

# UK Science and Innovation Network Report

INNOVATION  
IS  
**GREAT**  
BRITAIN



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Front cover image: British scientists produced critical components for the Large Hadron Collider at CERN's laboratory in Switzerland. For cutting edge research expertise, choose the UK.

# Introduction

In December 2014 the UK Government published *“Our Plan for Growth: Science and Innovation”*<sup>1</sup>, a strategy aiming for the UK to be the best place on the world for science and business.

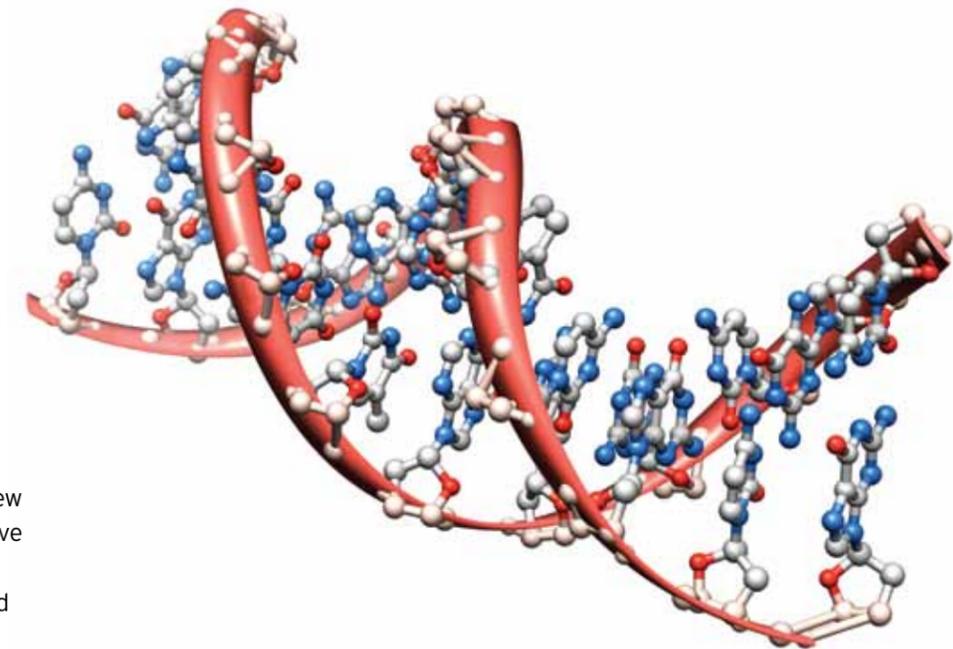
It focuses on the great strengths of British science and enterprise, and sets out the Government's priorities for investment and support to 2020/2021. The six main elements of the strategy are: deciding priorities, nurturing talent, investing in scientific infrastructure, supporting research, catalysing innovation and participating in global science and innovation.

Supporting this global goal is central to the role of the Science and Innovation Network (SIN). International collaboration plays a crucial role in the on-going development of science and technology in the UK, by providing UK researchers the opportunities to work with the best in the world, to use the best facilities in the world and to ensure science and innovation supports UK growth through international outreach. These collaborations encourage new ideas, inform policy and help to drive further innovation, which in turn supports and promotes growth and prosperity in the UK.

This report gives a brief introduction to the broad spectrum of work that the SIN supports. Like our previous report<sup>2</sup>, we focus on how SIN prioritises activity directly linked to the UK's innovation and growth priorities under the Industrial Strategy and Eight Great Technologies, as well as examples of SIN working on wider global

challenges. This report also includes a feature on the Newton Fund, launched in 15 countries during 2014. In all our work, SIN's model is one of partnership. The report includes a section illustrating some of the work done with SIN's main UK partner organisations.

This document provides only a snapshot of the work of the Science and Innovation Network. To discover more from our teams in 28 countries and territories, based in our embassies, high commissions and consulates please visit the website<sup>3</sup>.



<sup>1</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/387780/PU1719\\_HMT\\_Science\\_.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/387780/PU1719_HMT_Science_.pdf)

<sup>2</sup> <https://www.gov.uk/government/publications/science-and-innovation-network-annual-report-2013>

<sup>3</sup> [www.gov.uk/government/world/organisations/uk-science-and-innovation-network](http://www.gov.uk/government/world/organisations/uk-science-and-innovation-network)

# What is the Science and Innovation Network?

The Science and Innovation Network (SIN) is jointly funded by the Department for Business, Innovation and Skills and the Foreign & Commonwealth Office. SIN works across the entire UK science and innovation landscape supporting UK stakeholders to make international connections, set up strategic collaborations and leverage research and innovation funding.

Comprised of 90 officers in 28 countries, SIN supports the government to government engagement that opens the door for researchers and innovators to form exciting and productive partnerships that provide a platform for engagement on issues of international concern and benefit. SIN works with UK government departments and closely with the UK Research Councils, UKTI, Innovate UK, researchers from universities and a range of other bodies including Royal Societies and other academies.

### What does SIN offer?

**A first point of contact and gateway to science and innovation (S&I) opportunities:** for UK and host country research institutions, universities and research and development (R&D) intensive business.

