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**FORUM FOR INDIAN
SCIENCE DIPLOMACY**

SCIENCE DIPLOMACY NEWS ALERTS | 16-31 MARCH 2022 | ISSUE 82

www.fisd.in

NEWS ALERT

Forum for Indian Science Diplomacy

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CONTENTS

GLOBAL

[Symmetric redox flow battery based on organic compounds](#)

[New Solar Tiles from Denmark](#)

[Storing renewable electricity with supercritical CO₂](#)

[Monolithic fuel cell with power density of 5.6kW/Litre](#)

[Nanoparticle-based COVID-19 vaccine for future infectious diseases](#)

[Producing faster CAR-T cell therapy inside the body with an implant](#)

COVID-19 (WORLD)

[New PCR Test can identify all COVID-19 variants](#)

COVID-19 (INDIA)

[Novavax' COVID-19 Vaccine authorised for age 12-18 in India](#)

[TDB and Sapigen Biologix sign MoU for intranasal COVID-19 and malaria vaccines](#)

INDIA – SCIENCE & TECHNOLOGY

[Effective way to transform Plastic waste](#)

[2D monolayers show potential in next-generation self-powered materials](#)

[Platinum-based electro-catalyst could pave way for low-cost, durable fuel cells](#)

[DRDO successfully test-fires Surface to Air Missile](#)

IN BRIEF

[Efficiency record for mass production heterojunction PV cells](#)

[High performance electrolysis cell for renewable hydrogen](#)

[High-energy and low-cost membrane-free chlorine flow battery](#)

[Wax-coated sand reduces water loss, improves crop yields in arid regions](#)

[Researchers use unique ingredient to strengthen bamboo](#)

[Snail venom could for new insulin and pain relief](#)

RESOURCES AND EVENTS

[Intel announces investment of €80 billion in EU for semiconductors](#)

[UK lays out Science Strategy for 2022-27](#)

[India's Arctic Policy released](#)

[IAEA on Nuclear Safety and Security in Ukraine](#)

SCIENCE POLICY AND DIPLOMACY

[India to build Solar Power Plant in Sri Lanka](#)

[High Seas Treaty talks fail to reach a deal](#)

[Joint Declaration issued on privacy and the protection of personal data](#)

[IGSTC sign MoU with Tata Steel](#)

[India, South Korea develop training system for robot-assisted surgeries](#)

GLOBAL

[Symmetric redox flow battery based on organic compounds](#)

A Dutch-Danish research team has used Blatter radical compounds, which are also known as 1,2,4-benzotriazin-4-yl radicals, to build a prototype of a symmetric redox flow battery for applications in stationary storage. Blatter radicals are organic compounds that have remarkable electronic and magnetic properties, strong chemical and thermal stability and reversible redox properties. The scientists selected a single molecule that is intrinsically stable and that can accept or donate electrons, which means it can be used on both sides of the battery and, at the same time, show how minimal capacity fades during battery cycling. The special compound was used in a prototype small electrochemical cell and was found to remain stable over 275 charge/discharge cycles. The team is planning to develop a water-soluble version of the Blatter radicals.

[New Solar Tiles from Denmark](#)

Danish BIPV module manufacturer Dansk Solenergi ApS has unveiled two new solar tiles for applications in residential projects. A dark grey tile measures 1,610x400x5.5mm and has a weight of 6.5kg. It features a power output of 70W and a power conversion efficiency of 18.15 percent. Its open-circuit voltage is 16.09V and the short-circuit current is 5.57A. Another is a 70W tile of terracotta color and the same other characteristics as the gray tile apart from that its efficiency is slightly lower, at 16.7 percent. Both products can operate with a maximum system voltage of 1,000V and come with IP65 protection, a 25-year linear power output guarantee, and a 12-year product guarantee. The operating temperature coefficient is -0.34% per degree Celsius. The new products are ideal for use on heritage buildings, new residential complexes, architectural projects, churches, and building facades. The tiles are based on a monocrystalline all-contact solar cell technology provided by Maxeon Solar Technologies Ltd. Each cell has an area of 155cm² and weighs around 6.6 grams. Danish solar energy is looking for investors and partners to start large scale production.

