JOURNAL OF THE PARLIAMENTARY AND SCIENTIFIC COMMITTEE
ALL-PARTY PARLIAMENTARY GROUP

SCIENCE IN PARLIAMENT
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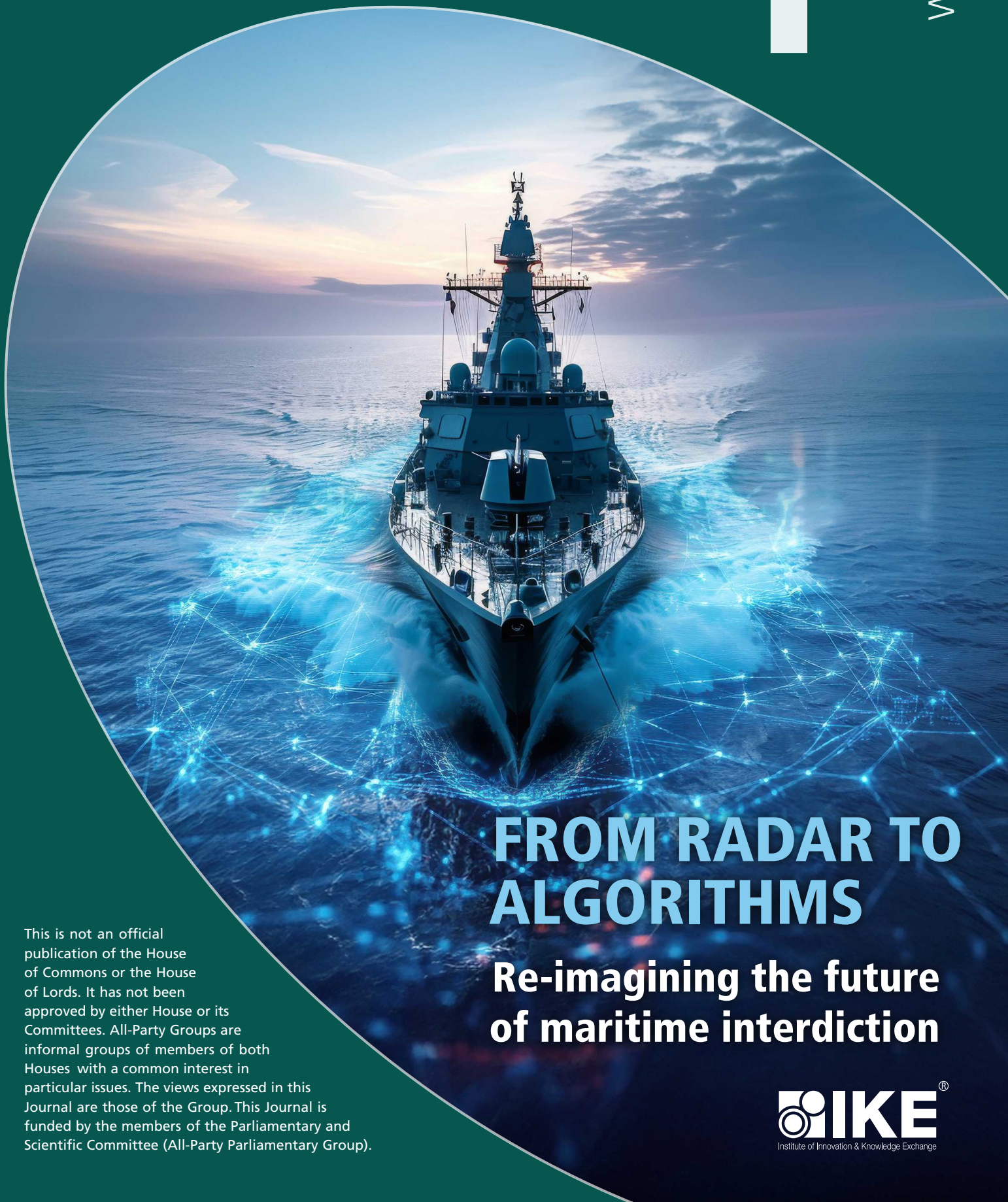
WINTER 2025



FROM RADAR TO ALGORITHMS

Re-imagining the future of maritime interdiction

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The Parliamentary and Scientific Committee is an All-Party Parliamentary Group funded by Membership.

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Published by Parliamentary and Scientific Committee.
Correspondence to: karen@scienceinparliament.org.uk.
Published four times a year.

Editor: Leigh Jeffes, leigh.jeffes@scienceinparliament.org.uk

Design: Moncrieff & Co

Printed by Premier Print Group Ltd

SUBSCRIPTIONS

The 2025 subscription rate is £80. Single numbers £20.

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SCIENCE DIARY

Forthcoming discussion and other meetings

■ Tuesday 20th January 2026

DISCUSSION MEETING

Building a Thriving UK Neurotechnology Ecosystem

In partnership with the Newcastle Upon Tyne Hospitals NHS Foundation Trust and Newcastle University
5.15pm to 6.30pm, Palace of Westminster
Chairman's Reception 6.45pm to 7.30pm, One Parliament Street

■ Monday 9th February 2026

DISCUSSION MEETING

In partnership with the National Oceanography Centre
5.15pm to 6.30pm, Palace of Westminster
Chairman's Reception 6.45pm to 7.30pm, One Parliament Street

■ Monday 2nd March 2026

DISCUSSION MEETING

In partnership with Applied Microbiology International
5.15pm to 6.30pm, Palace of Westminster
Chairman's Reception 6.45pm to 7.30pm, One Parliament Street

■ Tuesday 17th March 2026

STEM FOR BRITAIN 2026

Palace of Westminster

■ April 2026 (date to be confirmed)

DISCUSSION MEETING

In partnership with the Met Office
5.15pm to 6.30pm, Palace of Westminster
Chairman's Reception 6.45pm to 7.30pm, One Parliament Street

■ Tuesday 12th May 2026

DISCUSSION MEETING

In partnership with the Nuffield Council on Bioethics
5.15pm to 6.30pm, Palace of Westminster
Chairman's Reception 6.45pm to 7.30pm, One Parliament Street

■ Tuesday 9th June 2026

DISCUSSION MEETING

In partnership with The Physiological Society
5.15pm to 6.30pm, Palace of Westminster
Chairman's Reception 6.45pm to 7.30pm, One Parliament Street

■ Tuesday 30th June 2026

ANNUAL LUNCHEON

House of Lords

British Science Week will take place between 6th–15th March celebrating science, technology, engineering and maths.

The theme for 2026 is "Curiosity: What's Your Question?"
www.britishscienceweek.org

ISSN 0263-6271

Sam Carling MP
Chair, Parliamentary & Scientific Committee

A warm welcome to our Winter Edition.

I'm delighted to be taking over as Chair of the Parliamentary and Scientific Committee. Huge thanks to my predecessor, George Freeman, for all his great work with the Committee.

With a background in pathology, I'm passionate about building strong links between MPs, Peers and our scientific industry across academia, industry and the broader sector. There is so much potential for the P&SC to fill that role, and I look forward to working with members to deliver that vision together.

We've got some fascinating events coming up this winter. In January, we're partnering with Newcastle University and the Newcastle NHS Trust for a discussion meeting around the work on neuroscience coming out of the city. We're also looking forward to welcoming the National Oceanography Centre and Applied Microbiology International in the second half of the season.

Capping off the winter we have the wonderful annual STEM for Britain event, offering Members of Parliament an insight into the outstanding work of early-career researchers in biological and biomedical sciences, chemistry, engineering, mathematical sciences and physics.

We have lots of brilliant articles in this edition focusing on the scientific issues of the day, such as AI, our industrial future, and microplastics. Many thanks to our contributors for their work on these key issues at the forefront of our national discourse.

To echo the comments made in the previous edition of Science in Parliament, we live in extraordinary times. Making sense of a muddled world is tricky, and it's where science can be our most valuable tool – cutting through the noise when we need it most.

Finally, I want to say a huge thank you to Leigh, Karen, Kinga, and all the team. Their tireless efforts are vital to keeping the P&SC thriving.

Wishing you a very Happy Christmas and New Year,

Sam

EDITOR'S NOTE

At the AGM on the 27th October, the following Officers were elected for 2025–26:

Sam Carling MP (Labour), Chair; **Viscount Stansgate** (Labour), President; **George Freeman FRSA MP** (Conservative), Co-Chair and **Baroness Walmsley** (Liberal Democrat), Vice-Chair.

My congratulations to Sam, Stephen, George and Joan on their election.

I am also very happy to confirm that our former Chair, **Stephen Metcalfe**, has been awarded Life Membership of the Parliamentary & Scientific Committee.

A number of new members have joined since the publication of the Autumn journal. A warm welcome to:

Parliamentary:	**Baroness Bottomley of Nettleton, Lord Shamash, Daniel Aldridge MP**
Commercial:	**R2AI**
Universities:	**University of Lancashire**
Scientific & Technical:	**Society for Endocrinology**
Individual:	**Dr David Schley**, Deputy Director, Sense About Science

Finally, I am delighted to report that we have received an excellent response to STEM for BRITAIN 2026, with applications from Early Career-Researchers up 12% on last year.

Leigh

SCIENCE IN PARLIAMENT
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Journal of the Parliamentary and Scientific Committee (All-Party Parliamentary Group)

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Science in Parliament has two main objectives:

Inform the scientific and industrial communities of activities within Parliament of a scientific nature and of the progress of relevant legislation

Keep Members of Parliament abreast of scientific affairs

From radar to algorithms:

Reimagining the future of maritime interdiction

Professor Sam Medhat PhD MPhil CEng FIET FRAeS FRSC FCIM FCMI FRSA FIKE FIoD FIRL
Chief Executive, Institute of Innovation & Knowledge Exchange; Visiting Professor of Innovation and Digital Transformation, University of Westminster; Senior Mentor NATO Allied Command Transformation

NATO's ability to disrupt evasion of sanctions, illegal transfers at sea, and grey-zone threats around critical subsea infrastructure, depends increasingly on how cleverly it fuses data, deploys automation and updates doctrine.

Maritime interdiction has always balanced seamanship, intelligence and law. What has changed rapidly is the tempo and texture of the oceans themselves.

Uncrewed systems now loiter for months. Stellites listen for radio-frequency (RF) traces of ships that 'go dark' by switching off their Automatic Identification System (AIS, a shipborne transponder). Artificial Intelligence (AI) ranks voyage-risk faster than a duty officer can brew a cup of tea!

For NATO, this is not a niche technology story, but a strategic 'Inflection Point'. The Alliance's ability to disrupt evasion of sanctions, illegal transfers at sea, and grey-zone threats around critical subsea infrastructure, depends increasingly on how cleverly it fuses data, deploys automation and updates doctrine.

Why Interdiction is being rewritten

Three forces are converging.

First, the target set has expanded from pirates and drug smugglers to those evading sanctions (e.g., 'shadow fleets' bypassing oil caps), illegal, unreported and unregulated (IUU) fishing, arms embargoes and hybrid activity near offshore energy networks.

Second, commercial space and edge-AI (Artificial Intelligence running on satellites and drones) have matured: RF Geolocation and Synthetic Aperture Radar (SAR) expose regularly vessels with their AIS-off, while on-board interference shortens the 'Sensor-to-Decision' loop.

Third, uncrewed systems (e.g., drones in the air and Uncrewed Surface Vessels – USVs at sea) deliver cost effectiveness. Such systems make it possible to enable manned-uncrewed vehicle teaming – a model that the US Navy's Task Force 59 (TF-59) demonstrated from 2024 through 2025 in their Fifth Fleet.[1]

Europe is also reshaping the legal perimeter. The European Union Artificial Intelligence Act (EU AI Act 2024) restricts certain law-enforcement uses of AI (notably some real-time biometric identification), nudging maritime users towards behaviour-based analytics with strong audit trails.

The UK has tightened sanctions' practice through maritime services and price-cap guidance, explicitly flagging deceptive shipping practices such as AIS manipulation and opaque ship-to-ship transfers. The US Department of Homeland Security's AI Roadmap in 2024, and the associated Blue-Ribbon Advisory Board emphasise safe, mission-aligned AI adoption across homeland security, including the maritime domain.[2]

Across NATO waters, then, interdiction is moving from episodic patrols to *predictive, multi-sensor, legally-literate operations*. The implications for doctrine, and thus, training are profound.

NMIOTC's moment: from courses to a digital ecosystem

NMIOTC in Souda Bay is NATO's dedicated hub for Maritime Interdiction Operations (MIO) training. It already delivers boarding (visit, board, search and seizure – VBSS), Weapons of Mass Destruction (WMD) interdiction, and surveillance courses.

Commodore Piyis Periklis, NMIOTC Commandant said: "Digital transformation is not simply about new technologies; it is about reshaping how we think, train, and operate at sea. At NMIOTC, we are forging digitally-empowered maritime professionals who can out-think, out-decide, and out-pace emerging threats, thus, turning data into decisive action across every interdiction mission."

Ioannis Pantazis, Department Head of the NATO Education and Training Digital Discipline, at NATO Communications and Information Academy, stated: "To lead in the digital era, particularly in the volatile and diverse maritime domain, we must train within a living digital ecosystem that brings together operational instructors, data engineers, legal advisors, and AI safety specialists".

So, what needs to happen to meet the digital transformation aspirations and goals?

Here are the initial guiding steps to delivering effective digital maritime capability:

1. Build the 'NATO Interdiction Cloud'
A secure, exercise-grade data fabric that ingests AIS, SAR, RF, electro-optical imagery and open-source data in near real-time. Curated, privacy-aware datasets would be available for training and red-teaming. Instructors could replay

real interdiction timelines, swap in synthetic data to protect sources, and benchmark AI tools under common scenarios.

2. **Make edge-AI and uncrewed teaming the default training lane**
Every boarding package should be preceded by an 'AI cueing' phase where trainees must interrogate an automated risk-score: validate AIS anomalies, check RF hits, and decide whether to escalate to a USV or drone for positive identification. TF-59's operational experience provides a blueprint for realistic, manned–uncrewed vignettes.[3]

3. **Create an 'Evidence-from-Orbit' legal lab**
After France's first pollution conviction based solely on satellite detection in April 2025, NATO MIO teams must understand how to preserve, explain and, when necessary, challenge remote-sensing evidence. A joint legal-forensics cell inside NMIOTC should teach chain-of-custody for satellite/RF cues, model documentation and expert-witness skills.[4]

4. **Institutionalise AI-Assurance and Red-Teaming**
The EU AI Act and Allied policy, point towards model governance: bias testing, performance drift monitoring, and Human-on-the-Loop controls. NMIOTC should run 'AI Failure Festivals', where trainees experience spoofed AIS, adversarial imagery and false positives, and learn graceful degradation tactics (e.g., reverting to independent sensor confirmation).[2]

5. **Integrating sanctions intelligence and due-diligence tradecraft**
Embedding UK/EU sanctions guidance into training will help operators spot deceptive charters, opaque beneficial ownership, and suspicious voyage economics, before a boarding. Decision cells should practice constructing 'case packages' aligned to flag/port-state evidentiary standards.[5]

6. **Credential the talent**
Introduce micro-credentials in maritime data fusion, uncrewed systems CONOPS (Concept of Operations) and remote-sensing evidence management. These should be jointly badged with Allied Command Transformation to lift standards across the Alliance.

Two models for NATO interdiction

Incremental digitisation will not be enough. Two bolder models can create new value pools, and alter the cost-curve of persistence and legality.

Model A: Interdiction-as-a-Service (IaaS) for the Alliance

Think of a standing, federated service managed by NATO that coastal states 'subscribe' to during operations or surges. It would provide: (i) Access to the NATO Interdiction Cloud; (ii) A pooled fleet of uncrewed assets (air and surface) pre-cleared for cross-border exercises; and (iii) An on-call legal-forensics cadre.

Nations contribute sensors, or taskable hours; NMIOTC curates training and standards; the Maritime Command (MARCOM) tasking cycles consume the service. The advantage here, is the lift-and-shift persistence – smaller Allies gain immediate access to high-end sensing and analytics, without acquiring full stacks, whilst larger Allies gain standardised interfaces and shared burden.

Model B: Behavioural Rules of the Road (BRoR) with explainable AI

Rather than chasing identity alone, NATO promulgates a behavioural schema – BroR – that defines Explainable Risk Features: anomalous course/speed relative to traffic, rendezvous patterns in high-risk boxes, RF–AIS mismatches, and emissions signatures. Algorithms trained on these features produce risk scores that are auditable and portable across jurisdictions, easing information exchange under different privacy regimes. BRoR would be taught and stress-tested, including 'Challenge Rights' (how a Master can contest an automated suspicion) to strengthen legitimacy.

Policy, people and pragmatism

Three cautions deserve emphasis.

1. **Law and legitimacy are strategic enablers**
The April 2025 French case demonstrates that satellite-only evidence can meet appellate standards– when provenance is robust, and analysis is transparent. NATO training must inculcate evidentiary hygiene equal to seamanship.[4]

2. **AI must be safe, useful and explainable**
The EU AI Act sets the benchmark in Europe; Department of Homeland Security's Roadmap and Advisory Board illustrate the US appetite to adopt with safeguards. Training should embrace every tool used in training ships with: a Model Card; Documented Failure Modes; and a Human-on-the-Loop concept.[2]

3. **Treat uncrewed systems as teammates, not talismans**
The real value of Task Force 59 (TF-59) lies not in its technology, but in its CONOPS: affordable, persistent systems that promote scarce crewed assets. Training should focus less on the question of "which drone?" and more on "who decides, on what evidence, and how fast?".[3]

Conclusion: seizing the initiative

A digitally transformed NATO Maritime Interdiction enterprise can out-observe, out-decide and out-argue adversaries. If NMIOTC becomes the Alliance's crucible for fused data, assured AI and manned-uncrewed teaming – anchored in law and legitimacy, NATO can create the strategic space to deter, disrupt and, when necessary, detain. The oceans are not getting any simpler. Our training, and our imagination, must get sharper!