**Policy insight:** two-way flow of ideas to improve science and innovation policy in the UK and partner countries.

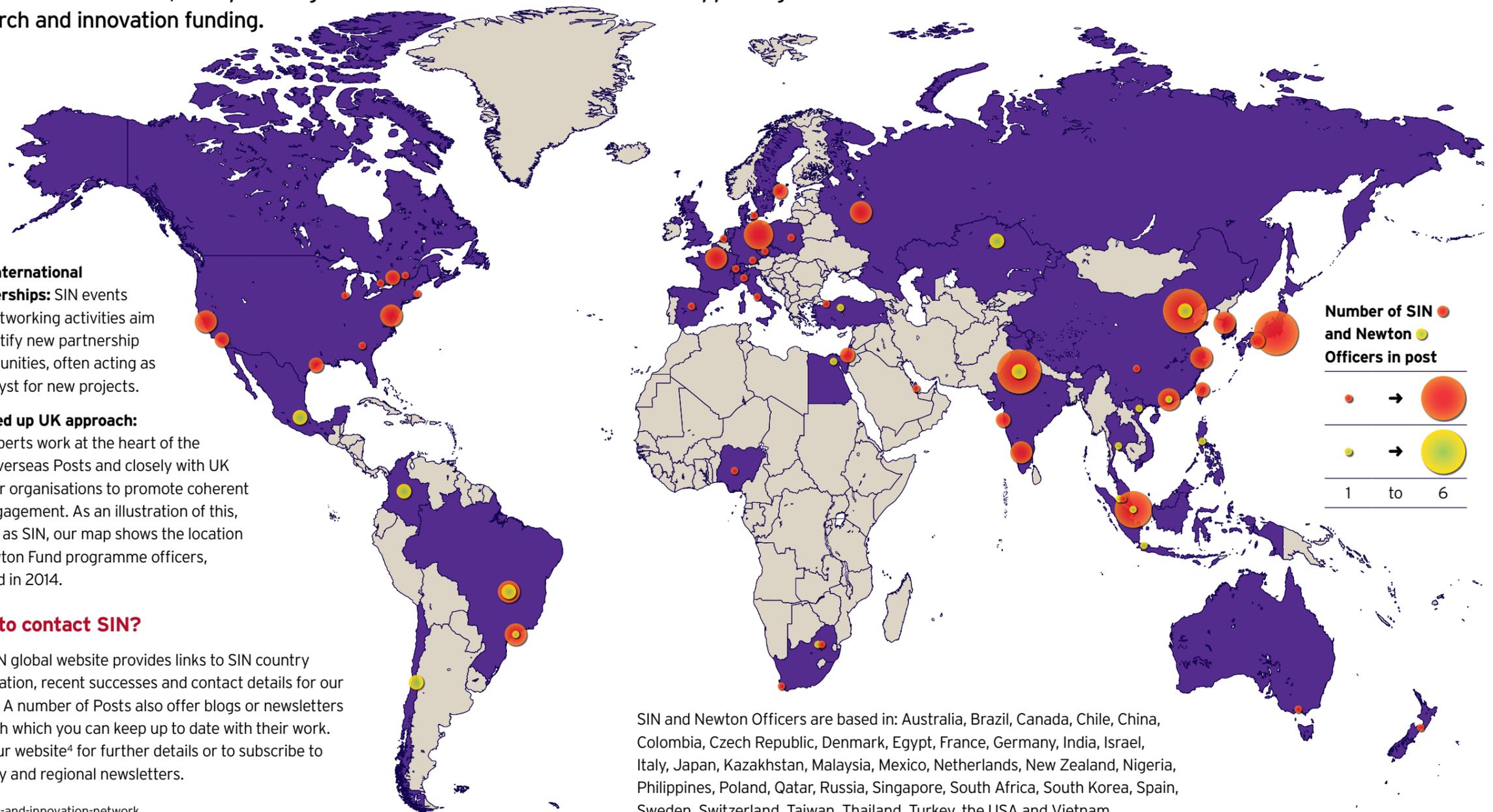
**New international partnerships:** SIN events and networking activities aim to identify new partnership opportunities, often acting as a catalyst for new projects.

**A joined up UK approach:** SIN experts work at the heart of the UK's overseas Posts and closely with UK partner organisations to promote coherent UK engagement. As an illustration of this, as well as SIN, our map shows the location of Newton Fund programme officers, created in 2014.

### How to contact SIN?

The SIN global website provides links to SIN country information, recent successes and contact details for our teams. A number of Posts also offer blogs or newsletters through which you can keep up to date with their work. Visit our website<sup>4</sup> for further details or to subscribe to country and regional newsletters.

SIN tailors its priorities to the local context. Its delivery model varies from small posts with one officer working across portfolios, often as part of a regional network, to large teams with individual sector specialists in places like China, India and the US and supporting Newton officers.



SIN and Newton Officers are based in: Australia, Brazil, Canada, Chile, China, Colombia, Czech Republic, Denmark, Egypt, France, Germany, India, Israel, Italy, Japan, Kazakhstan, Malaysia, Mexico, Netherlands, New Zealand, Nigeria, Philippines, Poland, Qatar, Russia, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, Turkey, the USA and Vietnam.

