News story: UKHO features in new UK Chamber of Shipping film

Focusing on their role as the UK's hydrographic and marine geospatial agency, the film gives an insight into the vital role the UKHO played in the arrival of HMS Queen Elizabeth into Portsmouth. The UKHO analysed and verified bathymetric data about the depth and nature of the seabed to ensure safe passage.

It also explores their international responsibilities as the Primary Charting Authority for 71 nations. As well as charting these waters to support safe navigation, the UKHO helps small island states to sustainably manage their marine resources by helping them to build their knowledge of their marine environment. This work brings economic benefits and can help to build resilience to the impact of climate change and natural disasters.

More recently, the UKHO supported relief efforts in the Caribbean in the devastating wake of Hurricane Irma. By providing emergency navigational charts to the British Virgin Islands within 24 hours, this enabled ships to safely bring in emergency supplies.

The film demonstrates the wide range of location-based information the organisation handles from its office in Taunton, Somerset. Chief Executive John Humphrey explains:

> Good marine information supports trade, tourism, civil defence, managing the marine environment. All of those different things require good information to be able to do them and we are the people who can provide that information.

By investing in new data capabilities and facilities, the UKHO is developing its world-class capabilities into the future.

You can view the UK Chamber of Shipping film below.

'Sea Change' – The United Kingdom Hydrographic Office

News story: New UK projects look at the impact of spaceflight on the human

body

By supporting this research, the Agency will enhance the UK's capabilities in space exploration and support areas that can lead to the development of new technologies.

The funding, from the Agency's Microgravity Science Programme, will help scientists with upcoming experiments in European Space Agency microgravity facilities, including the International Space Station and parabolic flights simulate the effects of gravity.

Libby Jackson, Human Spaceflight and Microgravity Programme Manager, said:

> We are delighted to be supporting the growing microgravity science community in this research. These exciting experiments will further our understanding of how the human body copes with the challenging environment of living and working in space, which in turn will help humans to carry out more research in space.

The three projects, which have been awarded a total of £534,421, are:

Exploration Studentship: Molecular basis of muscle alteration in response to spaceflight – Professor Nate Szewczyk, University of Nottingham – £59,196

Professor Nate Szewczyk, from the University of Nottingham, is the Principle Investigator of the Molecular Muscle experiment, due to be flown to the International Space Station (ISS) on SpaceX-16 flight at the end of 2018. This grant will support a post-graduate student to work with the experiment team, receiving training in the conduct of molecular mechanistic experiments to further understand why muscle declines in response to spaceflight and, potentially, how it can be countered as well as gaining experience in the conduct of an actual life sciences spaceflight mission to the International Space Station.

The long-term goal of crewed missions to Mars poses technical challenges with respect to engineering appropriate spacecraft and associated subsystems as well as with preserving human health on long duration space missions. One of the potentially mission limiting health risks that has been identified for Mars missions is the decline of muscle strength and aerobic capacity. Over a number of years and spaceflight missions a consistent set of molecules has been identified that change in response to spaceflight and do so not only in astronaut muscle but also in other animals such as mice and worms. By conducting experiments in worms on Earth, researchers have found that they have been able to change the response of the molecules that change in response to spaceflight. Thus, they will now attempt to use these gene and drug therapies on board the International Space Station to see if they can alter the response of worm muscle to spaceflight.

Muscle Tone in Space – Professor Maria Stokes, University of Southampton – £191,892

Professor Maria Stokes, from the University of Southampton, is part of the international team behind the Myotones experiment, led by Professor Dieter Blottner, of the Charité Universitätsmedizin Berlin, which will take place on the International Space Station (ISS) in the coming years.

The tone of a resting muscle is affected by tissue called fascia, as well as the tissue within the muscle itself and these shape the human resting muscle tone (HRMT) system. Changes in the HRMT system and the effects on function due to microgravity have yet to be studied directly. This project aims to monitor muscle health of crew members by non-invasive, objective measurement of biomechanical properties of muscles pre-, in- and post-flight.

The two technologies used are Myoton and ultrasound imaging of musculoskeletal tissues. Ultrasound images will be used to measure muscle thickness to see how this changes over time, from pre-flight to inflight and pos-flight periods. The MyotonPRO device offers a hand-held, user-friendly and non-invasive measurement method to test key biomechanical parameters of the superficial skeletal muscles, tendons and other soft biological tissues.

Development and evaluation of countermeasures to prevent spinal antigravity muscle deconditioning in simulated partial- and micro-gravity – Professor Nick Caplan, University of Northumbria, £283,333

Professor Nick Caplan and his team are working to mitigate injury risk and maintain operational effectiveness in astronauts by understanding how spinal anti-gravity muscles are affected by reduced gravity, and how their condition can be preserved by artificial gravity exposure or recovered through exercise. This will be done through participation in the International Space Life Sciences Working Group parabolic flight campaign (2018) and the NASA/ESA Artificial Gravity Bedrest Study (2018-19) using techniques that they have developed to assess the role of these muscles during postural control in low back pain. Working in partial gravity conditions (e.g. Moon and Mars) will lead to musculoskeletal deconditioning in astronauts that will increase spinal injury risk and reduce operational effectiveness, risking mission failure. This study will demonstrate how partial gravity influences spinal antigravity muscle activity and spinal postural control. This knowledge will enable effective countermeasure development for long duration human habitation of Moon and Mars.

