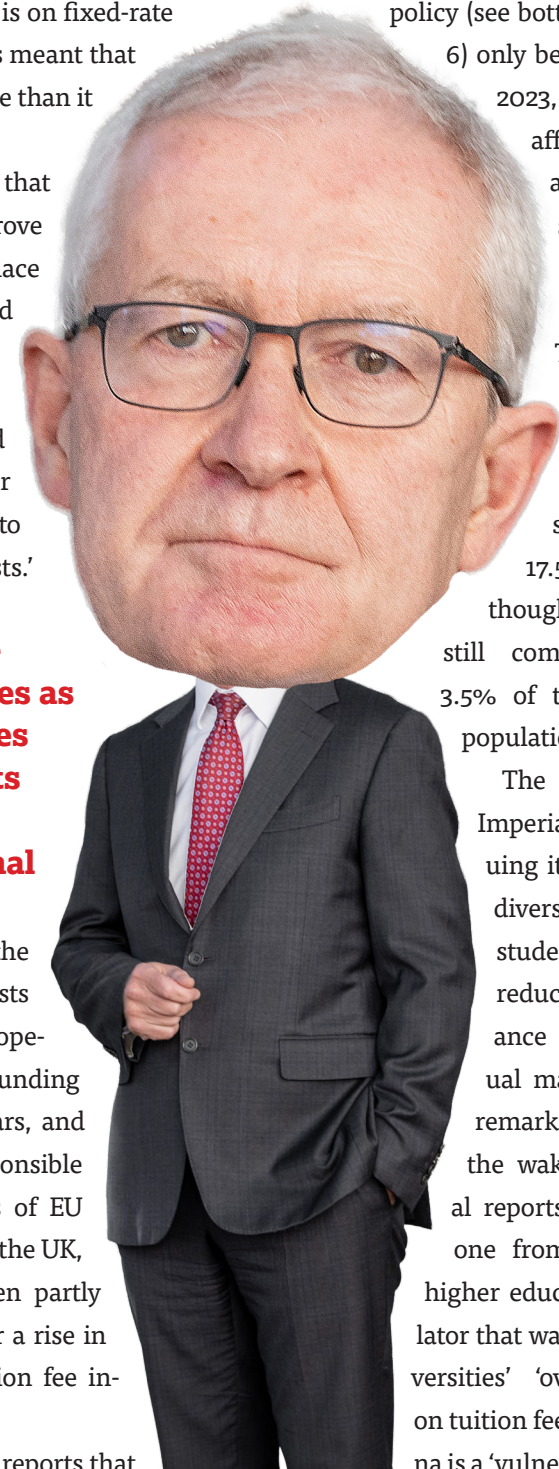
President's remuneration, Gast (2021/22) vs Brady (2022/23), £'000



### Tuition fee income rises as Brexit forces EU students to pay international fees

Brexit cut the UK's scientists off from European Horizons funding for several years, and has been responsible for an exodus of EU students from the UK, but it has been partly responsible for a rise in Imperial's tuition fee income.

The College reports that



# Cut ties with weapons companies, students urge Imperial

The activists argue that Imperial's relationships with Caterpillar Inc., BAE Systems, and Rolls-Royce make it complicit in 'genocide'.

**Editor-in-Chief**  
**JAMIE JOHN**

Students have called on Imperial to cut ties with weapons companies that they allege have fuelled 'a campaign of genocide by the Israeli Defence Forces [IDF] in Gaza'.

The group – who call themselves 'ICL Action for Palestine' – have obtained data on income the College receives from arms trade companies using Freedom of Information requests. They have

**News Writer**  
**MOHAMMAD MAJLISI**

highlighted Imperial's ties to three of these enterprises: Caterpillar Inc., BAE Systems, and Rolls-Royce.

Caterpillar, the world's largest manufacturer of construction equipment, has attracted the ire of human rights groups such as Amnesty International for supplying the IDF with DC9 armoured bulldozers, which the IDF has used to bulldoze Palestinian homes.

In an open letter addressed to Imperial, the students argue that 'Imperial research fuels Caterpillar,' citing £336,000 Imperial's Sustainable Energy Technology and Turbomachinery Lab (SETTL) has accepted from the manufacturer to establish the Caterpillar Innovation and Research Centre.

Alongside Caterpillar, they criticise Imperial's relationships with BAE Systems and Rolls-Royce, British defence companies that have designed parts of the Lockheed Martin F-35 Lightning II, a stealth combat jet that the IDF has deployed in the Gaza Strip.

'I want us to be acutely aware of the real impact of this,' said a student activist, addressing a crowd of around a dozen at a protest on Wednesday. 'We as students have a real responsibility to care about this – our money is being used to fund this, and we are complicit in it.'

The group of 20 to 25 students, staff, and external protestors chanted "Imperial College management, shame on you," and "From the river to the sea, Palestine shall be free". They waved Palestinian flags and held banners, one of which read: 'Kick out Caterpillar, Stop Israel's Gaza Genocide'.

"It's important for me to show that we stand by the Palestinian people and feel their pain," said a Physics undergraduate participating in the protest. "We want to expose Imperial management for their

cooperation with companies that are helping commit this mass murder."

"We want a free Palestine, we want their suffering to stop."

Former Imperial College Union President Piers Corbyn – the brother of former Labour leader Jeremy Corbyn – was present at the protest.

ICL Action for Palestine said that it had not invited Corbyn, an anti-vaccine activist and conspiracy theorist, to the protest. They added that his views do not 'align with the values of our actions and work.'

There is no indication that Imperial has broken the law in its relationships with Caterpillar, BAE Systems, or Rolls-Royce.

The College's research relationships are governed by its Ethics Code and its Relationship Review Policy. The latter forbids relationships that violate 'international conventions on human rights'.

Responding to the open letter, BAE Systems and Rolls-Royce both said that they abide by defence export controls.

A BAE Systems spokesperson said: "We're horrified by the situation in Israel and Gaza and the devastating impact it's having on civilians in the region and we hope it can be resolved as soon as possible. We respect everyone's right to protest peacefully. We operate under the tightest regulation and comply fully with all applicable defence export controls, which are subject to ongoing assessment."

A spokesperson for Rolls-Royce said: "Rolls-Royce supports the UK Government and its allies in providing power solutions for defence purposes. In doing so, we abide by all applicable export control and sanction laws. In the UK, those regulations demand that exports are considered against a range of criteria including relevant international law."

Caterpillar did not respond to a request for comment, but in 2012, it responded to similar criticism by telling the BBC that it 'shares the world's concern over unrest in the Middle East and certainly [has] compassion for all those affected by political strife'.

Nevertheless, it said it has "neither the legal right nor the means to police individual use of its equipment."



Students, staff and members of the public protest Imperial's ties with Caterpillar, BAE Systems and Rolls-Royce. Inset: The protestors apologised after Piers Corbyn, Imperial alum, anti-vaxxer and brother of former Labour leader Jeremy, made an appearance at Wednesday's protest. Walt Gao for Felix

# New dean for IC Business School

**Professor Peter Todd, former dean of HEC Paris, will join the College in September.**

**Editor-in-Chief  
JAMIE JOHN**

**P**rofessor Peter Todd is to succeed Interim Dean Professor Franklin Allen as the head of Imperial College Business School.

Todd, a Canadian, became the first non-French dean of HEC Paris in 2015, but stepped down in 2020 to focus on recovering from a benign brain tumour. He will take up his position at Imperial in September 2024, serving a five-year term.

“I am thrilled to be joining Imperial College Business School,” he said, adding that the College’s expertise

across science, engineering and medicine mean it is “uniquely positioned” to tackle society’s biggest problems – “climate and sustainability, health and wellness, AI and autonomous technology, income inequality, diversity and inclusion, and building resilient societies”.

The 61-year-old’s appointment concludes Imperial’s search for a new dean, after Professor Francisco Veloso left in April 2023 to join INSEAD, the world-renowned European business school.

Todd holds a PhD in business administration from the Sauder School of Business at the University of British Columbia, and completed his bachelor’s degree in commerce, finance, and information systems at McGill University.

“Peter brings a wealth of experience of leading globally oriented, internationally prominent business schools in Europe and North America,” said Professor Ian Walmsley, Provost of Imperial College London.

“His international outlook, academic reputation and understanding of high-profile business schools will greatly enhance the Business School’s ambitions to capitalise on its position within the university.”



Professor Peter Todd said he was “thrilled to be joining Imperial”. He will succeed Interim Dean Franklin Allen in September. École Polytechnique, CC BY-SA 2.0

## UK immigration rhetoric threatens university finances, warns sector rep

**Editor-in-Chief  
JAMIE JOHN**

**A** fall in international student numbers is putting large numbers of universities at risk of falling into deficit, warned Vivienne Stern, the chief executive of Universities UK (UUK), which represents 142 higher-education institutions.

Stern said that recent government

rhetoric was deterring overseas students from studying in Britain.

“If they want to cool things down, that’s one thing, but it seems to me that through a combination of rhetoric, which is off-putting, and policy changes... [they have] really turned a whole bunch of people off that would otherwise have come to the UK,” she told the *Financial Times*.

Her comments followed the release of a PwC study, commissioned by UUK, that

found up to 80% of higher education providers could fall into deficit over the coming years if there is ‘a gradual or sudden drop in international student numbers’.

Tuition fees for domestic students have remained capped at £9,250 since 2017 – a decline in real terms. This has forced universities to look elsewhere for income, and many have recruited large numbers of overseas students. Non-EU students now account for nearly 20% of

income across the sector.

But the government has promised a raft of restrictions on international students, in order to reduce record-high net migration figures.

Since the start of this year, new overseas students have been unable to bring family members to the UK, and in December, the Home Office announced it was reviewing the ‘graduate visa route’, which allows international students to remain in the UK for two years after graduation.

“The government needs to be very careful: we could end up with, from a policy point of view, what I would consider a serious overcorrection,” said Stern.

## → FROM P. 1: HEATING FAILURES

zero-by-2040 targets.

Imperial says that to address this week's problems, it is distributing portable heaters and running its heating system 'around the clock'.

Not every building has been affected equally, but *Felix* has heard from students in the Royal School of Mines, Roderick Hill Building, Sir Ernst Chain Building, and the Abdus Salam Library, who are furious at the College's response.