<sup>4</sup> www.gov.uk/government/world/organisations/uk-science-and-innovation-network

# Industrial Strategy Sectors

The *Industrial Strategy* published by the UK government in 2013, highlighted 11 sectors that hold the potential to deliver the greatest impact for growth in the UK. The Strategy aims to foster long term strategic partnerships to benefit UK growth and support innovative products and technologies.

The Science and Innovation Network aims to support the Strategy by enabling new research and technology collaborations for UK organisations in the different sectors, helping attract new inward research and investment, or working with partners on regulatory or other measures to support growth in these areas. Each SIN Post works with UK partners to identify the sectors for most impact in its country.

Current SIN activity covers almost all the Strategy sectors. This section presents a sample of SIN's work:



**Over £50bn**

UK life science sector  
annual turnover

## Life Sciences

**SPAIN:** Cancer Research UK (CRUK) and the Spanish National Oncology Research Centre signed a confidential disclosure agreement to exchange information about current drug discovery projects, approaches and technologies, allowing for the study and evaluation of common areas of interest. The agreement followed meetings brokered by SIN. As well as improved information exchange, it should increase scope for joint research.

**SOUTH KOREA:** SIN helped organise the first UK-South Korea Future Health Forum. The focus included accelerating joint industry-government actions to accelerate neuroscience research, drug discovery and big data to fast-track therapeutic solutions. An agreement signed by the Medical Research Council and Korea Health Industry Development Institute (KHIDI) opens the way to possible joint research calls. Around the event, Bristol and Gachon Universities agreed joint doctoral degree programmes in health sciences and South Korea confirmed continued funding for UK-Korea Alzheimer's Disease Consortium.

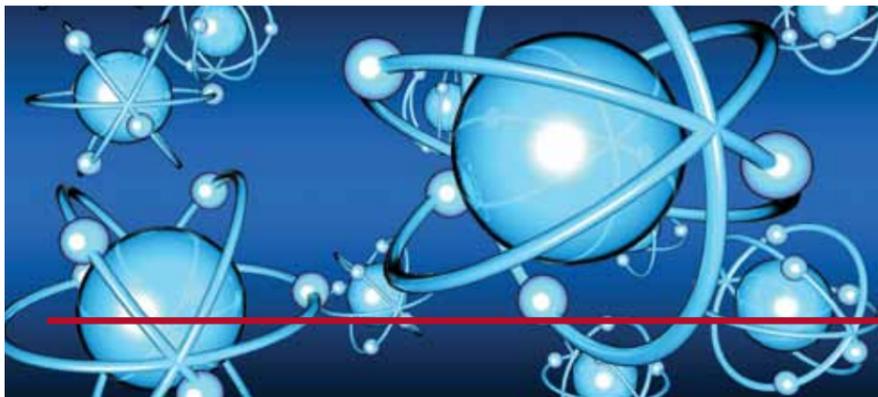
**ISRAEL:** UK and Israel excel in neuroscience research, and are home to pioneering work, new drugs, and new innovative ways to tackle the challenge of dementia and neuro-degeneration. SIN Israel organised the first UK-Israel Dementia Symposium, with outcomes including an Israeli pharmaceutical company committing \$1 million for early stage work on dementia in UK academic and medical centres.

**GERMANY:** 2014 saw the opening of the Centre for Computational Psychiatry and Ageing Research, a jointly funded project between the Max Planck Institute for Human Development and the UCL Wellcome Trust Centre for Neuroimaging. This first UK-based Max Planck research centre is the result of longstanding cooperation between the two institutes and support from the SIN team in Germany.



**\$1m**

commitment for UK early stage  
dementia research from Israeli  
pharmaceutical company



**£380m**

invested each year by UK Government funded agencies in agricultural research

## Nuclear

**SOUTH KOREA:** In August 2014, a £4m UK-South Korea joint-funded call in nuclear decommissioning and radioactive waste management was launched by the Engineering and Physical Sciences Research Council (EPSRC) and Korean Ministry of Science. The call is a part of the bilateral Nuclear Dialogue and should fund five projects over three years. Related exchange with potential to grow into full scale research includes the Korean Atomic Energy Research Institute working with the University of Manchester's Dalton Institute.

**JAPAN:** As part of collaboration following the Fukushima Daiichi nuclear accident in 2011, SIN helped set up a joint Working Group on Nuclear Safety Research. 2014 saw the Engineering and Physical Sciences Research Council and Japan Science and Technology Agency (JST) announce a joint call for research on severe accidents and environmental safety. Funding of £30m JPY (c £159,000) over three years was awarded to two joint UK-Japan research teams. Additional themes such as decommissioning are now under discussion.

## Agricultural Technologies

**CHINA:** UK's East Malling Research have set up the Sino UK Sichuan Agriculture R&D Centre with Sichuan Provincial Agriculture and Forestry Institute and China Technology Exchange. The centre takes the form of a registered company worth £1m, and aims to develop strawberry varieties for the Chinese market, as well as introducing more efficient irrigation methods and developing treatments for strawberry root virus. The relationship was initiated through a technology partnering workshop run by SIN.