[Storing renewable electricity with supercritical CO₂](#)

Researchers from Spain's Universidad Politécnica de Madrid (UPM) have proposed to store renewable electricity with a pumped thermal energy storage (PTES) system based on supercritical carbon dioxide (CO₂) as the working fluid and molten salts as the thermal storage fluid. The proposed system is claimed to achieve an efficiency of 80.26% and an levelled cost of storage (LCOS) of €0.116/kWh. During charging, a cycle compressor raises its temperature and pressure of the carbon dioxide to the maximum level. The thermal energy generated is then stored in a hot storage unit that lowers the fluid temperature until it reaches the inlet value of a turbine. During the discharge cycle, the compressed CO₂ raises its own temperature using hot storage energy and is then expanded, producing both electrical and mechanical energy for the compressor power requirements, as well as thermal energy that is

stored in the cold storage system to be used later during the charging phase. The LCOS of €0,116/kWh makes places the PTES one of the most cost-efficient technologies surpassed only by pumped-storage hydroelectricity (PHS) and pumped heat electrical storage (PHES), but for these two, the initial cost is much higher and the geographical conditions are particular and rare.

Monolithic fuel cell with power density of 5.6kW/Litre

A Danish-Norwegian research group has designed a metal-based monolithic solid oxide fuel cell (SOFC) that is claimed to be suitable for transport applications. In the proposed fuel cell configuration, the ceramic anode was replaced with metallic interconnects. The monolith concept integrates the cell support, gas channels, and the interconnects into a single layer, thereby reducing the stack height by a factor of 2–4. A monolith SOCF with an active cell area of around 18 cm² was built. The device was found to have an open-circuit voltage of 1065mV and a power density of 5.6 kW/L, which the researchers said are on par with the best performing fuel cells based on ceramic anodes. This or similar design could enable large-scale production of electrified transportation powered by fuel cells with considerably increased range, decreased charging times, and lower cost. Details [here](#)

Nanoparticle-based COVID-19 vaccine for future infectious diseases

Northwestern University researchers have developed a spherical nucleic acid (SNA) nanoparticle based one dose new COVID-19 vaccine which produced an immune response in animals on track with vaccines currently in clinical use. 100 percent of mice who received the protein-based immunization survived when challenged with lethal doses of the SARS-CoV-2 virus, which causes COVID-19. None of the mice experienced lung damage due to SARS-CoV-2 exposure. All mice who did not receive this nanoparticle vaccine died in a 14-day trial. The vaccine uses SNAs, the nanoparticles that house the immune target are a form of globular DNA that can enter and stimulate immune cells with extreme efficiency. SNAs have been tested in more than 60 cell types. Researchers experimentally determined the ideal ratio between the SNA's shell and core density that produces the most potent response. SNA vaccines have been used to treat mice with triple negative breast cancer -- and more vaccines for other cancers are in development. The platform can be used for infectious diseases. In the new vaccine, the antigen (a portion from the spike protein) is packaged inside the core of an SNA, and a specific sequence of DNA known to stimulate the immune system (adjuvant) is used as the radial shell surrounding the core. The researchers injected mice under the skin, causing an immune response to the spike protein, and then monitored antibody production in the weeks following injection.

Producing faster CAR-T cell therapy inside the body with an implant

Scientists from the US have found a potential way that could cut the CAR-T processing time from typically more than two weeks to a single day by using an implant. The all-in-one implant, called Multifunctional Alginate Scaffolds for T cell Engineering and Release (MASTER), takes the cumbersome CAR-T cell manufacturing steps from outside the body to the inside. In a proof-of-concept study in a lymphoma mouse model, the researchers isolated and implanted patient-derived T cells with the MASTER platform on the same day to generate CAR-T cells inside the animals' bodies. Compared with conventional CAR-T cells, CAR-T cells made with MASTER showed improved anticancer potency. This could provide a way to simplify and reduce the cost of Car-T cell therapy, which at present costs around \$400,000 per treatment.