A departmental representative told *Felix* that he had heard reports of students 'physically shivering' as they prepared for upcoming assessments. 'This is just unneeded stress for first years already worried about their first exams,' he said.

Students in the Royal School of Mines complained that they 'have literally been told to wrap up warm when we're on campus as a solution'. It 'is so cold that our teeth are chattering and the labs are too cold for 3D printing people's MEng projects,' said Sophie, a Materials student.

Sophie and a peer independently complained that the only portable heater they could see in the building was in a professor's office. 'Where are our tuition

fees going please?' she asked.

After a mild start to winter last term, temperatures have plummeted, and in the past week have fallen below zero.

The South Kensington campus is in the midst of replacing its old steam-based heating network, as part of the wider effort to improve energy efficiency and meet net-zero targets by 2040.

The temporary boiler network that it has been reliant on for the past few months encounters issues when outdoor temperatures fall below 5°C.

The College says that older buildings are especially vulnerable, and has urged students to report low temperatures to the Customer Services Centre.

Meanwhile at Imperial's Hammersmith campus, the Commonwealth Building, and Wolfson Education Centre have been closed after a suspected leak caused a water outage.

In an email sent on Tuesday, Chief Operating Officer Robert Kerse thanked staff and students for their 'patience while we address various heating and water supply issues across campus.

'Please accept my apologies for the disruption these are causing to your work and studies,' he said.



One of three new boilers Imperial is installing as part of its effort to reach net zero by 2040. Imperial College London

# Imperial spends up to £4m per year on scholarships requiring Xi Jinping support

## New estimate based on FOI revealing Imperial is host to 62 scholars this year.

**Editor-in-Chief**  
**JAMIE JOHN**

Imperial spends between £2m and £4m per year on a doctoral scholarship programme administered by the Chinese Scholarship Council (CSC), *Felix* has estimated, on the basis of a Freedom of Information (FOI) request.

Documents obtained by UK-China Transparency (UKCT) last term revealed that students on the CSC programme must 'have a correct worldview' and 'thoroughly implement Xi Jinping Thought'.

The FOI response shows there are 62 students currently receiving the scholarships, and previous estimates by this paper suggest Imperial spends up to £65,000 per head.

The College refused to reveal the proportion of the scholarship funded by the CSC, saying this would 'prejudice Imperial College's and CSC's commercial interests'.

The Freedom of Information Act allows institutions to reject requests on the basis of commercial interests, but says they must consider the public interest in disclosure. Imperial says it is 'unable to identify any public interest factors that would require disclosure'.

The CSC has the final say on which candidates are selected for the scholarships, and stipulates that a 'rigorous review of the applicant's political ideology' must be performed, in its 2023 selection guidelines.

A total of 37 UK universities have partnerships with the CSC, but many of those pay only for tuition fees, suggests a report by Civitas, while the CSC funds the maintenance allowance. Imperial pays for both tuition fees and a maintenance allowance.

A Universities UK spokesperson said: 'Universities take their security responsibilities extremely seriously. Any research partnerships and collaborations must comply with stringent regulations, including approval through the UK's export control regime where appropriate.'

A spokesperson for the Russell Group of universities said: 'Every applicant from China who wants to study for a higher degree in a sensitive area must pass enhanced security checks through the Government's academic technology approval scheme before they come to the UK.'

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## SCIENCE

# From maps to mathematics: the Four-Colour theorem

Delving into the origins of the first major computer assisted proof in mathematics.

Science Writer  
JOHN ZOU

In 1852, a letter was sent from Augustus De Morgan, a professor of mathematics, to his friend Rowan Hamilton. It describes a simple hypothesis which would take the field of mathematics over 100 years to finally prove. The theorem states: every map on a plane can be coloured using four colours such that two regions that share an edge cannot be the same colour. This is now known as the ‘four-colour theorem’.

## Origins: colouring in the counties of England

The theorem was inspired by a man who tried to colour in the counties of England, and believed he had done it in just four colours. He discussed this with his brother, who mentioned it to his lecturer, Augustus De Morgan, who then shared it further afield. The problem caught the eye of many mathematicians, and, although it is easy to describe, it turns out that the proof is surprisingly challenging. Even when a solution was finally published in 1976, it turned out to be a rather unsatisfying one, as it couldn’t easily be checked by other mathematicians and instead relied on a computer program to ensure its validity.

In 1879, Alfred Kempe attempted a proof by contradiction, which he started with the assumption that the four-colour theorem is false. This technique can also be used to prove the six-colour theorem, whereby one assumes that a map can’t be coloured using six colours and end up at a contradiction. Kempe published this proof and mathematicians accepted it, until ten years later,

when Percy Heawood showed that Kempe’s proof was false. Although Heawood couldn’t prove the four-colour theorem himself, he managed to prove the five-colour theorem, and shifted the focus of the proof not to the regions themselves, but to the borders between them. Through this shift, in 1898, he was able to show that if the number of edges around each region is divisible by three, then the four-colour theorem holds.

## Graph theory

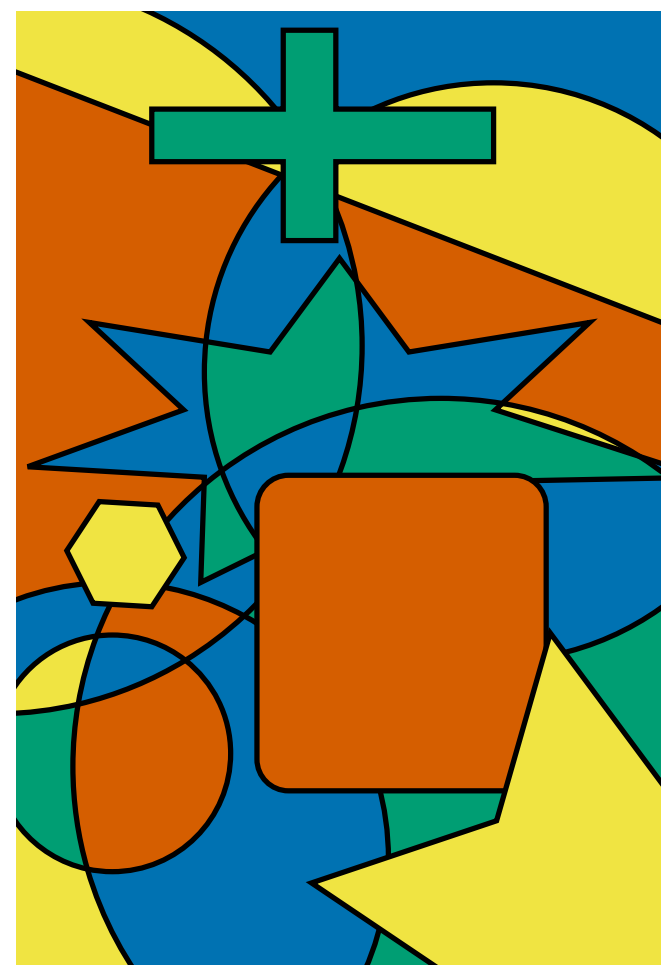
Later, the theorem was made more abstract by drawing each map into a graph, a 2D diagram made up of dots (known as nodes) and lines connecting them (known as edges). For the purpose of this problem, each node represented a region of the map that needed colouring in, while an edge connecting two dots meant the two regions had a common edge. Throughout the 20<sup>th</sup> century, mathematicians tried to reduce the graphs of maps down to special cases in order to simplify the problem.

Eventually, in 1976, it took two mathematicians at the University of Illinois – Kenneth Appel and Wolfgang Haken – to solve the problem. Reducing the number of maps to 1936 different configurations, they wrote an



**The four-colour theorem was one of the first significant mathematical theories to be proven with computer assistance.**

algorithm that worked in a similar fashion to Kempe’s proof, and checked each case using a computer. This algorithm showed that none of the configurations required five colours, thereby proving the four-colour theorem. Following this, the number of configurations that needed checking continued to be reduced, and by 1996, the number of cases needing to be checked had been reduced down to 633. The algorithm used to check each case also improved significantly, and an alternative proof was announced in 2001, but was never published.



A piece of artwork illustrating the four-colour theorem.  
Wikimedia Commons

## Unconventional methods

The four-colour theorem was one of the first significant mathematical theories to be proven using computer assistance. Hence, at the time it was not widely accepted, despite the proof being valid, and without flaws. However, many considered it to be inelegant because it was simply checking cases and didn’t provide a fundamental understanding as to why the theorem is true. One example of this is the Pythagorean theorem, which was proven simply by checking the angles of each possible right-angled triangle. Without this we wouldn’t understand why right-angled triangles behave the way they do.

Mathematicians wanted to find a fundamental reason why the four-colour theorem was true, and the computer-assisted proof simply failed to provide this kind of explanation.

While many didn’t like that the proof relied on a computer checking cases, traditional proofs all turned out to be faulty or flawed in one way or another. Hence, as time went on, people began to accept this proof, as well as computer-assisted proofs in general. In many ways, the proof of the four-colour theorem opened mathematics up to new methods and opportunities. Although computer proofs continue to make some mathematicians uncomfortable, it has nonetheless become a widely-used tool, and allows mathematics to advance alongside computer science and computer programming.

# ENVIRONMENT & SUSTAINABILITY FORUM

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## ENVIRONMENT

# Breaking down Imperial's 264,344 tonnes of pollution

**Environment Writer**  
**OSCAR MITCHAM**

In the 2021/22 academic year, Imperial College London emitted at least 264,344 tCO<sub>2</sub>e according to their 2022 Carbon Report. 17% of that is scope 1, 4% is scope 2, and the remaining 79% of Imperial's emissions are scope 3.

### Overview

Imperial uses combined heat and power (CHP) engines to produce most of its electricity and heat, rather than buying electricity and gas separately from the grid. This means scope 1 emissions are higher than expected and scope 2 emissions are lower. This makes it more useful to consider scope 1 & 2 emissions together in most cases.

Since 2018/19, Imperial's scope 1 & 2 emissions have not changed, which the Carbon Report calls 'making good progress' towards reducing emissions by 15% by 2025/26.