**8,500**

new food and drink products are created each year in the UK

**UNITED STATES:** SIN, the UK Meteorological (Met) Office and US National Centre for Atmospheric Research (NCAR) developed a platform for industry/academia exchange on climate-based services for the large-scale agriculture sector. The platform provided access to agricultural sector specialists that normally would have been difficult to achieve and leveraged science to increase efficiency and reduce risk in a sector that is an enormous driver for the UK economy - estimated to be worth \$300 billion in the US alone.



## Information Economy

**UNITED STATES:** Following a series of SIN led activities the US Coalition for academic supercomputing signed a Memorandum of Understanding (MoU) with the UK High Performance Computing special interest group. The MOU will allow sharing of information and collaboration in the field of advanced scientific computation.



**NEW ZEALAND:** As a result of a SIN led project, University College London collaborated with New Zealand's Victoria University to apply compressive sensing techniques to data harvested from astronomical observations. The collaboration forms one part of increasing cooperation between the UK and New Zealand on Square Kilometre Array (SKA) telescope.

**SINGAPORE:** Facilitated by SIN, Imperial College London and the Singapore University of Technology and Design signed a five-year academic partnership agreement focused on improving the resilience of critical infrastructure and protecting industrial control systems from cyber threats.

**SINGAPORE:** SIN facilitated a joint laboratory agreement between A\*STAR's Institute of High Performance Computing and the Southampton Marine and Maritime Institute for the maritime, energy and offshore sectors.

**5 year**

academic partnership agreement with Imperial College London and the Singapore University of Technology and Design

### Brief examples from some of the other industrial strategy sectors:

**Offshore wind**  
**CHINA:** SIN helped the University of Birmingham in identifying the right partners and securing R&D funding of over £1m from Guangzhou Municipal Government for joint projects in renewable energy and advanced manufacturing. This will help to develop solutions for cable erosion in offshore wind.

**International Education:**  
**SIN EUROPE:** SIN in the Netherlands, France, and Switzerland have helped FutureLearn, the UK's first MOOC (massive online open course) build new partnerships across Europe. Deals agreed in the three countries could be worth up to £250k per course.

**Automotive**  
**UNITED STATES:** SIN US enabled policy dialogue in California which informed the allocation of the UK's £500m package of support, announced April 2014<sup>5</sup>, to incentivise the update of ultra low emission vehicles in the UK.



<sup>5</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/307019/ulev\\_2015\\_2020.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/307019/ulev_2015_2020.pdf)

# 8 Great Technologies

Supporting technologies where UK science strengths and business capabilities combine is a core part of the government's *Industrial Strategy*. Therefore the UK government identified 8 Great Technologies where the UK has world leading research, a range of applications, across industries and the potential for the UK to be at the forefront of commercialisation, leading the world. The SIN prioritised these technologies and continues to work to support the innovations spinning out from them. Here is a sample of SIN's work in some of the 8 Great Technologies.

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## Energy Storage

**SOUTH KOREA:** Supported by SIN, the Engineering and Physical Sciences Research Council and the Korea Institute for Energy Technology Evaluation and Planning announced the launch of a £5 million matched fund call in August 2014. This call will focus on both countries' strategic need for research in fuel cell technologies, and in particular large scale storage. It includes commercial innovation, direct participation from Korean industry partners and existing UK industry-academia links.

**CHINA:** SIN held a workshop on Smart Grids with China Southern Power Grid, China's second largest grid operator and a key player in the energy industry. The workshop generated numerous opportunities for collaboration in smart grids, including research proposals worth £400k and the possibility of UK research organisations accessing China Southern Power Grid's £200m a year R&D budget.

## Regenerative medicine

**JAPAN:** Following a SIN workshop on regenerative medicine in January 2014, SIN Japan and UKTI helped Japanese research giant Tokyo Electron develop links with the UK, leading to the establishment of a major new Stem Cell Technology Centre, to be situated at Stevenage.



Following on from that event, a SIN Japan-led conference in January 2015 focussed on translating cell therapies from the lab to the clinic. The event showcased UK strengths as a partner in innovation, academia and industry, and explored opportunities for collaboration in light of pioneering regulatory developments in Japan. The conference has so far directly led to over £2.5 million in trade and investment business.

## Satellites and Space

**UNITED STATES:** University College London Centre for Space Medicine (CSM) signed two MoUs in May with Baylor College of Medicine and the National Space Biomedical Research Institute and joined NASA's Health and Human Performance Centre (NHHPC). Through access to this unique consortium, that coordinates the technology and expertise needs with the capabilities of member institutions, UCL researchers can locate end users for their space medicine research. The NHHPC forum presents numerous commercial opportunities ranging from a specific industry need, to solving NASA operational challenges.

**CHINA:** SIN held the UK-China Space Cooperation Workshop in Shanghai in May 2014, bringing 40 UK delegates from industry, academia and government to meet with Chinese counterparts. The workshop generated 26 MOUs on space collaboration. Outcomes

included: collaboration between Nottingham University and the Ministry of Technology on geospatial technologies and between Queen Mary's University of London and the Beijing University of Post and Telecommunications on satellite communications. Later in the year, SIN's technology partnering workshop on THz Satellite Applications established the UK China THz Technology Network.