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The invisible majority:

Microbes must be central to conservation and policy

Jack Gilbert
Director, Microbiome and Metagenomics Center

Raquel Peixoto
President, International Society for Microbial Ecology

Lucy Harper
Chief Executive, Applied Microbiology International

Without protecting microbial biodiversity, the UK cannot achieve net zero, ensure resilient food systems, or control antimicrobial resistance (AMR)

Microbes are the invisible foundation of life – and the missing link in the UK's climate, biodiversity, and health strategies. They regulate soil fertility, food security, water quality, climate resilience, and human health, yet remain absent from most conservation and policy frameworks.

In July 2025, the International Union for Conservation of Nature (IUCN) launched the Species Survival Commission's Microbial Conservation Specialist Group (MCSG) to close this gap. Drawing on global microbiological, ecological, and traditional-knowledge expertise, the MCSG will craft tools, targets, and policies to include microbes explicitly in biodiversity governance.

Under the IUCN, this coalition will help set conservation priorities for the invisible 99% of life. Microbes are finally earning a place in environmental strategy and treaties. The UK, with its scientific leadership and policy innovation, can help shape this global shift by embedding microbial criteria into domestic conservation frameworks and influencing upcoming UN and IUCN resolutions.

Mapping and protecting microbial life

The MCSG aims to map threatened microbial life worldwide and develop microorganism-specific Red List criteria that assess resilience and ecological function, not just population size. Its goal is to embed microbial criteria within the IUCN Red List and Red List of Ecosystems, so microbes are assessed alongside plants and animals (Lennon et al. 2025; Gilbert et al. 2025). This marks the first formal inclusion of microbes in IUCN frameworks, representing a historic shift that could see microbial metrics featured in global biodiversity and restoration plans by 2030.

The UK is positioned to lead microbial conservation action globally. By embedding microbes into biodiversity, climate, and health frameworks, the UK can safeguard food supplies, accelerate Net Zero progress, reduce healthcare costs, and expand its bioeconomy.

> Policy opportunity:
> Make microbes central to the UK's conservation and climate strategies, by treating soils, waters, and the microbiome as national assets.

Soil, food security, and climate

The science is unequivocal: a healthy ecosystem depends on microbes. A 2024 report highlights that soil microbial communities underpin soil health, food security, resilience to climate change, and biodiversity (Neale et al. 2024). Soil bacteria and fungi drive nutrient cycling, build organic matter, store carbon, and protect plants from stress and disease. Their activity boosts crop yields and stabilizes soils during drought, directly supporting UK food supply and Net Zero goals.

The UK Parliament's Soil Health inquiry already lists "microbiomes" among biological factors determining soil function. Regenerative agricultural studies confirm that keeping living roots in the ground, through cover crops and integrated livestock, improves soil organic matter, structure, nutrient availability, and biodiversity (Handelsman 2021). These translate into measurable gains in productivity and resilience.

The emergence of microbial biofertilisers (living formulations of microbes that enhance plant growth and soil function) illustrates both economic and environmental potential (Beattie et al. 2024). In Brazil, these technologies have already been demonstrated to save billions annually while reducing greenhouse-gas emissions (Telles at al. 2023). Microbial solutions are not aspirational but proven, scalable interventions.

The lesson for the UK is clear: agricultural and land-use policies must conserve soil microbes. Practices such as no-till farming, agroforestry, and microbial amendments enrich soil biodiversity, yielding climate resilience and better harvests. In contrast, monocultures and heavy agrochemical use collapse soil microbiomes, undermining productivity. Protecting microbial life is thus central to Britain's climate adaptation and nature-recovery strategies. Investing in soil microbiome health is not niche, it's essential for food security, carbon sequestration, and the "30 by 30" nature-positive agenda.

A 'One Health' imperative

Microbes also anchor the One Health paradigm linking ecosystem, animal, and human wellbeing. As the MCSG emphasizes, microbes are 99% of life and determine health and disease risks for the other 1%. Healthy microbiomes in soil, water, and built environments suppress pathogens, reduce AMR, and limit disease spread. Rich aquatic

communities outcompete harmful bacteria, cutting antibiotic use in aquaculture. Microbial-rich diets and exposure to biodiverse environments support beneficial human gut and skin bacteria, improving immunity and mental health.

Conserving microbial diversity is therefore a public-health measure. It aligns with the UK's AMR strategy and disease-prevention goals. Integrating microbial stewardship into environmental and health policies (e.g. Environmental Land Management schemes, and NHS One Health initiatives) could yield major benefits: protecting ecosystems while reducing healthcare costs.

UK leadership and global influence

Achieving the UK's net-zero and nature-positive commitments requires mobilizing every available tool, including the microbial world. British institutions are already taking the lead in the development and integration of these microbial technologies.

Applied Microbiology International (AMI) coordinates six global advisory groups on microbiology and the UN Sustainable Development Goals (Neale at el. 2024), and research at Rothamsted, Quadram, and UK farmer networks are pioneering microbiome-informed agriculture. Also, DEFRA's Soil Health report and the 2024 Westminster Soil Conference both highlighted microbiomes as key to sustainability. As a founding partner in global microbial conservation, the UK's expertise can have an outsized influence. By championing the MCSG and related initiatives, agencies like DEFRA, UKRI, and Innovate UK can shape international conventions, from upcoming UN biodiversity targets to IUCN resolutions.

Funding and policy signals from Britain can catalyse global microbial innovation. Government strategies, including Bioeconomy and Industrial Innovation, should explicitly reference microbial technologies. Environmental and agricultural frameworks (Environmental Land Management, Nature Recovery Network, Farm to Fork) should include microbiome metrics to monitor ecosystem health. Doing so would unite net-zero, nature recovery, and One Health agendas under one evidence-based framework.

Policy actions for a microbial future

To realise these opportunities, the UK should act decisively on five fronts:

Integrate microbes into conservation targets and monitoring. Partner with the IUCN MCSG to adopt microorganism-specific Red List criteria and ecosystem assessments. Ensure microbial indicators are embedded in the UK biodiversity strategy. By 2030, microbial metrics should stand alongside those of plants and animals for UK conservation.

Invest in microbial science and innovation. Increase research funding for soil, urban, and aquatic microbiome science, and align grants with the national bioeconomy by investigating the translational potential and technology readiness of proposed research. Microbes must be seen as engines of net-zero, nature recovery, and green economic growth.

Embed microbial health in agriculture and environmental policy. Revise the Sustainable Farming Incentive and nature-recovery schemes to reward practices that build soil microbial biodiversity, e.g., cover cropping, reduced tillage, and microbial biostimulants. Create incentives similar to carbon credits that recognise soil and water microbiome health.

Adopt a One Health, microbiome-centric approach. Incorporate soil and water microbiome monitoring into the UK's AMR action plan and pandemic preparedness. Promote collaboration between DEFRA, DHSC, and research councils to translate microbial science into applied policy. Public-health campaigns should highlight microbiome-friendly behaviours: clean water, healthy diets, and reduced antibiotic overuse.

Engage across sectors and education. Establish expert panels to brief ministers on microbial conservation and restoration action, ensuring evidence-based decisions. Many innovations are delayed by outdated risk perceptions. Expert engagement will close this gap and accelerate responsible innovation. Include microbial literacy in parliamentary discussions and public education so the invisible majority of life becomes visible in policymaking.

The case for UK leadership

The UK now has a unique opportunity to lead globally by embedding microbes into environmental policy. Science in Parliament and AMI stand ready to convene experts and translate research for ministers and MPs. Policymakers should engage with the MCSG by inviting briefings, funding joint projects, and ensuring that upcoming frameworks explicitly recognise microbes. Doing so will safeguard the ecosystem services microbiomes provide, such as fertile soils, clean air, healthy food, and disease prevention, while accelerating progress on climate, nature, and health goals.

Conclusion

Microbes are the invisible allies of climate, food, health, and biodiversity policy. By acting now, the UK can strengthen resilience, lower health and food costs, and pioneer a new global frontier in conservation and innovation. Protecting the microbial majority is not only sound science – it's smart policy for a sustainable future.

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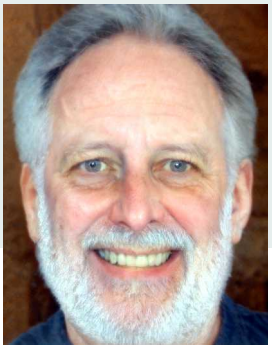
Microplastics –
The unseen dangers



Bryan Hanley PhD, FRSB
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Plastics and related polymers are one of the wonders of the 20th and 21st centuries. They are almost ubiquitous and are found in products used in research, healthcare, packaging, consumer goods, dental materials, transport and many more.

While the stability of plastics to environmental degradation has been one of their strengths, this persistence has been an important factor in their demonisation – there are few 'end of life' strategies for removal of waste plastic and the visible signs of discarded bulk plastic can be seen on land and in the sea.In addition, plastic use is both profitable and growing and the impact of post-use plastic is increasing.

The environmental impact of large deposits of plastics can be seen; however, the discovery of microscopic plastic particle that cannot be seen by the naked eye and are derived from synthetic (and even biodegradable) plastics has created new areas of concern for health and for the environment. The impact of these microplastics on health and the environment is still being assessed and there are numerous unanswered questions regarding the possible effects of these unseen microscopic particles and what mitigation strategies might be required to reduce the potential for deleterious consequences of their production.

Definition and sources of microplastics

The sources of microplastics are bulk plastics and functional microplastic materials added to cosmetics etc. The term microplastics is used to describe plastic particles of less than 5mm in length and was first introduced by Thompson et al in 2004[1]. Because of their small size and biostability, microplastics can enter cells and their potential biological effects at sub-cellular level are suggested to be of particular concern. It should be noted, however, that most microplastics are considerably larger than, for example, asbestos fibres (about 20,000 times larger) and so the effects ascribed to asbestos are less likely to be manifest. However, it should also be considered that a lower limit for the size of microplastics has not been defined (see Analysis and Quantification of Microplastics) and there have been relatively few studies of their potential mechanisms of toxicity based on particle size or chemical composition[2].

The growth in the production of the inadvertent microplastics 'starting materials' (half of all plastic ever made has been produced since 2010) suggests that microplastic production from post-use plastic has probably not yet reached a peak level.

As noted above, microplastics can either be incorporated intentionally to impart a desired functional property (for example, in cosmetics, tooth pastes, detergents or paints) or can be produced from the physical, chemical or biological degradation of bulk polymers such as the tyres of vehicles, the grinding of dental materials[3] or the production of ash from the incineration of plastics. Of these, tyre-derived microparticle release generated by shear forces between the tread and the road or by volatilisation contributes from one-third to half of microplastics unintentionally created and released into the environment[4].

All of the different potential production routes for microplastics have not yet been delineated and this is a knowledge gap that has to be addressed in order that any mitigation measures can be assessed for ease of application and prioritised in terms of impact.

Analysis and quantification of microplastics

The development of harmonised and cost-effective methods for the analysis of microplastics in a range of environmental and tissue matrices is a priority[5]. Most methods rely, at some stage, on microscopic analysis using visual or spectroscopic methods. While a range of methods of varying degrees of precision are available, the question of which are 'fit for purpose' in terms of cost, time taken for analysis, level of automation that is possible and the required sample preparation remains to be confirmed. In addition, different bulk plastics will produce different microplastics (both in terms of physical and chemical properties) and the extent to which the composition of individual microplastics must be determined (and the potential physiological and environmental effects of mixtures of microplastics) is unknown.

Potential health and environmental effects of microplastics

One of the most significant knowledge gaps concerns the potential biological and environmental effects of microplastics, the mechanisms that underpin these effects and if any effects are species-specific. Ingested substances undergo four processes – Adsorption, Distribution, Metabolism and Excretion (ADME) and the balance of these treatments defines the toxicokinetics of the compounds. Even the route of exposure (commonly inhalation or ingestion from food or other oral routes) can affect the toxicokinetics and, in turn, the risk of deleterious effects. Some types of microplastics (those derived from polystyrene and polyethylene, in

Micro plastics mixed in the sand in Famara beach, Lanzarote

Photo Credit: GaiBru Photo

particular) have been associated with organ-specific physiological effects but studies are incomplete and a range of test systems (animals, in vitro cell models etc.) have been used. Effects on a range of clinical endpoints have been noted however in many cases comparisons between experimental systems (and data) is not possible and a quantitative risk assessment of microplastics from different bulk plastics with different chemical and physical (e.g. shape of the particles) has not been carried out. Microplastics may also have different effects on different ecosystems and this variation is not obvious simply by inspection.

Possible mitigation strategies

A number of potential mitigation strategies have been proposed. For those products that contain added, functional microplastics, reformulation to remove the necessity of having microplastics in the product can be suggested. For microplastics produced from bulk plastics the combination of removal of those materials most prone to producing microplastics during use and post-use processes can be advised. However such interventions can only be effective if more complete knowledge of the toxicological and environmental consequences of microplastics is available. The removal of microplastics from air, food and water has been proposed as a post-formation strategy.

Conclusions and next steps

Microplastics represent an acknowledged possible toxicological and environmental hazard. Control of the risk associated with exposure to microplastics will require a number of gaps in the knowledge base to be filled. These include the following:

- The development of appropriate, cost effective and harmonised procedures for the analysis and quantification of microplastics.
- A detailed analysis of the different sizes and shapes (smooth, irregular etc.) of microplastics and the biological consequences (including ADME studies) of the production of types and sizes of particles.
- The carrying out of ADME and toxicokinetic studies of microplastics by size, shape (see above) and chemical composition.
- The development of a better understanding of how different types of microplastics are formed from bulk plastics and the dependence of this on factors such as the degree of micro crystallinity or amorphous nature of the bulk material.
- The development of methods (e.g. filters etc) to remove microplastics from, in particular, air and water in a cost effective and efficient manner.
- Based on the above, the development of a suite of appropriate microplastic control methods.
- In addition, new methods of manufacture (including the synthesis of biodegradable plastics), should be assessed for their potential to produce microplastics[6].

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The benefits of UK leadership in Global Health Science

Lord Oates
Vice-chair, Global Health and Security APPG; Co-chair APPG for Africa

Professor Geoff Garnett
Dean of Faculty, London School of Hygiene and Tropical Medicine

For decades, UK science has partnered with governments and institutions worldwide to improve health outcomes and build strong global partnerships. Even amid ongoing challenges from HIV, tuberculosis, and malaria, child survival and life expectancy have risen in the world's poorest populations, especially in sub-Saharan Africa, through innovative health interventions and care.

The long institutional history of UK Universities such as the London School of Hygiene and Tropical Medicine (LSHTM) and the Liverpool School of Tropical Medicine (LSTM) has allowed the development of partnerships across the world. These, increasingly equitable partnerships, drive locally relevant research on interventions that reduce the burden of disease.

With innovative funders such as Unitaid, the Global Fund for AIDS, Tuberculosis, and Malaria (GFATM), and GAVI these interventions have been scaled in resource poor settings. Examples include insect treated bed nets for malaria, more effective drugs for HIV treatment and HIV prevention, and new diagnostics for tuberculosis. Further interventions such as even more effective HIV prevention drugs and vaccines against tuberculosis and malaria are in the pipeline.

Global health impact and diplomacy

A recent exchange visit between South African and UK Parliamentarians, co-hosted by STOPAIDS and WACI Health, illustrated the regard with which UK research is held and how the UK's science diplomacy delivers measurable health outcomes and strengthens scientific capacity. It also allowed the UK delegation to learn from South Africa's experience and expertise in addressing HIV/Aids and TB. South Africa bears the greatest burden of HIV in the world with over 7 million people living with HIV. The HIV epidemic also exacerbated the country's existing problem with tuberculosis.

> The visit to South Africa offered important lessons from a country that has made huge progress in tackling HIV through innovation, collaboration, and strong community leadership

After tragic delays, the response to HIV has seen the majority of those living with HIV treated with virus suppressing drugs, leading to a decline in HIV spread and a reduction in tuberculosis incidence. The South African Government for the most part funds this HIV response but is nonetheless grateful for the partnerships and support provided through UK funding and hopes to learn how to better its health research ecosystem. Elsewhere, less well-resourced African countries are reliant on international funding for a functioning response to major health challenges.

The visit to South Africa offered important lessons from a country that has made huge progress in tackling HIV through innovation, collaboration, and strong community leadership. Delegates visited health facilities and research sites in Johannesburg and Pretoria to see how tuberculosis prevention therapy and HIV prevention options are being rolled out through youth-friendly and community-based services.

The visit also highlighted the importance of local production and long-term sustainability. Delegates met with a local pharmaceutical manufacturer that is developing the raw materials for essential medicines, helping to strengthen regional supply chains and reduce reliance on imports. Conversations with community-led organisations and service providers underlined that placing people at the centre of the response including through harm reduction and support for sex workers is essential to ensuring no one is left behind.

These experiences demonstrated that collaboration between the UK and South Africa can be mutually beneficial: while the UK brings scientific and policy expertise, South Africa offers valuable experience in implementation, community engagement, and delivering innovations equitably.

> Discovery and development are crucial for the emergence of new products to prevent and treat disease, but these products achieve little if not available at scale

The visit also provided an opportunity to showcase the work of Unitaid. The UK has been a founding partner of Unitaid since its creation in 2006. Over that time, Unitaid has reinvested more than £250 million back into the UK through partnerships with leading British research institutions such as LSHTM, LSTM, and the University of Oxford. These collaborations have helped translate UK-led innovation into affordable, scalable health solutions from HIV self-testing and long-acting prevention tools to new TB diagnostics and vector control technologies.

Discovery and development are crucial for the emergence of new products to prevent and treat disease, but these products achieve little if not available at

scale. Unitaid supports the implementation research and market shaping that allows policy and practice to embrace innovation.

During the exchange visit, the parliamentarians were keen to visit LSHTM where results were presented from examples of investments by Unitaid in HIV, tuberculosis, and malaria control.

HIV self-testing: Rapid, easy to use tests for HIV allow people concerned about HIV acquisition to assess their own status and find out whether they need to seek medical help. Self-testing helps overcome the barriers of stigma and discrimination, thereby improving the coverage of suppressive HIV treatment. Initially, many concerns about the ability of people to use the tests, manage results, and appropriately reach care were raised as stumbling blocks to introduce HIV self-tests. Research in Malawi, South Africa, and Zimbabwe provide evidence of effectiveness of self-tests promoting shifts in policy and practice to allow for self-test distribution. Such use has now been normalized and helped pave the way for World Health Organization guidance on other self-tests, such as those for Covid used during the pandemic.

