



UK Research
and Innovation

UKRI International Strategic Framework

Bringing global
knowledge to the UK
and UK expertise to
the world





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UKRI International Champion and Executive Chair, AHRC

Foreword

In March 2022 we published a strategy for UKRI, setting out how we are harnessing the extraordinary potential of research and innovation to enrich and improve lives in the UK and around the world.

International collaboration is integral to our strategy. We need only look at the Covid-19 pandemic, during which we worked with partners around the world to understand the disease, develop treatments and vaccines and address its social and economic impacts. The UK's research and innovation system has great strengths, but we are only one part of what is now a truly global scientific effort. To be successful we must play our part in bringing global capability to bear on global challenges and drive economic growth.

International collaboration is also deeply important on a personal level for those working in research and innovation. Our lives and our work have often been enriched by international experience and relationships. Working together stimulates innovation, as we exchange ideas and explore new settings.

The wider context shapes international collaboration in research and innovation. UK government policy, including the Integrated Review, recognises science and technology as a source of strategic advantage and that it therefore has a competitive dimension. In very many cases international collaboration is for the global good, but there are actors who would exploit knowledge and relationships to advance other objectives.



The UK's research and innovation system has great strengths, but we are only one part of what is now a truly global scientific effort.

World events rightly cause us to examine who we work with and how. We have seen – and in many cases directly enabled – the international research and innovation response to the global challenge of climate change. In response to Russia's invasion of Ukraine we worked alongside others to create opportunities for Ukrainian researchers to continue their work and ended partnerships with organisations linked to the Russian state.

This argues for an approach that recognises the vital importance of international collaboration in research and innovation and enables that

collaboration in ways that address wider imperatives, from global development to security.

This International Strategic Framework sets out UKRI's approach to international collaboration and highlights the ways in which collaboration will contribute to each of our six strategic objectives.

We now look forward to advancing this approach with our many partners, old and new, around the world and in the UK.

Our approach will be guided by the four principles for change in the UKRI strategy:

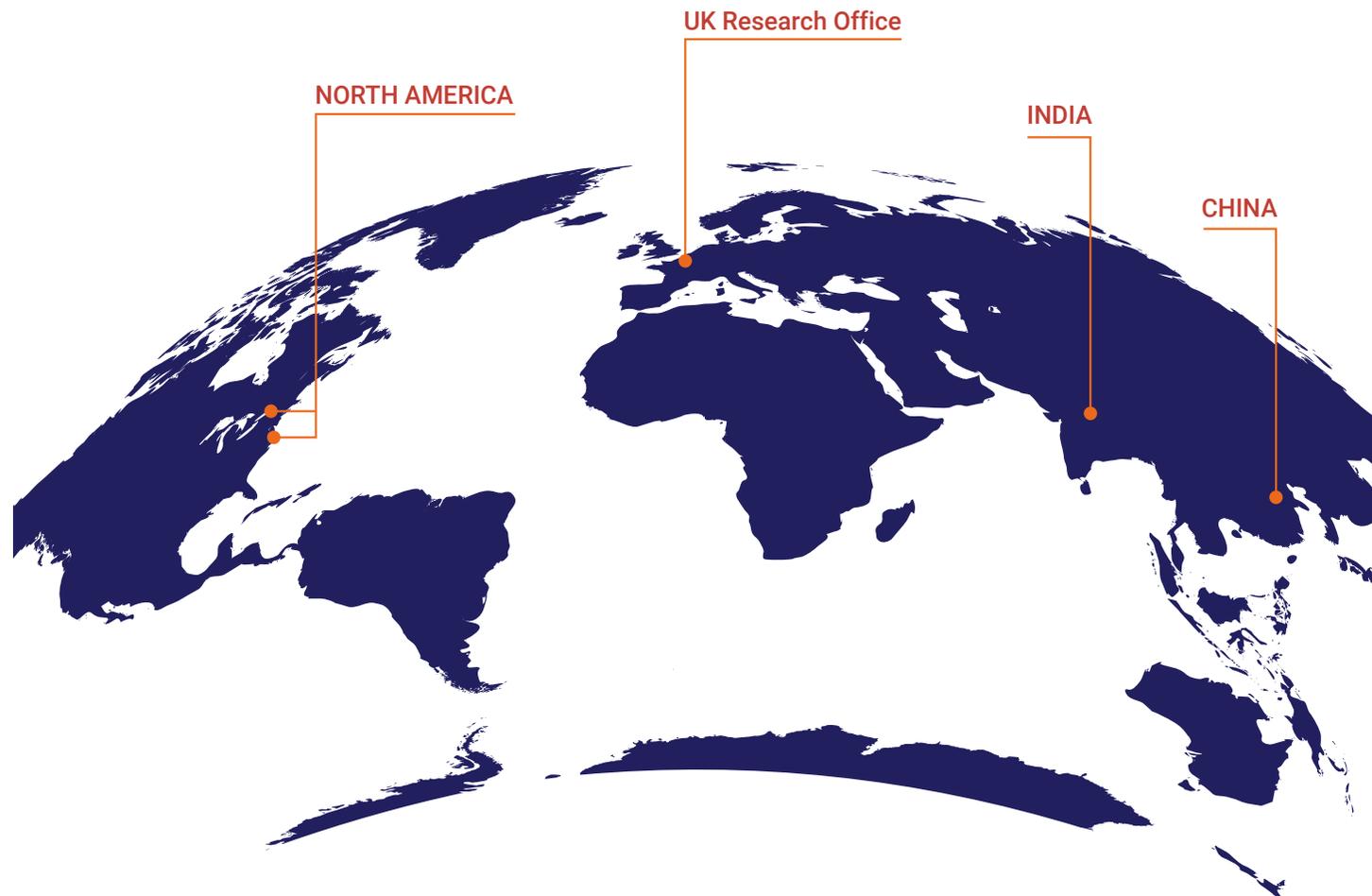
- **Engagement:** We will work in collaboration with partners in the UK and around the world, engaging in a constructive spirit to build mutually beneficial relationships and with respect for diverse perspectives.
- **Connectivity:** We will reduce barriers to international collaboration and encourage circulation of people and ideas. We will place particular focus on global connectivity to address global challenges, from creating a green future to building more secure and resilient societies.
- **Diversity:** We will enable a diverse range of research and innovation partnerships through a variety of means, from support for researcher- and business-led collaborations through to bilateral and multilateral partnerships with research and innovation funders. We will learn from and contribute to international best practice to encourage diversity in all its forms from advancing equality, diversity and inclusion, to improving research assessment.
- **Resilience:** We will advance the long-term health of research and innovation systems, building equitable partnerships and capability and increasing awareness of the principles of Trusted Research and Innovation.