**NIGERIA:** SIN further cemented UK-Nigeria relations on space with the signing of a MoU on satellite technology development between the Nigerian space agency NASDRA and the UK Space Agency. The MOU was followed up with a SIN-led two day conference on space technology development in emerging economies. The conference brought together fifteen representatives from Chile, South Africa, Ghana, Nigeria, Czech Republic, Poland, Turkey, UAE and Thailand and academic, business and government representatives of the UK space sector. Discussion focussed on the opportunities and challenges when working with emerging economies, and discussing the expectations developing countries had of UK partners.

Global regenerative medicine market forecast to grow to

# US\$35bn

in 2019 from US\$1bn in 2012

## Brief examples from some of the other 8 Great Technologies:

### Big Data

**SWEDEN:** SIN led a collaboration on 'Big Data, Big Questions' at Scandinavia's biggest digital health conference looking at the regulatory, technological and ethical challenges on the use of big data in healthcare. Working with the Digital Health KTN and Liverpool John Moores University, five innovators were selected to come to Stockholm to showcase the quality and breadth of UK expertise. The strong UK presence at the conference highlighted the UK as a leader, with one of the UK companies securing an estimated £600,000 business contract and other participants collaborating on new technology for the NHS.

### Advanced Materials

**SWITZERLAND:** SIN organised an event on bio inspired technologies bringing together researchers and industrial players like Airbus, Nokia, and Unilever to identify common interests and sustainable partnerships opportunities. As a result, a consortium has been established to investigate carbon fibre reinforced composites and take forward a proposal under Horizon 2020.

**COLOMBIA:** As part of widening SIN reach, SIN brought a delegation of leading UK experts to Colombia to deliver a series of seminars on nanotechnology research, instrumentation, regulation, commercialisation, and specialised facilities. This introduced the UK's world class nanotechnology expertise to the Colombian market, opening opportunities for future collaboration and consultancy.

# Global Challenges

In an age of increasing interconnection, the natural and technological challenges that face societies are becoming increasingly globalised. Using the best international science to help tackle global challenge is another priority area for SIN. SIN has supported a broad spectrum of projects in this area:



## Water and Food Security

**UNITED STATES:** SIN and the UK Research Councils' UK Global Food Security Programme worked with US partners on scenarios of disruption to the global food system caused by increasing frequency and intensity of extreme weather events. Workshops in Chicago and London examined risks to food supply and ways that industry and policy could mitigate or exacerbate these risks. A report is due in mid-2015.

**COLOMBIA and UNITED STATES:** SIN US, the British Embassy in Colombia and UK Collaborative on Development Sciences co-hosted a workshop on disaster risk assessment, producing a report on principles and best practice for a

peer reviewed journal. The event was held alongside the STREVA Volcanic Risk Conference, with scientific case studies including the landslide in Gramalote, Colombia and the Bophol Earthquake and Typhoon Haiyan in the Philippines.

**GULF:** As part of the new Water and Drought Initiative (WADI), SIN supported a water efficiency workshop between UK's Leeds University (Leeds Water), South Africa and six Gulf Cooperation Council members (Qatar, Saudi Arabia, UAE, Kuwait, Oman, Bahrain). WADI has led to Leeds Water winning a £300k research grant from Abu Dhabi Meteorological Office for meteorological monitoring and evaluation.

## Dementia

SIN has also prioritised support for the Prime Minister's Dementia Challenge, and follow up to the 2013 UK G8 Summit on Dementia. Dementia affects more than 35m people worldwide, with that number set to exceed 100m by 2050. The estimated costs in 2010 were already 1% of Global GDP.

**SPAIN:** As part of taking dementia collaboration beyond the G7, SIN Spain organised a conference focussed on research and commercial opportunities. Outcomes included Spanish company Araclon investing £200k in the Medical Research Dementias Platform (DPUK), with associated collaboration including access to DPUK research resources and data as a basis for future collaboration.

**CANADA, EUROPE, JAPAN and US:** As part of the legacy events following the 2013 Summit, SIN worked with the World Dementia Council in an innovate series of Dementia Young Leaders events including bringing together young innovators with people living with dementia, and exploring new approaches to research and practical innovation. The event series reported to the WHO Ministerial Dementia Conference in March 2015.

SIN's wider work on life sciences includes neuroscience collaboration that supports progress on dementia.



## Antimicrobial Resistance

SIN prioritises support for the UK strategy to tackle antimicrobial resistance (AMR). The Strategy is led by the Department of Health (DH) as a cross-government effort, including the Department for International Development, and the Department for Environment, Food and Rural Affairs, FCO and BIS. AMR is a major global health challenge and actions needed include; reducing the number of infections and control their spread, to diagnose infections quickly, use the antibiotics we have appropriately and to develop a sustainable supply of new antibiotics.

As an illustration of the challenge, an initial report by the independent review launched by the Prime Minister David Cameron and led by renowned economist Jim O'Neill, suggested that without action, by 2050 AMR could cost some 2-3.5% of global GDP and 10 million more deaths than if resistance is kept to today's level.

SIN worked to help win support for a World Health Assembly resolution calling for a Global Action Plan, and promote collaboration on the "One

# £10m

**UK led-challenge** to find a cheap, accurate, rapid and easy-to-use point of care test kit for bacterial Infections

Health" agenda through the Food and Agriculture Organisation and World Organisation for Animal Health (OIE). SIN also works with NESTA to promote the Longitude Prize, a £10m UK led-challenge to find a cheap, accurate, rapid and easy-to-use point of care test kit for bacterial Infections. Country work includes:

**UNITED STATES:** Events with Public Health England and the Department of Health on collaboration around the microbiology of the built environment, helping tackle AMR and other infections in healthcare institutions.