COVID-19 (WORLD)

[New PCR Test can identify all COVID-19 variants](#)

A team from Rutgers University has developed a PCR test that uses molecular beacons not only to diagnose COVID-19 infection, but also to identify the specific variant causing that infection. Their methodology is openly available so that it can be replicated by any facility that can run a PCR test. The test is based on molecular beacons, hairpin-shaped molecules that can be designed to selectively bind to a specific mutant sequence. Nine mutations were selected for testing, and the beacon for each has differently colored dyes. Every original variant of concern – alpha, beta, gamma, delta, and omicron — has a unique combination of these mutations. When the beacon binds to its target molecule, its distinct color can be detected by the assay. The test was 100 percent accurate in identifying the variants, and could be adapted to include the omicron variant also.

COVID-19 (INDIA)

[Novavax' COVID-19 Vaccine authorised for age 12-18 in India](#)

Novavax, Inc. and Serum Institute of India Pvt. Ltd. (SII) announced receipt of emergency use authorization (EUA) for Novavax' protein-based COVID-19 vaccine for adolescents aged 12 to 18 years in India. The vaccine, also known as NVX-CoV2373, is manufactured and marketed in India by SII under the brand name Covovax™ and is the first protein-based vaccine authorized for use in this age group in India. This follows a Phase 2/3 study in a total of 460 Indian adolescents and a Phase 3 trial in adolescents in the U.S. Covovax is the fourth vaccine to receive EUA from the DCGI for use among adolescents 12 and older. Studies evaluating the safety and immunogenicity of Covovax for the age groups of 7-12 and 2-7 years in India are underway. DCGI initially granted EUA for Covovax for adults 18 years old and above in December. In addition, Covovax has received Emergency Use Listing (EUL) from the World Health Organization, as well as EUA in Indonesia, the Philippines, and Bangladesh.

[TDB and Sapigen Biologix sign MoU for intranasal COVID-19 and malaria vaccines](#)

The Technology Development Board (TDB), Ministry of Science & Technology, and Sapigen Biologix Pvt Ltd, an arm of Bharat Biotech International Ltd, have entered into a Memorandum of Understanding (MoU) for the development and commercialisation of an Intranasal COVID-19 vaccine and RTS, S Malaria Vaccine. Under the agreement signed on Saturday, TDB and Bharat Biotech have pledged support of Rs 2 billion each to create a Rs corpus for its development and commercialisation of these Vaccines. The Hyderabad-based company plans to set up a modern cGMP facility in Bhubaneswar, in compliance with the latest global standards, for manufacturing the two vaccines. The intra nasal vaccine can generate mucosal immune response, thereby, protecting both the upper and lower respiratory system of a vaccinated individual. The project uses the technology platform developed by Washington University, School of Medicine in St Louis for the SARS-COV-2 chimpanzee

adenovirus in inactivate or killed virus form. RTS, S is a vaccine that acts against Plasmodium falciparum, the deadliest malaria parasite globally and most prevalent in Africa.

INDIA – SCIENCE & TECHNOLOGY

[Effective way to transform Plastic waste](#)

Researchers at the Indian Institute of Technology (IIT) Mandi have developed a method to transform plastic into hydrogen when exposed to light. The generation of hydrogen from plastics is beneficial because gas is considered the most practical non-polluting fuel of the future. The researchers have developed a new photocatalyst that combines iron oxide in the form of nanoparticles with conducting polymer polypyrrole which resulted in the formation of a semiconductor-semiconductor heterojunction, which in turn results in strong visible-light-induced photocatalytic activity. The IIT-Mandi catalyst can function simply with sunlight. The researchers found 100 percent degradation within four hours when they used a catalyst in which about four per cent weight iron oxide was present in the polypyrrole matrix. They then tested this catalyst on polylactic acid (PLA), a plastic that is extensively used in food packaging, textiles, medical articles and cosmetics. The team found hydrogen was evolved during the breakdown of PLA when the catalyst was exposed to visible light.