UKRI's international reach

UKRI is nine councils, working together to foster an outstanding research and innovation system for the UK. We leverage expertise across all disciplines and sectors and through our many partnerships, enriching lives locally, nationally and globally.

The international reach of UKRI-funded research and innovation:

- Over the eight years to 2019-20, 38% of grants from UKRI research councils had an international component¹.
- Our offices** highlighted on the map are co-located with British Embassies and High Commission in North America, India, Europe and China. They are building and broadening our research and innovation partnerships with those regions.
- We also have renowned research facilities in the Gambia, Uganda, Antarctica and Svalbard in the Arctic Circle that attract collaborators worldwide.
- The UK publicly funds over 500 nationally and internationally significant infrastructures, with 92% of the infrastructures collaborating with international partners and 39% of users coming from outside the UK.ⁱⁱ UKRI directly funds approximately 300 of these infrastructure sites.



This helps ensure the UK's research and innovation system is highly international:

- Since 2016, over half the UK's publications result from international collaboration. This makes the

UK the second most internationally collaborative country in the G7, second to France (56%) and significantly higher than the Organisation for Economic Co-operation and Development (OECD) average (31%).ⁱⁱⁱ

1. A grant is considered to have an international component if it includes an international research organisation, staff member, project partner or other country involvement.

The wider context

UKRI's approach to international collaboration is shaped by the wider context. Many advanced economies see the need for significant investment in research and innovation (R&I) to provide the engine for current and future economic growth and to tackle the major challenges such as climate change, ageing populations and pandemics. The UK's ambition on research and innovation matches this but also sees the value of R&I for global influence, advancing global development but also reducing the risks to national security.

Research and innovation are central to the UK government's global vision for the UK, as set out in the [Integrated Review of Security, Defence, Development and Foreign Policy](#). This sets an ambition for the UK to become a Science and Technology Superpower by 2030, positioning this as a key means to achieve prosperity, security and influence. The Integrated Review has led to the creation of new structures to provide strategic coordination of research and innovation, through the Prime Minister's National Science and Technology Council (NSTC) and the Office for Science and Technology Strategy (OSTS).

With our unique ability to connect all parts of the UK's research and innovation system, UKRI has a critical role in achieving this ambition and managing the risks. All our activities contribute, from our

investment in people and institutions to our work with government departments to tackle national and international challenges.

This includes our international activities, through which we are building durable partnerships to exchange new ideas and develop new solutions.

As a source of strategic advantage, science and technology also have a competitive dimension. In most cases the research and innovation we fund will contribute to global knowledge through dissemination and application and benefit the UK and our partners on an equitable basis. However, there are those who would exploit partnerships in ways that do not serve UK interests, or which conflict with our values. We consider these issues and expect and support those we fund to do the same through our advice on [Trusted Research and Innovation](#).

UKRI is a major and long-standing funder of research and innovation for development. We have contributed to the UK government's [strategy for international development](#), which places science and technology at the core of both the UK's offer to partner countries and work on global challenges like climate change and health.

The government's decision to reduce and cap the UK's Official Development Assistance (ODA) at 0.5% of Gross National Income in 2021 required a scaling down of spending commitments that was immensely challenging for all involved and adversely affected researchers, businesses and the beneficiaries of research in the UK and around the world. UKRI nevertheless remains committed to the principle that research and innovation conducted through equitable global partnerships has an essential role in tackling global challenges and improving the lives of the poorest and most vulnerable.

The UK's future economic model has also been rethought via the [Innovation Strategy](#), which establishes an ambition for the UK to become a global hub for innovation by 2035. Realising this vision of an 'innovation nation' will require even more UK businesses to succeed on the international stage and for the UK to be positioned as a highly attractive destination for investors. All of UKRI's councils are contributing to this work, with a particularly vital role for Innovate UK as the UK's national innovation agency.

UKRI Strategy and International Strategic Framework

In March 2022 we published [UKRI's strategy for 2022-27](#), which sets out how we will power an innovation-led economy, securing the UK as a global leader in research, technology and innovation. By defining our vision, objectives and principles for change, the strategy provides clarity of purpose for UKRI and our many partners and stakeholders. Figure 1 shows the six strategic objectives of the UKRI Strategy.

The strategy is followed by further publications including, our councils' Strategic Delivery Plans and a UKRI Corporate Plan and this International Strategic Framework.