Management of AIDS

Despite the success AIDS programmes have had in increasing HIV testing and treatment there remain some for whom diagnosis and care is too late, leading to advanced HIV disease. A single dose of liposomal amphotericin injection was shown in trials coordinated by LSHTM to be an effective treatment for cryptococcal meningitis. Unitaid is supporting the use of diagnostics and treatment for cryptococcal meningitis in sub-Saharan Africa to benefit from such findings.

Tuberculosis vaccines: with success in reducing AIDS deaths tuberculosis is now the leading infectious cause of death with an estimated 1.09 million deaths in 2023. For the first time in decades new drugs are emerging that provide shorter and more tolerable tuberculosis treatments. Unitaid is supporting the use of these drugs. Concomitantly there is hope for a vaccine. A large, pivotal efficacy trial is underway for a vaccine expected to prevent progress to tuberculosis disease in those latently infected. This will both prevent disease in the vaccinated individual and reduce the spread of tuberculosis. LSHTM is exploring affordability, impact, and cost-effectiveness, and working with governments, including South Africa, to plan rapid vaccine adoption and distribution.

Malaria prophylaxis: seasonal malaria chemoprophylaxis with sulfadoxine pyrimethamine is recommended to reduce malaria morbidity and mortality. Despite the recommendation, prophylaxis is often not implemented because of uncertainty about when and how it should be used. The Plus Project funded by Unitaid and lead by Population Services International (PSI) is studying seasonal chemoprophylaxis in different epidemiological contexts. The results show that where malaria incidence is high, this prophylaxis can be both effective and cost-effective.

These examples illustrate the work of Unitaid and researchers from the London School of Hygiene and Tropical Medicine but are a fraction of the work done by both organizations to improve health worldwide. Both organizations work with global and local partners to fund, research, and implement transformative health interventions. Investments in Global Health improved outcomes include: AIDS deaths in Southern and Eastern Africa fell 59% between 2010 and 2023, tuberculosis deaths by 23%, and malaria deaths by 30%, with faster declines in child and maternal mortality where HIV programmes were strongest.

> The public and policymakers often underestimate how Overseas Development Assistance and global health science serve UK interests

The United Kingdom has been a leader in providing efficient and effective funding. Through investment in all parts of the 'value chain' – funding for science on discovery, development, and implementation of interventions, support for partnerships developing local capacity and resources for international agencies to work with governments to scale interventions locally. This value chain turns science into global health impact. Ultimately, investments in Global Health are an investment in the UK's soft power and global competitiveness.

Unfortunately, the public and policymakers often underestimate how Overseas Development Assistance (ODA) and global health science serve UK interests. We need to better communicate success stories and how they change lives whilst promoting soft power at low cost. A failure to tell this story has made support vulnerable at a time when there is a retreat from global solidarity, particularly from the United States. It will be a tragedy if the UK follows this lead and walks away from the success it has generated.

> The move away from the commitment to 0.7% GNI for ODA has undermined the UK's standing – we need a roadmap to restore funding to global health and science innovation

Despite Unitaid investment in the UK, the government has not honoured its 20-year agreement with the global health multilateral. Funding for Unitaid is a fraction of its ODA spending but withdrawing or reducing support risks weakening the very ecosystem that makes the UK a global leader, undermining long-term research partnerships, diminishing influence within global health institutions, and eroding the UK's reputation as a trusted scientific partner. Sustained investment in platforms like Unitaid offers not only exceptional global health returns, but also tangible benefits to the UK's research base, innovation economy, and international standing.

The move away from the UK's long-term commitment to 0.7% GNI for ODA has undermined the UK's standing and we need a roadmap for restoring funding to global health and science innovation.

Conclusion

The UK's global health science is one of the country's greatest diplomatic and economic assets; an engine for innovation, influence, and international cooperation. Sustaining UK leadership demands consistent investment, clear strategy, and recognition that partnerships like those with LSHTM and Unitaid are not just about saving lives abroad but about securing the UK's place as a trusted global science power.

Precision policy:

Why measurement science deserves a seat at the table

Julian Braybrook
Director, National Laboratories at LGC and UK Government Chemist

Caroline Pritchard
Director, Key Accounts and Government Relations, NML at LGC

Grace Andrews
Policy Coordinator, NML at LGC

Metrology underpins public safety, innovation and trade. The National Measurement Laboratory (NML) ensures the UK remains at the forefront of reliable, evidence-based policy and practice.

Measurement powers progress in ways many of us never see.

The security of our food system is predicated on our ability to test that what is in our food is as expected, in substance and quality. Consumers trust that food is safe from, for example, pesticide or allergen contaminants, because of their confidence in the enforcement and regulatory system to detect and measure them before food reaches their plate.

In modern medicine we diagnose and treat disease more than ever before, underpinned by our increasing ability to detect diseases and measure the effectiveness of novel treatments. As we transition to a community-based preventative healthcare system, measurement science will be key to giving all healthcare workers access to the same accurate and trustworthy data, helping to ensure equality of health provision across the four nations.

Globalisation, which sees international trade as commonplace, is possible because industries have common agreements for measuring products, ensuring measurements are comparable regardless of when or where they are made.

Metrology, the science of measurement, is a critical underpinning discipline, supporting global trade, ensuring public safety and fostering innovation. Metrology is not just the routine making of measurements, but the infrastructure that ensures we have confidence in their accuracy, precision and repeatability – ensuring common understanding of these measurements, their units and application.

The NML, hosted at LGC, has been the Designated Institute for 'Chemical and Biological Metrology' within the UK, since 1988. We play a leading role internationally to standardise chemical and biological measurements to support global trade in established and emerging sectors. We give stakeholders confidence in chemical and biological data, supporting the innovation pipeline, promoting productivity and economic growth. We enable efficient translation of novel technologies, encouraging and de-risking investment. The NML supports the role of the 'Government Chemist' (GC), which has a statutory function as an independent referee analyst under several Acts of Parliament, particularly for food and feed, and an advisory role to stakeholders, focusing on public protection, value for money and consumer choice.

Through the NML and the GC we make sure the UK is ready to face the chemical and biological measurement challenges of today and tomorrow.

Delivering our core function

We have a strong heritage, delivering high quality measurement science to the UK for over 180 years, since the establishment of the government Excise Laboratory, and are continually developing our capabilities to address current and emerging challenges.

The recent NHS 10-year plan identified genomics and predictive analysis as one of five "big bets to drive healthcare reform". To fully realise this ambition and support the move to community care, it is essential that novel genomic profiling techniques are accurate and, crucially, comparable across laboratories and regions. High test accuracy and reliability is essential in gaining and maintaining public confidence in the adoption of genomics. Without this, a shift to pre-emptive, personalised care will be unlikely to succeed. Our scientists are at the forefront of addressing this urgent need for standardisation through, for example, leadership in the Horizon Europe-funded GenomeMet project, developing Reference Measurement Systems to support the comparability of genome profiling techniques between laboratories.

Our work provides national resilience not only to the NHS but also in protecting our food and feed system. For example, a recent referee case centred on the disputed level of a toxic substance in a sample of Basmati rice. The substance was found to exceed the maximum permitted level and therefore the consignment was rejected at point of entry into the UK, protecting consumers.

Not only are we protecting consumers today, but we are helping prepare for the future. As the food sector drives towards sustainability, there is a push towards novel foods and away from plastic packaging, in favour of recycled, eco-friendly materials. These new food types and novel materials present currently unmet metrology challenges: on the quantification of unknown risks, development of consistent safety standards and implementation of appropriate regulation. By our working with food providers, testing laboratories and the wider regulatory system, we are helping ensure the continued safety of the UK food system.

The NML new purpose-built laboratory on the Surrey Research Park.

The Priestley Centre
10 Priestley Road
Guildford
GU2 7XY

Looking further forward, disruptive technologies such as engineering biology have the potential to impact society greatly but bring potential risks as well as opportunities. Working with UKHSA and other partners we are seeking to improve UK biosecurity, limiting our reliance on international providers and increasing the UK government's resilience in the face of novel biological threats.

Sharing our expertise

As a Public Sector Research Establishment (PSRE) we have a duty to share our capabilities with the wider UK research, development and innovation ecosystem, improving understanding of chemical and biological measurements for the benefit of the UK public.

We have several programmes which facilitate partnerships with innovators, such as the Healthcare Scientist Knowledge Transfer Partnership Programme. Through this we work directly with healthcare scientists to address specific measurement challenges, helping implement innovative approaches into the NHS and improve the quality of patient care.

Recently, we collaborated with the MHRA and clinical scientists at Bart's NHS Trust to support the standardisation of a novel technique for rapidly diagnosing bacterial infections. Serious infections can cause huge risk for patients and it's crucial they have quick access to the right treatment. This innovative approach cuts diagnostic timeframes from seven to two days, helping patients receive treatment sooner and recover faster.

Antimicrobial resistance is a major global health problem with the potential to return healthcare to a pre-antibiotic age, putting patients at risk from drug-resistant infections. We partnered with Microplate Dx Limited through our joint Centre for Advanced Measurement Science and Health Translation at the University of Strathclyde to support the scaling-up of their innovative point-of-care diagnostic device. This technology will enable clinicians to select with confidence the best choice of antibiotic to treat a patient's infection in minutes.

Within our Northern Cell Metrology Hub in Leeds, we partnered with SME HeartCells to develop their cutting-edge cell therapies used to treat heart failure. Our experts improved their standardisation and quality assurance for regulatory approval, bringing this innovative treatment one step closer to improving patient outcomes.

Beyond healthcare, our work spans many different sectors – collaboration with MDCO, a specialist chemicals company, enabled them to confidently market their cleaning products as environmentally friendly, contributing to safer and greener practices in the nuclear decontamination industry.

Our strategic 'city-region' partnerships, including those mentioned above in Strathclyde and Leeds, support sustained productivity improvements at a local level. Our Centre for Excellence in Agriculture and Food Integrity, based at the ASSET Technology Centre at Queens University Belfast, supports the UK agrifood industry to become more sustainable, reliable, safe and productive. Our partnership with the Liverpool School of Tropical Medicine, The Pandemic Institute and Liverpool City Region will support UK efforts for future nanomedicines and infectious disease diagnostics.

The future of chemical and biological metrology

The NML and GC functions are strategic national assets, central to the UK's scientific resilience. Our work, its impact and our scientists are recognised as world-leading or internationally competitive in our fields (International Science Review). Through our lead, and active participation, in multiple international research projects and expert standardisation and policy committees, we have positioned the UK as a global leader in chemical and biological metrology.

Sustained public sector investment has provided the base from which to build such nationally – and internationally – recognised capabilities that we can apply flexibly to metrology challenges as they emerge to best benefit wider UK industry. We deliver for the NHS, tackle food security, protect the environment and underpin UK trade. Our strategic regional partnerships are engines of translation and impact helping us build roots in local research ecosystems, developing local talent and driving local economic growth.

With our future in mind and supported by significant investment from our private-sector host organisation, LGC, we relocated this summer to a new purpose-built laboratory on the Surrey Research Park. The facility provides our experts with the infrastructure needed to deliver the UK's next-generation metrology solutions, while continuing to attract top talent to the UK research ecosystem.

Measurement challenges will continue to emerge – from novel medicines and diagnostics, to green technologies, to innovative food products – and our new facilities put us on the front foot to meet them head-on.

Metrology matters. Continued support for measurement science and its role in sound policy making is not just an investment in science – it is an investment in public health, economic growth and national security.

The International Year of Quantum:
Engaging the next generation

Tom Grinyer
CEO, the Institute of Physics

Quantum is beginning to take the shape of a genuine new industry in its own right and just like the emergence of other revolutionary technologies … the next wave of quantum will change our world in ways we cannot yet imagine.

2025 is the UN's International Year of Quantum Science and Technology (IYQ), aimed at giving fresh impetus to the world's understanding of quantum. The Institute of Physics (IOP), as professional body and learned society for physics in the UK and Ireland, has led on this in the UK on behalf of the Department for Science, Innovation & Technology. This has included coordinating activities run by a wide range of groups and putting on a series of high-profile events to raise awareness of how quantum is changing our lives for the better, including taking the message to parliament and government.

Why celebrate quantum, why an international year, why this year?

Put simply, the first generation of quantum technology has touched every part of modern life. It has underpinned the digital revolution over the last 100 years – in the form of lasers, optical fibres, semiconductors and much more – yet quantum has remained an enigmatic science in many ways.

2025 marks a century since the German physicist Werner Heisenberg's paradigm-shifting formulation of quantum mechanics. Since then, quantum mechanics has profoundly transformed our understanding of the natural world and the nature of matter. The innovations in technology it has driven that have benefitted humanity are myriad.

In the UK, the government set up the National Quantum Technologies Programme in 2014 to accelerate the development and commercialisation of quantum technologies and with a £1bn initial investment gave the UK a strong foundation to build on. By most measures, over a decade on, the UK is a global leader in quantum, with the second largest private sector investment and third largest quantum sector in the world.

Quantum is beginning to take the shape of a genuine new industry in its own right and just like the emergence of other revolutionary technologies – the invention of the railways two hundred years ago this year, the combustion engine, the internet, AI – the next wave of quantum will change our world in ways we cannot yet imagine.

The influential Institute of Physics 2022 report *A Vision for Quantum Technologies in the UK* aimed to support the development of a national quantum strategy. In 2024, this call was answered when the government announced a £2.5bn 10-year plan for quantum – the UK's largest ever long-term investment in an emerging technology.

This commitment gives long-term certainty to support private investment and new business creation and gives the UK a strong position in the commercialisation of quantum technologies.

In response to the opportunity quantum represents, IOP members set up a quantum Business Innovation and Growth (qBIG) group and alongside their very busy schedule of networking activities they award the qBIG prize, celebrating small and medium-sized startups taking quantum technology services and products to market. It offers a £10k prize and mentoring from quantum VC specialists Quantum Exponential plus access to the IOP's Accelerator space, which is now home to nine quantum start-ups.

The science, however, remains one of the hardest to explain to non-physicists. That's why the public engagement opportunities the IYQ offers are so important – you don't need to understand quantum to understand its potential. So alongside celebrating with the physics community, we have sought to engage the public– especially the next generation – and to support political momentum.

To reinforce the message, in June we brought a quantum exhibition to the Houses of Parliament showcasing real-world applications and the future possibilities of quantum science. Alongside the exhibition, we hosted a drop-in event where parliamentarians could meet quantum physicists and businesses driving innovation. Our goal was clear, to demonstrate that quantum is not just a scientific frontier where the UK is a global leader but also a strategic investment for the UK's long-term prosperity.

At the start of November, the IOP welcomed hundreds of people to events at the Royal Institution to learn about the history of quantum and to explore its future as part of a broader IYQ-focused week of activities dubbed "quantum week".

Expert speakers from academia, government and business gave people the opportunity to hear more about quantum development, its importance to the UK, and how this technology could change our future. Theoretical physicist Professor Jim Al-Khalili OBE, an IOP honorary fellow and well-known broadcaster, gave a keynote speech highlighting the many opportunities presented; by quantum timing, imaging,

Left to right: Jim Al-Khalili and some young quantum enthusiasts; The IOP's event at the Royal Institution; A multi-stage dilution refrigerator used for cooling superconducting quantum processors to millikelvin temperatures, with layered gold-plated plates and wiring for qubit control and readout (photo by permission of National Quantum Computing Centre)

sensing, encryption, internet and the holy grail of quantum research, quantum computing.

Quantum week attracted delegations from around the world and other highlights included a National Physical Laboratory event – where science minister Patrick Vallance launched NMI-Q, a global network of measurement bodies to shape quantum standards – and the UK National Quantum Technologies Showcase 2025, organised by Innovate UK, which this year attracted more than 3000 attendees – a tangible sign of the industry maturing into a new industrial sector.

Applications of quantum: why is this such a special area of physics?

Quantum mechanics explains how matter and energy interact at the smallest scales. Over the past 100 years physicists have discovered that particles at this level behave in ways that defy classical physics, challenging our traditional understanding of the material world.

While this has changed our understanding of the world on a fundamental level, quantum phenomena such as entanglement and tunnelling have also led us to technological advances that have profoundly altered the ways we live. These applications – from phones to computers – are all around us and the world would not function as we know it without our understanding of quantum mechanics.

And this science is increasingly coming into plain sight. The revolutionary first wave of quantum technology promises to be eclipsed by a second wave that leverages the counterintuitive ways the quantum world works. Quantum computers, for example, will enable computing to be done in a fundamentally different way – some calculations will be done exponentially faster than a classical computer. This will change how we work, how we problem solve, how we diagnose and treat health issues and how we interrogate the world around us.

But while the way the second quantum technology revolution will shape our future can be glimpsed, there are still many unanswered questions.

The application of quantum mechanics in encryption and cybersecurity throws up the twin possibilities of new, more powerful, encryption tools, as well as more well-known decryption methods – a real cause for concern in industries and governments working with and trying to protect sensitive data.

Scientists talk of 'q-day', the fast-approaching point at which quantum computers should be able to crack RSA encryption, which is widely used across the internet to secure sensitive data for instance for financial transactions. New standards will be required to manage the threat posed by the cryptographic powers of quantum computers – organisations such as the National Institute of Standards and Technology are already working on what will be a hugely complex problem to solve.

As the quantum sector continues to emerge, there is a responsibility on us all to ensure it works towards a common good. The IOP promotes this work across the physics ecosystem: alongside our expert members, universities, politicians and policymakers, funders, and physics-based businesses (the latter of which in 2023 accounted for 11% of UK GDP). Elsewhere UKQuantum is collaborating with the ecosystem on the Responsible Quantum Industry Forum.

Other challenges in developing the industry.

We face many obstacles, one of which is the very real skills gap. Two-thirds of businesses we surveyed told us they have had to stop or delay R&D over the last five years, because of a lack of relevant skills. Meanwhile, a quarter of our state schools don't have a specialist physics teacher at GCSE level, leading to a postcode lottery of access and likelihood of taking physics study further.

