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# NEWS ALERT

*Forum for Indian Science Diplomacy*

RIS Science Diplomacy News Alert is your fortnightly update on Indian and global developments in science research, technological advancements, science diplomacy, policy and governance. The archives of this news alert are available at http://fisd.in. Please email your valuable feedback and comments to science.diplomacy@ris.org.in

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## GLOBAL

### Renewable Energy from Cold Atmosphere

Solar panels produce power only during the day and hence the excess energy has to be stored over night. Researchers led by Aswath Raman from the University of California, Los Angeles (UCLA) have developed a prototype device that works almost in the reverse way, by harvesting energy from the night sky to passively power a device, in this case a LED.

.The device works on the thermoelectric principle, where in by using the temperature difference between two surfaces an electric current is generated. This idea can be used in many ways for various purposes, ranging from clothes that use heat of the body to provide power to wearable devices, to thermoelectric exhaust pipes that could enable charging a battery. By making use of radiative cooling and thermoelectric principle, they developed a device that could produce power. This device produces 25mW per m2 and can be scaled up to produce .5 W/m2.

## Method to produce Hydrogen from water

Researchers at the Technion–Israel Institute of Technology have developed a novel technology for producing hydrogen, with a 98.7% energy efficiency, much above the current level of about 75%. This is done in two stages and is called (Electrochemical – Thermally-Activated Chemical water splitting. To commercialize this a start up H2Pro has been set up. It is estimated that both equipment cost and operating costs would be reduced when E-TAC water splitting is adopted.

## Chinese telescope to be made available for other countries

The world's largest single-dish radio observatory established in South China is expected to be made available to researchers from other countries soon. Recently the technical assessment of this five hundred-meter Aperture Spherical Radio Telescope (FAST) has been completed and it is expected that clearances for use of scientists from other countries will be issued soon. Established at a cost of 1.2-billion-yuan (US$171-million) telescope, also known as Tianyan or 'Eye of Heaven' has already been tested and used to detect pulsars. It is expected that this will give a fillip to international research and co-operation in the study of inter alia, pulsars, polarized waves and planets outside Solar System.

## INDIA

## DST to launch five technology missions

The Department of Science and Technology (DST is set to launch five technology missions - Mission on electric mobility, Mission methanol, Mission on promoting research and development in quantum technology, cyber physical systems Mission and the Mission on digital mapping. The electric mobility Mission seeks to promote research, innovation and adoption of electric vehicles. Under Mission methanol entres of excellence for production and utilisation of methanol and dimethyl ether will be set up. The mission will also focus on training human resources and enhancing knowledge base .The third mission will promote research, development and innovation in cyber physical systems, including in, artificial intelligence, robotics, sensors, big data analytics, geographical information systems and advanced materials. The mission on quantum technology will focus on quantum computing, quantum cryptography, quantum communication, etc so as to harness quantum mechanics. The fifth mission aims map digitally the country to a scale of 1:500 using satellites and drones. The entire country is expected to be mapped within the next two years under this mission.

## New scientific social responsibility policy Draft for Discussion

Department of Science and Technology has released the draft of the policy on Scientific Social Responsibility (SSR) Policy. PM Sri. Narendra Modi briefly mentioned this idea in his address to the Indian Science Congress held in 2017. The policy proposes to enhance links between science and society, suggests a mechanism for access to scientific knowledge

and proposes that scientists/knowledge workers commit to spend at least 10 days in SSR related activities. The draft also indicates the incentives that have to be provided and support that would be needed. The draft defines SSR as "the ethical obligation of knowledge workers in all fields of science and technology to voluntarily contribute their knowledge and resources to the widest spectrum of stakeholders in society, in a spirit of service and conscious reciprocity". DST will establish an agency to implement it. The draft is available at DST website.

## IN BRIEF

### Use of AI to monitor health of solar PV modules

Using AI to monitor the solar PV modules and take necessary corrective measures can save time and other resources. A system for this has been put in place in Adani's solar plant in Kamuthi which is in Tamil Nadu. With a DC capacity of 780 MWs this is one of the largest such solar plants. Spread over an area of 2,500 acres, and with 2.5 million solar modules using an AI system Therm TM Solution, in combination with robotics and machine learning , a comprehensive thermal scan of the plant is possible in less than three weeks.

### North-South discourse in AI governance

According to researchers at ETH Zurich while there are many guidelines and policies on AI, the voice of the global South is missing in this debate. They point out that some developing countries have been engaged in international efforts in ethics and regulating AI, by and large they have hardly added any new ethical principle. Based on the work done by OECD, in June 2018, leaders from G-20 agreed and accepted a set of non-binding principles. As a follow up many governments are panels for monitoring AI development and ethical principles. There is a broad consensus on adopting the principles of transparency, justice, fairness and equity, non-malfeasance; responsibility and accountability; and privacy as guiding principles in regulating AI development and adoption.