[2D monolayers show potential in next-generation self-powered materials](#)

Researchers at Institute of Nano Science and Technology, Mohali have computationally predicted two fascinating 2D monolayers having great potential for applications in next-generation self-powered materials which develop spin currents in response to strain. The material design is based on hexagonal buckled 2D semiconductors ZnTe and CdTe monolayers from the previously synthesized bulk structures having a different pattern. Apart from showing strong spin-orbit coupling (SOC), these semiconductors are found to be highly flexible. Such exquisite results obtained in these monolayers indicate their great potential for applications in next-generation self-powered flexible-piezo-spintronic devices. This is the first time such a simultaneous combination of spin-orbit coupling, piezoelectricity, and flexibility in two-atomic layer thick semiconductors has been reported in 2D semiconductors. The wide bandgap provides ample room for modulation in its electronic properties via external perturbations. The computational predictions need to be translated into actual materials.

[Platinum-based electro-catalyst could pave way for low-cost, durable fuel cells](#)

Scientists at the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) have synthesized platinum-based electrocatalysts using an efficient procedure. The key step in the synthesis lies in functionalization of carbon to enhance the carbon to platinum interaction known as strong metal substrate interaction (SMSI), thereby increasing the durability of the electrocatalyst. This electrocatalyst showed comparable properties to the commercially available electrocatalyst and could enhance the lifetime of the fuel cell stack performance. The commercialization of indigenous electrocatalysts could reduce the dependence on imported electrocatalysts and pave the way towards green hydrogen technology in India.

[DRDO successfully test-fires Surface to Air Missile](#)

Defence Research and Development Organisation (DRDO) successfully conducted two flight tests of the Medium Range Surface to Air Missile (MRSAM) at Chandipur off the coast of Odisha. The Indian Army version of MRSAM was carried out as part of the live firing trials against high-speed aerial targets. Both the missiles intercepted the aerial targets and destroyed them completely, registering direct hits at both the ranges. The first launch was aimed at intercepting a medium-altitude long-range target and the second launch was for proving the capability of a low altitude short-range target. The Medium Range Surface to Air Missile (MRSAM) has been developed jointly by DRDO and Israel Aerospace Industries (IAI), Israel, to serve in the Indian Army. The Surface-to-Air Missile weapon system comprises a mobile launcher system, multi-function radar, and other vehicles. It is noteworthy that the flight tests were carried out with the weapon system in deliverable configuration and the performance of the weapon system was validated through the flight data captured by range instruments.

IN BRIEF

[Efficiency record for mass production heterojunction PV cells](#)

An Australian company SunDrive said it has teamed up with China-based heterojunction (HJT) equipment manufacturer Maxwell Technologies to demonstrate a solar cell efficiency of 26.07 percent on a full-size silicon HJT solar cell. The company's technology replaces the expensive silver used in conventional solar PV cells with cheaper and more abundant copper, by using large-scale production processes provided by Maxwell Technologies. The metallization of the HJT cell, with a total area of 274.3 cm² (M6 size), was performed using SunDrive's latest generation of direct copper plating technology which achieves finer feature sizes and superior aspect ratios compared to commercial silver screen-printing technologies. Replacing silver with copper which is 100 times cheaper per kilogram and around 1,000 times more abundant will bring down the cost of solar cells significantly.

[High performance electrolysis cell for renewable hydrogen](#)

A research group from Australia has developed a unique concept of water electrolysis, in which water is supplied to hydrogen- and oxygen-evolving electrodes via capillary-induced transport along a porous inter-electrode separator, leading to inherently bubble-free operation at the electrodes. An alkaline capillary-fed [electrolysis cell of this type demonstrated](#) water electrolysis performance exceeding commercial electrolysis cells, with a cell voltage at 0.5 A cm⁻² and 85 °C of only 1.51 V, equating to 98 percent energy efficiency, with an energy consumption of 40.4 kWh/kg hydrogen (vs. ~47.5 kWh/kg in commercial electrolysis cells). High energy efficiency, combined with the promise of a simplified plant, could bring cost-competitive renewable hydrogen closer to reality. A company Hysata has been set up to commercialize the technology, which could produce green hydrogen for less than US\$1.5 per kilogram. Moreover, the process can be scaled up for gigawatt scale hydrogen production as its design is simple and suitable for mass manufacture.