And while we are seeing small positive changes (this year physics jumped from the ninth to sixth most popular A-level choice) physics is still the 15th most popular A-level choice among girls and the 2nd among boys – a very strong indication of the kind of messages girls and young women are getting about physics – something we're working hard to change through our pioneering 'Limit Less' programme.

So there is huge opportunity, and also significant challenge. We are hoping the International Year of Quantum Science and Technology inspires the next generation of physicists to seize that opportunity and tackle the challenges with us. The UK was an early mover in this area and has maintained an important role as a global quantum leader, it is down to us all to maintain the UK's well-earned position.

Harwell Quantum Cluster:
The UK's gateway to quantum

Dr Najwa Sidqi
Harwell Quantum Cluster Manager, UKRI STFC

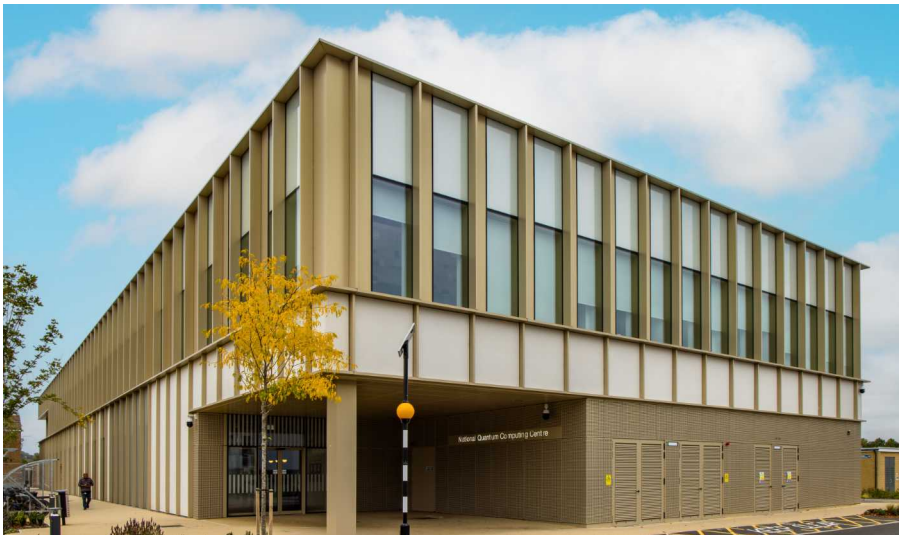
The question facing policymakers is not whether quantum will matter, but how quickly the UK can build sovereign capability, attract global investment and accelerate adoption across both the economy and the society? Harwell Quantum Cluster is designed to be the UK's answer to that challenge.

Quantum technologies are now central to the UK's long-term science and industrial strategy. With quantum explicitly recognised as one of the UKRI technology missions alongside AI, future telecoms and engineering biology, the policy environment and the government direction are shifting from research excellence to deployment, capability-building and strategic advantage.

A strategic asset for the UK's quantum leadership

Government has been clear that the UK's competitiveness relies on mission-led infrastructure that can translate scientific excellence into real-world impact. Harwell Campus already plays this role for space, health tech, energy and defence. The Harwell Quantum Cluster extends that model into a field where the UK must build both economic advantage and national resilience. The Harwell quantum strategy sets out a 10-year plan to do so by:

- Providing shared testbeds and national infrastructure, including the National Quantum Computing Centre (NQCC), to de-risk validation and accelerate adoption across the industry and the society.
- Concentrating cross-sector pilots in areas essential to national missions including secure communications, energy systems modelling, health decision-support in the NHS, navigation and timing systems, and environmental sensing.
- Supporting commercialisation and scale-up by linking early-stage ventures to investors, technical partners, and end-users to accelerate market readiness and business scale up.
- Creating a globally connected gateway for trusted international quantum partnerships.
- Developing a diverse, sovereign talent pipeline for quantum engineering, systems integration and applications to enable business scale up and accelerate economic growth.

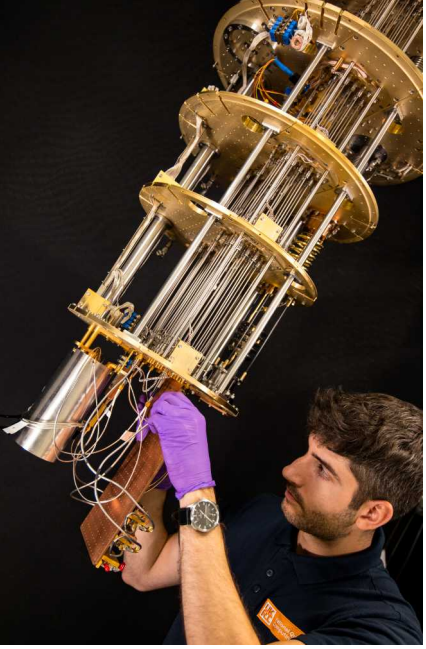


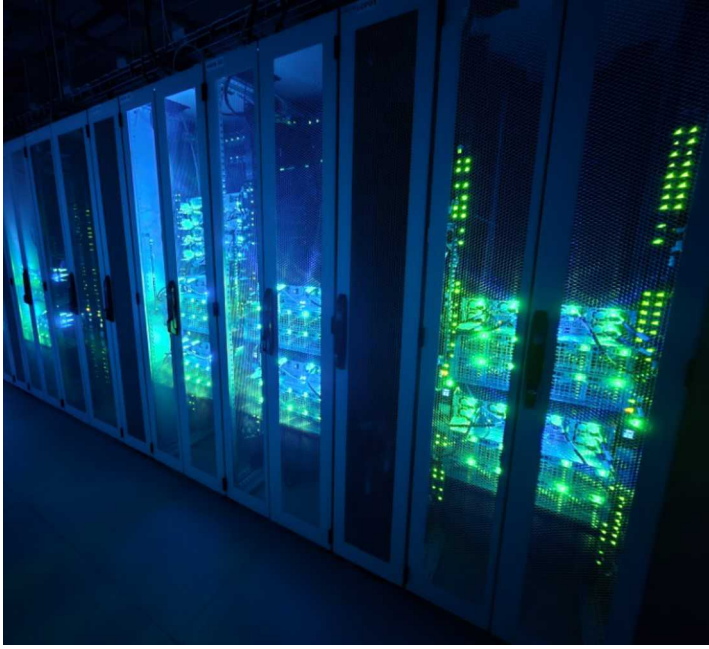
The National Quantum Computing Centre, a purpose-built facility hosting multi platform quantum computing infrastructure and the UK hub dedicated to accelerating the development and adoption of quantum computing technologies.

New MoU with Quantum Exponential: Catalysing UK investment into quantum scale-ups

This autumn, the Harwell Quantum Cluster and Quantum Exponential, the UK's leading listed quantum investment vehicle, announced a Memorandum of Understanding to accelerate early commercial deployment of quantum technologies developed at Harwell.

Under the MoU, Quantum Exponential and the Harwell Quantum Cluster will co-develop an investment pipeline focused on companies using Harwell facilities, testbeds and technical capabilities. A new £100 million funding window will be targeted at hardware, sensing, networking and other quantum enabled technologies from Harwell's incubation and demonstration programmes and other Harwell Quantum Cluster affiliated companies. Joint demo days, investor showcases, and technical due-diligence programmes will operate on-campus, giving quantum ventures access to investors with specialist expertise and realistic adoption timelines. The partnership will support mission-aligned pilots, helping ventures secure early revenue through links to public-sector buyers, regulated sectors, and large-scale industrial partners across the wider Harwell ecosystem. This MoU is not just a campus announcement; it is a policy





Left to right:

NQCC scientist working on a dilution refrigerator, preparing cryogenic hardware used to cool quantum processors to millikelvin temperatures, for superconducting qubit operation.

NQCC scientist adjusting optical components and fibre connections on a photonic experiment used for quantum information research.

Illuminated server racks inside the NQCC data centre housing the control electronics and infrastructure that support quantum experiments

signal. It demonstrates how public infrastructure and private capital can co-operate to accelerate technologies identified as strategically important by Government. It responds directly to the call, repeated in several recent parliamentary committees and industry forums, for greater mobilisation of patient capital, de-risking of deep tech, and clearer pathways between UK research strengths and economic outcomes.

The UK needs quantum deployment, not just discovery

The UK is globally respected for quantum science, but leadership in the next phase will depend on:

- De-risking early adoption in sectors where performance, security and trust are paramount.
- Building sovereign capability in hardware, networks and high-value supply chain components.
- Linking quantum to applied missions, from environmental modelling to secure infrastructure.
- Attracting long-term private investment, complementing UKRI, DSIT and defence funding streams.

By providing interdisciplinary testbeds, co-located infrastructure and end-user access, Harwell reduces barriers that typically slow quantum progress: fragmented supply chains, long iteration cycles, high capital costs and regulatory uncertainty.

The cluster is expected to support up to 100 quantum-focused companies, alongside over £1 billion of inward investment, creating a national capability that benefits the whole UK, similar to the regional innovation models from the Yorkshire bioeconomy to Scotland's built-environment innovation ecosystem.

A policy model for the UK's Emerging Technology Strategy

The UK must now demonstrate not only research excellence but investability, scale and system-level capability, three features that international investors and partners identify as prerequisites for quantum deployment. Harwell offers a replicable model that is a place-based asset with capability concentration. As seen across other sectors such as bioeconomy clusters, net-zero manufacturing hubs, regional AI accelerators, place matters. Harwell's integrated ecosystem reduces fragmentation and ensures that quantum innovation is not happening in isolated pockets.

Quantum will require new standards, procurement models, supply-chain assurance, and responsible innovation frameworks. Harwell provides a testbed environment where these can be developed collaboratively, in line with POSTnotes on quantum risks, responsible data use and interdisciplinary regulation. The Quantum Exponential MoU is a practical demonstration of how the UK can attract market-led investment into deep tech while retaining sovereign capabilities in sensitive technologies.

With the market moving rapidly in North America, Europe and Asia, global partnerships will be essential. Harwell's track record across space, energy and life sciences, positions the quantum cluster as the UK's international front door.

Looking ahead: The UK's moment of opportunity

The International Year of Quantum Science and Technology in 2025 provides a platform to demonstrate the UK's strengths in quantum science and technology. But momentum must be sustained beyond the year itself. By expanding infrastructure, scaling talent programmes, and deepening public–private investment partnerships, the Harwell Quantum Cluster is ensuring that quantum technologies deliver economic, security and societal benefits for the whole UK. Quantum is no longer a future challenge, it is a present strategic opportunity. Harwell is building the place where the UK can seize it.

Delivering the UK's industrial strategy:

The crucial role of chemical engineering

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President, Institution of Chemical Engineers
Professor of Chemical Engineering, Heriot-Watt University

Dr Kate Barclay MBE CEng FIChemE
Skills Strategy Consultant, Bio-Industries Association

Chemical engineering needs to draw on the widest possible pool of talent, and that means increasing awareness of the field among all age groups and particularly among teachers, parents and other key figures that influence the decisions of the next generation.

The role of chemical engineering in the UK's industrial strategy

The United Kingdom's Industrial Strategy sets out an ambitious vision of economic growth, innovation and an accelerated transition to a sustainable, net zero future. Central to achieving each of these objectives is chemical engineering, a discipline that applies science, mathematics, economics, and engineering design to transform raw materials into products essential to modern life, fuels and energy vectors. Chemical engineers design, implement and run the processes and systems that make this production happen efficiently, at scale, safely, and sustainably.

Contributions across key sectors

This broad field covers sectors from pharmaceuticals and food production to energy, advanced manufacturing, and environmental technologies. Chemical engineers are experts in scaling things up. A chemist or biologist may discover a promising new compound in a lab, but it is the chemical engineer who figures out how to make it in the quantities needed to actually put it to use, and who makes that production happen safely, efficiently and sustainably.

The contributions of chemical engineers are fundamental to the industrial strategy's priority sectors, including clean energy, life sciences, and advanced manufacturing. To take just a few examples: chemical processing inputs form the backbone of roughly 95% of manufactured goods, the chemicals sector contributes around £30 billion in value annually and supports 140,000 jobs, and energy supply chains linked to chemical engineering add a further £176 billion in economic output. Advancements in biopharmaceutical manufacturing and engineering biology rely on chemical engineering expertise to scale laboratory breakthroughs into commercial realities, underpinning a life sciences sector valued at over £19 billion. In advanced manufacturing, chemical engineering supports materials innovation and process optimisation, enabling domestic industries to remain competitive and resilient in global markets.

As well as growth, the industrial strategy also aims to pursue a number of environmental goals and the transition to net zero. Achieving these objectives depends heavily on technologies such as offshore wind, hydrogen energy, carbon capture, utilisation and storage (CCUS), where chemical engineers are critical to development, scale-up, and deployment.

Barriers to innovation, scale-up, and workforce growth

Unfortunately for the UK's aspirations for economic growth, the country falls behind when it comes to scaling up new innovations. Although we are world leaders in coming up with cutting edge research and new ideas, these new ideas are too often commercialised overseas rather than here. To address this challenge, the UK must cultivate a supportive ecosystem with accessible pilot infrastructure to allow innovators the ability to work out how to scale up their projects in the UK.

We also need to do more to create an environment that encourages managed risk-taking and investment – the UK is often held back by an overly conservative attitude to risk that makes it harder to push forwards bold new ideas here. We also need more of the professionals who are experts in taking innovations to scale – chemical engineers. Not only do we need more chemical engineers right now, this need will only increase as we look to grow the economy and make it more innovative and sustainable.

Workforce development is a critical factor in delivering the industrial strategy. While the UK chemical engineering workforce is highly skilled and productive, it currently falls short in size and in terms of diversity – not just of gender but also regarding neurodiversity, socioeconomic diversity and diversity of thought. This seriously threatens the delivery of the industrial strategy. With many experienced engineers approaching retirement, there is an even greater need to expand recruitment and broaden access.

Chemical engineering needs to draw on the widest possible pool of talent, and that means increasing awareness of the field among all age groups and particularly among teachers, parents and other key figures that influence the

DiscoverChemEngLIVE showcase at our UK headquarters to mark Tomorrow's Engineers Week. The event brought together 400 students aged 11–18 from local schools and colleges, offering them the chance to connect with a diverse group of engineers and scientists from leading employers and universities, and explore the wide-ranging opportunities in chemical and process engineering.

decisions of the next generation. It also means addressing misconceptions about working in industry – such as thinking that "there's no industry here in the UK" or "jobs in industry are dirty and unpleasant" – and helping people see the transformative role that engineering has to play in tackling the big challenges of the day such as climate change. And it also means helping people see that engineering skills are ones that can set them up for a successful career in a wide variety of sectors. The life sciences sector gives a clear example of these challenges: just 9% of people working in the field are from working class backgrounds despite the fact that as an industry it produces products that are used across the population.

To address this workforce challenge we need to expand vocational routes, apprenticeships, and drastically increasing access to the industrial placements that are so vital to cultivating practical interdisciplinary skills. We must support all non-traditional routes into engineering.

There are also challenges facing our higher education system which threaten its ability to deliver skilled workers and novel research. Current funding constraints and a reliance on cross-subsidy from international students pose challenges for STEM subjects with significant laboratory components such as chemical engineering, as they are more expensive to deliver.

International competition and policy stability

These workforce challenges have an international dimension as well, as the United Kingdom has to compete both to attract skilled international workers and to retain its home-grown talent. We often hear of the challenges that companies face recruiting international talent, such as competition for a small number of internationally skilled workers in particular fields, as well as barriers such as visa restrictions which make it harder to attract talent to the country.

The visa system is particularly challenging for SMEs and individuals to navigate, and important opportunities such as the Global Talent Visa are under-utilised due to a lack of awareness. To attract and retain the skilled workers that it needs, the UK has to ensure that it, and its companies, are able to provide opportunities that are attractive when compared to those available in other countries. It needs to ensure that the visa system is both easy to understand and navigate.

Attracting investment to the UK, which is vital for the success of the industrial strategy, hinges on allowing businesses to make long-term plans and reducing their uncertainty about the future. The UK has had a number of years of political uncertainty, but what industry needs is a clear and consistent long-term vision for the country so that they can make plans for the future with confidence.

We consistently hear from industry about how stability and clarity in government policy, funding, and regulation are so important. Long-term, stable investment and strategic planning spanning decades are essential for capital infrastructure, training programmes, and apprenticeship schemes to ensure the UK remains competitive for talent and investment.

The path forward

Delivering the industrial strategy demands addressing the intertwined challenges of innovation scale-up and risk taking, drawing more talent into the STEM workforce through greater diversity and inclusion, and creating the right policy framework to let businesses make long term investment decisions with confidence.

Chemical engineering's unique blend of multidisciplinary expertise and practical scaling experience makes it a linchpin for the success of the strategy – we look to the government to play its part in helping the profession make the biggest possible contribution.

Building the workforce to deliver our modern industrial future

Professor Della Freeth
CEO, the Science Council

Sarah West
Head of Engagement & Policy, the Science Council

If we are to meet the government's ambitions for regional growth, net-zero innovation and global competitiveness, we must ensure that the science workforce is broad, inclusive, and professionally equipped at every level.

Powering progress: why science skills matter to the UK's industrial future

Delivering the UK's Modern Industrial Strategy depends on having a skilled and adaptable scientific workforce available. From life sciences to clean energy and digital technologies, the government's priority sectors rely on people who can apply scientific knowledge in real-world contexts. Yet persistent skills shortages are undermining the UK's capacity to innovate and compete globally.

The Modern Industrial Strategy and the Science and Technology Framework both recognise that talent and skills are critical to maintaining the UK's reputation for excellence. But despite these ambitions, the STEM workforce pipeline remains fragile – constrained by uneven provision of technical education, financial pressures on Small and Medium Enterprises (SMEs), limited collaboration between employers and training providers, and a persistent perception that science is an elite or academic-only career.[1]

The challenge: a strained pipeline and missed potential

The UK faces an ongoing shortage of skilled scientists and technicians. At the same time, higher education provision in STEM subjects is contracting – particularly in regions where it is most needed. Universities trimming costs often cut expensive science courses, creating "cold spots" that limit local opportunities and stifle regional innovation.[2]

This shortage is compounded by cultural and structural barriers. Science careers are too often portrayed as the domain of the academic elite, rather than as a diverse ecosystem of research, technical, industrial and applied roles. Funding models and rigid career structures can hinder flexibility, making it more challenging for individuals to enter or transition between sectors. As a result, promising talent – particularly from underrepresented backgrounds – is being lost.[3]

The Science Council believes that every person with scientific capability should have a pathway to professional recognition and career progression, regardless of their educational starting point. That vision requires systemic change: closer integration between education, employers and professional bodies, and greater recognition of technical routes into science.