UKRI's International Strategic Framework

International considerations touch all that we do at UKRI. We are uniquely positioned in the UK's research and innovation system to be able to bring global knowledge to the UK and UK expertise to the world. Through policy advice, funding streams, existing collaborations and assets, UKRI shapes and gives substance to our continuing role as a global science superpower and an innovation nation. We will contribute to government ambitions by using our profound knowledge of the UK's research and innovation system and that of our global partners,

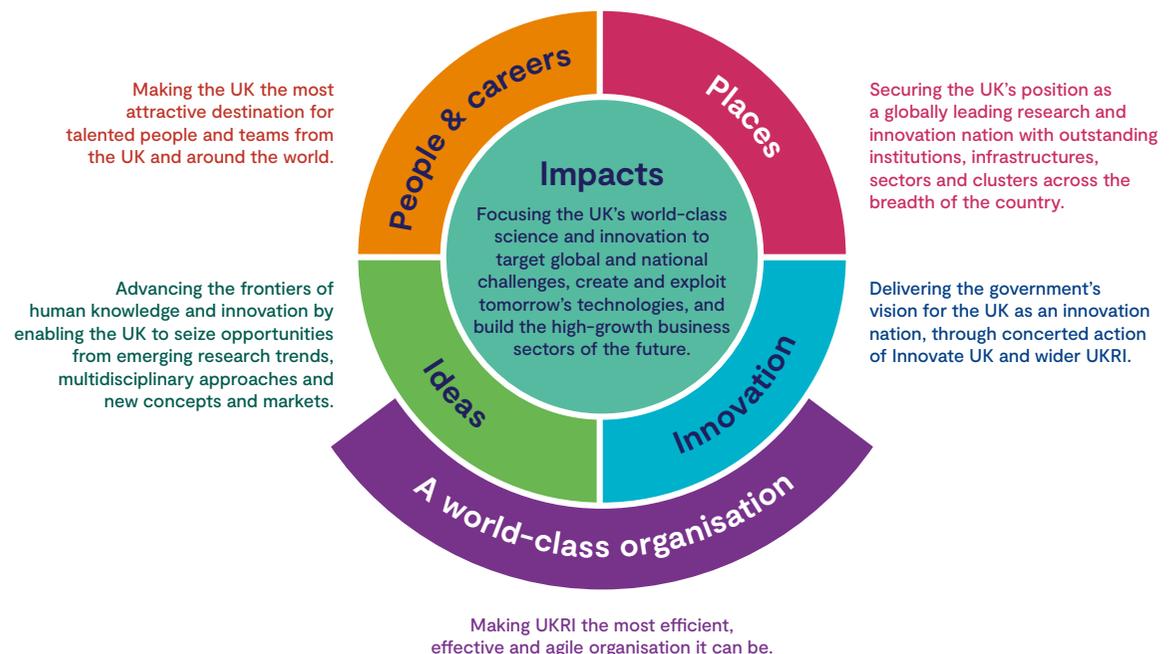
to support targeted, impactful and responsible investment in research and innovation.

Reflecting that vital international dimension to UKRI's work, we have developed this International Strategic Framework to accompany the UKRI strategy. This framework sets out how we plan to achieve UKRI's six strategic objectives through

our international activities, how we will work in partnership with others to achieve this and how we will assess progress and be accountable.

In implementing this framework, we will be guided by the four principles for change that we set out in the UKRI strategy, of diversity, connectivity, resilience and engagement.

Our strategic objectives provide the framework for how we will achieve our vision and realise our principles through world-class:



UKRI's six strategic objectives will guide our international activities:

People and careers	Places	Ideas	Innovation	Impacts	World-class organisation
<p>Enabling people and teams to collaborate, exchange and thrive through international collaboration.</p> <ul style="list-style-type: none"> We will develop and promote opportunities for international researchers and businesses in the UK and help UK-based researchers and businesses to build and benefit from international connections. We will help shape the open international order of the future, learning from and contributing to international best practice on issues including equality, diversity and inclusion, open access, research assessment and trusted research and innovation. 	<p>Strengthening our global relationships and working together on the infrastructures that often underpin collaboration.</p> <ul style="list-style-type: none"> We will strengthen our key international partnerships, prioritising based on demand from our communities, our and our partners' research and innovation capabilities and the compatibility of our approaches. We will ensure the UK remains an active partner in priority international research infrastructures, to benefit from sharing of knowledge, expertise, data and capability across borders. 	<p>Advancing the frontiers of human knowledge and innovation by supporting the best ideas wherever they are found.</p> <ul style="list-style-type: none"> We will continue to fund in ways that enable researcher and business-led international partnerships and links between universities, research centres, institutes and businesses. We will develop and support bilateral and multilateral funding programmes with international partners to support great ideas in areas of strategic priority. 	<p>Enabling innovation by connecting UK and international businesses, researchers, institutions and investors, in the UK and globally.</p> <ul style="list-style-type: none"> We will do more to enable UK businesses, researchers and institutions to innovate globally, whilst ensuring value to the UK. We will increase the involvement of international businesses and investors in the UK's research and innovation system, contributing to the 2.4% target. 	<p>Embedding international considerations in our work on strategic themes and transformative technologies.</p> <ul style="list-style-type: none"> We will enable international collaboration to address the global challenges set out in UKRI's five strategic themes and contribute to the Sustainable Development Goals through equitable international partnerships. We will provide evidence and intelligence and enable international partnerships to advance the seven technology families. 	<p>Catalysing change through partnerships, championing diversity and increasing the efficiency and effectiveness of our activities.</p> <ul style="list-style-type: none"> We will catalyse change through equitable partnerships, guided by our principles and championing diversity. We will increase our efficiency and effectiveness, particularly by significantly improving the way we use data and evidence to inform our international activities and priorities.

People and careers

Enabling people and teams to collaborate, exchange and thrive through international collaboration.