**CHINA:** A series of collaborative research workshops on quantitative microbial risk have created to links between the UK Institute for Food Research (IFR) and China National Centre for Food Safety Risk Assessment (CFSA). Results include IFR conducting risk assessment training for the Chinese Centre for Disease Control and Prevention, and plans for further workshops on AMR risk assessment in aquaculture.

**JAPAN:** An expert meeting considered new technologies for identifying resistant bacteria, diagnostic development and significant issues from the perspective of environmental issues (agriculture, water and plant). A public seminar and communications highlighted the urgent need for international collaboration on policy, and a One Health approach linking researchers and medical practitioners, in human health, veterinary and environmental spheres.

**INDIA:** An early Newton Fund initiative focuses on research into antimicrobial resistant TB and minimising the indiscriminate use of antibiotics.

**CARIBBEAN:** In addition to SIN's country work, wider cooperation under the FCO Prosperity Fund lead to the first Commonwealth laboratory AMR regional twinning workshop, in Trinidad and Tobago.



# Working with UK Partners

As has been demonstrated in this report, working with UK partners to develop international collaborations is central to SIN's approach. SIN works to help support the science objectives of UK government departments as well as supporting a broad range of research projects in UK universities. SIN additionally coordinates in country with other international UK organisations to ensure best value for the UK and in some countries joint working on Newton Fund priorities with partners is now a major focus. This section highlights some examples of SIN working with principal UK partners.

## The Newton Fund

The £375 million Newton Fund was launched last year as the first truly significant UK bilateral international science and innovation fund. Through this the UK will use its strength in research and innovation to promote the economic development and social welfare in 15 partner countries. This will also enable us to build strong, sustainable and systemic relationships with these countries that will support the continued excellence of the UK research base. Small teams are established in each of the partner countries to facilitate new partnerships and supported by SIN teams in locations as demonstrated by our map on page 3. In 2014, the priority for SIN was to support the initial design and enable roll-out of the Newton Fund, ensuring that the programme could start in a timely fashion.

Newton programmes will be delivered by key science and innovation stakeholders in the UK:

- Research Councils UK (RCUK)
- British Council

- Innovate UK
- The Academies (Royal Society, British Academy, Royal Academy of Engineering, Academy of Medical Sciences)
- Meteorological Office

The Newton teams and their delivery partners, working with funding organisations in partner countries, offer programmes in three pillars of activity:

- **People:** Capacity building, people exchange and joint centres;
- **Research:** Research collaborations on development topics; and
- **Translation:** Innovation partnerships.

Early examples of progress include:

**SOUTH AFRICA:** The UK-South Africa Newton Fund was launched in September, with both countries jointly committing up to £8m per year. Activities focus on public health, environment and food security, and science and technology capacity building, underpinned by themes of big data and developing a regional footprint in sub-Saharan Africa.



**CHINA:** SIN continues to support the negotiation of the Newton programmes in China. The focus of activity under the Fund includes: Health, Environmental Technologies, Food and Water Security, Urbanisation, Energy, Education, and Creative Economy.

Programmes supported by the Fund include the MET office Climate Science for Service Partnership, Atmospheric Pollution and Human Health, Increasing resilience to Natural Hazards, the UK-China Stem Cell partnership Initiative, and the Newton Advanced and International Fellowships amongst others.

**BRAZIL:** For Newton Fund in Brazil significant progress has been made in co-operation with 3 Brazilian key organisations: CNPq (Federal Funding Agency), CONFAP (Council of State Funding Agencies) and SENAI (Brazilian Confederation of Industries' Innovation arm). For each of those we now have an overarching MoU (signed by HMG), in addition to the MoUs that have been signed with UK delivery partners.

**COLOMBIA:** The new Newton-Caldas Fund, provides £4m to match an equivalent value from Colombian organisations for research and innovation activity targeted at Colombia's welfare and economic development. Themes for projects agreed by both governments cover agriculture, competitiveness, future cities, stimulation of entrepreneurship, institutional strengthening of science and innovation within government and policy making, climate change planning and mitigation, and health.

**INDIA:** The UK committed £50 million over five years to the Newton Bhabha Fund. The Fund has three grand societal challenges (sustainable cities and urbanisation, energy-water-food nexus, public health and well-being) and two underpinning capabilities (high value manufacturing and big data) for the UK and India to address through future science and innovation (S&I) collaborations, confirmed in November 2014, at the Ministerial



Science and Innovation Council when UK and Indian ministers signed a MoU.

**CHILE:** the Newton-Picarte Fund is a jointly funded science and innovation collaboration worth £8m a year for three years. In year one the collaboration has resulted in four competitive calls, worth £2.2m covering academic mobility, joint research projects, socio-economic and technical education projects.