A practical solution: linking technical education and professional recognition

The Science Council represents over 30 professional bodies and learned societies, supporting more than 320,000 science professionals across disciplines from physics and geology to food science and environmental management. This community is united by a shared commitment to professional excellence and public trust in science.

Our professional registration framework recognises and assures competence across the full spectrum of science roles. From Registered Science Technician (RSciTech) and Registered Scientist (RSci) to Chartered Scientist (CSci) and Chartered Science Teacher (CSciTeach), registration validates the skills, integrity and professional development of practitioners throughout their careers.

By linking professional registration with apprenticeships and technical qualifications, the Science Council provides a joined-up route from learning to professional credibility. Our mapping of more than 30 science apprenticeships to registration standards enables apprentices to gain early-career recognition as Registered Science Technician or Registered Scientist via a shortened application process. This approach helps to ensure that professionals are not only qualified in their specialist area of science but are able to apply their expertise, knowledge and understanding in real-world situations, using strong interpersonal skills, professional practice and equipped to take personal responsibility.

Technical pathways: building the bridge between learning and work

The Science Council's Technical Pathways Programme is central to our mission to open science careers through vocational routes. Over the past two years, the programme has engaged more than 11,500 teachers, students and early-career scientists through five complementary strands: curriculum-resource downloads, live CPD webinars, online career workshops, regional roadshows and a digital-mentoring pilot.

This engagement helps to:

- Equip educators to communicate technical science career options confidently.
- Support employers to offer T Level placements and apprenticeships.
- Ensure that technical learners understand the value of professional registration as a benchmark of competence and integrity.

In practice, this means that a school leaver starting a science apprenticeship today could gain early professional recognition, progress through their career with a clear CPD framework, and eventually achieve Chartered Scientist status – all through pathways that are inclusive, affordable and responsive to the needs of a rapidly changing and innovative industry.

To encourage talent retention, we need employer-friendly environments where employers can afford to invest in their workforce. This includes removing the barriers that currently exist for employers to take on apprentices.

Supporting the modern industrial strategy through skills

The success of the Modern Industrial Strategy will be determined by how effectively the UK can translate scientific discovery into innovation and application which depends on developing and sustaining the right technical and professional skills.

Professional registration provides the practical mechanism to deliver the quality and assurance set out in government strategies. It provides portable standards across sectors, enhancing mobility, transparency and confidence in the science workforce. It also supports ethical practice, with registrants bound by codes of conduct and committed to ongoing professional development.

As new technologies such as artificial intelligence reshape the workplace, human scientific expertise – in critical thinking, communication, and governance – will be more important than ever. Ensuring that these skills are cultivated, recognised and continually developed is fundamental to a resilient industrial future.[4]

Building a talented and resilient workforce

Maximising the UK's scientific potential depends on drawing from the widest possible pool of talent. To meet national needs in research, innovation and industrial capability, we need scientists and technicians trained through a variety of routes – from apprenticeships and technical qualifications to degrees and postgraduate research. Each pathway develops complementary skills that together strengthen the national science base and build the next generation of technicians, researchers, innovators and entrepreneurs.

The Science Council's work – particularly through Technical Pathways – is helping to shift perceptions, showing that there are many routes into meaningful and respected scientific careers. Professional registration provides a common framework that recognises the achievements of individuals at every level and ensures that all science professionals are equipped to contribute effectively and progress throughout their careers.

Employers that invest in professional registration report benefits in staff retention, morale and organisational reputation.[5] For the public and policymakers, registration offers reassurance: that scientific decisions, innovations and advice are underpinned by competence, ethics and accountability.[6]

Securing a future for UK science

The UK's global reputation for excellence in science is a cornerstone of its economic and diplomatic strength.[7] But in a world where reputation is a currency, we must invest continually in the skills and integrity of our scientific workforce. Professional registration is not merely a credential – it is the foundation of public trust, industrial capability, and international influence.

By empowering people through technical pathways and promoting professional recognition, we are building a workforce that can help to deliver on the promise of the Modern Industrial Strategy.

One approach to support the science skills ecosystem is to fund regional 'Technical Science Skills' clusters, based around high-performing science parks, to strengthen links between cutting-edge science-based enterprises, regional strategic authorities, training providers, and professional bodies to strengthen local skills pipelines.

How you can help

We invite parliamentarians to work with the Science Council to champion science as a career for all – supporting apprenticeships, professional registration and lifelong learning as essential tools for national competitiveness by:

- Raising parliamentary questions or supporting debates on the inclusion of professional registration in the government's Skills and Science Strategies.
- Connecting the Science Council with strategic regional authorities, Skills Improvement Plans, Local Skills Partnerships, or sector skills bodies to explore partnership opportunities.
- Advocating for funding allocations within UKRI, DfE or local skills budgets to expand science-based apprenticeships to ensure that every region of the UK benefits from this investment.
- Endorsing or co-sponsoring a cross-party briefing or roundtable on "Building the Technical Science Workforce for a Modern Industrial Future", hosted jointly with the Science Council.

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Reporting the UK-Japan Young Scientist Workshop programme

Inspiration and achievement beyond the curriculum

Dr Eric Albone MBE
Order of the Rising Sun Gold and Silver Rays (Japan)
Founding Director, Clifton Scientific Trust

To share an understanding of the success of our UK-Japan Young Scientist Workshop programme, and specifically our 2025 UK-Japan Young Scientist Workshop which was hosted at Cambridge University, and celebrate with you the outcomes which young people from both our countries achieve living and working together with scientists and engineers through these Workshops, let me begin by reporting words from Aimee Li, the teacher from the outstanding Urswick School in Hackney, and two of her students, Lucas and Ayan (see right). The Urswick School is the fourth most deprived school in London and has 504 of its 814 pupils eligible for pupil premium.

So, what brings about these transformations, and what happens?

The 2025 Workshop built on the experience of 30 such Workshops that the Clifton Scientific Trust has organised and hosted with our Japanese colleagues in universities in Britain and Japan since 2001. Our 2026 Workshop in Japan will mark our 25th Anniversary.

Following our usual pattern, last summer we brought together 50 senior high school/post-16 school students from a dozen schools, equally split between from Japan and from UK, including six students from Urswick School.

They lived closely together for a week in a Cambridge college, sharing rooms between the two countries and in the evenings were engaged in all manner of student-centred activities: a gift exchange evening, an evening playing sports, etc.

> "This is the second year The Urswick School has had the privilege of participating in this programme and somehow, it has once again far exceeded my expectations. The progress of the students over the course of the week has been extraordinary. What began as a group of nervous but enthusiastic participants developed into a cohort of confident, articulate young scientists capable of presenting and defending their ideas with clarity and professionalism. It allowed me to witness the remarkable capacity of my students to rise to intellectual and personal challenges. I cannot put into words how grateful we are… Your vision has changed countless lives and your legacy will continue for many years to come."
>
> Aimee Li, Teacher, The Urswick School

> "It was the most valuable, most exciting, experience of my life. Meeting so many different people was eye-opening and helped me inform my future career choices. I learned a lot about scientific research and it really changed my perspective on lab work and postgraduate degrees."
>
> Lucas, student from The Urswick School.

> "Coming from a background where chances like this don't come around often, this trip left a deep mark on my heart. The opportunity shaped the way I view the scientific world, how diverse it is and what it has in store for me in the future. Friends of a lifetime have been made across the world."
>
> Ayan, student from The Urswick School.

During the day, as small international student teams, they were welcomed as guests of science/engineering research groups across the university, where they were introduced to the focus of their hosts' research and given a research challenge related to that work to explore. There were no hidden answers and students were encouraged to question, and to think for themselves, and to work as an international team, putting their school knowledge to real-life work. At the end of the week, each team gave a formal presentation of their achievements and answered probing questions in front of an audience that included distinguished invited guests. As Aimee reports, the outcomes in just a few days are amazing.

Students worked as teams in six research projects

These projects ranged from the design of turbine blades – to enhance the efficiency of jet engines with a team in the Whittle



Laboratory in Engineering, to the exploration of past climates with a joint team from Earth Sciences and Geography, through to the examination of sediment core.

There was also a project in science communication with the Naked Scientist team – students interviewed the other project teams in their laboratories and put together a podcast, posted online, which encapsulated the essence of their research in a way which they judged would be of general public interest.

This year there were two new projects with research groups we had not worked with before. One, with scientists in the Department of Pathology and Cancer Research Cambridge Centre, explored the role of proteins associated with cancer cells. The other, with the Bionano Engineering Group in the Department of Chemical Engineering and Biotechnology, linked with the study of how nanomaterials could mimic enzymes. You can see more by visiting www.ukjapanscienceworkshop.com

On the final day of student team presentations of their achievements, valuable commentary and advice was provided by the Earl of St Andrews, Patron of the Great Britain Sasakawa Foundation (and also Patron of Clifton Scientific Trust); Dr Michael Rivera King, Chief Executive, the Japan Society; Mr Takeshi Maruyama, Managing Director and Head of Technology, Otowa Electric Co Ltd; Katherine Paynter, MOD Tri-Nation (Italy, Japan, UK) Future Aircraft Programme; and Professor Roger Cashmore CMG, Emeritus Professor of Experimental Physics, University of Oxford and formerly Principal of Brasenose College Oxford and formerly Chair of the Atomic Energy Authority and Director of Research at CERN.

We are grateful to have continued to receive financial support in 2025 (and over many years) from the Great Britain Sasakawa Foundation, from Mitsubishi Electric Europe, from the Japanese Women's Association in Great Britain. This year were were joined by a new supporter, Otowa Electric Co Ltd, whose senior executives travelled from Japan to be with us in Cambridge.

We are also grateful for the past substantial support from the Japanese offices of Barclays Bank and Rolls Royce, triggered by our engagement with schools serving communities in Japan affected by the 2011 Great East Japan Earthquake and Tsunami, as well as support from other donors. Funds are used to make it possible for students from schools who would not be able to take part, to participate.

Students grow through the workshop experience

Although it is very challenging, there is much laughter, and in just a few days, students develop as globally-aware young scientists, while developing teamwork and presentation skills in ways which they can then take forward in their lives.

Questioning is really important; no question is stupid. The experience is particularly valuable for students from schools serving disadvantaged communities, such as the Urswick School, whom we support through the funds we raise. For such students, their schools report that the growth in self-confidence through their achievement is a very important outcome.

Teachers accompany their students. They observe but do not take part in the research, take responsibility for and support their students. They take back to their own schools what they have learnt in the Workshop, including from networking with the teachers from the other country. This is enhanced by the "Teachers' Forum", which is always a part of the programme. We are now developing an Alumni Fellowship through which past and present students can support each other.

I end with some words from Professor Sir Martin Rees, Lord Rees of Ludlow OM FRS who looked in on our Cambridge Workshop this year, as he has done on previous Workshops since 2010.

> "What has really impressed me about the UK-Japan Young Scientists Workshops are how quickly the talented young scientists from two very different countries develop friendly contacts and are able jointly to tackle challenging projects. The programme offers a memorable and formative experience of science as the one truly global culture that transcends national boundaries which the students can share.
>
> "The 'format' plainly works. Much dedicated effort goes into the planning and running of these events, but above all it's Eric Albone's vision and commitment over the last 25 years that's been crucial. Let's hope these Workshops will continue for another 25 years – and it's a 'template that could surely be expanded and replicated if the funds were there."
>
> Professor Sir Martin Rees

If you are interested in learning more or might consider being involved in some way, please do not hesitate to get in touch at eric@clifton-scientific.org.

Website: www.clifton-scientific.org

The AI Problem is culture, not technology

Peter Spayne MSc BEng(Hons) CEng MIET RN
Co-founder and Principal Consultant, R2AI

Is AI Killing Your Organisation? AI is rewriting the very fabric of life; altering how we think, decide, and create value. The organisations that treat AI as another system to deploy will be overtaken by those that embrace it as a new culture.

Adoption without understanding

Since the launch of OpenAI's Chat GPT to the public domain in November 2022 Generative AI has spread like wildfire. Almost overnight AI has evolved from an experiment to an essential part of daily operations across industries. But there's a catch: adoption has outpaced understanding.

For example: In Gaza, artificial intelligence now sits inside the chain of command. The Israel Defence Forces use systems such as Habsora and Lavender to process surveillance and communications data to generate target lists at extraordinary speed. These systems don't launch weapons, they influence decisions about when and whom to strike. Human operators still approve and execute each attack, but the process is now driven by machine-generated intelligence that can compress a life-or-death choice into seconds. The result is new warfare; faster, less accountable, and harder to control. AI embedded in operations improves efficiency and rewrites how decisions are influenced. The challenge is no longer whether to integrate AI. It's ensuring human judgement and culture can keep up.

Warfare offers an extreme example, but the shift applies everywhere. AI is permeating businesses, governments, and daily life far behind the battlefield. Presently, 78% of organisations report using AI in at least one business function[1].

The productivity paradox

Despite the gross increase in uptake, productivity gains remain elusive.

Administrative workloads haven't disappeared; they've shifted. Staff are busier than ever, but they spend their time maintaining, integrating, and supervising a growing constellation of digital tools. The technology that promised acceleration added layer upon layer of configuration, compliance, and oversight complexity. Complicating simple tasks instead of simplifying work. Badly integrated AI multiplies this phenomenon exponentially.

Has our obsession with AI started to hurt productivity? When focus shifts from solving problems to managing tools, and working weeks are lost learning systems instead of using them, even simple tasks become a maze of logins, prompts, and security blocks where pen and paper would have done the job in seconds.

As staff roles become lost to data slavery, their sense of purpose gives way to chasing new features, and real progress grinds to a halt. The challenge isn't to bolt on more tech, but to rethink what meaningful progress looks like in an AI-saturated workplace.

Shockingly only 5% of custom AI projects actually make it out of pilot phase into full production use.[2] Most likely because of a lack of full system integration and cultural by-in due to change fatigue.

In other words, few companies becoming distracted with AI have succeeded in weaving it into the fabric of how they run. This gap between experimentation and integration is a cultural chokepoint.

Too often AI is implemented as little more than enhanced Ctrl+F, bolted-on to enhance search and speeds up analysis, without much thought to wider policy, process, or organisational mindset required to collect and sanitise the input data. Such surface-level "AI-powered" apps might deliver capability, but they rarely prompt retirement of older processes. Resulting in increased workload, as employees juggle legacy procedures with the new burden of cleaning input data to support the new AI tools that were never integrated.

In short, treating AI as just a shiny new software package misses the point.

Many organisations do adopt the *language* of AI; talking confidently about "humans in the loop" and "responsible oversight" but few truly understand what those phrases entail. AI buzzwords have become shorthand for safety without a real plan behind it. Most companies cannot explain *who* the human in the loop actually is, *what* they're supposed to do, or how they fit into systems that operate at machine speed. In practice, "the loop" is poorly defined because modern operations generate more data, alerts, and automated outputs than any human can reasonably track, let alone govern in real time. So, while the concept sounds reassuring, the implementation is often superficial.

Building an AI-ready culture

Using AI effectively means recognising its role in the chain. AI is an active part of the decision flow, filtering and prioritising information so humans focus only on what matters. This relationship lets decisions scale and move at a manageable speed. Autonomy doesn't replace authority, humans still set direction, but the "loop" model no longer fits and in practice never did.

Chris Dodd and Peter Spayne consulting with 'Spot' after speaking at the Military Aviation Authority conference hosted at IBM's head offices in London.

Decision frameworks built for AI-native operations, where machines are trusted to act within defined bounds require total organisational reform to implement. Until organisations lead with AI, place it centrally and rebuild everything around it they are not transforming - they're tinkering.

Placing AI centrally requires trust. Building trust in AI is a cultural challenge that cannot be implemented by an IT rollout. To embed AI into decision-chains, organisations must be confident the systems will behave reliably and transparently. In the UK, for example, the Department for Science, Innovation & Technology (DSIT) has published guidance and a roadmap for AI assurance that emphasise continual monitoring and third-party verification.[3] Companies are now recommended to document limitations, stress-test AI models under realistic conditions, and build oversight into the interfaces, not just tick a checkbox at launch for the benefit of auditors. Assurance is not a one-time step; it is a continuous cycle of evaluation, refinement and validation so that humans can confidently trust the machine.

To prevent data slavery, before creating another policy or form, leaders should ask whether AI could capture or generate the information automatically, or even handle the workflow end-to-end. In many cases, it can. An AI-centric culture starts by designing systems with machines in mind, not people filling gaps.

AI should free employees from tedium, not turn them into operators of yet another system. Instead of forcing people to type, file, and upload, AI can capture data passively, by observing inputs and acting on intuition, updating records automatically, and only involving humans when judgement is needed. The goal isn't more digital paperwork; it's to let people focus on decisions, not data entry.

The result of this redesign is organisations that run on autopilot. Administrative load drops sharply, and people can focus on what actually matters; care, judgement, creativity, relationships. This is a glimpse of what's possible when AI handles the routine and humans handle the exceptional. Now scale that across an organisation: HR systems that surface staffing risks before they bite, operations platforms that propose and test options before presenting them for approval, maintenance tools that log issues, predict failures, and order parts automatically. In each case, AI owns the repetition, humans own the reasoning.

The biggest failures come not from the technology, but from cultures still designed for a pre-AI world.

In conclusion

Without fostering a culture of AI literate people, even the most powerful AI will just be digital window dressing. If your people don't understand AI as a strategic partner, if they can't conceptualise working in tandem with the system, distributing cognitive work, and trusting autonomous systems with appropriate tasks, then no amount of investment will move you forward. Money can buy software, but it cannot buy mindset. Retaining a competitive edge in the coming years means cultivating AI-literate mindsets, AI-ready organisational structures, and AI-led operations. Until you achieve that, all the PowerPoint decks and innovation workshops in the world won't save you from stagnation.