Since 2018/19, Imperial has seen a 12% increase in the number of Full Time Equivalent (FTE) staff and students and a 5% increase in estate size, so Imperial's emissions intensity when including either metric has fallen. While this does show a genuine effort to reduce emissions, the College only has another 2.5 years to meet their target, so they will likely need to significantly speed up emissions reductions.

Both 2020/21 and 2021/22 were affected by the COVID-19 pandemic, when we saw reductions in per FTE and per square metre intensities. Imperial increased

ventilation to reduce the chance of infection for those still working on campus. This meant they had to heat more air even though lectures were remote for some periods, which explains why we did not see a substantial decrease in emissions. Considering these years are the latest data, it is hard to reach strong conclusions about future emissions.

### Energy

The Carbon Report notes that 'CHP engines are a relatively low-carbon technology, and we would have been responsible for greater overall carbon emissions had we raised heat in local gas boilers in each building and imported our electricity from the grid.' However, the data is now inconclusive. In 2015/16 the College's CHP engines were being replaced, so they generated no power. Despite this, the scope 1 & 2 emissions were about the

## Terminology breakdown

tCO<sub>2</sub>e: tonnes of carbon dioxide equivalent. By converting other gases like methane into the equivalent amount of CO<sub>2</sub> to have the same warming effect (usually over 100 years), we get one number which covers all greenhouse gas emissions.

Scope 1: Direct emissions, usually burning fuel on site.

Scope 2: Indirect emissions from purchased energy – all emissions from purchased energy (mostly electricity).

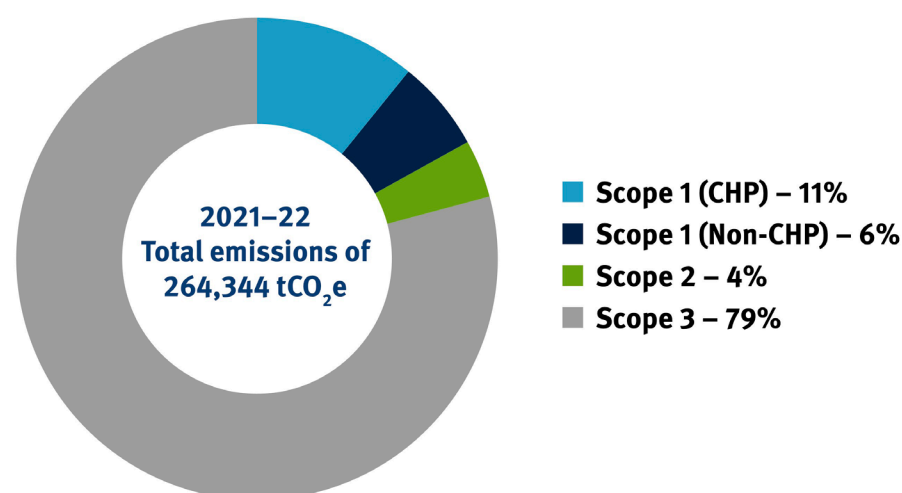
Scope 3: Other indirect emissions – other emissions, including emissions to produce goods you use.

same as other years. The Carbon Report acknowledges the need to move from CHP to renewable sources. When grid emissions factors were higher, CHP would have been cleaner than other options. As the grid continues to decarbonise, the case for CHP will get worse – especially as infrastructure is improved to make heat pumps more viable.

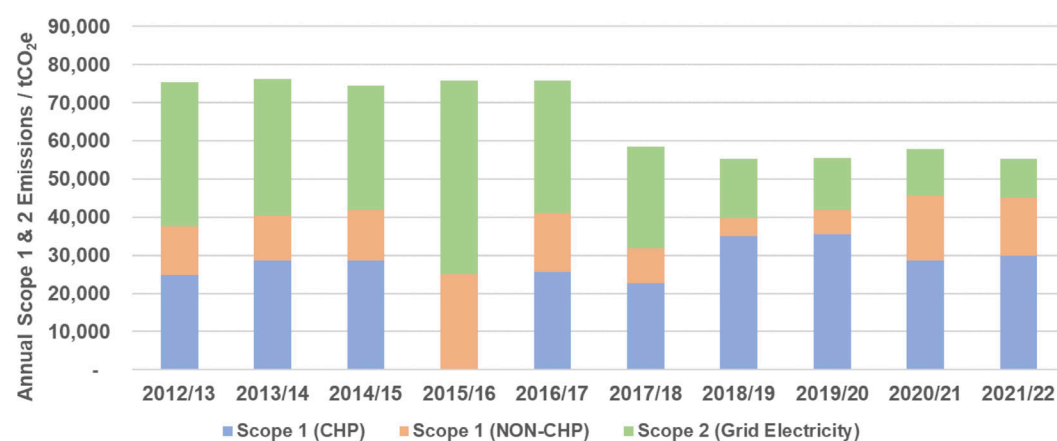
The balance between CHP and buying from the grid depends on the grid emissions factors (part of the UK grid greenhouse gas conversion factors), which we can expect to continue to reduce as the UK approaches its 2050 net zero commitment.

### Estates

The consulting firm Arup produced a plan for South Kensington Campus and White City Campus which aligns them with the College's 2040 net zero commit-



Imperial's emissions in 2021-22. 21% came from scopes 1 & 2, within which 11% from CHP, 6% from gas for heating, and 4% for grid electricity Imperial College London



Graph showing Imperial's total scope 1 and 2 emissions from 2012/13 to 2021/22. Emissions have remained roughly constant since 2018/19 Imperial College London

ment. Changes to the fabric of Imperial's estate, such as adding insulation, are limited by the age and variety of the buildings. According to Imperial College Estates Operations' *People, Places, Spaces* magazine, the plan is to move to a hybrid approach using air source heat pumps (ASHPs) with gas boilers as a backup for high load. This allows the buildings to use lower carbon heating options without making the fabric-first changes they might want to make.

Across campuses, Imperial is removing steam boilers and is trialling a heat pump. The College also has plans to retrofit buildings and introduce more LED lighting. On White City South Campus there will be no fossil gas and the sustainable materials should reduce the emissions of the Infrastructure Development Plan works by 28% compared to the initial proposals. White City Campus has also been designed to support more active travel, which is supported by requests from staff for more cycling and sustainable travel options.

The Arup strategy is in the process of being signed off by the Sustainability Strategy Committee, who should be able to share more details once this is complete.

### Food

Food systems account for 21-37% of global emissions according to the Intergovernmental Panel on Climate Change. Most of these are scope 3 emissions for Imperial, arising from raising and feeding the animals. Imperial's food purchases emitted 146 tCO<sub>2</sub>e in the 2022-23 financial year. This was a surprisingly small amount of the College's total emissions but hopefully food system emissions will be disclosed in more detail in future sustainability reports.

Imperial's Sustainable Food and Drink Policy sets out targets in line with their 2021-26 Sustainability Strategy. Most notably, the policy sets a target to reduce beef 35% annually until no beef is served in 2025/26, and lamb in line with that. Beef herds emit 99 kgCO<sub>2</sub>e/kg of beef and lamb emits 40 kgCO<sub>2</sub>e/kg, making them the two highest emissions intensities

among major foods. Meat, poultry, and offal cover about 35% of Imperial's food emissions – so policies here are significant.

According to Sustainability Strategy Director Harriet Wallace, Imperial's targets are hopefully made easier to achieve by the fact that around 80% of students are willing to take up more of the sustainable food and drink options on offer.

### Scope 3

Wallace presented at a recent MRC seminar some more details on Imperial's scope 3 emissions. The indicative breakdown of scope 3, which is 79% of Imperial's total, is:

- 30% - ICT goods and services
- 20% - Lab purchases
- 20% - Business services
- 15% - Capital expenditure (incl. lab kit)
- 7% - Business travel

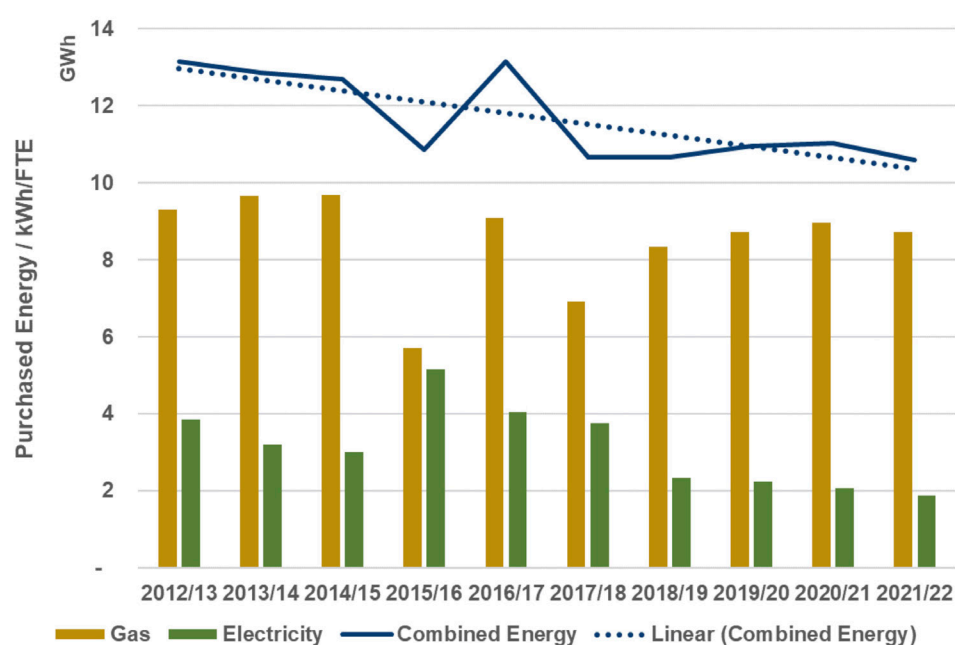
Of the ICT footprint, around 8,000 tCO<sub>2</sub>e is from purchasing equipment and the other roughly 20,000 tCO<sub>2</sub>e

is from software and associated servers. The electricity required to run equipment usually falls under scope 2 emissions, so Imperial is checking they have avoided double counting here.