- We will develop and promote opportunities for international researchers and innovators in the UK and help UK-based researchers and innovators to build and benefit from international connections.
- We will help shape the open international order of the future, learning from and contributing to international best practice on issues including equality, diversity and inclusion, open access, research assessment and trusted research and innovation.

Developing and promoting opportunities for researchers and innovators in the UK and internationally

The UK's research and innovation system benefits from its openness to global talent. Our universities, research institutes and businesses benefit from the many people of other nationalities who choose to live and work here.

We are already in a strong position but will do more to make the UK an open, appealing destination for talented people from around the world. We will reform our domestic system by implementing the recommendations of the R&D People and Culture Strategy, including developing a wider range of career paths with much greater permeability between sectors and improved conditions for researchers. We will also do more to ensure the UK is genuinely open to international researchers and innovators, including through our support for visa schemes like the [Global Talent Visa](#) and we will promote those opportunities internationally.

We recognise that research and innovation careers are often global in nature and that the UK's research and innovation system is improved by the international experience of those working here. We will do more to enable UK-based researchers and innovators to develop and benefit from international connections, including periods spent outside the UK.

Shaping the open international research and innovation landscape of the future

We can help to create the conditions for successful international collaboration by encouraging common standards, learning from and sharing best practice.

Transparency, openness, verification and reproducibility are important features of research and innovation. Open research helps to support and uphold these features across the whole lifecycle of research. Working internationally is important in achieving openness and transparency in research, which is why we are a member of cOAlition S, along

with several other national research funders and foundations and are working with Science Europe and its members on activities to promote and develop open access, open data and responsible research assessment.

Similarly, we believe that research and innovation can best maintain public support and legitimacy by adhering to the highest ethical standards.

We will make it harder for those who would exploit the collaborative, open nature of research and innovation for their own benefit, by promoting the principles of trusted research and innovation.

Case studies



Understanding memory through theatre and museums

A research project that examines how theatres and museums are shaping public memory of difficult pasts is using UKRI's international co-investigator policy to collaborate with researchers at the University of Minnesota, USA; and partnering a number of museums in Argentina, Poland and Spain.

*Staging Difficult Past*s, led by the University of London, analyses how a number of highly politicised and divisive debates and historical narratives have been staged in contemporary theatre and museal practices and recent attempts to expose or reinterpret public memory of formerly taboo historical narratives through live audiences.

UKRI's International Co-Investigator policy can be used on a number of our funding programmes across our Councils to include researchers from anywhere in the world on a research project.

UK-Japan collaboration underpins regenerative medicine advances

An international team of researchers have created an algorithm, Mogrify, to precisely predict the proteins required to reprogram any human cell type. Mogrify predicts the key trigger proteins, or transcription factors, required to transform one cell type into another. Identifying the right transcription factors experimentally is time-consuming, expensive and labour intensive.

The creation of Mogrify was underpinned by a Biotechnology and Biological Sciences Research Council (BBSRC) International Partnering Award with RIKEN, Japan, which supports the development of partnerships with laboratories in Japan. Mogrify has since been used by two spin-out companies founded by the researchers to develop novel cell-based therapies for the treatment of diseases such as osteoarthritis.

Places

Strengthening our global relationships and working together on the infrastructures that often underpin collaboration.

- We will strengthen our key international partnerships, prioritising based on demand from our communities, our and our partners' research and innovation capabilities and the compatibility of our approaches
- We will ensure the UK remains an active partner in priority international research infrastructures, to benefit from sharing of knowledge, expertise, data and capability across borders.

Strengthening our partnerships

Research and innovation recognise no boundaries: great scientific advances can happen anywhere and they are more likely when we work together. International partnerships arise through formal nation-to-nation agreements and from bottom-up, investigator to investigator networks that occur organically within research communities.

Partnership is at the heart of the UKRI ethos. Partnerships help us discover new science, develop new technologies, scale UK companies through access to overseas markets, improve our resilience including in supply chains and increase our global influence. We will make it a priority to be an international partner of choice for individuals, businesses and governments.

Over the coming years we want to deepen our cooperation with existing strong partners and develop new relationships. With finite resources we will be guided by where UKRI activity can generate a step change in the quality and impact of

collaboration. In prioritising partnerships between UKRI – including council-specific partnerships – and its councils and our global peers, we will consider:

- Alignment with our overall strategy, corporate plan and council strategic delivery plans.
- The existing demand from our research and innovation communities.
- The research and innovation capacity of potential partners and complementarity to UK strengths.
- The extent to which we have compatible systems and approaches that enable us to work together effectively.

This is likely to involve a combination of council-led partnerships focused on distinct areas of research and innovation and broader partnerships which UKRI advances collectively. Our prioritisation approach will be informed by data and evidence from within UKRI and from our partners. These partnerships will take different forms, from lead agency arrangements and jointly designed and

operated funding calls, to collaboration through multilateral fora.

Ensuring the UK remains an active partner in priority international research infrastructures

These underpin many forms of collaboration, from the contribution of the British Antarctic Survey (BAS) and the RRS *Sir David Attenborough* to the International Thwaites Glacier Collaboration, to the use of the ARCHER supercomputer to forecast the dispersion of volcanic ash from Icelandic volcanoes. We will ensure the UK remains an active partner in priority international research infrastructures, to benefit from sharing of knowledge, expertise, data and capability across borders.

UKRI is the UK's subscribing mechanism for multinational scientific collaborations such as the European Molecular Biology Laboratory (EMBL) – who have collaborated with AI pioneers DeepMind to predict and now publish the structures of nearly all catalogued proteins known to science.