The technology is ready, but are you? Leading with AI requires champions who cut through silos and integrate the technology into strategy and culture. At R2AI, we work with organisations to design AI-first strategy, train teams to think with AI, and build the structures that make trust and accountability real. We're not about buying or selling tools; we're about rewiring how decisions are made. The gap is not technical anymore – it's cultural.

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How POST research works

Matthew Tudball
Energy Adviser at POST

The Parliamentary Office of Science and Technology (POST) provides impartial, evidence-based briefings on the important research of the day. While our briefings are short, they are based on in-depth research gathered using a range of methods. However, our main approach is surprisingly simple – we ask people!

As a bicameral team, we bring together a wide range of stakeholders to contribute to research to help inform both Houses of parliament. POST research is commissioned by individual parliamentarians and committees, and can cover any topic from defence and digital to environment and health. Some of our recent briefings include winter mortality, defending UK airspace, and regenerative agriculture.

Our main briefing format, the POSTnote, is informed through written contributions, interviews and research, undertaken over three months to make sure that it is impartial, evidence-based, topical – and above all – useful to parliamentarians.

Who contributes to a POSTnote?

Let's take an example. For our recent POSTnote, *Winter Mortality*, the interviews used to inform the research included government departments, research institutes, academics, the NHS, local government, learned societies and charities.

How do they contribute?

Suggestions for POST research from Members and committees are reviewed by the POST board, made up of peers, MPs and experts from the research community.

If they are given a green light, a call for contributions is put on our website. Anyone can send their thoughts and research to POST, to help inform the scope and direction of research. A few will also be asked for an interview to dig deeper into the complexities and challenges of the issue.

After the final draft is completed, it gets sent around for external review to fact check everything that we've written. We consider all the comments, particularly where there is disagreement, correcting any inaccuracies and making sure nothing important to parliament is missed out.

What do they contribute?

Contributions take many forms. Academics get in touch to tell us about their latest research, sharing links to new papers or important historical or upcoming work.

Industry bodies tell us about their advancements, research and developments, alongside highlighting important policy discussions that they know have crucial real-world implications.

Charities and NGOs often represent the experiences of the wider public and those most affected by the topic.

Finally, government bodies and regulators clarify complex policy, inform us of upcoming announcements and keep us up to date on government direction.

Speaking to all sides of a discussion gives us an overview of the range of opinions and sentiment, ensuring the POSTnote gives a balanced view, and that it does not miss out on important perspectives and lived experience.

What research does POST do?

Alongside the interviews, our team of fellows (academics embedded with us for short periods of time), work with our permanent staff to conduct our own review of the evidence.

These academics help us to break down academic papers, pick out trends and important findings, and combine it with wider information from publications covering issues such as the latest government policy and stakeholder opinions. The bibliography for a 3,600 word POSTnote can be around 400 references long!

What about other researchers in parliament?

POST sits in the heart of parliament, with strong links to experts in the parliamentary libraries and committees in both Houses. These wider experts not only help us to scope ideas, but direct us towards key issues that parliamentarians are interested in.

We also work on joint research with the libraries and committee staff, embed POST fellows in these teams, and help them to access external academics and experts to help inform parliamentary scrutiny.

Get involved!

Members of both Houses can email POST to suggest research on any topic, or to request that we find them experts to speak with.

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Subscribe at: **post.parliament.uk/subscribe**

Quantum technologies

MEETING HELD IN PARTNERSHIP WITH THE INSTITUTE OF PHYSICS

L to R: **Professor Sir Keith Burnett CBE FRS**, President, IOP; **Professor Sir Peter Knight FRS**; **Tom Grinyer**; **Dr Najwa Sidq**; **Viscount Stansgate**, President, Parliamentary & Scientific Committee; **Jonathan Legh-Smith MBE**; **Anne Crean**, Associate Director of Science and Innovation, IOP; **Louis Barson**, Director, Science, Innovation and Skills, IOP.

Recent advances in quantum physics research have significant implications for technological progress; they have allowed new ways to control objects at the scale of atoms, and could transform many areas of life.

Our discussion meeting, held in partnership with the Institute of Physics (IoP) gave an overview of recent developments in what is the International Year of Quantum Science and Technology. Visitors were welcomed by George Freeman MP, Chair of the P&SC, who introduced our four speakers, remarking that Sir Keith Burnett, the IoP President, was also present.

Quantum is a potential game changer, and firstly **Tom Grinyer, Group Chief Executive of the IoP**, explained the organisation's interests in science, skills and society, and described their leading role in the International Year of Quantum, coordinating a wide variety of events and activities across the UK and Ireland, including a week-long exhibition at Parliament in June 2025, and at the Royal Institution in November with an emphasis on young people. The UK initiated the first QT programme in the world, with support from the previous government; it is encouraging that the new government is continuing this support.

Dr Najwa Sidqi, Quantum Cluster Manager, Science and Technology Facilities Council (STFC), explained that there are now potential business applications that can be derived from the theoretical research basis; today's challenges include healthcare, public services and communications networks. Harnessing properties of materials, it is possible to unlock new possibilities in navigation systems and GPS, secure networks and satellites, reducing carbon emissions, and better energy consumption and resources management.

Jonathan Legh-Smith MBE, Executive Director for UKQuantum, the association for the UK's quantum industry, represents the interests of members nationally and internationally. It is an open organisation, welcoming non-UK members; quantum is a strategic choice in many countries. He listed some quantum 'unicorns' (privately held start-up companies valued at $1bn+) in the USA and UK, citing recent US investment in the UK. It is quite early for really commercial QT companies, though many existing companies in a variety of sectors, from banking to engineering, are showing interest in quantum computing applications; there is great potential.

George Freeman, a former science minister, spoke of his involvement in QT developments in the UK. Britain is still viewed as a world leader in quantum science, though a shortage of funding is an issue; we can invent and be creative but can't industrialise. Huge computers and huge amounts of money are needed to progress, and there is currently a global race between the USA and China.

Professor Sir Peter Knight FRS, Chair of the UK National Quantum Technology Programme Strategy Advisory Board, described how the UK was an early starter in QT; since 2014 the government has invested £1.1bn including funding for 5 research hubs involving 6 universities, and focusing on Quantum Computing, Quantum Networks, Biomedical Sensing, Quantum Enabled Position, Navigation and Timing, and Sensing, Imaging and Timing. The UK is regarded as a world leader, with centres of excellence, and talented people but there is a need to scale up, create bigger companies, and attract more venture capital, or we will lose out. In education physics is now a fast-growing subject choice, but poor teaching in schools is a challenge.

In the subsequent Q&A session it was recognised that more investment is needed to produce home-grown 'unicorns', but venture capitalists remain nervous of what is a less known area of technology. We are vulnerable to foreign takeovers and mergers, but we need resultant jobs to be here in the UK.

A pipeline of young STEM educated people is essential, but there are not enough physics graduate teachers, and they often quickly leave teaching for other jobs, as do teachers with computer expertise. Creative, collaborative mentoring of teachers, with better rewards and planning for the future is necessary in what can be a challenging profession. Enthusiasm was expressed for involving young people in research at an earlier stage, making science education more hands on, and encouraging STEM engagement generally.

AI and quantum science should be regarded as partners for the future not rivals. There must be realism about what we can do just in the UK, there has to be collaboration with the USA and the EU; we must also focus on our strengths, it is impossible to do everything in this developing field.

Delivering the industrial strategy

MEETING HELD IN PARTNERSHIP WITH INSTITUTION OF CHEMICAL ENGINEERS

L-R: **Leigh Jeffes**, Chief Executive, Parliamentary & Scientific Committee; **Sam Carling MP**; **Duncan Lugton**, Head of Policy and Impact, Institution of Chemical Engineers (IChemE); **Professor Raffaella Ocone OBE**; **Kate Barclay MBE**; **Viscount Stansgate**, President, P&SC, **Stephen Metcalfe**, former Chair, P&SC and **Yvonne Baker**, Chief Executive, IChemE.

Parliamentarians, policy professionals, researchers and industry figures attended our recent discussion meeting to debate science and technology strategy, and in particular the contribution of chemical engineers.

Sam Carling MP, P&SC Co-Chair outlined some aspects of the recent government Science and Technology Strategy, which aims to encourage industry and deliver change over the next 10 years. A proper strategy is long overdue, driving the direction of research; there is a focus on housing, water supply, education, clean energy, data and skills, with emphasis on the life sciences sector. Advances in manufacturing are underpinned by the chemical industries, needing new materials, manufacturing resilience, and recycling. Our education system must provide a suitable skills base, and enable life-long learning for the new jobs likely to be created.

We were introduced to **Professor Raffaella Ocone OBE**, School of Energy, Geoscience, Infrastructure and Society, Herriott Watt University, also current President of the Institution of Chemical Engineers (IChemE). Chemical engineers can assist in developing new processes, improving efficiency and boosting profits. To deal with innovation there is a requirement for upskilling; some chemical engineers are not good at dealing with the transition from laboratory to large scale applications, but new technology is essential for industrial growth.

The current challenge, in her opinion, is that people are not prepared to take enough risks, and are not innovative enough. Co-operation in research clusters can be a good idea, especially in areas like Scotland, transitioning from older industries, and investors need more encouragement. Diversity in employment is essential, with apprenticeships, not just university graduates; we must ensure the right skills are available in the right places to assist innovation and investment.

Our second speaker was **Professor Kate Barclay MBE**, Skills Strategy Consultant from the BioIndustry Association (BIA), an innovative life sciences trade association. She described her career path in the chemical industry, highlighting the value of her initial sandwich degree course, working in the pharmaceuticals industry. For a chemical engineer, apprenticeships are a good path to chartership, but there are currently not enough places. This route should be available to all, as well as the more traditional university degree. SMEs in the life sciences are the rocket fuel of innovation, but scaling them up is essential; often great new ideas, but bought up by foreign investors, and jobs moved from the UK. Chemical engineers contribute to multi-disciplined teams, but our current national educational curriculum doesn't encourage inter-disciplinary thinking and working. We have many talented people but we need far more diverse career pathways for them.

Q&A session topics included UK demographics, declining graduate numbers in the future, and increasing closures of university life sciences departments, often the origin of our SMEs, were a concern. Many universities have financial challenges, expensive lab-based courses are not covered by domestic student fees, and income from foreign students is declining.

Better school science education is needed especially in deprived areas, and the Covid impact is still felt; more science should be taught in primary schools. Our education system doesn't encourage risk taking and thinking differently; education should meet the needs of employers.

Universities are still not taking enough people from lower social groups, but how to tackle such inequalities? Degrees are expensive, so apprenticeships are very important for those who cannot afford to train, certainly when local courses and student loans are unavailable. Apprenticeships are underfunded, difficult to find, and many SMEs don't have the resources to offer them; neglecting diversity means we can miss out on talent.

To increase the pool of suitably trained employees chemical engineering needs to be promoted as a more attractive career, and we should also consider employing expertise from overseas.

Private investment in UK industry is still quite low, but how do we change this, and improve scaling up to commercial success? The country is not attractive to inward investment, with high costs, old factories, and some off-putting regulatory research issues. Researchers/SMEs are still innovating, just in need of more funds and support.

There was some scepticism about perpetual industrial strategies. Companies need long term investment strategy and stability, or they tend to go overseas; even 10 years is not long enough. Government stability is needed, with consistency and clarity of leadership. Sam pointed out that the government has committed funds, especially for the life sciences, and there will be ongoing monitoring of the strategy.

MEETINGS

Parliamentary & Scientific Committee AGM

The Annual General Meeting of the Parliamentary & Scientific Committee APPG was held on the 27 October in the House of Commons.

The meeting was chaired by the **Rt Hon Esther McVey MP**.

17 NOVEMBER 2025 IN PARTNERSHIP WITH NATIONAL LABORATORY AT LGC

Sound policy-making for future foods

L–R: **Dr Julian Braybrook**, UK Government Chemist and Director, National Laboratories at LGC; **Sam Carling MP**, Chair, Parliamentary & Scientific Committee; **Dr Rick Mumford**, Deputy Chief Scientific Advisor and Deputy Director of Science and Research, UK Food Standards Agency; **Dr Sonja Billerbeck**, Department of Bioengineering, Faculty of Engineering, Imperial College London; and **Leigh Jeffes**, Chief Executive, Parliamentary & Scientific Committee.

SELECT COMMITTEES

HOUSE OF COMMONS EDUCATION COMMITTEE

CURRENT INQUIRIES	Opened	Report	Gov't response
Reading for pleasure	23 Nov 2025		
Early years: improving support for children and families	4 Sep 2025		
Higher education and funding: threat of insolvency and international students	12 Jun 2025		
Further education and skills	29 Jan 2025	23 Sep 2025	overdue
Solving the SEND crisis	20 Dec 2024	18 Sep 2025	
Children's social care	22 Nov 2024	10 Jul 2025	17 Oct 2025

Chair: Helen Hayes MP

Clerks: Laura Daniels and Sian Woodward

Email: educom@parliament.uk

General enquiries: 020 7219 2370

Media enquiries: 020 7219 8895

X @CommonsSITC

Address: Education Committee, House of Commons, London SW1A OAA

Further information at: https://committees.parliament.uk/committee/203/education-committee

HOUSE OF COMMONS ENVIRONMENT, FOOD AND RURAL AFFAIRS COMMITTEE

CURRENT INQUIRIES	Opened	Report	Gov't response
Climate and weather resilience	9 Sep 2025		
Preventing waste and enabling a circular economy	20 May 2025		
Fisheries and the marine environment	23 Jan 2025		
Animal and plant health	9 Jan 2025	15 Sep 2025	19 Nov 2025
Fairness in the food supply chain	20 Dec 2024		
Reforming the water sector	19 Dec 2024	16 Jun 2025	
The future of farming	6 Dec 2025	16 May 2025	3 Sep 2025
Work of the Department and its arm's-length bodies	6 Nov 2024		

Chair: Rt Hon Mr Alistair Carmichael MP

Clerk: Sean Kinsey

Email: efracom@parliament.uk

Media enquiries: 020 7219 3138

X @CommonsEFRA

Address: Environment, Food and Rural Affairs Committee, House of Commons, London SW1A OAA

Further information at: https://committees.parliament.uk/committee/52/environment-food-and-rural-affairs-committee

HOUSE OF COMMONS ENERGY SECURITY AND NET ZERO COMMITTEE

CURRENT INQUIRIES	Opened	Report	Gov't response
International climate change policy	5 Nov 2025		
Managing the future of UK oil and gas	30 Oct 2025		
Planning for nuclear energy generation	17 Jul 2025	24 Oct 2025	19 Nov 2025
National planning for energy infrastructure	25 Apr 2025	7 Jul 2025	19 Nov 2025
Revisiting the nuclear roadmap	20 Feb 2025		
Building support for the energy transition	19 Feb 2025		
The cost of energy	18 Feb 2025	29 Oct 2025	
Industrial strategy for clean power	5 Feb 2025		
Retrofitting homes for net zero	19 Nov 2024	22 May 2025	18 Aug 2025
Unlocking community energy at scale	11 Nov 2024		
Work of the Department of Energy and Net Zero	11 Nov 2024		
Workforce planning to deliver clean, secure energy	11 Nov 2024		

Chair: Bill Esterson MP

Clerk: Stephen McGinness

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Address: Energy Security and Net Zero Committee, House of Commons, London SW1A OAA

Further information at: https://committees.parliament.uk/committee/664/energy-security-and-net-zero-committee

SELECT COMMITTEES

HOUSE OF COMMONS SCIENCE, INNOVATION AND TECHNOLOGY COMMITTEE

CURRENT INQUIRIES	Opened	Report	Gov't response
Life sciences investment	2 Oct 2025		
Innovation and global food security	21 Jul 2025		
Science diplomacy	3 Apr 2025		
Digital centre of government	3 Feb 2025		
Under the microscope	13 Jan 2025		
Innovation, growth and the regions	6 Dec 2024		
Innovation showcase	4 Dec 2024		
Social media misinformation and harmful algorithms	20 Nov 2024	11 Jul 2025	17 Oct 2025

Chair: Dame Chi Onwurah MP

Clerk: Faten Hussein

Email: commonssitc@parliament.uk

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Media enquiries: 020 7219 0731

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Address: Science, Innovation and Technology Committee, House of Commons, London SW1A OAA

Further information at: https://committees.parliament.uk/committee/135/science-innovation-and-technology-committee

HOUSE OF COMMONS ENVIRONMENTAL AUDIT COMMITTEE

CURRENT INQUIRIES	Opened	Report	Gov't response
The seventh carbon budget	23 Sep 2025		
The environment in focus	5 Sep 2025		
Addressing the risks from Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)	10 Apr 2025		
Airport expansion and climate and nature targets	28 Mar 2025	24 Oct 2025	
Governing the marine environment	16 Dec 2024	5 Jun 2025	16 Oct 2025
Flood resilience in England	10 Dec 2024	13 Oct 2025	
The UK and the Antarctic environment [revived]	5 Dec 2024	9 Jun 2025	11 Sep 2025
Environmental sustainability and housing growth	18 Nov 2024	16 Nov 2025	
The role of natural capital in the green economy [revived]	13 Nov 2024	7 May 2025	22 July 2025

Chair: Mr Toby Perkins MP

Clerk: Ian Cruse

Email: eacom@parliament.uk

General enquiries: 020 7219 8890

Media enquiries: 020 7219 1034

X: @CommonsEAC

Address: Environmental Audit Committee, House of Commons, London SW1A OAA

Further information at: https://committees.parliament.uk/committee/62/environmental-audit-committee/

HOUSE OF COMMONS BUSINESS AND TRADE COMMITTEE

CURRENT INQUIRIES	Opened	Report	Gov't response
Priorities of the Business and Trade Committee for 2026	24 Sep 2025		
Financing the real economy	4 Aug 2025		
Small business strategy	16 Jun 2025		
UK trade with the US, India and EU	6 Jun 2025	14 Sep 2025	overdue
Industrial strategy	28 Jan 2025	6 Jun 2025	12 Sep 2025
Export led growth	15 Jan 2025	29 Jun 2025	19 Sep 2025
The work for the Department of Business and Trade	20 Nov 2024		
Make work pay: Employment Rights Bill	31 Oct 2024	3 Mar 2025	22 May 2025

