FORUM FOR INDIAN SCIENCE DIPLOMACY

SCIENCE DIPLOMACY NEWS ALERTS | 16-31 MAY 2019 | ISSUE 14 www.fisd.in

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

GLOBAL

Process initiated for NPT Review Conference 2020

The third and final session of the Preparatory Committee (PrepCom) for the 2020 Review Conference of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) ended on May 10 with disagreements over the pace and extent of nuclear disarmament at United Nations headquarters in New York. The main issues discussed were: (1) nuclear disarmament and security assurances; (2) nuclear verification (IAEA safeguards), nuclear weapon-free zones, regional issues including with respect to the Middle-East, and North Korea and South Asia; and (3) peaceful uses of nuclear energy, NPT review process and provisions for withdrawal from the Treaty. Many non-nuclear-weapon States pointed out that the promise of the NPT to end the age of nuclear weapons remains largely unfulfilled. States parties were unable to overcome their deep differences and thus did not agree on any "recommendations" even though these are only indicative and not binding for the review conference. The NPT Review Conference will be held from 27 April to 22 May 2020 in New York to mark the 50th anniversary, the Golden Jubilee, of the world's most important and fundamental nuclear non-proliferation and nuclear disarmament treaty and to chart the course for the next five years (2020-2025)

ATTRACT provides funding for disruptive technology

A major research and innovation project, named ATTRACT, funded by the European Union under the Horizon 2020 programme has announced 170 breakthrough ideas. These disruptive ideas aim to foster breakthrough innovations to key societal challenges. Each idea would receive € 100,000 after having proved their scientific merit and innovation potential during a rigorous evaluation process. These funded projects are grouped under four broad categories; data acquisition systems and computing; front end and back end electronics; sensors; and software and integration

UNESCAP report on Status of SDGs in Asia Pacific for 2030

The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) released a report titled 'Asia and the Pacific SDG Progress Report 2019"

during its 75th Commission session, held in Bangkok, Thailand. One of the major findings of the report is the lost track trajectory of all the 17 SDGs in the Asia Pacific region. It highlighted that the region's progress is deteriorating especially on SDG 6 (clean water and sanitation); SDG 8 (decent work and economic growth) and SDG 12 (responsible consumption and production)

OECD announces five principles for AI use

The Organisation for Economic Co-operation and Development has announced a set of five principles for the development and deployment of artificial intelligence. The principles focus on use of AI, keeping in view set of values including; rule of law, human rights, democratic values, transparency, accountability, inclusive growth and sustainability. The announcement was made at a meeting of the OECD Forum in Paris.

BGU develops Flying/driving robot

The Ben-Gurion University of the Negev (BGU) researchers have developed the hybrid FSTAR (flying sprawl-tuned autonomous robot), the first experimental robot drone. It was introduced at the International Conference on Robotics and Automation 2019, held in Montreal recently. The robot can fly over obstacles or run underneath them and can also transform its movement from a flying quadcopter to a car-like robot. It also adjusts its width to crawl or run on flat surfaces, climb over large obstacles and up closely-spaced walls, or squeeze through a tunnel, pipe or narrow gaps. It can run on the ground at a speed of up to eight feet per second (2.6 m/s). That combined with low energy consumption using the same motors makes FSTAR ideal for a broad range of applications that may require longer work time. Possible commercial uses are package deliveries, search and rescue applications, agriculture, maintenance, cleaning, filming, and entertainment, as well as law enforcement.

ATRP creates enhanced materials for various applications

A team from Carnegie Mellon University have developed a new methodology that can be used to create a class of stretchable polymer composites with enhanced electrical and thermal properties. The method called atom transfer radical polymerization (ATRP) uniformly incorporates eutectic gallium indium (EGaIn), a metal alloy that is liquid at ambient temperatures, into an elastomer. This created a new material -- a highly stretchable, soft, multi-functional composite that has a high level of thermal stability and electrical conductivity. The researchers envision that this process could be used to combine different polymers with liquid metal, and by controlling the concentration of liquid metal, they can control the properties of the materials they are creating. The number of possible combinations is vast and their approach could be used to design "made-to-order" elastomer composites that have tailored properties. The result will be a new class of materials that can be used in a variety of applications, including soft robotics, artificial skin and bio-compatible medical devices.