Case studies

The UK is one of 12 founding members of CERN, home to more than 13,000 researchers from over 75 countries, all seeking answers about the nature of the universe. Life-changing breakthroughs like the World Wide Web, detectors for positron emission tomography (PET) scanners, touchscreens, fibre-optic sensors and supercomputing have been enabled through the major advancement in technology required for CERN experiments, all of which contribute to the UK's economy. UK scientists were involved in three of the eight Nobel Prizes awarded for work at CERN, including the Nobel Prize in Physics for work on the Higgs boson in 2013.^{iv}

UK-India collaboration in the creative industries

With the UK and India both global leaders in creative industry sectors such as film and textiles, a programme funded by AHRC is developing research collaborations that demonstrate how the creative and cultural sectors can foster economic growth and societal wellbeing in both countries. Working in partnership with UKRI India, Innovate UK, the British Council and partners in India, including the Indian Council of Historical Research, the programme will map and analyse the value of the creative industries and heritage to India and

UK cultures and economies. Activities include scoping studies and impact and engagement awards exploring screen industries, live performance, cultural heritage and sustainable fashion. This work is being carried forward by AHRC India Fellow, Professor Navtej Purewal, who will consolidate partnerships and generate a roadmap for long-term, large-scale collaboration. These collaborations will develop a better understanding of the value and impact of these sectors on the prosperity and wellbeing of both countries.



James Webb Space Telescope launch

On Christmas Day 2021 the telescope, known as just 'Webb', blasted off from Europe's spaceport in French Guiana, in the culmination of decades of scientific collaboration. Almost seven months later, the first images from Webb were published, proving us with a glimpse through space and time like never before.

The UK played a major role by leading the European Consortium that, in partnership with US institutes, designed, built and tested one of the four main science instruments. The Mid-Infrared Instrument (MIRI) can see the faint light from the most distant stars and peer through dust and gas to spot stars being born.

The MIRI project involved a European Consortium of 10 member countries led by the UK, in partnership with the US.

STFC RAL Space Chief Engineer Paul Eccleston with the Mid-Infrared Instrument. Credit: STFC RAL Space

Ideas

Advancing the frontiers of human knowledge and innovation by supporting the best ideas wherever they are found.

- We will continue to fund in ways that enable bottom-up researcher and business-led international partnerships and links between universities, research centres, institutes and businesses.
- We will develop bilateral and multilateral funding programmes with international partners to support great ideas in areas of strategic priority.

Enabling researcher and innovator-led international partnerships

From aesthetics to zoology, from the study of the beginning of our planet, to the beginning of human history, to the challenges of our own world, to the opportunities of the imaginable future, to the end of time itself, UKRI convenes, catalyses, conducts and incentivises some of the world's greatest ideas and thinkers.

UKRI is championing an agile and responsive research and innovation funding environment that embraces curiosity, creativity and risk-taking. Answers to the most important and intractable research and innovation questions will rarely lie within a single country.

There is more that we can do to reduce barriers to international collaboration:

- UKRI welcomes trusted project partners from anywhere in the world for most of our research funding schemes, which means that much

UKRI-funded research is international from the outset. An increasing number of our schemes allow international co-investigators to be funded through UKRI grants.

- In some cases, we may implement lead agency arrangements, in which an application involving international collaborators need only be submitted to one lead funder.
- We support participation in multilateral funding programmes, like Horizon Europe or initiatives like the Open Research Area (ORA) for the social sciences, the Belmont Forum for research into environmental change and Eureka for business-focused collaborations.
- We also support partnerships between research centres in the UK and around the world. For example, the recent Engineering and Physical Sciences Research Council (EPSRC) Centre-to-Centre call funded twelve partnerships in areas ranging from quantum computing to electric vehicles.^v

Building collaborations focused on great ideas

Joining up great ideas is also important. Few problems have a single answer and UKRI has a leading role in creating research synergies. We often advance international partnerships through focused joint calls, on a bilateral and multilateral basis. For example, the Medical Research Council (MRC) have supported cutting-edge research to tackle incurable degenerative conditions through the UK-Japan Regenerative Medicine initiative.

Another excellent example, the UK has broad expertise across the range of ideas needed to deliver sustainable fashion from analysing the environmental impact of fast fashion, developing new materials, identifying supply chain issues and developing novel and convincing marketing. This has led to a significant investment in a series of tech and infrastructure tie-ups with India to boost both economies and help countries grow their economies in a clean, green and sustainable way.

Case studies

Predicting the weather

A longstanding collaboration between the UK and Canada is transforming how we predict weather patterns. For decades, researchers have relied on computational methods that divide the Earth into small regions to predict the weather. But a new method, known as a 'computational mesh' now enables researchers to target an area and in turn make more precise predictions.

The mesh has been worked on since the 1980's and can be used for a range of needs, from predicting rainfall in Texas to tracking a tsunami across the Indian Ocean. Decades later, the collaboration remains strong, with workshops, a UK-Canada student exchange programme and joint conferences continuing to share knowledge and build capacity across both countries.



Enabling collaborative research in the social sciences

The Open Research Area (ORA) originated as an agreement between UKRI's Economic and Social Research Council (ESRC), ANR (France), DFG (Germany), and NWO (the Netherlands) to strengthen international co-operation in the social sciences through a common call for proposals to fund the highest quality joint research projects. To date the partners have successfully completed six rounds of ORA, funding over 60 international collaborative proposals.

Credit: Daniel Harrison, University College London

The ORA has established itself as a model of international collaboration where funding is distributed among the national agencies according to the place of work of the researchers and according to the funding rules of each agency.

The ORA enables improved coordination and collaboration between teams of researchers from different countries, supported by funding organisations in those countries; as well as enabling research collaboration with major and emerging research nations beyond Europe.