Chair: Rt Hon Liam Bryne MP

Second Clerk: Catherine Meredith

Email: commonsbtc@parliament.uk

General enquiries: 020 7219 8586

Media enquiries: 020 7219 4984

X: @CommonsBTC

Address: Business and Trade Committee, House of Commons, London, SW1A 0AA

Further information at: https://committees.parliament.uk/committee/365/business-and-trade-committee

SELECT COMMITTEES

HOUSE OF COMMONS HEALTH AND SOCIAL CARE COMMITTEE

CURRENT INQUIRIES	Opened	Report	Gov't response
Food and weight management	17 Jul 2025		
Healthy ageing: physical activity in an ageing society	26 Jun 2025		
The first 1000 days: a renewed focus	21 Mar 2025		
Community mental health services	17 Dec 2024		
The 10 year health plan	13 Nov 2024		
Adult social care reform: the cost of inaction	31 Oct 2024	5 May 2025	9 July 2025

Chair: Layla Moran MP

Clerk: Fergus Reid

Email: hsccom@parliament.uk

General enquiries: 020 7219 6182

Media enquiries: 020 7219 3138

X: @CommonsHealth

Address: Health and Social Care Committee, House of Commons, London SW1A OAA

Further information at: https://committees.parliament.uk/committee/81/health-and-social-care-committee

THE HOUSE OF LORDS SCIENCE AND TECHNOLOGY COMMITTEE

CURRENT INQUIRIES	Opened	Report	Gov't response
Forensic science: follow-up	3 Nov 2025		
Financing and scaling UK science and technology: innovation, investment, industry	20 Mar 2025	5 Nov 2025	

Chair: Professor The Lord Mair CBE

Clerk: John Turner

Email: hlscience@parliament.uk

Committee Staff: 020 7219 5750

Press Officer: 020 7219 1692

X: @LordsSTCom

Address: Science and Technology Committee, House of Lords, London SW1A 0PW

Further information at: https://committees.parliament.uk/committee/193/science-and-technology-committee

THE HOUSE OF LORDS ENVIRONMENT AND CLIMATE CHANGE COMMITTEE

CURRENT INQUIRIES	Opened	Report	Gov't response
Drought preparedness	24 Oct 2025		
Waste crime	29 Jul 2025		
Nitrogen	30 Jan 2025	24 Jul 2025	9 Oct 2025

Chair: The Baroness Sheehan

Clerk: Andrea Ninomiya

Email: ninomiyaa@parliament.uk

Committee Staff: 020 7219 6076

Press Officer: 0207 219 8550

X: @HLEnviroClimate

Address: Environment and Climate Change Committee, House of Lords, London SW1A 0PW

Further information at: https://committees.parliament.uk/committee/515/environment-and-climate-change-committee

UK Parliament POST

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POST board meeting, October 2025.

NEW POST RESEARCH

POST research is available to all at **post.parliament.uk**. Recent briefings include:

PARLIAMENTARY SCRUTINY OF GOVERNMENT SPENDING PLANS

POSTbrief, published 30 October 2025

How does Parliament examine government spending plans before money is spent? This briefing explains "ex-ante" financial scrutiny, and compares UK practices with other Westminster-style parliaments. It highlights mechanisms such as budget committees, parliamentary budget offices and research services, and explores why the UK is considered an outlier in some areas. The briefing also looks at how Governments can facilitate ex-ante scrutiny, such as through the timetabling of the budgetary cycle and the provision of accessible budgetary information.

REGULATION OF PSYCHOLOGICAL PROFESSIONALS

Rapid response, published 28 October 2025

Some psychological professionals deliver mental health care across diverse settings, but regulation varies widely. This quick-read rapid response article explains which titles are legally protected, how statutory and voluntary systems operate, and the implications for public safety and professional standards. It explores challenges such as inconsistent training, safeguarding risks, and public confusion, alongside proposals for reform and the role of accredited registers

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Packaging extended producer responsibility

Research Briefing CBP 10352
published 19 November 2025

This briefing sets out the government's plans to shift the full cost of dealing with household packaging waste onto producers. It explains the policy's objectives, how the new system will work, and the timeline for implementation. You'll also find details on expected impacts for businesses, local authorities, and consumers, alongside links to supporting data and legislation.

The Warm Home Discount (WHD)

Research Briefing CBP 10366
published 11 November 2025

How does the Warm Home Discount help households with energy costs? This briefing explains the scheme's purpose, eligibility rules, and recent changes for winter 2025–26 following the latest announcements from the government. It also looks at how the programme is funded and its role in reducing fuel poverty.

The UK's plans and progress to reach net zero by 2050

Research Briefing CBP 9888
last updated 6 November 2025

What does the UK's journey to net zero involve? This regularly updated briefing provides a detailed picture of where the UK stands and what lies ahead, setting out the legal commitments, key milestones, and current progress, alongside sector-specific challenges and government strategies. It also explores what policies aim to accelerate decarbonisation.

UK-EU relations: Energy and climate

Research Briefing CBP 10385
last updated 5 November 2025

Energy security and climate cooperation remain central to UK-EU relations. This briefing examines post-Brexit agreements on electricity trading, shared climate goals, and the implications for supply resilience and decarbonisation. It also considers future areas for collaboration and potential challenges. If you're interested in how these issues shape policy and markets on both sides, this briefing offers a comprehensive overview.

Digital ID in the UK

Research Briefing CBP 10369
published 3 November 2025

What does a digital identity mean for individuals and businesses? This briefing explores the government's plans for digital ID systems, their potential benefits, and the challenges around privacy, security and trust.

Introduction to the domestic energy market

Research Briefing CBP 9768
last updated 31 October 2025

This briefing provides an overview of how Great Britain's domestic energy market works. It explains how households receive gas and electricity through a system of generation, transportation (transmission and distribution), and supply, with energy policy set by the government and markets regulated by Ofgem. You'll also find details on how energy bills are calculated, and what the current challenges are in the market, making this a useful starting point for anyone wanting to understand the basics of household energy bills.

How is biomedical research infrastructure funded in the UK?

Research Briefing CBP 10373
published 21 October 2025

From laboratories to data platforms, biomedical research relies on complex infrastructure. This briefing examines how these facilities are funded, the organisations involved, and the balance between public and private investment. It also considers the challenges of sustaining long-term capacity and the implications for innovation in health and life sciences.

Fossil fuels, advertising and 'greenwashing'

Research Briefing CBP 10311
published 16 October 2025

How are fossil fuel companies using advertising, and what counts as 'greenwashing'? This briefing explores the debate around environmental claims in marketing, the regulatory framework, and recent proposals for tighter controls. It also looks at the role of consumer protection law and the challenges of balancing commercial speech with climate goals.

Broadband companies and telegraph poles

Constituency Casework Article
published 14 October 2025

This quick-read article, produced for caseworkers, explains the rules governing telegraph pole installation, the rights of operators, and the concerns raised by communities. It also considers planning requirements, dispute resolution and the implications for rural connectivity.

Climate Change at the International Court of Justice

Research Briefing 10354
published 8 October 2025

Explains the legal framework and practical issues surrounding rights of way in England and Wales. It covers the process for recording, modifying, and extinguishing public paths, as well as recent legislative changes and ongoing debates about access to the countryside. The paper also highlights the responsibilities of local authorities and landowners, providing a clear overview for those interested in land management, recreation, and rural policy.

Packaging extended producer responsibility

Research Briefing 10352
published 7 October 2025

How will new rules change the way packaging waste is managed? This briefing explains extended producer responsibility, outlining what it means for manufacturers, retailers and local authorities. It looks at the objectives behind the policy, expected costs, and how implementation is being phased in. The paper also explores the environmental benefits and the challenges raised by industry stakeholders.

Horizon Europe 2028–2034: What do we know so far?

Insight
published 29 September 2025

The next phase of Horizon Europe, an EU funding programme for research and innovation, is already taking shape. This briefing summarises what is known about the 2028-2034 programme, including proposed priorities, funding structures and opportunities for UK participation. It also considers the implications for research collaboration and innovation, and how negotiations could affect access for UK institutions.

Energy standing charges

Research Briefing 10339
published 26 September 2025

Standing charges are a daily charge that energy customers have to pay even if they use no energy. This briefing explains what standing charges cover, how they are calculated, and the role of regulation in setting them. It also examines recent trends and proposals for reform.

The regulation of non-surgical cosmetic procedures in England

Research Briefing 10331
published 10 September 2025

What rules govern treatments like Botox and fillers? This briefing explains the current regulatory framework for non-surgical cosmetic procedures, recent legislative changes, and proposals for further reform. It also looks at issues around practitioner standards, patient safety and enforcement, providing a clear picture of how regulation is evolving in this growing sector.

BRIEFINGS ON LEGISLATION

Our legislative briefings help you understand the content and journey of bills as they pass through parliament. Latest updates include:

Biodiversity Beyond National Jurisdiction Bill (2024–25)

Research Briefing CBP 10362
last updated 14 October 2025

This legislative briefing outlines the purpose and provisions of the Biodiversity Beyond National Jurisdiction Bill, which implements parts of an international treaty on marine biodiversity. It explains how the bill would enable the UK to meet its obligations, covering areas such as conservation measures, environmental impact assessments and enforcement powers.

DATA DASHBOARDS

The Library also produces a range of interactive data dashboards, helping you find data at constituency, regional and national levels. Our most recently-updated dashboards include:

Constituency data: road traffic collisions and casualties

(data last updated 10 October 2025)

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SCIENCE DIRECTORY

UK Research and Innovation

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UK Research and Innovation (UKRI) is the largest public funder of research and innovation in the UK, investing £8 billion annually spanning all disciplines and all sectors.

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AIRTO, the Association of Innovation, Research and Technology Organisations, comprises approximately sixty principal organisations operating in the UK's Innovation, Research and Technology (IRT) sector. The IRT sector has a combined turnover of £6.9bn, employs over 57,000 people and contributes £34bn to UK GVA. AIRTO's members work at the interface between academia and industry, for both private and public sector clients. Members include independent Research and Technology Organisations, Catapult Centres, Public Sector Research Establishments, National Laboratories, some university Technology Transfer Offices and some privately held innovation companies.

Applied Microbiology International

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Applied Microbiology International believes that global challenges need to be solved by global, interdisciplinary experts who apply their diverse experience and unique voices to achieve a common goal. Because of this, we're a truly inclusive, international organisation.

With a strong focus on influencing international policy, we are organised around seven goals which align with core UN Sustainable Development Goals and encourage partnership between industry and academia to increase our impact. We publish the leading industry magazine, *The Microbiologist*, and in partnership with Wiley and Oxford University Press, publish six internationally acclaimed journals.

AWE NUCLEAR SECURITY TECHNOLOGIES

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SCIENCE DIRECTORY

British In Vitro Diagnostics Association

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BIVDA is the UK industry association representing companies who manufacture and/or distribute the diagnostics tests and equipment to diagnose, monitor and manage disease largely through the NHS pathology services.

Increasingly diagnostics are used outside the laboratory in community settings and also to identify those patients who would benefit from specific drug treatment particularly for cancer.

British Pharmacological Society

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The British Pharmacological Society is a charity with a mission to promote and advance the whole spectrum of pharmacology. It is the primary UK learned society concerned with drugs and the way they work, and leads the way in the research and application of pharmacology around the world. Founded in 1931, the Society champions pharmacology in all its forms, across academia, industry, regulatory agencies and the health service. With over 3,500 members from over 60 countries worldwide, the Society is a friendly and collaborative community. Enquiries about the discovery, development and application of drugs are welcome.

British Society for Antimicrobial Chemotherapy

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BSAC is a learned society whose members are among the world's leading infectious disease physicians, pharmacists, microbiologists, and nurses. With more than 45 years of leadership in antibiotic research and education, BSAC is dedicated to saving lives by fighting infection. It does this by supporting a global network of experts via workshops, conferences, evidence-based guidelines, e-learning courses, and its own high-impact international journal. BSAC also provides national surveillance and susceptibility testing programmes, an outpatient parenteral antimicrobial therapy (OPAT) initiative, research and development grants, and the secretariat for the All-Party Parliamentary Group on Antibiotics. BSAC has members in 40 nations and active learners in more than 135 countries.

British Society for Immunology

Contact Dr Jennie Evans, Director of External Affairs
British Society for Immunology
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The British Society for Immunology is the leading UK charity representing scientists and clinicians who study the immune system in humans and animals.

As a membership organisation, we act as a focal hub for the immunology community, supporting and empowering immunologists working in academic, industry and clinical settings to drive forward scientific discovery and application. We aim to harness the knowledge generated by our membership to ensure society is aware of and can gain from the health benefits that immunology research can deliver.

bsas

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The British Society of Animal Science (BSAS), the principal body for animal science in the UK, was established in 1944.

We work globally with members and partners to shape the future of animal science, supporting the advancement of responsible, environmentally and economically sustainable animal production, addressing issues such as the role of animal science in resolving the world's food crisis.

BSAS disseminates research findings to ensure practical and beneficial application of positive outcomes to include livestock, animal health and welfare, the care of equine, companion, and zoo animals.

British Society of Soil Science

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The British Society of Soil Science (BSSS) was founded in 1947 and is an established international membership organisation and charity committed to the study of soil in its widest aspects.

The society brings together those working within academia, practitioners implementing soil science in industry and all those working with, or with an interest in soils. We promote research and education, both academically and in practice, and build collaborative partnerships to help safeguard our soil for the future. This includes hosting the World Congress of Soil Science 2022 in Glasgow, where those with an interest in soil science met to discuss the critical global issues relating to soil.

Brunel University London

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Brunel University London is an international research active university with 3 leading research institutes: Institute of Energy Futures: Led by Professor Savvas Tassou, the main themes of the Institute are Advanced Engines and Biofuels, Energy Efficient and Sustainable Technologies, Smart Power Networks, and Resource Efficient Future Cities. Institute of Materials and Manufacturing: The main themes of research are Design for Sustainable Manufacturing, Liquid Metal Engineering, Materials Characterisation and Processing, Micro-Nano Manufacturing, and Structural Integrity. The Institute is led by Professor Luiz Wrobel. Institute of Environment, Health and Societies: Professor Susan Jobling leads this pioneering research institute whose themes are Health and Environment, Healthy Ageing, Health Economics Synthetic Biology, Biomedical Engineering and Healthcare Technologies, and Social Sciences and Health. Brunel University London offers a wide range of expertise and knowledge, and prides itself on having academic excellence at the core of its offer, and was ranked in the recent REF as 33rd in the UK for Research Power (average quality rating by number of submissions) and described by The Times Higher Education as one of the real winners of the REF 2014.

Cavendish Laboratory

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The Cavendish Laboratory houses the Department of Physics of the University of Cambridge. The research programme covers the breadth of contemporary physics.

Extreme Universe: astrophysics, cosmology and high energy physics

Quantum Universe: cold atoms, condensed matter theory, scientific computing, quantum matter and semiconductor physics

Materials Universe: optoelectronics, nanophotonics, detector physics, thin film magnetism, surface physics and the Winton programme for the physics of sustainability

Biological Universe: physics of medicine, biological systems and soft matter. The Laboratory has world-wide collaborations with other universities and industry

CIPA

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CIPA represents virtually all of the UK's 2,600 registered patent attorneys in industry and private practice. We are the UK's largest intellectual property organisation with over 4,700 members, including 1,100 trainee patent attorneys.

It is our members that support British SMEs, universities and large companies in protecting their innovative technology worldwide. The reputation of the UK for IP advice draws work from around the world; only 11% of European patent applications by British representatives are for UK applicants. Consequently, the profession generates around £1 billion for the economy in gross value added and approaching £750 million in exports.

SCIENCE DIRECTORY

The Cosmetic Toiletry & Perfumery Association | ctpa

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W: www.ctpa.org.uk
W: www.thefactsabout.co.uk

CTPA is the UK trade association representing manufacturers of cosmetic products and suppliers to the cosmetic products industry. 'Cosmetic products' are legally defined and subject to stringent EU safety laws.

CTPA is the authoritative public voice of a vibrant and responsible UK industry trusted to act for the consumer; ensuring the science behind cosmetics is fully understood.

CLIFTON SCIENTIFIC Trust

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We bring school students and their teachers to:
- work closely with scientists and engineers
- experience science as a creative, questioning, team exploration
- add real-life meaning and motivation, from primary to post-16
- internationally build global awareness and experience science as a cultural bridge
- build transferable skills for employability and citizenship

Two powerful exemplars:
- Post-16; our unique UK-Japan Young Scientist Workshop Programme hosted in universities in England and Japan since 2001
- Primary; our local Meet-a-Medic Programme since 2005

Clifton Scientific Trust Ltd is registered charity in England and Wales 1086933

The Council for the Mathematical Sciences

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The Council for the Mathematical Sciences is an authoritative and objective body that works to develop, influence and respond to UK policy issues affecting mathematical sciences in higher education and research, and therefore the UK economy and society by:

- providing expert advice;
- engaging with government, funding agencies and other decision makers;
- raising public awareness; and
- facilitating communication between the mathematical sciences community and other stakeholders

THE FRANCIS CRICK INSTITUTE

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The Francis Crick Institute is an independent charity, established to be a UK flagship for discovery research in biomedicine. The Crick's mission is discovery without boundaries. We don't limit the direction our research takes. We want to understand more about how living things work to help improve treatment, diagnosis and prevention of human disease, and generate economic opportunities for the UK. In our institute more than 2,000 staff and students use their wide-ranging knowledge and expertise to work across disciplines and explore biology at all levels, from molecules through cells to entire organisms.

Daphne Jackson TRUST

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Founded in 1992 in memory of the UK's first female Professor of Physics, the Trust is the UK's leading charity dedicated to realising the potential of scientists and engineers returning to research after career breaks for family, caring and health reasons. Recently, we have expanded our remit to incorporate the social sciences and arts & humanities. Our Fellowship programme, working in partnership with universities, UKRI, charities, learned societies and industry, enables individuals to undertake part- time research in universities and research institutes. Fellowships comprise a research project alongside an individually tailored retraining programme, with additional mentoring and support, enabling recipients to re-establish their research credentials, update skills and redevelop confidence, in a suitably supportive environment.

