

Press release: UK-India Science Ministers announce joint research projects to address shared challenges

The UK Minister of State for Universities, Science, Research and Innovation Jo Johnson and Indian Minister of State for Science & Technology and Earth Sciences Shri Y S Chowdary together announced new UK-India joint research projects and saw high-impact current Research Councils-India collaborations succeed at the first ever Newton Prize award ceremony at the National Science Centre, New Delhi.

Both Ministers applauded the flourishing UK-India research and innovation partnership and congratulated the UK Research Councils and Indian funding bodies for working as true partners and delivering swiftly on the commitments made by their Prime Ministers in New Delhi a year ago.

They welcomed the RCUK and India's Department of Biotechnology (DBT) partnership addressing Antimicrobial Resistance (AMR), an increasingly serious threat to public and animal health, and released a Joint Mapping Report on AMR Research in India commissioned by RCUK and DBT. The report identifies gaps in our understanding, and highlights that we can use multi-disciplinary research to fill key areas of potential action including the environment, industrial waste, farming practise, and how people use and understand valuable antibiotic drugs.

The Ministers announced new awards from joint programmes delivered by the UK Research Councils and Indian partners under the Newton-Bhabha Fund:

- Eight new joint research projects funded under the India-UK Water Quality programme (Natural Environment Research Council (NERC) and Engineering and Physical Sciences Research Council (EPSRC) in partnership with India's Department of Science and Technology (DST)
- Four new research projects on Energy Demand Reduction in the Built Environment programme (EPSRC and Economic and Social Research Council (ESRC) in partnership with DST)
- £7 million joint programme on UK-India Agricultural Data: Enhancement by Integration, Interpretation and Reusability (Biotechnology and Biological Sciences Research Council (BBSRC), Science and Technology Facilities Council (STFC), and NERC in partnership with DBT)
- Extension of funding for the India-UK Water Centre (IUKWC) (Indian Ministry of Earth Sciences (MoES) in partnership with NERC)

These projects will bring together the best minds and facilities from the UK and India to address shared social and economic challenges such as public health, clean water, and demand for energy, where excellent research can contribute to national missions.

Minister Jo Johnson also visited the Indian Institute of Technology (IIT) Delhi, where he was impressed by the fast advances in technology made by the EPSRC-DST project – Advancing the Efficiency and Production Potential of Excitonic Solar Cells (APEX)-II that could eventually revolutionise the affordability of cheaper electricity. He announced:

- A new project focussed on innovation and skills enhancement between STFC's Central Laser Facility (CLF) and India's Tata Institute of Fundamental Research (TIFR) under which Indian engineers will be trained on cutting-edge technology as they jointly develop control systems for next-generation high power lasers to be built in the UK.

Shri Y S Chowdary, Minister of State for Science & Technology and Earth Sciences, said:

I am delighted at the announcement of the partnership between India and the UK on the problem of anti-microbial resistance. I am also delighted to see the announcements of new awards under the Newton-Bhabha programme. India is exponentially growing its science capability and using science and technology to transform society. Our collaboration with the UK shows how partnerships of the highest quality can help both countries advance, as well as have a global positive impact for sustainable development.

Sir Mark Walport, Chief Executive Designate of UK Research and Innovation said:

The UK and India are working together to deliver world-class research. These new collaborative projects will strengthen bonds between our research communities and deepen our collective understanding across a range of fields: from energy and water to medicine and physics. Creating opportunities for the UK to collaborate with the best scientists from around the world is a core focus of UK Research and Innovation.

Professor K. VijayRaghavan, Secretary, Department of Biotechnology, said:

The Department of Biotechnology is very pleased to see how well our collaborations with RCUK have gone and how many new ones at the next level are being started. India sees science and technology as the fulcrum to attain its sustainable development goals. Our partnership with the UK benefits both countries immensely but also has an impact for global good. Amongst the many exciting

collaborations, a new one on agriculture is particularly ambitious and aims to cater to farmers with small- and marginal- holdings by delivering decision-making tools based on the latest technologies from biotech to artificial intelligence. The new partnership and report on antimicrobial resistance is another major milestone. It follows directly from the meetings of our Prime Minister with the UK PM and their joint-statement.