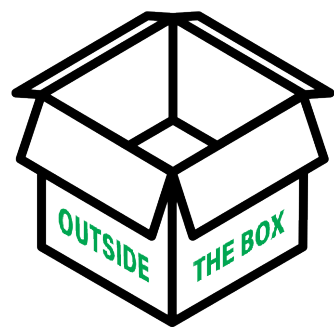
Of the 7% of scope 3 emissions attributed to business travel, 95% comes from air travel. Imperial has committed to reducing emissions from air travel per person by 25% by 2026 relative to 2018/19. The College also recognises the importance of climate conscious travel – meeting online where possible and taking trains where it is not. Students and staff recognise the importance of this too, with over 80% saying they would be willing to adopt a more climate-conscious approach to travel.

Scope 3 is by far the most difficult scope to track since it involves all the emissions created by products and services bought. Imperial is still working on calculating their scope 3 emissions, which is probably why we do not have historical data or many commitments here yet. This year Imperial came 98th in the People & Planet University League – scoring 50% in environmental policy, 25% in carbon management, and 33% in carbon reduction. This score puts the College at the very bottom of 2:2 class universities. By comparison, King's College London came 5th overall – receiving 100% in environmental policy, 80% in carbon management, and 78% in carbon reduction. Clearly we have a long way left to go.

I am impressed by the rigour and care being taken by Imperial when it comes to calculating their emissions. The College has set several ambitious targets and I am excited to see them being met. Sustainability work is always subject to scrutiny and we will only help by enthusiastically continuing to push for more ambitious action.

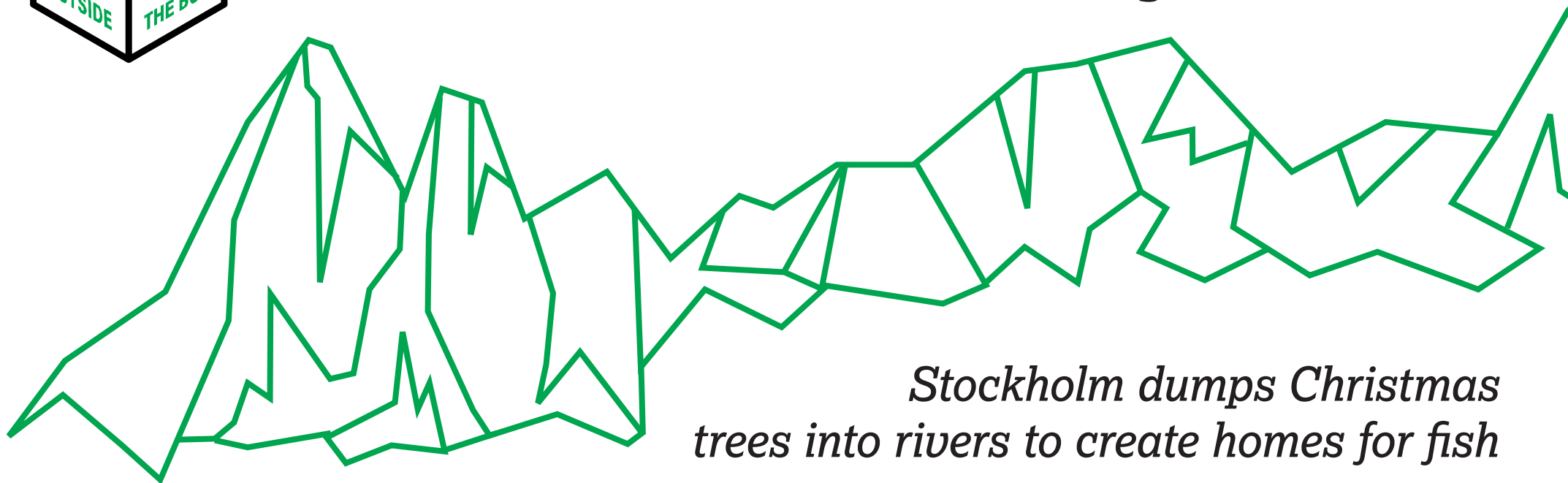


Graph showing purchased electricity per full time staff and student equivalent from 2012/13-2021/22. Total energy purchasing has plateaued despite growth in full-time equivalent students and staff Imperial College London



# Sustainability in Scandinavia

## Environmental news from the Arctic regions



### *Stockholm dumps Christmas trees into rivers to create homes for fish*

Since 2016, Stockholm has been throwing its used Christmas trees into its lakes and rivers to create habitats for fish, in a practice begun by the national sport fishing association Sportfiskarna, in collaboration with the Worldwide Fund for Nature (WWF). Using entirely biodegradable materials, several trees are tied together in bunches then dropped into local bodies of water such as Lake Mälaren, where they sink to the bot-

tom, weighted down with bags of stones. There, these pine trees sink and become makeshift reefs, providing spawning grounds and shelter for aquatic life – particularly salmon and trout, which are popular among local anglers.

Lake Mälaren and other rivers in Sweden have been damaged by the dredging needed to allow large cargo and cruise ships to pass through. This creative solution for habitat restoration gives a second life to the numerous Christmas trees that would otherwise end up in

landfills or be incinerated.

Students might have seen the many Christmas-tree graveyards littering the streets of London in the past few weeks; perhaps these could be revitalised in the same way as the Swedish trees are, finding a new home on the Thames riverbed. However, citizens mustn't go around dumping their trees in their nearest body of water. The process is a controlled one, carefully executed with oversight from the city council and the help of experts from WWF and the Swedish Anglers Association.

### *Norway passes harrowing deep sea mining bill*

On Tuesday 9th January, the Norwegian government voted in a bill that approves deep-sea mining (DSM) activities in the open Arctic waters near to the country. This makes them the first country in the world to allow the commercialisation of this practice in domestic waters, despite warnings about its likely impact on the exploited marine areas.

DSM is the harvesting of metal ores from the deep seabed to extract useful metals. The three main types of ore being targeted are polymetallic nodules, polymetallic sulphides, and cobalt crusts. These mineral deposits have formed over thousands of years, storing metals such as manganese, cobalt, copper, zinc, nickel, gold, and silver.

It has long been known that the deepest, most-untouched parts of the ocean contain these rare earth and precious metals, but interest in DSM has only recently resurfaced owing to demand for technologies that require these materials. Because many of these technologies, such as renewable-energy generation and lithium-ion batteries for electric vehicles, will aid the transition towards net-zero, this makes it easier for companies to jus-

tify any environmental damage caused by the practice.

The Norwegian government claims that it will implement this bill gradually while remaining conscientious of relevant environmental research, but a lot of study still needs to be done on the environmental impacts of DSM.

It is thought that the sweeping of the seabed necessary for DSM would kill many of the creatures inhabiting areas such as the Clarion-Clipperton Zone (CCZ), a region of high scientific and economic interest in the Pacific Ocean, where more than 5,000 species were newly identified last year. DSM would disrupt the delicate balance of these ecosystems, directly affecting the feeding and reproductive patterns of organisms in the mined areas. Mining machinery would also cause severe noise and light pollution, as well as create sediment clouds, which would have further-reaching effects on marine life that could be detrimental to nearby fishing communities in the long term.

Norway's decision exposes its blatant irreverence for Earth's resources. Expecting to exhaust supplies of rare earth metals in the near future, firms are looking for

them in the few parts of the planet left unexploited. It's a sad commentary on the state of today's policymaking that, instead of more heavily regulating the use of existing processed materials, governments are instead approving further exploitative activity. Some studies have shown that expanding existing mining activities on land has less environmental impact than initiating new DSM practices. Governments should incentivise the recycling of electronic devices and more-efficient use of the refined rare earth metals that they already possess to reduce demand for mining.

Though somewhat protected by the jurisdiction of the International Seabed Authority, this interest and approval of commercial mining activities in the deep oceans could become more widespread in the coming years. Oceans contain many of Earth's most precious ecosystems, being home to one of our primary food sources, and being the planet's largest natural carbon sink. Surely we should be focusing on finding ways to better preserve and protect this vital resource instead of exploiting it?



## *Start-up sells Arctic ice to Dubai cocktail bars*

**A**rctic Ice is a start-up that exports glacial ice from Greenland to cocktail bars in the United Arab Emirates. Co-founder Malik V Rasmussen says that he was looking to expand the scope of Greenland's exports by commodifying the country's supply of glacier ice. This polar ice is said to take longer to melt owing to its lack of aeration and is free of the contaminants present in regular mineral-water ice.

The company claims that, by harvesting ice that has already broken off glaciers and larger icebergs, it creates minimal environmental impact. However, these small ice floes are as vital to the Arctic ecosystem as large glaciers are, providing crucial resting and birthing spots for large mammals such as polar bears, walruses, and seals. Rasmussen also claims that Arctic Ice is 'committed to becoming carbon neutral', but it is yet to be seen whether it will achieve this. The response to this news has been one of confusion, outrage, and even amusement at the ludicrousness of the venture.

## *Refreezing polar ice: feasible or fantasy?*

**T**he Ice Sheet Mass Balance Inter-comparison Exercise (IMBIE), funded primarily by NASA and the European Space Agency, assesses the state of ice sheets in Greenland and Antarctica by using satellite data. The latest IMBIE assessment, published on 20th April 2023, estimated the rate of Greenland's ice loss to be more than five times faster in 2020 than it was in 1992, when records first began. This increased rate of ice loss, driven by global warming, is leading to sea-level rise that will cause devastating flooding around the world. Ice loss leads to fewer bright surfaces off of which sunlight can be reflected, which has the knock-on effect of accelerating the greenhouse effect and amplifying global warming. Losing large stretches of glaciers also means habitat loss for polar bears and other Arctic wildlife.

In efforts to slow the ice melt, a number of innovative geo-engineering projects for 'refreezing' Greenland and other neighbouring glaciers have been proposed.

Marine cloud brightening (MCB) is one of these promising technologies, outlined by teams of researchers at the University of Cambridge, UK, and Delft University, the Netherlands. MCB draws on the physics of

## *Waste-dumping licences granted to Nordic mining company*

**T**he verdict of a 15-year legal dispute between the private mining company Nordic Mining and two Norway-based environmental organisations – Friends of the Earth and Nature & Youth – was decided last week. Nordic Mining has been awarded a licence to discard its waste products in an area spanning 4% of Norway's Førde fjord. Although this permission was granted in 2015, Friends of the Earth and Nature & Youth, along with several other environmental groups, submitted complaints to oppose the project in the years following, which has restricted the operations until now.