Speech: UK is focused on boosting

regional trade and connectivity

Excerpts of speech by the British Deputy High Commissioner to India Dr Alexander Evans at the Young Thinkers' Conference in Kolkata, Wednesday 8 November 2017.

The BBIN vision is to improve economic cooperation and connectivity among four South Asian countries.

But connectivity is not just about roads, railways inland waterways, or energy transmission lines. That only gets you so far. It also includes removing barriers and streamlining processes – thinking about tariffs and customs as connectivity and the broader regulatory burden on the private sector are key.

The World Bank estimates that intra-regional trade in South Asia could nearly quadruple to $100 billion if just the barriers were removed and processes streamlined; boosting physical connectivity would dramatically boost this further.

BBIN is also about people. This region already has a lot to connect it – shared systems, shared values, people to people and cultural links. There is common understanding. As we become better connected, we understand each other better and there is strength in our commonality.

It's not a zero-sum game and it's not a competition. Done properly, economic cooperation and connectivity can lead to sustainable and shared prosperity for everyone.

This doesn't just mean improved economies – but better security, better understanding between our nations and more transparent systems and potential for further co-operation – whether in disaster management, cyber security or the exchange of ideas and technology.

How is the UK helping? Part of our work is focused on boosting regional trade and connectivity across the region to help turn proximity into a competitive advantage to drive economic growth and reduce poverty, especially in areas which are poorly connected and integrated into global markets. That includes work on:

- physical connectivity and building infrastructure in the energy and transport sectors (and potentially IT in the next few years) to integrate lagging areas into regional and global value chains

- reducing red tape and regulatory burdens to ease the movement of goods across borders and allow energy to be traded across national boundaries

- driving investment in key regional value chains through both regulatory reform and investment identification and investor matchmaking.

There will be challenges: political objectives and countries priorities won't always align. There are security and cross-border concerns. Part of these conversations as countries align their economic goals must be to have these difficult conversations to tackle boundary and water disputes, the undocumented movement of people and goods and cross-border incursions.

I hope the discussions today will lead us towards answering some of these questions.

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Speech: Research and innovation: How intellectual property supports global progress

Thank you for the introduction. Mayor Ying, Minister Miao, Vice Chairman Lin, Chairman Lu, ladies and gentlemen. Good afternoon and thank you for inviting me to join you today at this Innovation and Emerging Industries Development Forum.

I am especially pleased to be attending this event alongside the China International Industry Fair. I had the honour yesterday of accompanying Minister Miao on a tour of the Fair over in Hongqiao. The range of exhibitors from China and overseas was impressive.

And of course, I was proud to see the UK's Country-of-Honour Pavilion showcasing the best of British technology.

The branding of the UK Pavilion includes images from the global campaign GREAT for Imagination. This campaign marks 400 years since UK patent number 1, which was granted in 1617, and designated the patent number "GB1" when the UK Patent Office was founded in 1852.

The GREAT for Imagination campaign celebrates the long history of scientific inventions leading to industrial and consumer products that have had a profound impact on people's lives. This is what I would like to speak about today.

UK research & innovation

We like innovation in the UK.

We are home to less than 1% of the world's population, but the UK punches above its weight in science and technology.

The UK is home to 3 of the world's top 10 universities – Oxford, Cambridge and Imperial College London – and more than 30 of the top 200. These universities are equipped with first class facilities and talent from around the world, producing top quality research.

A report published last month by the UK Department for Business, Energy and Industrial Strategy, and Elsevier showed that the UK accounts for:

- 9.9% of downloaded academic articles;
- 10.7% of citations; and
- 15.2% of the world's most highly-cited articles.

The report notes that the UK has a broad and diverse research base, and relative to its comparator countries the UK continues to rank number one in Field-Weighted Citation Impact, a measure of the influence of scientific research.

As well as excellence in curiosity-driven science, the UK also has a wide range of policies and funding initiatives to support commercialisation of the research base.

For example, the government provides funding for projects that link universities and research institutes with businesses and entrepreneurs. And many local governments across the UK are undergoing Science & Innovation Audits, which seek to deepen relationships between universities and their wider communities.

Given the important role of IP in research and innovation, the Intellectual Property Office is also playing its part to support commercialisation of the research base:

- Last year we updated the Lambert Toolkit, a set of practical resources to support IP management in university-industry collaborations. The Lambert Toolkit includes a set of model contracts and consortia agreements, and a model Heads-of-Terms.

- We offer an "IP Asset Management Guide for Universities" to help senior university managers set strategies to make the most of the IP created by their staff and students; and we recently launched "IP for Research", which helps PhD students and early career researchers understand how to commercialise technology.