**As well as close collaboration on the Newton Fund, SIN's wider work with UK partners also remains a top priority. Examples include:**

### British Council<sup>6</sup>

As part of the British Council's role as the UK's international organisation for educational opportunities and cultural relations, the British Council works to link scientists globally, provide information for researchers and encourage grass roots discussion of science. SIN and the British Council work together in a number of ways.

**SOUTH EAST ASIA:** SIN and British Council formed the UK-Southeast Asia Knowledge Partnership to establish UK as a partner of choice as the region develops world-class capabilities in education, research and innovation. The partnership has supported over 100 collaboration visits, showcased UK organisations including Innovate UK and Catapults

<sup>6</sup> www.britishcouncil.org

alongside large and small innovative UK companies and the Bloodhound Project.

**GULF:** SIN has collaborated with the British Council Qatar, Universities UK, and the Qatar National Research Fund (QNRF) to develop a UK/Qatar Research Networking Programme under the 2013 UK/Qatar Foundation (QF) MoU on Research and Education. Together they have created a £250K fund from government and commercial sources to run a programme of bilateral research networking workshops running Nov 2014 to March 2015. The Qatar/UK Research Networking Programme will run annually with similar funding. Workshops will develop joint research bids from Qatar and UK institutions into research funds including the QNRF - National Priorities Research Programme.

### UK Intellectual Property Office (UKIPO)<sup>7</sup>

The UK IPO aims to promote innovation by providing a clear, accessible and widely understood IP system which enable both the economy and society to benefit from knowledge and ideas.

**CHINA:** SIN identified a need for a greater knowledge-base of international best practice amongst technology transfer professionals in China, in order to reduce IP concerns being a barrier to UK-

<sup>7</sup> www.ip.gov.uk

## Working with UK Partners

...continued



China innovation collaboration. In partnership with PraxisUnico and the IPO, SIN held a programme of two training workshops on 'Effective Licensing and IP Best Practice in International Technology Transfer' in Shanghai and Fuzhou, training 60 technology transfer professionals from both cities and equipping them with the skills and knowledge needed to develop sound international innovation partnerships.

### NESTA<sup>8</sup>

NESTA is an independent charity with a mission to help people bring great ideas to life.

**SOUTH EAST ASIA:** SIN worked with Nesta to scope future innovation opportunities in Singapore as part of the development of a new UK-Singapore Innovation & Research Partnership, signed at the time of the Singapore state visit to UK. As a result, Nesta established new contacts with a range of Singapore government, academic and industry stakeholders. This work is continuing to inform the implementation of the new partnership.

### Research Councils UK<sup>9</sup>

RCUK is the strategic partnership of the UK's seven Research Councils that annually invest around £3bn in research. The RCUK Overseas Teams work with the research funding organisations in their respective

countries to facilitate collaboration between researchers in the UK and abroad. SIN and RCUK work closely together across the globe.

**INDIA:** SIN along with RCUK India co-organised an interactive scoping workshop on Mental Health in February 2014 at the National Institute of Mental Health and Neuro Sciences (NIMHANS), Bengaluru. The scientific remit and agenda for the workshop was jointly developed by the Medical Research Council, Indian Council of Medical Research (ICMR) and NIMHANS. Following this workshop, MRC and ICMR launched the MRC - ICMR joint initiative on the aetiology and life-course of substance misuse and relationship with mental illness. The call was worth up to £2m from the UK side with equivalent resources from India.

### The Royal Society<sup>10</sup>

The Royal Society is the UK's national academy of science, and is a self-governing fellowship of many of the world's most distinguished scientists drawn from all areas of science, engineering, and medicine.

**MALAYSIA:** Malaysia is home to the Royal Society's South East Asia Rainforest Research Programme (SEARRP) since 1985. A SIN project organised to address the growing concern of deforestation, initiated new partnerships and contributed towards a science for policy paper

for the oil palm research-policy partnership network, which is aimed at helping policy makers make decisions about land conversion to oil palm plantations.

### Royal Society of Chemistry (RSC)<sup>11</sup>

The RSC is the professional body for chemistry in the UK and the largest organisation in Europe for advancing the chemical sciences. The RSC's strategic objectives focus on building networks, developing skills and talent, and collaboration through knowledge-sharing.

### SOUTH AFRICA, BRAZIL, INDIA:

SIN in South Africa and India jointly hosted a workshop with the Royal Society of Chemistry on green chemistry methodologies for the sustainable production of biofuels. Participants from four African countries, India, Brazil and the UK, including BBSRC, developed South-South and North-South opportunities, and agreed to a follow-up meeting in Brazil with support from Brazilian funders.

### Innovate UK<sup>12</sup>

Innovate UK is the UK's innovation agency. It aims to accelerate economic growth by stimulating and supporting business-led innovation. SIN's work with Innovate UK includes promoting the role of Catapult Centres.

<sup>11</sup> <http://www.rsc.org/>

<sup>12</sup> [www.innovateuk.org/](http://www.innovateuk.org/)



**UNITED STATES:** SIN established a new collaboration between the Centre for Personalized Cancer Therapy at University of Massachusetts Boston with Imperial College London following a trade event hosted by Secretary of State Business Innovation and Skills and Foreign and Commonwealth Office's Chief Scientific Adviser.