Innovation

Enabling innovation by connecting UK and international businesses, researchers, institutions and investors, in the UK and globally.

- We will do more to enable UK businesses, researchers and institutions to innovate globally, whilst ensuring value to the UK.
- We will increase the involvement of international businesses and investors in the UK's research and innovation system, contributing to the 2.4% target.

Innovation is embedded across all that we do at UKRI. Innovate UK has a specific responsibility as the UK's innovation agency to promote business-led innovation. Research councils support innovation through knowledge exchange and commercialisation programmes and by working with businesses to co-develop and integrated research into products, processes and services. Research England enables universities in England to build knowledge exchange and commercialisation capability and incentivises links between universities and businesses.

Enabling UK businesses, researchers and institutions to innovate globally

Successful innovation often relies upon access to ideas, resources, value chains and markets outside the UK. That may involve a UK business carrying out an R&D project with another business to jointly strengthen their offer, including with potential customers and access future supply chains or a UK-based research group collaborating with an international firm that could help to anchor future inward investment. We will continue to develop our support for these collaborations, whilst also helping to ensure that potential value is not lost to the UK.

This will include:

- Helping individual businesses through Innovate UK EDGE (and its links through the Enterprise Europe Network) and the Global Business Innovation Programme and Global Incubator Programme, which support innovative UK companies to go global. Our networks and unique expertise can facilitate collaboration with international researchers and businesses, access to markets and help obtain vital inward investment.
- Helping businesses to fully exploit opportunities offered by Eureka, the world's biggest public network for international cooperation in R&D and innovation. Participants in the global Eureka innovation programme showed additional annual employment growth of 3.5% compared to non-participants. Almost two-thirds entered new markets and more than half improved their market share.
- Enabling institutions and researchers to collaborate and innovate internationally, using Impact Acceleration Accounts, Higher Education

Innovation Fund and Connecting Capability Fund investment.

- Continuing to provide support on intellectual property for companies working in global collaborations through working with the Intellectual Property Office's IP Attaché Network and we will increase representation of UK perspectives in the development of international standards and measurements through BSI and through the National Measurement System and its quality infrastructure.

Increase involvement of international businesses and investors in the UK research and innovation system

Successfully raising UK R&D intensity to 2.4% of GDP by 2027 and 3% in the longer term will require a significant increase in R&D investment from overseas. In a survey of 120 major European R&D investing companies in 2019, 'Quality of researchers' was rated as the most important factor in terms of determining where to locate R&D, with almost 90% of firms rating it as 'highly attractive'. The second and third most important factors were: 'High availability of researchers' and



'Access to specialised R&D knowledge'.^{vi} UKRI helps to create these conditions in the UK.

We know that our system has an international reputation. Overseas investment accounted for 14% of gross expenditure on research and development in the UK in 2018, higher than any other country in the G7, as well as South Korea and China.^{vii} The Catapult Network, for example, has built partnerships across the globe, working across 30 countries and played an important role in attracting inward investment by companies such as Thermo Fischer and Boeing, while the Innovate UK KTN acts as an important gateway connecting international partners to innovative UK companies and the knowledge base in specific thematic areas.

As we invest to create the best possible research and innovation system in the UK, we will do more to promote opportunities in the UK to international partners and drive co-funded international investment for strategic advantage.

Robotics as a service in the ocean industries

Devon-based HydroSurv has developed a range of revolutionary Uncrewed Surface Vehicles to measure the effects of climate change in coastal areas and gather critical data for the ocean industries. The company has participated in an Innovate UK Global Business Innovation Programme with Canada focused on marine robotics to explore collaboration and partnership opportunities and has gone on to establish a presence in the Centre for Marine Entrepreneurship in Halifax. Delivered by Innovate UK EDGE, the Global Business Innovation Programme is helping over 350 UK innovative SMEs a year across a range of countries to build the partnerships and collaborations vital for their international growth and scaling success.

Case studies

Solar lamp promotes sustainable design in Africa's off-grid markets

To help address the unnecessary waste from renewable technologies, Solar What?! – a small portable light which can be built from recycled plastics and ethically-sourced electronic components – was developed by researchers in collaboration with the international charity SolarAid. Solar What?! not only reduces waste by being easy to take apart but is also easily repairable and powered by mobile phone batteries that are widely available across Africa.

Solar What?! has challenged unsustainable design practices in the solar industry, receiving an International Forum Product Design Award for Best Professional Design in 2020.

To maximise societal and environmental impact, Solar What?! designs are available for use under a Creative Commons license which can be freely downloaded on the project's website.

Impacts

Embedding international considerations in our work on strategic themes and transformative technologies.

- We will enable international collaboration to address the global challenges set out in UKRI's five strategic themes and contribute to the Sustainable Development Goals through inclusive international partnerships.
- We will provide evidence and intelligence and enable international partnerships to advance the seven technology families.

Building international partnerships to address global challenges

The UK has a proud history of contributing research and innovation expertise to tackle global challenges, from climate change to the Covid-19 pandemic.

In our strategy we identify five strategic themes where, working collectively across UKRI, we can bring the full power of the UK's research and innovation system to bear on major challenges. Over the next year we will be working in partnership with researchers, businesses, policymakers and civil society to co-create plans for activity in each of these areas. We will specifically seek to involve international partners as we do so, as we recognise that each of these challenges spans national borders.

Our strategic themes will directly contribute to the priorities of the Integrated Review. For example, our theme *Building a Secure and Resilient World* will address the many dimensions of resilience identified in the Review, from cyber security to community cohesion and we will work with partners in the UK and beyond to achieve this.