- The IPO is currently running a public consultation on collaborative

innovation and licensing of IP rights. This consultation looks at areas such as IP trading platforms, IP-backed finance and IP valuation, all of which are being studied here in China as well.

All these initiatives by the IPO and others are in line with the commitment from our minister Jo Johnson to put science and innovation at the heart of our industrial strategy.

International research and innovation collaboration

As an open country at the centre of world and European research for centuries, the UK has a long history of collaboration with international partners. We strongly believe that global cooperation in research and innovation is a really good thing.

51% of all UK research publications in 2017 were co-authored, which helps explain the global impact of UK science. The UK is a global hub for research and innovation.

All other things being equal, research produced by authors of different nationalities produces higher citation rates. Cross-border licensing of technology creates new revenue flows, and spreads cutting-edge technology to markets and research communities around the world.

This shows how important it is to resist nationalistic science and innovation policies. Technology is not a zero-sum game, where one country's strength is another country's weakness.

Flourishing UK-China science and innovation collaboration is a good example of this. The UK places great value on the strength of our partnership with China, and research and innovation collaboration between our two countries is a cornerstone of our relationship:

- This year Research Councils UK celebrated 10 years in China, over which period they have invested over £230million in joint research in more than 150 projects;

- The UK-China Research and Innovation Partnership Fund, also known as the Newton Fund, has funded over 450 joint projects in fields such as antimicrobial resistance, atmospheric pollution and human health, and remote-sensing for agriculture; and

- Last year Innovate UK and the Chinese Ministry of Science and Technology jointly invested £21m in 15 research and development projects, including Innovate UK's largest ever international R&D competition. This year Innovate UK is has launched joint calls with Shanghai, Jiangsu and Guangdong provinces on smart cities, infrastructure systems and urban innovation.

And of course, the UK-China success story in science and innovation is not only about government-backed projects. Here in East China:

- Edinburgh University recently completed an Innovation Week in partnership with COMAC and Shanghai Jiaotong University; and

- Nobel Prize winner Sir Kostya Novodelov of the University of Manchester spends two months per year supervising research collaborations in Nanjing.

IP in research and innovation

Technology is intellectual property. The process of creating and commercialising IP enriches our society and drives economic growth.

It is the responsibility of IP policymakers such as myself to maintain accessible and non-discriminatory IP system. An effective IP system should encourage investment in research and innovation, and ensure that the results of that investment are used and protected.

And given the enhanced benefit of cross-border science and innovation collaboration, it is important that an IP system facilitates – rather than frustrates – international projects.

Researchers and companies involved in cross-border collaboration should be allowed to freely negotiate IP arrangements that suit their projects, including ownership of IP generated by joint research.

And the commercialisation of jointly developed technology should be transparent, enabling all contributing parties to benefit, wherever that use occurs.

This is genuine win-win cooperation.

UK-China intellectual property cooperation

The UK and China have a broad and deep cooperation on intellectual property. This year:

- Patent examiners from the UK IPO visited China for exchanges with Chinese counterparts, including hosting a seminar on accelerated patent examination;

- Mr Justice Carr, one of our leading IP judges, visited Beijing to meet with members of China’s judiciary;

- We hosted the 2017 UK-China IP Symposium in London; and

- Vice-Minister Zhou Huilin of the National Copyright Administration of China visited me in London to discuss copyright enforcement and legislative developments in our two countries.

This week I will also visit Hangzhou and Beijing, including to meet with my counterparts in China's IP agencies. Our discussions will cover how to provide the best possible service to users of the IP systems in both our countries.

This builds on initiatives such as the UK-China pilot Patent Prosecution Highway – or PPH – which was extended last summer. PPHs enable faster patent protection for users filing corresponding applications in both countries. I know that schemes such this are especially welcomed by Chinese institutions and businesses that are building IP international portfolios.

And of course I am also using my visit to China to support UK-China research and innovation collaboration.

Today I am happy to announce the publication of a new template Non-Disclosure Agreement for use in negotiations between British and Chinese partners as they develop a joint research bid or a technology licensing deal. The NDA will help provide legal certainty so partners can engage with confidence.

The NDA is drafted in both English and Chinese, and is mutual, meaning it provides equal protection to all parties, whether from the UK or China.

This is part of a set of practical resources and advice we provide to British and Chinese researchers to help them effectively manage IP in cross-border projects.

Closing

Distinguished guests, in both the UK and China, scientific research and innovation are important drivers of economic growth. New technologies enrich our societies and improve our quality of living.

The evidence shows that these benefits are maximised by open and mutually-beneficial international collaboration.

Barriers to genuine win-win cooperation should be overcome and removed, including:

- Nationalistic, zero-sum policy narratives; and

- Restrictions on the flexibility of research institutions to fully benefit from the global commercialisation of the IP they help create.

The UK IPO shall continue to promote a domestic and international IP system that facilitates investment in research and innovation, and responds to the

needs of it users around the world.

Thank you for listening. I wish you a successful forum, and I look forward to further presentations throughout the afternoon.

Thank you.

Speech: Research and innovation: How intellectual property supports global progress

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