Nordic Mining mines primarily garnet, rutile (titanium oxide), quartz (silicon oxide), and lithium, extracting valuable minerals and metals that are some of the country's most unique exports. This might somewhat explain the government's willingness to support the

industry, despite the disposed waste products posing a severe risk to the marine wildlife – cod and salmon in particular – that call the fjord home.

The Norwegian Institute of Marine Research advised against using the fjord for waste disposal on the grounds that it would "jeopardise a healthy, sustainable ecosystem". Local businesses, fishing and tourism organisations, environmental bodies in the Norwegian government, and citizens have all expressed discontent at the project's approval, which makes it all the more surprising that it was finally given the go-ahead. Although this is a devastating outcome for environmental legislation given the time and money that was spent on campaigning and court cases, financial support for environmental law firms and NGOs goes a long way to ensuring they can continue their work on these kinds of cases.

cloud formation; that higher concentrations of nucleating particles tend to create clouds with a higher albedo, which would reflect more sunlight away from the atmosphere. To achieve this the researchers, supported by the Refreeze the Arctic Foundation, suggest artificially dispersing seawater through the atmosphere to make clouds denser and brighter.

Along similar lines is stratospheric aerosol injection, a method described in a 2022 paper by Wake Smith, a climate researcher at Yale University, USA, and his colleagues. High-altitude jets would spray aerosols at roughly 43,000 feet. These aerosols would drift upwards and create an artificial atmospheric layer to deflect the Sun's rays. The study concludes that, although this is a feasible option for helping refreeze glacial ice, further research is necessary to confirm that the aerosols in question wouldn't pose a threat to Earth's ecosystems. Additionally, it will take time to convince policymakers to accept and allow this technique to be implemented.

Finally, a study published in March 2023 investigates the feasibility of implementing seabed-anchored curtains, with a focus on identifying the optimal conditions and design for this technology. These curtains would sit

attached to the sea floor to block the flow of warm water in lower down channels, aiming to slow the melting of glaciers while still allowing movement of icebergs and nutrient-rich waters in the upper levels of the sea. The researchers have proposed trials in Greenland to further test the technology. While a technology for glacier preservation rather than a method of refreezing them, seabed-anchored curtains could prove useful for slowing the melting of the larger West Antarctic Ice Sheet.

These novel technologies will take time to gain traction and funding, so further studies are needed to test their viability and improve their public and political reception. If refreezing of glaciers and ice sheets in the Arctic and Antarctic can be achieved, this could slow the effects of global warming and buy us more time to work on conservation, climate-change mitigation, and ecosystem restoration. Innovative solutions like those described here are especially important given recent news that scientists might have severely underestimated – by as much as 20% – the amount of ice lost from the Greenland ice sheet since 1985.

## COMMENT

# The Farmers' Market air-pocalypse

Everyone's favourite market has a negative impact on more than just the student budget.

Comment Writer  
**PETE KNAPP**

Anyone based at the South Kensington campus will be familiar with the Farmers' Market, which takes place every Tuesday. With its many adoring fans, the Market is known for bringing people throughout the community together, from both the College and the wider public. Despite how expensive it is, many would argue that, for a weekly treat, you might as well try something new from there.

Sounds amazing, right?

Not quite. I work in air quality at Imperial College, and therefore I am painfully aware that this weekly event causes particulate air pollution to spike around campus.

So, how bad is the spike, and what can be done?

Firstly, let me explain how air pollution is measured. The 'healthy range' for the mass concentration of particles under 2.5 micrometres (called PM2.5) is an average of 5 micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ) over the year. We study the concentration of small particles because they cause inflammation that may lead to strokes, cancers, and even diabetes. Worryingly, the readings around the Farmers' Market exceed 500  $\mu\text{g}/\text{m}^3$ ... over 100 times the maximum limit recommended by the World Health Organisation (WHO).

This air pollution seeps into indoor spaces as well – I measured up to 25  $\mu\text{g}/\text{m}^3$  in a room nearby that had all the windows closed. Again, that's over five times the healthy maximum.

For context, according to the research published by the Greater London Authority, the average level across London was 13.3  $\mu\text{g}/\text{m}^3$  in 2016. In their 2013 paper, exposure scientist Itai Kloog and others found that for every 10  $\mu\text{g}/\text{m}^3$  increase in PM2.5 exposure there was a 2.8% increase in PM-related mortality, for short-term exposure.

According to the Environmental Research Group at Imperial, air pollution affects every organ in the body and causes between 28,000 and 36,000 premature deaths in the UK each year. It also impacts people unequally – the young, the elderly, people from deprived communities, and people with existing health conditions are most at risk. Air pollution also generates £20bn in health costs in the UK every year.

Clean air is essential for our health and the health of the planet. While in reality, there is no 'safe limit' on air pollution, the guidelines from the WHO are helpful to provide some idea of what is acceptable.

The particulate air pollution at the Farmers' Market comes from cooking at high temperatures. This burns oils and other biomass, turning them into fine particles that can sometimes be seen as smoke, though they can be invisible when small. These particles are in highest abundance when cooking meats, wood, and spices.

Moreover, overfrying tends to produce the highest emissions out of all common UK cooking methods. In general, the lowest air pollution comes from cooking low-fat foods (these tend to be plant-based) at low temperatures, while using non-burning methods such as electric elements or induction hobs.

Keeping these in mind, both meat consumption and gas burning (gas is a fossil fuel) need to be drastically reduced to meet our climate targets and to reduce the scale of climate chaos.

Cooking on gas also creates harmful carbon monoxide and nitrogen dioxide. Cooking at home is where most people have their highest air pollution exposure.

To reduce air pollution when cooking at home: open a window when cooking; use the microwave rather than frying or boiling on a gas hob; turn on the ventilation hood if it extracts outside; cook less meat or animal products; and purchase an air quality monitor to keep track of conditions indoors, and help make healthier decisions.

But this article is not about how to avoid air pollution. It is to stop air pollution at the source. People working at the Farmers' Market and surrounding buildings should not be exposed to a weekly dose of air pollution from cooking meats on solid fuels. The employees of the food stands and the College, and the students, have a right to a healthy work environment. To emphasise, I do not think the Farmers' Market should be abolished. We can keep the Farmers' Market, but we must change what is being served and how it is being cooked.

Many researchers from Imperial College London advise the UK government and the London Mayor on national and city-wide air pollution measures, yet efforts to reduce the air pollution around the university itself are lacking. Sometimes, we need to look at what is happening right under our nose. Together, we must stop the Farmer's Market air pollution problem.



Even standing outdoors next to food being fried is unhealthy. Pete Knapp



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## MUSIC

# Good People Is Good Music

Canadian R&B duo, Majid Jordan, delivers an easy, understated listen and a masterclass on moderation

Music Writer  
SELINA YE

With over 10 years since the SoundCloud EP that first drew the attention of producers at OVO, a 2013 breakthrough feature on Drake's album that thrust the largely unknown duo into the mainstream gaze, Majid Jordan have been steadily cultivating their own sound, and a dedicated fanbase with a constantly evolving take on contemporary R&B.

I've been following them since their 2014 EP, *A Place Like This*. Their discography, which blends alternative R&B, synth-pop, and dance-friendly sensibilities, was

on heavy rotation throughout the winter of my second year in university. The two, who met as students at the University of Toronto and produced their first tracks in their dorm, have retained the same musical curiosity throughout the past decade, effortlessly switching from synth-wave tracks like 'Summer Rain' to stripped-back acoustic confessionals such as 'Forget About The Party'. This time around, the pair are back with a soulful, sonically cohesive album entitled *Good People*, a nod to the original pseudonym they released their first SoundCloud collaboration under.

This album forgoes the dynamic track shifts of its 2021 predecessor *Wildest Dreams*, instead opting for a mellow, simmering experience akin to watching a gradual sunset in solitude. The colours of one song melt seamlessly into the next. Some may call it inconsequential or underwhelming, but I consider the simplicity of production its virtue. This album might not be your first choice for handling the aux at your next function, but it's great for 3am sentimentality. Majid Jordan offers a new iteration to their sound journey with a more sophisticated, restrained palate. Beats are minimal, Majid's vocals are centerstage, and the atmosphere is warm.

The opener 'Tears In Your Eyes' features gentle guitar and vocal layers in the background substituting chords as Majid croons about his need for a lover in his life. Warbling keys add an extra shimmer to the track. The song leads with his winding vocal lines that defy the austerity of its supporting production, making way for the entry of a smooth bass line, conga beat and rustling shakers.

These earthy sounds and the repeating lyrics coalesce, creating a lulling ambience to the track and a definitive introduction to the creative direction of subsequent tracks.

Listeners will catch traces of a Michael Jackson influence on the track 'Eyes Closed'; to my surprise, sounds reminiscent of The xx on the song 'Hands Tied' which they interestingly chose as one of the three pre-released singles. My personal standouts from this album were 'Violet' and 'The Message'. The former is a seven minute ebb and flow between radio-filtered verses, and buzzing, almost psychedelic vocals in the chorus. All of this takes place over a relaxed drumbeat, synths, and a looping electric guitar which immediately conjures up the image of a leisure cruise at sundown.

The album would not be complete without a tender, guitar-backed declaration of love found in 'The Message'. This is like the older, more mature cousin to 'Forget About The Party'. 'Cyanide' is the perfect second punch in the tail end of the album with its affectionate, falsetto delivery of the line: "You take my shy away". The album ends on a pensive note, with the ambient, sparse aural expanse of the track 'Sunset'. *Good People* tells us that good music need not be complicated. Majid Jordan show off immense feelings with sincerity and soul while keeping the production's moderation in mind. Brian Hamilton, one of the duo's background vocalists, explained that this new layout with the violins facing each other, rather than being in their usual close proximity, was something that they had never done before. The effect of having a mirror image violin proved particularly effective in a section in one of the songs in which the two violins performed a heated virtuosic duet!