**ITALY:** SIN organised a mission of Italian experts to the Satellite Applications Catapult. The mission comprised of Italian Space Agency officers, representatives from the Ministry of Research, academics, experts and company representatives. Aimed at developing bilateral cooperation in the field, the project resulted in an MoU being signed between UKSA and Agenzia Spaziale Italiana (ASI), as well as an Italian company locating a new operation in Harwell.

### Royal Academy of Engineering<sup>13</sup>

The UK's national academy for engineering, bringing together the country's most eminent engineers from all disciplines to promote excellence in the science, art

<sup>13</sup> <http://raeng.org.uk/>

and practice of engineering. The Academy works closely with SIN to help drive bilateral and multilateral engagement with partner academies and engineering communities in many countries and regions.

**INDIA:** In June 2014, SIN India supported a RAEng distributed manufacturing workshop in London with the Indian National Academy of Engineering, covering issues such as skilling and academia-industry joint programmes. Some of the resulting insights informed wider SIN India work on manufacturing, including an advanced manufacturing workshop in Bangalore with strong representation by the High Value Manufacturing Catapult centres, which produced a range of suggestions for future UK India work.

### UK Trade and Investment (UKTI)<sup>14</sup>

UKTI works with UK-based businesses to ensure their success in international markets, and encourage the best overseas companies to look to the UK as their global partner of choice. SIN's work often helps bring direct benefits to UK business. Recent examples include:

**CHINA:** Enigma Diagnostics, a UK molecular diagnostics technology company, signed a US\$50m contract in London in August with their Chinese partners. This commercial opportunity was initiated through SIN

<sup>14</sup> [www.ukti.gov.uk](http://www.ukti.gov.uk)

working together with UKTI, as part of a longer term partnership which could be worth £3bn.

**BRAZIL:** An example of SIN impact over time is Oxford spin-out Oxitech opening its first factory producing transgenic mosquitoes to fight dengue and chikunguna viruses - six years after SIN & UKTI brokered initial links. The sterile Aedes Egyptian mosquitoes are released to the environment to decrease the population of the dengue and chikunguna virus vector.

**UNITED STATES:** SIN teamed with the Innovate UK and UKTI on a week-long Robotics mission, joining eight of the UK's most innovative robotics companies in California to see how the convergence of mobile phone technology, 3D printing, and improved artificial intelligence are driving next generation innovation. The companies involved made a number of important business connections, which resulted in £9million of contracts for two robotics businesses. In addition, a new UK company was formed in the field of assistive robotics, an area which will be essential in enhancing the experience of later life by allowing the ageing population more independence.

The global market for Robotics is worth over

# US\$25bn

# Building wider Science and Innovation relationships

All the examples in this report illustrate how SIN's work, including collaboration with a range of UK partners, strengthens the international science and innovation relationships we need for future prosperity and sustainable growth. In addition to specific sectoral or thematic collaborations featured in this report, SIN helps support high level bilateral and multilateral dialogues which look across the range of ways we work together. SIN country websites provide more details of these dialogues.

As a final illustration of building wider relationships, SIN supports collaboration through big science infrastructure projects. The importance of big infrastructure was one of the issues in the UK 2014 Strategy presented at the start of this report. We end with a snapshot of SIN work on international big science infrastructure:

## Big Science Infrastructure Projects

**CZECH REPUBLIC:** Extreme Light Infrastructure (ELI) is a pan-European large research project to build lasers with a huge energy density. SIN worked to promote the opportunities to UK organisations, including through a Prime Ministerial visit, about the potential for both research collaboration and specialised R&D procurement. In April 2013, ELI Beamlines management announced that UK companies had won a total £5.5

million in procurement contracts. The Czech Institute of Physics, the host institute for ELI, also signed a contract with the Science and Technology Facilities Council and Rutherford Appleton Laboratories for delivery of another diode-pumped laser, worth £10.2 million, by April 2015.

**AUSTRALIA:** SIN organised a joint UK/Australian Ministerial visit to the Square Kilometre Array (SKA) radio astronomy site in Western Australia in early 2014, underlining the value of the international project. The UK hosts the HQ for the project which holds significant opportunities in big data and computing. The site visit resulted in renewed commitment of support for the SKA project. SIN works closely with Science Technologies and Facilities Council and the Australian SKA office to encourage wider international engagement and to bring the project to fruition.

**FRANCE/GERMANY:** The UK continues to work with partners across Europe to finance large scientific infrastructure. In July UK, France and Germany signed an agreement extending a commitment to fund the Institut Laue-Langevin (ILL), a major, international research facility based in Grenoble, until 2023. The UK has the largest community of neutron scattering researchers in the world who have access to the two best neutron sources in the world - ISIS in Oxfordshire and the Institut Laue-Langevin (ILL) in France.

**SWEDEN:** SIN Sweden assisted UK negotiations led by the Science, Technologies and Facilities Council to secure a UK contribution (£163m) to the European Spallation Source (ESS) being built in Lund, Sweden, billed as the world's largest microscope. The ESS when completed will be the world's most powerful Neutron source, 30 times brighter than existing sources leading to new research opportunities in the study of advanced materials. There will be strong collaboration with UK counterpart ISIS and access for UK researchers to this infrastructure.

## £5.5m

procurement contracts in total had been won by UK companies, as announced by ELI Beamlines management in April 2013



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