Daniel Shah, Director RCUK India, said:

India is the fastest growing major research power and the UK is the highest quality major research power. We have a true partnership delivering excellent, high impact research across disciplines and innovation connecting academics and businesses. Together our collaboration helps us both better understand, and make better, the world in which we live.

[Research Councils UK](#) (RCUK) India, launched in 2008, brings together the best researchers in the UK and India through high-quality, high-impact research partnerships. RCUK India, based at the British High Commission in New Delhi, has facilitated co-funded initiatives between the UK, India and third parties exceeding £230 million. The research collaborations are often closely linked with UK and Indian industry partners, with more than 100 partners involved in the research. RCUK India is actively involved in co-funded research activities with seven major Indian research funders on a wide array of research themes addressing global challenges.

[UK Research and Innovation](#) (UKRI), operating across the whole of the UK with a combined budget of more than £6 billion, UK Research and Innovation will bring together the seven Research Councils, Innovate UK and a new organisation, Research England. Research England will work closely with its partner organisations in the devolved administrations. UK Research and Innovation intends to be an outstanding organisation that ensures the UK maintains its world leading position in research and innovation. We will ensure that the UK maintains our world-leading research and innovation position by creating a system that maximises the contribution of each of the component parts and creates the best environment for research and innovation to flourish.

[Newton Fund](#) in India is known as the Newton-Bhabha Fund. The Newton Fund builds research and innovation partnerships with 18 partner countries to support economic development and social welfare, and to develop research and innovation capacity for long-term sustainable growth. It has a total UK Government investment across all countries of £735 million up until 2021, with matched resources from the partner countries. The Newton Fund is managed by the UK Department for Business, Energy and Industrial Strategy (BEIS), and delivered through 15 UK delivery partners, which include the UK Research Councils, the UK Academies, the British Council, Innovate UK and the Met Office & Newton Prize.

UK-India joint research programmes announced by the Ministers:

- Release of the joint mapping report on Antimicrobial Resistance (AMR) and Research in India by RCUK and Department for Biotechnology (DBT)

AMR is a major global challenge and determining, prioritising and understanding the drivers of resistance within the relevant setting are crucial to developing appropriate and effective responses. There are gaps in our understanding of AMR, especially in countries with high disease burdens, high levels of poverty and low income. Reliable microbial and resistance data are absent where they are most needed and consequently, there is inadequate knowledge of the spread and transmission of drug-resistant infections, the factors driving such resistance, as well as how these factors are influenced by, and interact with, different environments.

DBT-RCUK jointly commissioned this mapping report to identify the major issues and challenges for AMR research in India. This report will be used to help determine future research priorities in the area. Last year the UK-India Prime Ministers announced £13 million joint funding for research projects on AMR and a workshop will be held in November 2017 to build projects around this global challenge.

- Eight new joint research projects funded under the India-UK Water Quality Programme, led by the UK's Natural Environment Research Council (NERC) and Engineering & Physical Sciences Research Council (EPSRC) and Indian Department of Science and Technology (DST)

The first NERC-DST-EPSRC collaboration, the India-UK Water Quality programme has awarded eight joint research projects that will support policymakers, water managers, business and local communities to improve India's water quality by undertaking novel research on a range of water quality issues, such as reducing outbreaks of Cholera in Lake Vembanad, remediating arsenic pollution in the Ganga Basin, and the development on novel sensors to monitor water quality. The eight projects are:

- Innovative low-cost optical sensor platform for water quality monitoring – City, University of London and Indian Institute of Science, Bangalore – Principle Investigators Prof. Azizur Rahman (UK) and Prof. S. Asokan (India)
- Fate and Management of Emerging Contaminants – University of Exeter and Indian Institute of Technology (IIT) Madras. Principle Investigators Dr Fayyaz Memon (UK) and Prof. Ligy Philip (India)
- Impact of rainwater harvesting in India on groundwater quality with specific reference to fluoride and micropollutants – Cranfield University and National Institute of Hydrology, Roorkee. Principle Investigators – Dr Alison Parker (UK) and Dr Anupma Sharma (India)
- Rehabilitation of Vibrio Infested waters of Vembanad Lake: pollution and solution – Plymouth Marine Laboratory and CSIR-National Institute of Oceanography. Principle Investigators – Dr Shubha Sathyendranath (UK) and Dr Anas Abdulaziz (India)
- Future Secular Changes & Remediation of Groundwater Arsenic in the Ganga River Basin – University of Manchester and National Institute of

Hydrology, Roorkee. Principle Investigator – Prof. David Polya (UK) and Dr Narayan C. Ghosh (India)

- The development and implementation of sensors and treatment technologies for freshwater systems in India – University of the West of England and Bose Institute. Principle Investigators – Prof. Darren Reynolds (UK) and Prof. Tapan K. Dutta (India)
- Pathways and evolution of pollutants: Interactions between physical controlling effects, microbial community composition and pollutant biodegradation – University of Warwick and Indian Institute of Technology (IIT) Bombay. Principle Investigators – Dr Jonathan Pearson (UK) and Prof. Professor Kapil Gupta (India)
- Antimicrobial resistance and pollutants: interactive studies and novel sensor technologies – Heriot-Watt University and Indian Institute of Technology, Madras. Principle Investigators – Dr Helen Bridle (UK) and Dr T Renganathan (India)
- Four new research projects on Energy Demand Reduction in the Built Environment programme in partnership with Engineering & Physical Sciences Research Council (EPSRC) and Indian Department of Science and Technology (DST).

The four UK-India research projects on Energy Demand Reduction in the Built Environment will help monitor energy use and demand, explore better building efficiency and incorporation of solar generation, use data to improve urban planning and reduce energy use and demand, and aim to achieve reductions in carbon emissions. The four projects are:

- Residential building energy demand reduction in India (RESIDE) – Oxford Brookes University and International Institute of Information Technology (IIIT), Hyderabad – Principal Investigators Prof Rajat Gupta (UK), Dr Vishal Garg (India).
- iNtelligent Urban Model for Built environment Energy Research (iNumber) – University College London and Centre for Environmental Planning and Technology (CEPT) University, Allahabad – Principal Investigators Prof Paul Ruyssevelt (UK), Prof Vidyadhar Phatak. (India).
- Zero Peak Energy Building Design for India (ZED-i) – University of Bath and Indian Institute of Technology (IIT), Roorkee – Principal investigators Dr Sukumar Natarajan (UK), Dr Rajasekar Elangovan (India).
- Community-scale Energy Demand Reduction in India (CEDRI) – Heriot-Watt University and Indian Institute of Technology (IIT), Delhi – Principal investigators Dr David Jenkins (UK), Dr Abhijit R. Abhyankar (India).
- Extension of the India-UK Water Centre (IUKWC) funded by the Indian Ministry of Earth Sciences (MoES) and NERC

Funding to the NERC-MoES joint India-UK Water Centre is extended for a further two years. The Centre, managed by the Indian Institute of Tropical Meteorology and the UK's Centre for Ecology and Hydrology facilitates collaboration and cooperation between researchers in the UK and India, and will also launch a new initiative develop stronger links between the research

community and policymakers and water managers in India.