I am excited to see what the band comes up with next, especially with this new direction which seems to involve electronically-manipulated vocals sung by Magdalena McLean, reminiscent of Caroline Polacheck's heavily stylised singing or Georgia Ellery's extensively processed vocal manipulations in her London-based duo with Taylor Skye, Jockstrap. Keep your eyes and ears peeled for new single releases and concert performances from this relatively new and exciting eight-piece band caroline!



Cover of Majid Jordan's album, *Good People*, released on 17 November, 2023. SoundCloud ©

# All-Girl Astrophysics in the Music of Boygenius

Music Writer  
DANIEL HESK

Black hole opens in the kitchen,” sings Julien Baker to a swelling electric guitar. “Every clock’s a different time.” So begins the sixth track on Boygenius’s recent album, a twelve-song cycle unhelpfully titled *the record*. I can’t say with certainty that this is the first reference to gravitational time dilation to chart at #1 in the UK (for one thing, Imperial’s own Brian May might have slipped such allusions into any number of Queen songs) but it probably is. And with this band at the wheel, it may not be last.

Boygenius is an indie rock supergroup, formed in 2018 by the singer-songwriters Julien Baker, Lucy Dacus, and Phoebe Bridgers. In early 2023, they released their first full-length album to universal acclaim, going on to play a 25,000-person gig in London last August. Boygenius style

themselves as an all-queer, all-female boy band, noted for their complex and emotional songwriting and two-piece grey suits. They are also noted, though maybe only by me, for their increasing obsession with astronomy.

This isn’t entirely new territory for the band. Bridgers, especially, has for years been writing songs about full moons, foreign satellites, and planetary alignments. Her 2020 album closer, ‘I Know The End’, describes her apocalyptic thoughts upon seeing a bolt of lightning hanging frozen over the California coast – which later turned out to be the white smoke-trail of a nearby SpaceX launch. Still, this new artistic foray into general relativity is an impressive step into some fairly mind-boggling physics. In an interview with Emma Carey, Dacus said, “The benevolence of the black hole is just like, cope how you must on our journey into the dark. Also, on a personal level, everybody dies.” Cheery stuff.

This trend has only continued. In October they released *the rest*, a companion EP to *the record*. The subject of

first song is another black hole, this time a particular specimen: “You can see the stars the ones/The headlines said this morning/Were bein’ spat out by something we thought/Was just destroyin’ everything for good.” This refers to a paper that made headlines in April where a group of astronomers discovered what seemed to be a black hole ejected from its host galaxy, trailed by a path of anomalous blue stars. It is thought that the passage of such a massive object had so disturbed the clouds of intergalactic gas as to kickstart the process of stellar formation in its wake, creating a glowing arc across space. And the physics hardly stops there. ‘Powers’, the last song on the EP, manages to cram in two mentions of nuclear fission and one each of orbital mechanics and supercollider-induced particle production. Genuinely.

So, what’s behind this supernova of physics metaphors? Is pop music, contrary to widespread belief, actually getting more intelligent? In five years will we see albums about baryon asymmetry and p-nuclei topping the charts? Well, probably not. The truth is that since streaming became mainstream, pop has been fracturing. Most people now have at

least a couple of obscure bands that they unabashedly adore, so the already vague category of ‘Popular Music’ is becoming increasingly infiltrated by alternative genres.

In this case, the Boygenius members all have roots and branches in a ruminative form of folk-rock that has become more established in the last couple of decades. A big feature of much of this music is the use of imagery that the artist finds funny or interesting, even if nobody else knows what the hell they’re talking about. John Darnielle, a mainstay of this scene and one of Baker’s long-time favourites, wrote a song in 2015 about a professional wrestler being stabbed to death. That’s niche enough for anyone, surely, but whatever intersection there is between WWE fans and stellar physicists will have been thrilled by the song’s climax. “The sky goes dark,” Darnielle intones. “And there I am – climbing down the Hertzsprung-Russell Diagram.”

That H-R Diagram shows the main sequence of star types, arranged by temperature and luminosity. To descend down this chart into cold dim oblivion is the fate of all low-mass suns, including our own. In their own lifetimes as stars, however, it seems that Boygenius are still on the rise. May they continue to peddle their bizarre astro-analogies for as long as the planet keeps spinning.

Illustration:  
Jennie Chongbang  
for Felix



## BOOKS

# The Hitchhiker's Guide to the Galaxy review

Don't panic! Book Club's January choice will help you find your place in the universe.

**Books Writer**  
**ZAHIR THEBAULT**

**T**he *Hitchhiker's Guide to the Galaxy* was originally conceived by Douglas Adams as a radio series called 'The Ends of the Earth'. It may seem like I am ruining the story for you with this spoiler, but the destruction of our home planet is where the fun begins in this tale. The radio show was wildly successful, and went on to become a book series, an acclaimed television show, and a 2005 film starring Martin Freeman, in its leading role, as Arthur Dent.



**The radio show was wildly successful and went on to become a book series.**

Arthur is our dressing gown-clad, perpetually confused hero who must come to terms with Earth's catastrophe at short notice, while tagging along with his friend, alien journalist Ford Prefect – a writer for an electronic encyclopaedia known as the 'Hitchhiker's Guide to the Galaxy'. We meet many other memorable characters throughout his journey such as a paranoid android named Marvin, and Ford's egotistical part-playboy part-criminal cousin, Zaphod Beeblebrox.

The Guide itself, however, turns out to be the true star of the show. Numerous digressions and detours are taken via the electronic book, as you are treated to its entries and asides throughout the pair's intergalactic adventures. This format is very successful and brings to mind Herman Melville's *Moby Dick*, a novel with similarly encyclopaedic nature, but this time with aliens, and a lot more laughs!

*The Hitchhiker's Guide*, with its many histories and

descriptions of strange worlds and creatures, is amusing and endlessly creative. There is an interesting mix of dry British humor and outlandish leaps of imagination, which is entertaining and, at points, quite profound in its philosophy. Adams is said to have conceived the idea for the novel while drunkenly lying in a field, looking up at the stars, holding a copy of *Hitch-hiker's Guide to Europe*, a 1971 travel guide.

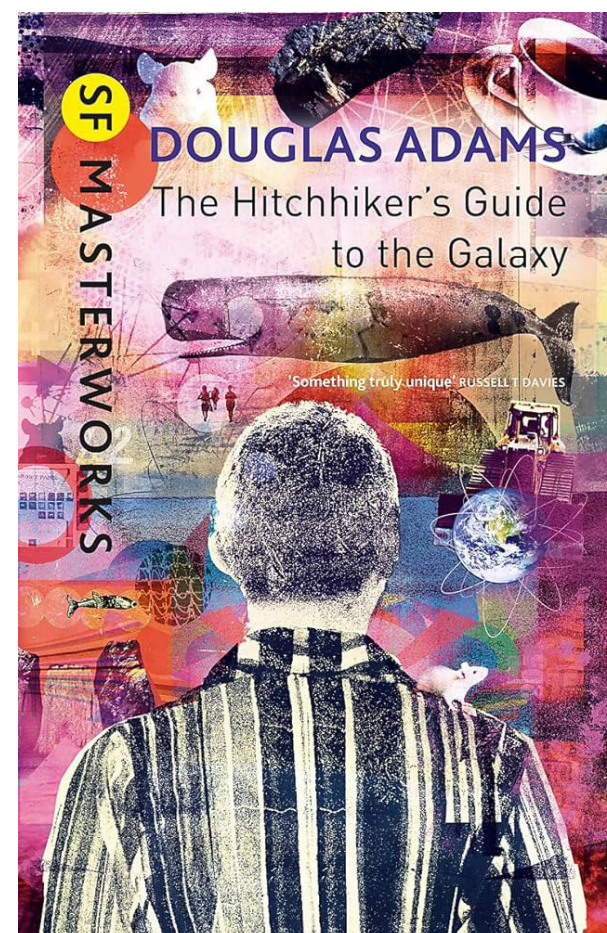
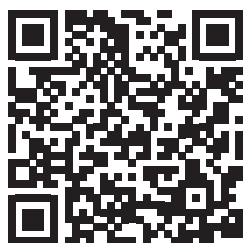
Its writing process seems to have been similarly chaotic – he once had to be locked in a hotel room with his editor for three weeks in order to complete it. However, it is wonderfully put together and, arguably, is his best work.



**Ford's egotistical part-playboy part-criminal cousin, Zaphod Beeblebrox.**

An internet-savvy generation might not appreciate the novelty of Adams' idea of an electronic guide with the knowledge of everything and everywhere, but this concept is at the heart of *The Hitchhiker's Guide*, and is key to its iconic status within science fiction.

The BBC2 television adaptation conveyed the exciting possibilities of this digital world through old-school video graphic techniques. (It is worth a wath, fragments of it can be found in the dark recesses of YouTube.) Both the TV and radio show hold up in-



S. F. Masterworks

credibly well 40 years since release and are great companions to further explore the worlds created by Adams. The novel itself remains timeless and extremely readable (and re-readable).

So, if you have ever had deep existential questions in need of being answered, wondered what's out there beyond our galaxy, or been plagued by suspicions about what mice do all day,

*The Hitchhiker's Guide to the Galaxy* could be the book for you!

## January Book Club

Book Club invites you to search the meaning of the universe with them at their January meeting.

Come along, whether or not you have the answer (or even read the book!) to engage in some great discussions.

**January 30th, 2024 at 6:30pm**  
**Skempton Building, Room 301**

## PHOTOGRAPHY

# Writer's block

Why creativity is a curse, and how to break it.



Cheval Sabine Weiss, 1952

## Head Photographer ROLANDO CHARLES

This week I won't present you with a winner from the photo competition because there isn't one. No photo of the week meant I had to find a different, self-containing theme or idea for this article.

I had a hard time. I spoke to friends and *Felix* colleagues, as well as other photographers, to try and motivate myself to write something deeply moving, profoundly inspiring, and altogether a great read.

Now, staring at a blank page, I think of my friend Jonah's own words: "They can't all be winners".

Truer words were never spoken, and they ring loud and clear in my mind as I scroll through my Babylonian archive of pictures. Our photos also can't all be winners. There's a common misconception that photography is an ever-improving skill. Peter McKinnon, photographer and YouTuber, talks about the "only bangers" myth, and how taking and sharing pictures shouldn't be focused on always producing the *best* result but more on creating for its own sake.