Our strategic themes are also a key means through which UKRI will contribute to the Sustainable Development Goals (SDGs). We are proud of the contribution that UKRI-supported researchers and innovators have made to the SDGs, through many of our programmes, including through UKRI councils' programmes investing in research for development and the Global Challenges Research Fund (GCRF) and the Newton Fund.

We will continue to invest from our core budgets in research which directly contributes to the prosperity and development of partner countries. We will continue to fund to conclusion existing GCRF projects. We intend to strategically fund research and innovation projects that address the SDGs under a new funding programme which we are currently developing with Government.

Enabling international collaborations to advance the seven technology families

Sustained UKRI investment over decades has developed a globally competitive position in the seven technology families identified in the Innovation Strategy. Over the coming years we will invest to improve relative UK strategic advantage in key technology families such as AI, quantum and engineering biology. We are working closely with the Department for Business, Energy and Industrial Strategy (BEIS) and other government departments to coordinate investment and are supporting the work of the NSTC to provide overall strategic steers.

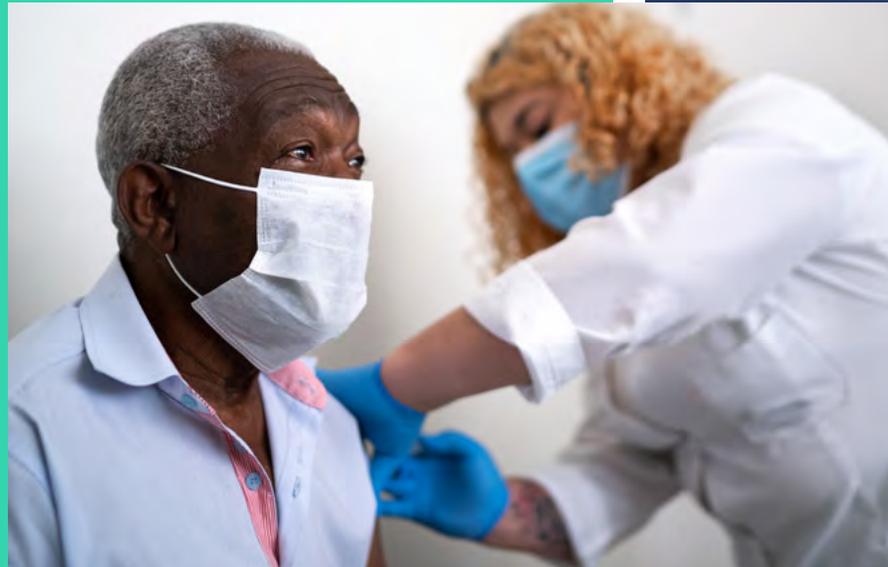
There is both a collaborative and competitive international dimension to our work on technologies. We will contribute UKRI evidence and intelligence to inform Own-Collaborate-Access decisions around key technology areas and where the data indicates that we should be collaborating, we will help develop those partnerships and influence and coordinate research and innovation plans.

UKRI's five strategic themes

- **Building a green future** – determining how to protect and improve the health of our natural environment for the long term whilst securing future economic prosperity across the whole of the UK, including the tools, evidence and policy options needed to underpin the transition to Net Zero.
- **Health, Ageing and Wellbeing** – addressing challenges around ageing, living with multiple conditions, poor mental health and health inequalities, supporting R&I that advances people's health and promotes well-being to maintain prosperous, productive and resilient communities throughout the UK and globally.
- **Tackling Infections** – research and innovation to predict, prevent and rapidly tackle human, animal and plant disease outbreaks and the slow-motion pandemic of AMR.
- **Building a Secure and Resilient World** – improving decision-making and awareness of risks and threats, preparedness and response, across virtual and physical spaces, to strengthen social and economic resilience and allow change to be understood as a force for good.

- **Widening Opportunities, Improving Outcomes** – supporting R&I focused on the causes and effects of social, economic, cultural and place-based disparities, around three key themes: Prevention, Inclusion and Prosperity.

Alongside these five strategic themes, we will build on existing and establish new, programmes to deliver UK strategic advantage in the seven technology families such as AI, quantum and engineering biology. We will develop international partnerships that will enable access to, and develop, scientific and innovation expertise, while protecting UK strategic advantage in priority technologies.



Case studies

Tracking COVID-19 in Brazil

A team of UK and Brazilian scientists working at the Centre for Arbovirus Discovery, Diagnosis, Genomics and Epidemiology (CADDE) in Brazil generated the first COVID-19 genomes from South America, sequencing the genome within 48 hours of the first confirmed case in March 2020.

Using international travel data, the team were able to track the virus's introduction to Brazil and spread into five regions, confirming local transmission in six states by the end of March 2020. The data was shared with other researchers through a global data-sharing platform.

Genomic surveillance capability in Brazil was mobilised in response to the Zika epidemic in 2015, with an MRC-funded project ZiBRA (Zika in Brazil Real Time Analysis) using mobile labs that would later be essential in providing important and timely information on the spread of Covid-19.

Case studies



UK-India collaboration to boost 5G networks and next generation telecoms

The UK-India Future Telecom Networks Initiative is building capability, capacity and collaborations between in telecoms diversification technologies and research for 5G and beyond, building on previous collaboration in this area.

The project will develop a roadmap for future research and innovation collaboration to support diversification, provide a platform for further bilateral investment and create new designs for future global technical standards from which new commercial opportunities can be formed.

The economic benefits are likely to be significant, given the scale of the global market and will unite UK and Indian businesses in this emerging technology field, prioritising small and medium-sized enterprises (SMEs) and leveraging large infrastructure owners in the UK and India.

World-class organisation

Catalysing change through equitable partnerships and championing diversity; and increasing the efficiency and effectiveness of our activities.