Cancer diagnosis through AI systems

Deep learning, which is a form of artificial intelligence, was able to detect malignant lung nodules on low-dose chest computed tomography (LDCT) scans with a performance meeting or exceeding that of expert radiologists, reports a new study from Google and Northwestern Medicine. This deep-learning system provides an automated image evaluation system to enhance the accuracy of early lung cancer diagnosis that could lead to earlier treatment. The deep-learning system was compared against radiologists on LDCTs

for patients, some of whom had biopsy confirmed cancer within a year. In most comparisons, the model performed at or better than radiologists. The deep-learning system also produced fewer false positives and fewer false negatives, which could lead to fewer unnecessary follow-up procedures and fewer missed tumors. This system may assist in improving the management and outcome of patients with lung cancer.

New technique for genetic analysis of cancer cells

University of Michigan researchers have developed a new way to cleanly separate out cancer cells from a blood sample, a dramatic improvement over current approaches because it also encompasses the variation among cancer cells within a single patient. The key technology is a chip with a system of channels and chambers. It traps cancer cells one at a time. The researchers then attached the cells to barcoded beads and released the RNA which attached to the bead. The team could then analyze the contents of each cell separately. This is a very powerful tool to monitor the changes in tumour cells over time. The technology could have wide applications

INDIA

PSA invites applications to form PM-STIAC lead Consultative Groups

The Principal Scientific Adviser to the Government of India Dr K. Vijay Raghavan has invited applications from scientists, economists and social sector specialists for forming "consultative groups" in specialized areas. The invite is for early and mid-career Indian scientists working in India or abroad across academia, industry and non-governmental sectors to lay stronger foundations in fundamental research useful for national development. The initiative is getting good response from the concerned stakeholders and is anticipated to be a major step towards building a better science and society connect.

Successful Firing of BrahMos Air Launched Missile

The Indian Air Force has successfully fired the BrahMos air version missile from its frontline Su-30 MKI fighter aircraft. The launch from the aircraft was smooth and the missile followed the desired trajectory before directly hitting the land target. The air launched BrahMos missile is a 2.5-ton supersonic air to surface cruise missile with ranges of close to 300 km. The IAF became the first Air Force in the world to have successfully fired an air launched 2.8 Mach surface attack missile of this category on a sea target on 22 Nov 17. The integration of the weapon on the aircraft was a very complex process involving mechanical, electrical and software modifications on aircraft.

Collaboration among government agencies for Cancer research

The Department of Biotechnology (DBT), Ministry Science and Technology and the Department of Atomic Energy (DAE), of the Government of India have signed an MOU for supporting joint collaborative research programmes in the area of Cancer, to work towards the common goal of tackling cancer and this is expected to bring a quantum change in the present scenario of cancer research. This MOU covers new and affordable technologies, clinical trials, translational research, interventions, training and infrastructure development.

PSLV-C46 successfully launches RISAT-2B

India, successfully launched RISAT-2B satellite on May 22nd, 2019 from the Satish Dhawan Space Centre, Sriharikota. It is a radar imaging earth observation satellite,

intended to provide services to Agriculture, Forestry and Disaster Management domains. The satellite was launched onboard PSLV-C46, without the use of solid strap-on motors.

CERN Exhibition comes to India

The 'Accelerating Science' Exhibit, flagship travel science exhibition of Geneva based European Organisation for Nuclear Research (CERN) is coming to India for the first time. The exhibit will be on show in Mumbai, Bengaluru, Kolkata and Delhi between May 2019 and March 2020. India and CERN have enjoyed a fruitful partnership since 1960s and the exhibition will showcase some of India's biggest contributions to world's biggest science projects, including CERN. It is jointly funded by the Department of Atomic Energy (DAE) and the Department of Science & Technology (DST).

IISc reports breakthrough in superconductivity at room temperature

Superconductivity at ambient temperature has been sought for about a century. A team from the Indian Institute of Science (IISc), Bengaluru has claimed that their material exhibits major properties of superconductivity at ambient temperature and pressure. The material consists of nanostructured films and pellets made of silver nanoparticles embedded in a gold matrix. Interestingly, silver and gold independently do not exhibit superconductivity. The team examined 125 samples, of which 10 showed a drop-in resistance signaling the onset of superconductivity at up to 13◦ C. Further research is underway.

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