- £7 million joint programme on UK-India Agricultural Data: Enhancement by Integration, Interpretation and Reusability (Biotechnology and Biological Sciences Research Council (BBSRC), Science and Technology Facilities Council (STFC), and NERC in partnership with DBT)

This joint programme is funded by Newton-Bhabha and aims to enhance the value of existing agricultural data focussing on animal and plant health to generate new knowledge that will inform effective pest and disease management. The call is one part of ambitious joint work to use research and technology to deliver solutions in the farming ecosystem, especially for small and marginal farmers, as a public good that can be of global benefit and contribute to the dream of doubling the income of Indian farmers by 2022.

The UK is DBT's biggest international research partner and this new initiative complements this growing collaboration. Updates on the call will be available shortly on the [DBT](#) and [BBSRC](#) websites.

- A new project focussed on innovation and skills enhancement between STFC's Central Laser Facility (CLF) and India's Tata Institute of Fundamental Research (TIFR) under which Indian engineers will be trained on cutting-edge technology as they jointly develop control systems for next-generation high power lasers to be built in the UK.

[Department of Biotechnology](#) (DBT), Ministry of Science and Technology, is India's nodal organisation for promoting bioscience research and development in the country. It is mandated to promote large scale use of biotechnology, support R&D and manufacturing in biology, support autonomous institutions, promote University and industry interaction, identify and set up Centres of Excellence for R&D, integrated programme for human resource development, serve as nodal point for specific international collaborations, establishment of Infrastructure Facilities to support R&D and production, evolve Bio Safety Guidelines, manufacture and application of cell-based vaccines, serve as nodal point for the collection and dissemination of information relating to biotechnology.

[The Department of Science and Technology](#) (DST) over the last forty-three years has developed several streams that later established themselves as departments or even ministries with focused goals. Some of these include the Department of Biotechnology (DBT), Department of Scientific and Industrial Research (DSIR), Ministry of Environment & Forests (MoEF), Ministry of New & Renewable Energy (MNRE), Department of Electronics (DoE) and Ministry of Earth Sciences (MoES). The DST serves as a nodal agency connecting the science sector to the Government verticals. The roles played by DST are varied and these evolved with time. DST develops S&T policies; strengthens human resources and institutional capacities; enables development & deployment of technologies; creates opportunities for societal interventions through S & T and establishes and engages in mechanisms of cooperation, partnerships & alliances. These approaches that reflect its mission ensure a holistic systemic influence, immediate, medium and long term relevance/gains. It enables cross-cutting impacts across sectors to sustain growth/

development and synergies to optimize on time, human, institutional and financial resources.

DST establishes strategically important systems/mechanisms to stimulate and foster excellence and leadership in scientific research and development. These are aligned with India's developmental aspirations and will further help consolidate the niche it has established in several frontiers at the national, regional and global levels.

[The Ministry of Earth Science](#) aims to conduct scientific and technical activities related to Earth System Science for improving forecasting of weather, monsoon, climate and hazards, exploration of polar regions, seas around India and develop technology for exploration and exploitation of ocean resources (living and non-living), ensuring their sustainable utilization. It augments and sustains long term observations of atmosphere, ocean, cryosphere and solid earth to record the vital signs of Earth System and changes; develop forecasting capability of atmosphere and oceanic phenomena through dynamical models and assimilation techniques and to build prediction system for weather climate and hazards. MoES helps understand interaction between components of Earth Systems and human systems at various spatial and temporal scales; conducts exploration of polar and high seas regions for discovery of new phenomenon and resources and translate knowledge and insight themes gained into services for societal, environmental and economic.

[Tata Institute of Fundamental Research](#) is a National Centre of the Government of India, under the umbrella of the Department of Atomic Energy, as well as a deemed University awarding degrees for master's and doctoral programs. The Institute was founded in 1945 with support from the Sir Dorabji Tata Trust under the vision of Dr Homi Bhabha. At TIFR, we carry out basic research in physics, chemistry, biology, mathematics, computer science and science education. Our main campus is located in Mumbai, with centres at Pune, Bangalore and Hyderabad.

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