- We will catalyse change through equitable partnerships, guided by our principles and championing diversity.
- We will increase our efficiency and effectiveness, particularly by significantly improving the way we use data and evidence to inform our international activities and priorities.

Catalysing change through partnerships, championing diversity and increasing the efficiency and effectiveness of our activities

We will ensure that we operate in ways that reflect the change we wish to lead in the research and innovation system. This includes encouraging and respecting diverse perspectives and developing equitable partnerships.

We have close working relationships with key internationally facing departments in the UK, including the Foreign, Commonwealth and Development Office (FCDO) and the Department for International Trade (DIT).

We collaborate with and value the Science and Innovation Network (SIN) and the network of regional Trade Commissioners. Our offices in Washington DC, Brussels, New Delhi and Beijing work very closely with UK government overseas and in many cases are co-located. We will

enshrine this close collaboration in a new FCDO-UKRI concordat and will continue to explore ways to deepen our collaboration with other internationally facing departments to increase our collective impact and effectiveness.

We collaborate with those working on global development, including the UK Collaborative on Development Research (UKCDR) and the UN Development Programme (UNDP). A core principle of our GCRF funding was to develop equitable partnerships, integrate indigenous voices and create better science and we will continue to do so in future programmes.

We will work with international peers through bilateral and multilateral relationships, where we will seek to be a reliable and respectful partner. We will redouble our leadership within international fora to influence the global research and innovation landscape, including the Global

Research Council, Science Europe, Taftie – the European network of innovation agencies and the Organisation for Economic Cooperation and Development (OECD), where we are a member of the Science Council. We will operate within those partnerships with curiosity and be open to international best practice which we can introduce to the UK research and innovation system.



Increasing the efficiency and effectiveness of our international work through data and evidence

We have instituted detailed monitoring and evaluation plans for the existing international funds, on which we will continue to report periodically. We will be informed by these existing approaches in developing a robust monitoring and evaluation approach to any new funds, whilst also being mindful of ensuring reporting requirements on UKRI award holders are proportionate, per Professor Adam Tickell's *Review of Research Bureaucracy*.

The UKRI Strategy introduces a performance management framework for UKRI, which takes a balanced scorecard approach to assess our performance through four different perspectives.

We will align our assessment of the performance of our international activities with this framework and aim to measure:

- The breadth and depth of our funder-to-funder international partnerships.
- The number and diversity of connections we are supporting between UK-based researchers and innovators and their international counterparts.
- The number and diversity of UK firms participating in international innovation programmes.
- UK participation in priority international research infrastructures.

- The extent to which our international activities are addressing the global challenges set out in UKRI's strategic themes and contributing to the SDGs.

We will also continue to evaluate our work, including commissioning external evaluations where appropriate. This will allow us to continuously improve our understanding of 'what works' for international R&I collaboration, determine whether and how we are delivering against our six strategic objectives and showcase the impact of our international activities.

Image credit: Medical Research Council Gambia (MRCG) at London School of Hygiene & Tropical Medicine (LSHTM)

UKRI and the US collaborating on research commercialisation^{ix}

UKRI has teamed up with the US Department of Commerce's National Institute of Standards and Technology (NIST) to advance areas of mutual interest in research, research translation and commercialisation. NIST and UKRI will initially work together to facilitate staff exchanges between technology transfer offices (TTOs), map and analyse regional innovation and economic impact and share best practice on metrics.

The signing of the MoU was announced at a meeting of TenU, an international consortium funded by Research England and NIST between the heads of the world's leading TTOs at ten top universities in the USA, UK and Belgium.

Building equitable and mutually respectful partnerships

When collaborating with partners outside of the UK, it is essential that our partnerships are equitable and conducted in a responsible manner. This ensures the research is impactful and effectively addresses global challenges and that research partnerships – especially when done in resource-poor environments – are done in a way that is mutually beneficial to all partners and recognises and mitigates against power imbalances.

That's why UKRI adopts an Equitable Partnerships approach towards the research collaborations we invest in, recognising our researchers and their research organisations working with vulnerable



Case studies

populations and those at higher risk of harm and exploitation or coercion also have a responsibility to identify possible risks and develop a framework of responsibilities and possible actions in advance.

Delivering the strategy

Supporting international activity through core budgets

Increases to the core research and core innovation budgets announced at Spending Review 2021 should enable us to fund more research and innovation, which we expect will increase the number or scale of international collaborations. We will continue to explore ways in which our core funding can do more to support international collaborations by expanding existing mechanisms like international co-investigator policies, joint calls and lead agency arrangements and longer-term strategic international partnerships.

Developing new international funding programmes

The research and innovation programmes that we have funded through GCRF, the Newton Fund and FIC have complemented those funded by core budgets. We will meet our commitments to those projects that are currently underway in each of these funds and will fully support them to realise impact.

In parallel and working with BEIS and other partners, we will phase in a new form of strategic international funding with a design informed by what we have learned from the current funds:

- Retaining the importance of being able to act across the whole spectrum of UKRI and its communities, from fundamental research to innovation and across all disciplines.
- The importance of having flexibility to work bilaterally and multilaterally depending on the research and innovation opportunity.
- Recognising that the inherently exploratory nature of research and innovation means that a single research question may be tackled in ways that partly meet the definition of ODA and partly do not. Rather than have wholly separate ODA and non-ODA funds, we will explore blended approaches in which programmes have both ODA and non-ODA elements, whilst still fully respecting the primary purpose test of ODA.
- Exploring where we can simplify governance to reduce complexity and increase the pace of delivery.

With BEIS we will provide more detail on our new approach to strategic international funding in Autumn 2022.

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