### Launch of Google's AI Research Lab in India

Google recently established an AI lab in Bengaluru, 'Google Research India' focussing on 1) advancing research in computer science and AI, by partnering with research community in India, and, 2) applying this for solving problems in sectors like agriculture and health and to develop apps for use by public at large. Google is partnering with BSNL to make accessible Wi-Fi available in villages in Bihar, Gujrat and Maharashtra.

## RESOURCES AND EVENTS

### Move towards 'land degradation neutrality' by 2030

The COP14 of the UN conference on fighting desertification adopted the Delhi Declaration on 13 September, agreeing to make the Sustainable Development Goal target to achieve "land degradation neutrality" (LDN), a national target for action. There was also a landmark decision to boost global efforts to mitigate and manage the risks of crippling drought. Countries will also now be expected to address insecurity of land tenure, including gender inequality; promote land restoration to reduce land-related carbon emissions; and mobilize innovative sources of finance from public and private sources to support the implementation of these decisions at a national level. Shri Prakash Javadekar, India's Minister for Environment, Forest & Climate Change and President of COP 14, reiterated the country's

commitment to achieving land degradation neutrality by the 2030. He also mentioned to provide effective leadership to the UNCCD during his two-year presidency.

### National Centre for Clean Coal Research & Development established
The National Centre for Clean Coal Research and Development (NCCCR&D) has been set up at Indian Institute of Science (IISc)-Bengaluru, to address R&D challenges in development of clean coal technologies, and in developing supercritical power plant technologies. This could help the country to achieve higher efficiency and capacity with lower operating costs . An Interdisciplinary Centre for Energy Research (ICER) has also been established at IISc for research and development of sustainable technologies, including renewable energy, combustion, concentrated solar power (CSP), next-generation solar photovoltaic (PV), novel energy storage technologies, hydrogen, biofuels and bio-mass.

### Royal Society's Note on AI and International Cooperation
AI research has undergone rapid expansion in recent years, with a new wave of excitement about the potential of these technologies, created by advances in the power and sophistication of AI techniques based on machine learning. As the field advances, AI methods are being applied across sectors, with significant economic benefits at stake. With the growing significance of AI, The Royal society came up with a Note about the workshop conducted jointly by the Royal Society and National Academy of Sciences, on 23-24 May 2019. It identifies challenges before policy makers in harnessing AI and discusses the scope and role of international cooperation in AI. The report asserts that AI could be advanced in ways that bolster social cohesion and democracy. Such AI would be open and operate in the service of all in society; it would work to explicit, transparent rules and roles; systems that use it would enable institutional memory and learning, and support processes of oversight and accountability.

### IPCC releases Special Report on Risks associated with Oceans and Cryosphere
The latest Intergovernmental Panel on Climate Change (IPCC) Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC) calls for prioritizing timely, ambitious and coordinated action to address the unprecedented changes in the ocean and cryosphere. The ocean and the cryosphere play a vital role in the life on Earth. About, 670 million people in high mountain regions and 680 million people in low-lying coastal zones rely on these systems for livelihood and sustenance . There is an overwhelming evidence that global warming is causing in serious consequences for ecosystems and people. The ocean has become more warmer, more acidic and with diminished productivity. The IPCC Special Report shows new evidence for the benefits of decreasing global warming to the lowest possible level – a goal that governments set themselves in the 2015 Paris Agreement. Reducing greenhouse gas emissions will result in reduction in the scale of ocean and cryosphere changes.

### World Bank's report on technology and productivity growth in agriculture
The fourth volume of the series under the World Bank Productivity Project has been released, focusing on the assertion that there are large potential gains to be made in productivity, and hence income, precisely where the vast majority of the extreme poor are found—in rural areas and engaged in small-scale farming. Thus, increasing agricultural productivity must be central to the growth, poverty reduction, and equity agendas. It is also critical to food security and environmental sustainability objectives. The edited volume, based on recent research, suggests some reconsideration of current approaches: the

potential gains from reallocating land and labour are probably less promising than previously thought. The volume focuses on intensifying the generation and dissemination of new, more productive practices and technologies, as well as removing the barriers farmers face to adopting them. The emergence of value chains and private sector research organizations offers important alternatives to direct public sector approaches to these ends, but their cultivation requires additional reforms, particularly with respect to the overall policy environment and incentives. This volume is a joint effort between the Agriculture and Food Global Practice of the Sustainable Development Vice Presidency and the Equitable Growth, Finance, and Institutions Vice Presidency. It was supported in part by the US Department of Agriculture (USDA) and the US Agency for International Development (USAID).

We welcome your comments and valuable suggestions. Please write to us for receiving publications, updates and notices regarding seminars, conferences etc.

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