Unfortunately, I'm also a victim and perpetrator of creative perfectionism; I take loads of pictures and rarely post or publish a single one. Scared of producing something worse than my previous creative endeavours, I end up in a rut, never living up to my own insane

expectations, and unable to accept that I haven't dramatically improved my photography over a couple of weeks.

The year's just started, and while I don't believe in New Year's resolutions, I do believe in just starting to do things, if one wants to. In light of this, I offer some advice. To myself: publish what you like and don't think twice about it. To you, the reader: take a few more pictures than you did last year, or edit those ones from a couple of years ago that you are still scared to have a look at. Who knows, maybe at the end of this year we'll both look back and be content purely with the fact that we practised our hobby, far removed from our vicious self-judgement.

But, at the end of it all, this is still the photography section, and the comments

have already been taken care of, so I'll leave you with a picture that summarises how I feel this cold January. It's up to you to decide whether you like it or not, but if you do, I recommend checking out all of Sabine Weiss' body of work, a French humanist photographer who died only recently in 2021. May her photography speak to you just as it does to me.

Scan the QR code to  
submit for the next theme  
**'What to live for':**



## FOOD&TRAVEL

# Let's play a game, shall we?

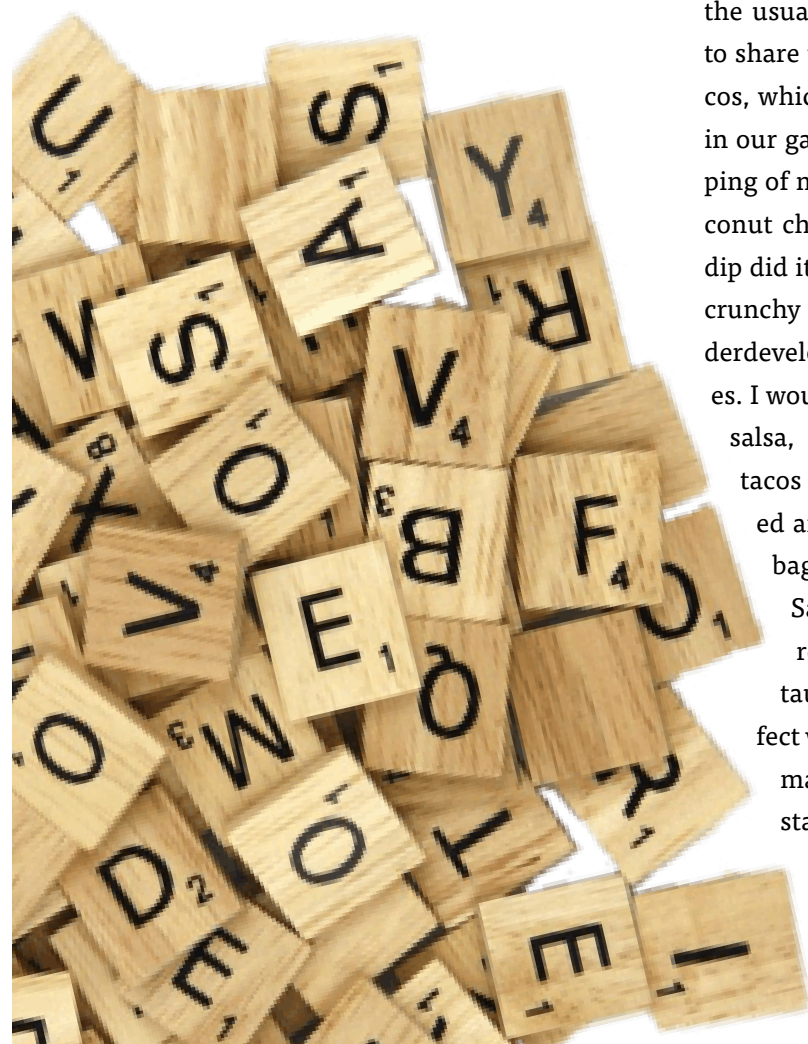
Waterloo is home to Draughts – a warm place filled with board games and vegan nachos.

Food & Travel Editor

CHARLOTTE PROBSTEL

This true hidden gem for game fanatics has been on my list for quite some time, but it requires a certain level of enthusiasm. Chess, Guess Who, Monopoly, and Cluedo are just some of the many board games offered, with at least 200 others available, along with a fantastic waiter who can explain them all to you – a game connoisseur, I called him. Draughts, my dear reader, is a restaurant-bar-pub open for all types of evenings: a date, a game night with family or friends, or just a simple way to determine the smartest player in your group. Nonetheless, it holds more than just games and good food, with kind staff who do not hide their excellent teamwork, and laughter which jumps from one table to the next.

[www.stickpng.com](http://www.stickpng.com)



### The staff

One of the waitresses saw me stare at the wall of games in front of me and asked, “Are you looking for anything specific?” to which I replied, “Something competitive, can you recommend anything?” Afterwards, she sent the game-master, the one with ultimate knowledge, to our table to give us some suggestions. Roughly my age, she was incredibly welcoming, as were her colleagues – a rare sight in London. The waiting team was abundant, leaving no worker feeling overburdened and stressed on this random Tuesday night. As the night ended at 22:30 and we were kicked out, we laughed a little with the staff and wished them farewell, discussing between ourselves that we will return soon.

### The vegan nachos

“It doesn’t seem as if they have many vegan options,” my friend proceeds to state. “Oh, they have more than the usual restaurant,” I replied quickly. We proceeded to share the large vegan nachos and the mushroom tacos, which sadly turned cold while we were immersed in our game. The nachos were crispy, with a small topping of mildly hot sour salsa and a light sprinkle of coconut cheese, all with creamy guacamole. The ‘queso’ dip did its best, but its texture did not complement the crunchy tortilla chips well. Vegan cheeses are still underdeveloped and are often still inferior to dairy cheeses. I would have left it out completely and added more salsa, or perhaps avocado. On the other hand, the tacos included a generous amount of well marinated and fried mushrooms, with beans and red cabbage forming the base of the tortilla. At last, the Sauvignon blanc was rather sweet and fruity, a real treat for the evening. The beauty of the restaurant is that the games and the food offer a perfect way to spend hours at the establishment. While main dishes are in the price range of £15–20 and starters are priced between £8–12, the starter and the main were filling enough for two people, averaging the price to £15 per person without drinks.



Draughts  
[www.draughtslondon.com](http://www.draughtslondon.com)

### Reservations

The reservation does require a £15 appearance fee which I happily paid as I soon noticed that the place was in high demand. Considering that guests typically stay for many hours, reservations make a lot of sense. I reserved for five hours, 7pm to midnight, but surprisingly they closed at 22:30. The staff was kind enough to warn us when the kitchen closed at 21:30, the bar closed at 22:00, and so did the restaurant half an hour later; however, no one was kicked out aggressively, rather just notified.

### Competition, huh?

Having taken advantage of the games available, we spent the last hour playing two games: Rummy, my favourite card game, and Speed Scrabble, a game designed by ourselves. The Scrabble board was large, wooden and carved, almost as if we had found old treasure. The tile holders were metal, painted in gold, and the tiles did not even have points on them – we had to use the board for reference. We played words such as ‘wee’, ‘yee’ and ‘xi’, which are technically legal and show the complexity and uniqueness of the game. Apparently, in competitive Scrabble, players may play illegal words as long as their opponent does not challenge them. I won the second round purely on this basis as my friend lost ten points for playing some word I no longer remember. I fear everyone heard me cheer as I won the game 46:39.

### Will I return?

Absolutely. You are allowed to bring your own games, as they do not charge you for any games to rent, hence it makes no difference to them. The warm colours of the interior reminded me of kindergarden. People of all ages played many kinds of games, from those involving complex strategies such as Dungeons and Dragons, to simpler ones such as UNO or Guess Who; they enjoyed themselves all the way into the night. It was one of my favourite experiences in London.

Until next time,  
Charlotte

Find out more at  
[draughts.com](http://draughts.com)