EngineeringUK

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EngineeringUK is an independent organisation that promotes the vital role of engineers, engineering and technology in our society.

EngineeringUK partners business and industry, Government and the wider science and technology community: producing evidence on the state of engineering; sharing knowledge within engineering, and inspiring young people to choose a career in engineering, matching employers' demand for skills.

The Geological Society

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The Geological Society of London is the UK's national society for geoscience, providing support to 12,000 Fellows (members) worldwide.

The Fellowship encompasses those working in industry, academia and government, with a wide range of expertise on policy-relevant science, and the Society is a leading communicator of this science to government bodies and other non-technical audiences.

The Society aims to be an inclusive and thriving Earth science community advancing knowledge, addressing global challenges, and inspiring future generations.

IBMS Institute of Biomedical Science

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Advancing knowledge and setting standards in biomedical science
With over 20,000 members in 61 countries, IBMS is the leading professional body for scientists, support staff and students in the field of biomedical science. Since 1912 we have been dedicated to the promotion, development and delivery of excellence in biomedical science within all aspects of healthcare, and to providing the highest standards of service to patients and the public. By supporting our members in their practice, we set quality standards for the profession through training, education, assessments, examinations and continuous professional development.

IKE® Institute of Innovation & Knowledge Exchange

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Institute of Innovation & Knowledge Exchange
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IKE is the UK's professional body for innovators. It accredits and certificates innovation practices. We influence the inter-relationship between education, business, and government through research and collaborative networks.

Our Innovation Manifesto highlights our commitment to support the development of innovative people and organisations. IKE runs think-tanks, conducts research, develops new business models and tools and supports organisations to benchmark their innovation capabilities.

SCIENCE DIRECTORY

Institute of Measurement and Control

Contact: Steff Smith, Chief Executive
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W: www.instmc.org
Registration Charity number: 269815

The InstMC is a professional engineering institution and learned society dedicated to the science and application of measurement and control technology for the public benefit. The Institute has a comprehensive range of membership grades for individuals engaged in both technical and non-technical occupations. Also, it is licensed by the Engineering Council to assess and register individuals as Chartered Engineers (CEng), Incorporated Engineers (IEng) and Engineering Technicians (EngTech). The InstMC works to develop the knowledge and skills of individual engineers, fostering communication and advancing the science and practices within the industry.

IOP Institute of Physics

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The Institute of Physics (IOP) is the professional body and learned society for physics in the UK and Ireland.

The IOP's mission is to raise public awareness and understanding of physics, inspire people to develop their knowledge, understanding and enjoyment of physics and support the development of a diverse and inclusive physics community.

As a charity, the IOP seeks to ensure that physics delivers on its exceptional potential to benefit society.

IPEM Institute of Physics and Engineering in Medicine

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The Institute of Physics and Engineering in Medicine (IPEM) is the professional body for Medical Physicists, Clinical Engineers and Clinical Technologists working across healthcare, academia and industry.

We are a charity with a mission of Improving Health through Physics and Engineering in Medicine. Our vision is one in which professionalism drives improvements in diagnosis, treatment and care, transforming the lives of patients.

IPEM is licensed by the Science Council to award CSci, RSci and RSciTech, and by the Engineering Council to award CEng, IEng and EngTech.

IChemE

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The Institution of Chemical Engineers (IChemE) is the UK based and internationally recognised qualifying body and learned society for chemical, biochemical and process engineers.

We advance chemical engineering's contribution for the benefit of society, facilitate the development of chemical engineering professionals across a wide range of sectors including energy, water, food and health, and provide connections to a powerful network of over 30,000 members in more than 100 countries.

IET The Institution of Engineering and Technology

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The IET is a world leading professional organisation, sharing and advancing knowledge to promote science, engineering and technology across the world.

Dating back to 1871, the IET has over 163,000 members in 127 countries with offices in Europe, North America, and Asia-Pacific. .

LGC

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LGC is a leading global life science tools company, providing genomics and quality assurance solutions into high growth application areas within human healthcare and applied market segments. Our core purpose is Science for a Safer World.

Our 180 years of scientific heritage, combined with a focus on innovation and value-enhancing acquisitions, has enabled us to build a highly valued product portfolio, and to closely collaborate with our customers, partners and the global scientific community.

As the UK Government Chemist www.gov.uk/government/ organisations/government-chemist, LGC acts as the referee analyst and advises Government and the wider analytical community on analytical measurement matters for policy, standards and regulation.

LGC is also the UK's National Measurement Laboratory for chemical and bio-measurement, finding solutions to fundamental and emerging measurement challenges, driving innovation, productivity and economic growth.

The Linnean Society of London

Contact: Professor Gail Cardew, Chief Executive Officer
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E: gail@linnean.org
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As the world's oldest active biological society, the Linnean Society is an essential forum and meeting point for those interested in the natural world. The Society holds regular public lectures and events, publishes three peer-reviewed journals, and promotes the study of the natural world with several educational initiatives. The Society is home to a world famous library and collection of natural history specimens. The Society's Fellows have a considerable range of biological expertise that can be harnessed to inform and advise on scientific and public policy issues.

A Forum for Natural History

Institution of Mechanical Engineers

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The Institution provides politicians and civil servants with information, expertise and advice on a diverse range of subjects, focusing on manufacturing, energy, environment, transport and education policy.

We regularly publish policy statements and host political briefings and policy events to establish a working relationship between the engineering profession and parliament.

Met Office

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The Met Office doesn't just forecast the weather on television.

Our forecasts and warnings protect UK communities and infrastructure from severe weather and environmental hazards every day – they save lives and money.

Our Climate Programme delivers evidence to underpin Government policy through the Met Office Hadley Centre.

Our Mobile Meteorological Unit supports the Armed Forces around the world.

We build capacity overseas in support of international development. All of this built on world-class environmental science.

SCIENCE DIRECTORY

Contact: Policy Officer
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The Microbiology Society is a membership charity for scientists interested in microbes, their effects and their practical uses. It has a worldwide membership based in universities, industry, hospitals, research institutes, schools, and other organisations. Our members have a unique depth and breadth of knowledge about the discipline.

The Society's role is to help unlock and harness the potential of that knowledge. Our principal goal is to strengthen our culture of being a community-driven Society by amplifying our members' voices, wherever they are in the world, and empowering them to embed the benefits of microbiology within wider society.

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The National Physical Laboratory (NPL) is the United Kingdom's national measurement institute, an internationally respected and independent centre of excellence in research, development and knowledge transfer in measurement and materials science.

For more than a century, NPL has developed and maintained the nation's primary measurement standards - the heart of an infrastructure designed to ensure accuracy, consistency and innovation in physical measurement.

Advancing the science of nature

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We challenge the way people think about the natural world – its past, present and future We use our unique collection and unrivalled expertise to tackle the biggest challenges facing the world today. We are leaders in the scientific understanding of the origin of our planet, life on it and can predict the impact of future change. We study the diversity of life and the delicate balance of ecosystems to ensure the survival of our planet. We help enable food security, eradicate disease and manage resource scarcity. We inspire people to engage with science to solve major societal challenges.

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The University of Northampton is an institution committed to science education through initial teacher training, a STEM Ambassador network which works within the community and teaching and research to doctoral level.

We are an Ashoka U 'Changemaker Campus' status university recognising our commitment to social innovation and entrepreneurship.

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With 43,000 students and campuses in Nottingham, China and Malaysia, The University of Nottingham is 'the nearest Britain has to a truly global university'.

With more than 97 per cent of research at the University recognised internationally according to the Research Excellence Framework 2014, the University is ranked in the top 1% of the world's universities by the QS World University Rankings.

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The Nutrition Society, formed in 1941, is a diverse community with the independence and courage to challenge, question and progress the field of nutrition.

Through a progressive approach that champions collaboration and breaking down research silos, we welcome members from around the world, regardless of their level of expertise. They must however have a genuine interest in pushing forward the field of nutrition for the benefit of people, animals while balancing the health of our planet too.

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As the largest network of physiologists in Europe, with academic journals of global reach, we continue our 140-year tradition of being at the forefront of the life sciences.

We bring together scientists from over 60 countries, and our Members have included numerous Nobel Prize winners from Ivan Pavlov to John O'Keefe.

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The £75m Quadram Institute opened in 2019 and is focused on fundamental and translational research into the interfaces between the gut microbiome, food, and human health.

The Quadram Institute combines leading-edge bioscience capabilities with NHS endoscopy, clinical trials and biobank facilities.

The Quadram Institute is a partnership between the Norfolk and Norwich University Hospital, University of East Anglia, Quadram Institute Bioscience and BBSRC.

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As the UK's national academy for engineering, we bring together the most successful and talented engineers for a shared purpose: to advance and promote excellence in engineering.

We have four strategic challenges:

- Drive faster and more balanced economic growth
- Foster better education and skills
- Lead the profession
- Promote engineering at the heart of society.

SCIENCE DIRECTORY

Kew
ROYAL BOTANIC GARDENS

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RBG Kew is a centre of global scientific expertise in plant and fungal diversity, conservation, and sustainable use, housed in two world-class gardens. Our scientific vision is to document and understand global plant and fungal diversity and its uses, bringing authoritative expertise to bear on the critical challenges facing humanity today. Kew's strategic priorities for science are: (1) To document and conduct research into global plant and fungal diversity and its uses for humanity. (2) To curate and provide data-rich evidence from Kew's unrivalled collections as a global asset for scientific research. (3) To disseminate our scientific knowledge of plants and fungi, maximising its impact in science, education, conservation policy and management. These priorities enable us to curate, use, enhance, explore and share Kew's global resource, providing robust data and a strong evidence base for our UK and global stakeholders. Kew is a non-departmental government body with exempt charitable status, partially funded by Defra.

THE ROYAL SOCIETY

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The Royal Society is the academy of science in the UK and the Commonwealth comprising 1400 outstanding individuals representing the sciences, engineering and medicine. The Society has played a part in some of the most fundamental, significant and life-changing discoveries in scientific history and Royal Society scientists continue to make outstanding contributions to science across the wide breadth of research areas. Through its Fellowship and permanent staff, it seeks to ensure that its contribution to shaping the future of science in the UK and beyond has a deep and enduring impact, supporting excellence in science and encouraging the development and use of science for the benefit of humanity.

Royal Society of Biology

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The Royal Society of Biology is a single unified voice, representing a diverse membership of individuals, learned societies and other organisations.

The RSB has a central role in facilitating scientific knowledge exchange and in harnessing the expertise of our community to advise policy-makers on key bioscience issues of national and global significance.

Our vision is a world that values biology's contribution to understanding and improving life for all.

ROYAL SOCIETY OF CHEMISTRY

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The Royal Society of Chemistry is the world's leading chemistry community, advancing excellence in the chemical sciences.

With over 50,000 members and a knowledge business that spans the globe, we are the UK's professional body for chemical scientists; a not-for-profit organisation with 170 years of history and an international vision of the future.

We promote, support and celebrate chemistry. We work to shape the future of the chemical sciences – for the benefit of science and humanity.

Society for Endocrinology

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The Society for Endocrinology has been the UK home of endocrinology for 80 years. Since 1946 we have been bringing together the global endocrine community to share ideas and advance discipline.

As a membership organisation, we support scientists, clinicians, and nurses who work with hormones throughout their careers. We also engage policymakers, journalists, patient, and the public with hormone science to encourage informed health decisions and demonstrate the value of endocrinology to the wider world.

Society for Underwater Technology

SUT Society for Underwater Technology

Contact: Dr Cheryl Burgess, Chief Executive
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The SUT is a multidisciplinary learned society that brings together individuals and organisations with a common interest in underwater technology, ocean science, and offshore/subsea engineering.

The society was founded in 1966 and has members from over 40 countries, including engineers, scientists, other professionals and students working in these areas.

Society of Chemical Industry

SCI where science meets business

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Established by Royal Charter in 1881, SCI is a unique multi-disciplinary community. Set up by a prominent group of forward thinking scientists, inventors and entrepreneurs, SCI continues to be a multi-science and industry network based around chemistry and related sciences. Our charitable objective is to promote links between science and industry for the benefit of society. Our passion is invention and creation. We deliver our charitable objective by:
• Supporting the commercial application of science into industry
• Tackling global challenges across Agrifood, Energy, Environment, Health and Materials.

Society of Cosmetic Scientists

SCS SOCIETY OF COSMETIC SCIENTISTS

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Advancing the science of cosmetics is the primary objective of the SCS. Cosmetic science covers a wide range of disciplines from organic and physical chemistry to biology and photo-biology, dermatology, microbiology, physical sciences and psychology.

Members are scientists and the SCS helps them progress their careers and the science of cosmetics ethically and responsibly. Services include publications, educational courses and scientific meetings.

The Society for Radiological Protection

S R P

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The Society for Radiological Protection is the principal independent professional body for radiation protection in the UK.

Its members operate in the fields of medicine, the nuclear power cycle and other industries, research, and teaching.

We offer a profession-wide view to regulators and are involved in training and educational outreach. We ensure that professional standards are maintained at the highest levels.

SCIENCE DIRECTORY

UK INNOVATION & SCIENCE SEED FUND

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W: https://ukinnovationscienceseedfund.co.uk

The UK Innovation & Science Seed Fund is a leading patient capital investor with more than £330 million private investment leveraged to date.

The Fund works to build technology companies from the earliest stage by working closely with its partners led by STFC, BBSRC, NERC and Dstl, with the National Research and Innovation Campuses they support, and with entrepreneurial science-led teams.

The Fund is also closely aligned with the Catapults and InnovateUK, helping to commercialise key technological advances in industrial biotech, agricultural technology, healthcare, medicine, clean energy, materials, artificial intelligence, software and space.

University of Essex

Contact: Dr Rob Singh, Director of Research and Enterprise
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W: www.essex.ac.uk/business

Established in 1964, the University of Essex is ranked highly in the Research Excellence Framework, with 100% of its research impact deemed internationally excellent or world-leading for 10 subjects, and is awarded Silver in the Teaching Excellence Framework.

It is home to world-leading expertise in analytics and data science, with research peaks spanning the social sciences, sciences, and humanities. Pioneers of quantitative methods and AI techniques, Essex is also in the UK top 10 for Knowledge Transfer Partnerships – working with businesses to embed innovation into operations, knowledge exchange and contract research.

Universities Federation for Animal Welfare

Contact: Dr Huw Golledge, Chief Executive and Scientific Director
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T: +44 (0)1582 831818.
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W: www.ufaw.org.uk
Registered in England Charity No: 207996

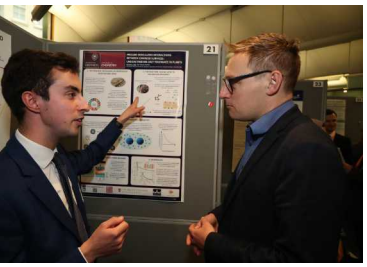
The Universities Federation for Animal Welfare (UFAW) is an international independent scientific and educational animal welfare charity and membership society. UFAW's vision is a world where the welfare of all animals affected by humans is maximised through a scientific understanding of their needs and how to meet them. We promote an evidence-based approach to animal welfare by funding scientific research, helping develop the next generation of animal welfare scientists and sharing animal welfare science knowledge with both experts and the wider public.

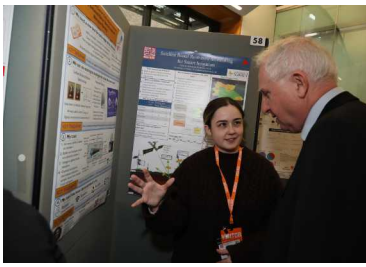
INTERESTED IN TAKING A DIRECTORY ENTRY IN SCIENCE IN PARLIAMENT`?

These are available to P&SC member and non-member STEM organisations.

For further details please contact Karen Smith: office@scienceinparliament.org.uk

Science in Parliament journal is circulated quarterly to P&SC subscribing members and all MPs and Peers.



STEM for BRITAIN

STEM for BRITAIN 2026 has attracted a strong wave of applications this year, showcasing outstanding research across chemistry, engineering, biology, mathematics, and physics. The judging panel will now begin the process of selecting the finalists, who will present their work to Parliament on 17 March 2026.

Members of Parliament whose constituents are exhibiting on 17 March will be notified in January. We look forward to welcoming them, together with other Parliamentarians.

A wide range of important scientific, engineering and mathematics institutions and organisations lend their support to this annual event, including the Royal Society of Chemistry, the Institute of Physics, the Royal Academy of Engineering, the Academy for the Mathematical Sciences, The Physiological Society, The Nutrition Society, the Royal Society of Biology, the Clay Mathematics Institute, Warwick Manufacturing Group, AWE, Elsevier, the Institute of Biomedical Science, the Heilbronn Institute for Mathematical Research, the Isaac Newton Institute for Mathematical Sciences, United Kingdom Research and Innovation, the Biochemical Society, and the Society of Chemical Industry.

This reflects the importance we all attach to the encouragement of researchers at this stage in their careers.

Dr Isabel Spence

www.stemforbritain.org.uk

Science Council

Elevating the Science Workforce

Elevating the Science Workforce

Our purpose is to connect the science professions and offer professional recognition for scientists, science technicians and science teachers.

Science Council Members & Licensed Bodies

Royal Society of Biology
ASE Association for Science Education
sdc society of dyers and colourists
Royal Astronomical Society
CASES
Institute of Mathematics & its Applications
iat Institute of Animal Technology
IST The Institute of Science & Technology
RMetS Royal Meteorological Society
British Blood Transfusion Society
The British Psychological Society Promoting excellence in psychology
CIWEM
British Society of Soil Science
AAPT Association of Anatomical Pathology Technology
Institute of Corrosion
Institute of Water
IChemE
The Institution of Environmental Sciences
Association for Laboratory Medicine
Institute of Marine Engineering, Science & Technology
IPEM Institute of Physics and Engineering in Medicine
Royal Society of Chemistry
IOP Institute of Physics
IBMS
TOPRA
I·M3 Institute of Materials, Minerals & Mining
Operational Research Society
ASPiH Association for Simulated Practice in Healthcare
SCS Society of Cosmetic Scientists
Institute of Food Science + Technology ifst
Society for Natural Sciences
The Geological Society
Nuclear Institute
Royal College of Podiatry