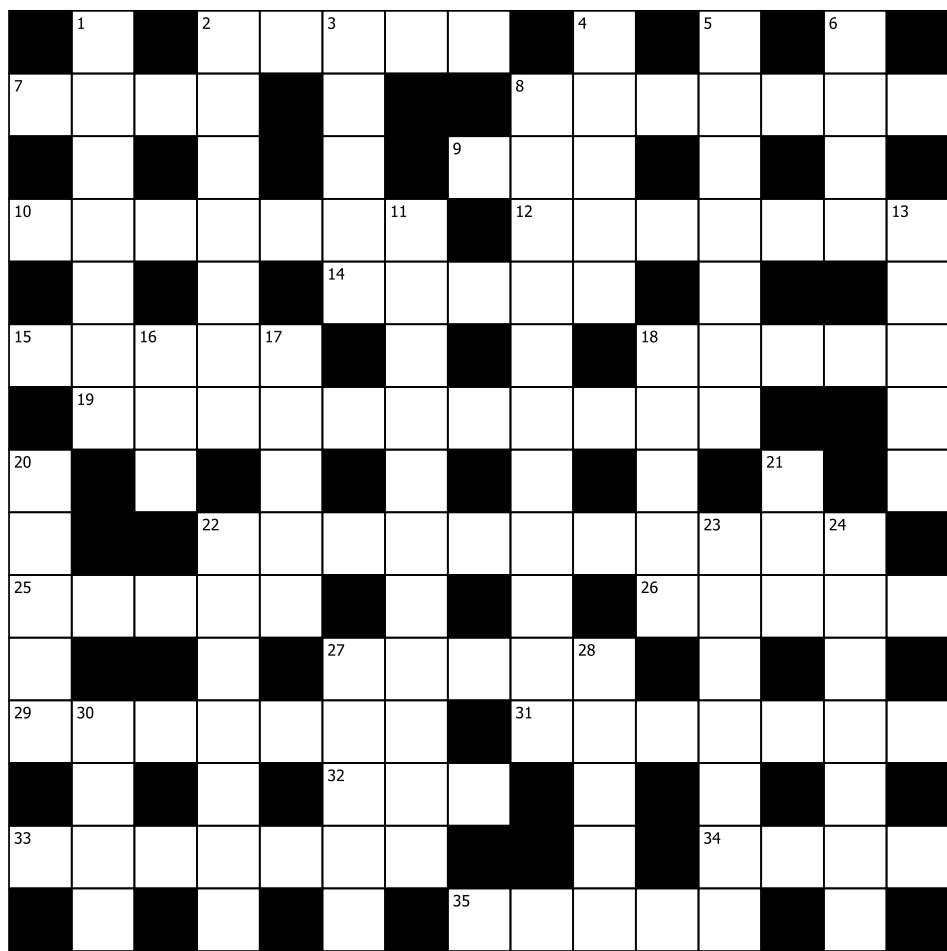


# PUZZLES

Puzzles Editor  
STANLEY SCOTT

## CROSSWORD

*What's the Point?*



### Across

- 2. Northern Italian town. [5]
- 7. Word in many a scientific journal title, e.g. \_\_\_ *Mathematica*. [4]
- 8. One who gives the kiss of life. [7]
- 9. Scottish negative, often preceding 'bother'. [3]
- 10. It's connected to the Arctic via the Bering Strait. [7]
- 12. 'Tired and emotional'. [7]
- 14. Dog genus. [5]
- 15. Gravy granule company. [5]
- 18. Irritated. [5]
- 19. Natural minor scale. [7 4]
- 22. Spread, as cancer. [11]
- 25. Prime Minister Harold in *Doctor Who*. [5]
- 26. Puccini opera. [5]
- 27. Alternative line, in sheet music. [5]
- 29. You're likely studying one! [7]
- 31. Word following 'drinks' or 'shadow'. [7]
- 32. Masculine indicative contraction. [3]
- 33. Like the proverbial tree falling in the forest. [7]
- 34. \_\_\_ and *Apollo* - 2013 song by the Studio Killers. [4]
- 35. Canticles. [5]

### Down

- 1. Much of it is contained in 10 Across. [7]
- 2. Harness. [3 4]
- 3. Ancient object. [5]
- 4. Compatriots. [5]
- 5. Mister in Italian. [7]
- 6. Cackle causer. [4]
- 8. Word describing the Geiger counter, e.g. [11]
- 11. Spice rack member. [7 4]
- 16. Taylor's task. [3]
- 17. Welsh mythological character. [5]
- 18. 'That is' abbreviation, unabbreviated. [2 3]
- 20. Yellowjackets, e.g. [5]
- 21. It comes before tee. [3]
- 22. Ambled. [7]
- 23. Charges. [7]
- 24. Rank. [7]
- 27. Yellow hue. [5]
- 28. \_\_\_ *Burr, Sir* - song from *Hamilton*. [5]
- 30. Recovering pet apparel. [4]

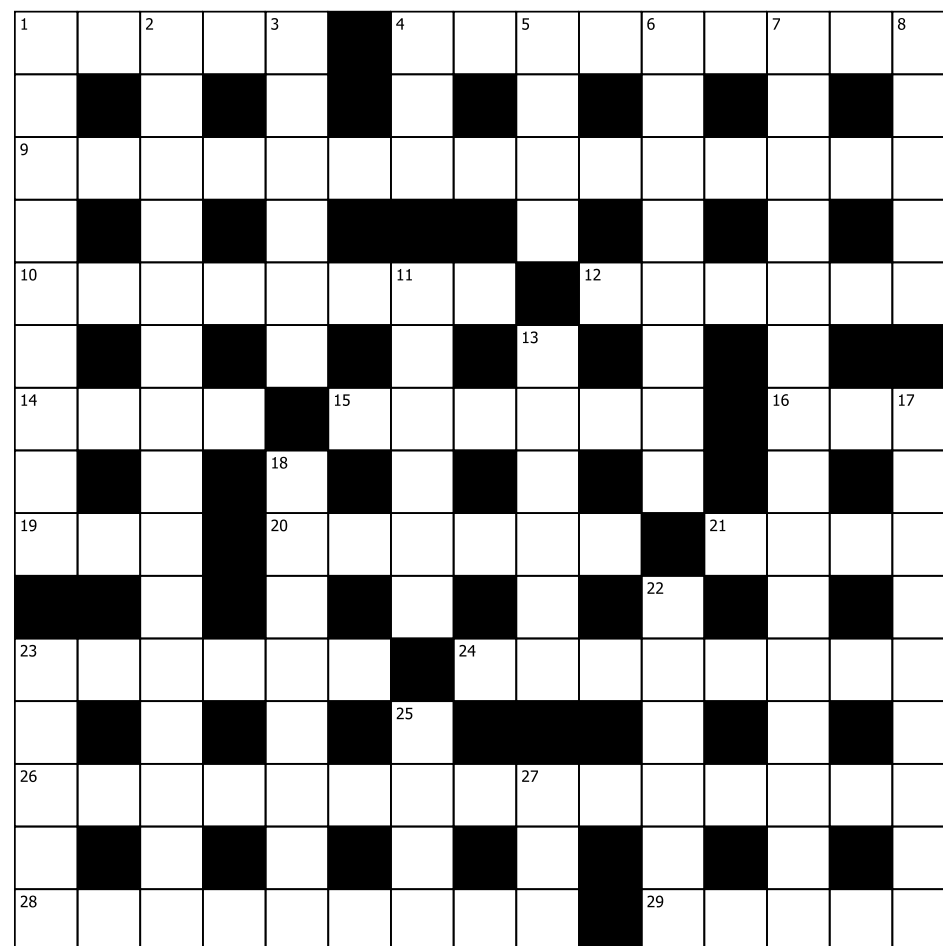
### Cryptic across

- 1. Water, as it's found on the menu. [5]
- 4. Repeats addendum about how to relax. [9]
- 9. The philosopher angrily blurts "slanderer!". [8 7]
- 10. I was this when I previously took the test at the front! [8]
- 12. Old, yet I ran around Greenwich's borders! [6]
- 14. He who needs to pay any amount? [4]
- 15. Be against the procedure to get the model in shape. [6]
- 16. At its core, basic kinda fringe music. [3]
- 19. Have tea, hurriedly? [3]
- 20. The company isn't bowing, I hear! [6]
- 21. Drink back a big tequila first with a flicking manoeuvre. [4]
- 23. It's the best railway - dazzling! [6]
- 24. Primary exercise right out of service. [8]
- 26. Masterpiece left by the brass section. [4 3 4]
- 28. God almost completely devoured five hundred but got full. [9]
- 29. Organs, or their bellows? [5]

### Cryptic down

- 1. It's noble to re-shape the chocolate. [9]
- 2. Favourite person with the wild manner met with gymnastic demand: it's always attractive! [9 6]
- 3. Pull through the anxiety. [6]
- 4. Every utensil? [3]
- 5. Ignores a US taxman. [4]
- 6. Wager about idiot in the crib. [8]
- 7. Former statesperson? [15]
- 8. Cloud quality in the Italian sky. [5]
- 11. Ethiopian, Mongol, Portuguese, Inca, Russian or Egyptian! [6]
- 13. Failing your degree in this language. [6]
- 17. High-energy indicates these elements. [9]
- 18. Sprinted back to royal tower with no shirt and got thinner. [8]
- 22. Show outside school - some skived for a pound. [6]
- 23. The spearhead has a great time in those stories. [5]
- 25. Up to no good with a bird. [2 2]
- 27. Bear talk? [3]

## CRYPTIC CROSSWORD



# SUDOKU

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

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

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

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

## Last week's solutions

B	E	S	T	W	I	S	H	E	S	T	H	I	S	T	W	E	N	T	Y				
E	X	T	O	L	I	N	T	E	N	T	H	E	R	E	W	I	R	E					
S	P	A	R	E	C	R	E	A	S	E	R	E	M	I	T	A	B	E	L	I	A		
T	E	N	T	K	E	L	V	I	N	O	I	M	G	J	E	S	S	E	S				
I	N	D	I	G	O	S	L	E	G	N	O	N	P	O	L	A	R						
A	S	I	M	O	V	V	S	N	O	B	C	S	I	A	N	S	A	T	E	D			
L	E	N	A	E	E	L	D	O	N	T	K	N	O	W	N	H	S	I					
			G	E	R	M	A	N	S	P	R	U	C	E	G	A	S	S	I	N	E	S	S
S	A	M	I	B	O	D	O	N	I	R	A	T	H	E	R	T	R	U	C	E	S		
A	G	A	S	S	I	I	N	E	R	T	G	A	S	E	S	S	O	I	L	U	R	E	
T	U	T	T	U	T	S	H	E	A	R	R	L	P	A	S	I	D	E	S				
E	T	H	K	E	B	L	E	D	O	O	M	T	O	D	E	A	T	H					
D	I	S	C	L	A	R	K	I	N	O	R	D	E	M	E	E	N	T	J				
			S	L	A	V	O	N	I	C	I	S	E	A	O	R	T	A	O	R	E		
P	L	U	S	H	I	E	S	O	H	A	Y	D	N	U	N	I	T	E	S				
L	E	P	T	O	N	S	B	R	A	S	S	I	N	E	S	R	A	M	E	A	U		
E	N	R	A	G	E	M	O	R	P	H	O	T	E	E	O	F	F	A	D	D	S		
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D	I	A	Z	W	A	I	L	E	D	O	N	E	Y	E	I	L	K	S					
S	C	R	A	P	P	Y	S	I	A	M	A	S	S	S	S	O	N	E	R	I			
			R	A	N	C	H	E	R	O	T	A	S	S	T	A	G	G	E	D			
W	A	N	T	O	N	A	L	T	N	A	R	M	A	G	H	S	S	U	E				
O	N	E	O	F	F	L	Y	O	N	S	N	E	B	U	L	A	I	B	I	Z	A		
R	E	N	O	I	R	I	O	D	E	A	D	E	N	S	I	D	E	R					
T	W	E	N	T	Y	F	O	U	R	S	P	R	I	N	G	T	E	R	M				

## Puzzle Editor's Note

Clue 119 Across in last week's crossword contained a misprint; the clue should have read:

119. What the  $\Sigma$  operator does. [4]

Congratulations to those solvers who managed this beast of a puzzle in spite of this issue!

- Stanley



We are always looking for new recruits!

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