[High-energy and low-cost membrane-free chlorine flow battery](#)

Scientists from the United States and China have fabricated a reversible chlorine redox flow battery for stationary energy storage. The device has a membrane-free design and uses an aqueous electrolyte made of sodium chloride (NaCl) which uses chlorine (Cl₂/Cl⁻) redox couple as the active material for the positive electrode. Sodium chloride is one of the cheapest commodities available due to the abundant source in seawater and large-scale production. In the device, the chlorine is immiscible in the electrolyte, which means that no membrane is

needed to prevent crossover, thus further reducing costs. The reversible chlorine redox flow battery starts from the electrolysis of aqueous NaCl electrolyte and the produced Cl₂ is extracted and stored in the carbon tetrachloride (CCl₄) or mineral spirit flow. The immiscibility between the CCl₄ or mineral spirit and NaCl electrolyte enables a membrane-free design with an energy efficiency of >91 percent at 10 mA/cm² and an energy density of 125.7 Wh/L. The chlorine flow battery can meet the stringent price and reliability target for stationary energy storage with the inherently low-cost active materials (~\$5/kWh) and the highly reversible Cl₂/Cl⁻ redox reaction.

Wax-coated sand reduces water loss, improves crop yields in arid regions

A research team from Saudi Arabia has developed a wax coated sand layer to reduce soil water evaporation and improve crop yields. They used purified paraffin wax, a biodegradable substance available in large quantities, and dissolved the wax in hexane and poured silica sand into the mixture. As the solvent evaporated, a 20-nm-thick coating of wax was left behind on the grains. When the team applied the wax-coated sand in a thin layer on an open field in Saudi Arabia, it decreased the loss of soil moisture up to 50-80 percent. Field trials revealed that tomato, barley and wheat plants mulched with the new material produced substantially more fruit and grain than those grown in uncovered soil. In addition, the microbial community around the plants' roots and in the soil was not negatively impacted by the waxy mulch, which could have acted as a food source for some of the microbes. This simple nature-inspired technology could make water use more efficient in arid regions.

Researchers use unique ingredient to strengthen bamboo

A team from Canada has found a way to strengthen natural fibers such as bamboo, but reduce their tendency to degrade over time, making them even more environmentally friendly. Bamboo has nearly the same strength as a mild steel while exhibiting more flexibility. It is one of the world's most harvested and used natural fibers with more than 30-million metric tons produced annually. However, its natural fibers can absorb water and degrade and weaken over time due to moisture uptake and weathering. The team used a process called plastination to dehydrate the bamboo, and reinforce it with other fibers and materials to make a new high-performance hybrid biocomposite. This new durable hybrid bamboo/woven glass fiber/polypropylene composite, treated with the plastination technique has a promising future and leads to a sizable reduction of non-degradable waste in many industries.

Snail venom could for new insulin and pain relief

University of Utah researchers have found potential breakthroughs in somatostatin-analog pain relief and fast-uptake insulin from the highly potent venom cone snails use to stun and sedate their prey. Consomatins Ro1, a peptide found in the venom of one particular kind of cone snail, had a similar affect to morphine when injected in mice. There are many species of Cone snails, and their venom is rich in a variety of compounds. The researchers are still trying to assess whether Consomatins Ro1 works better than the drugs already available. The researchers have also created two variations on fast-acting insulin using the venom from different types of cone snails.

[Intel announces investment of €80 billion in EU for semiconductors](#)

US chipmaker Intel has announced investments across the EU in a move hailed by the European Commission as the first sign of success for its Chips Act. The company announced the first phase of a plan to spend up to €80 billion in manufacturing and research facilities in Germany, Ireland, Italy, Poland, Spain and France. Its central €17 billion investment will be two new semiconductor fabs in Magdeburg, Germany, that should start construction in 2023 and be in production in 2027. Ireland will get an investment of €12 billion to expand and upgrade an existing foundry in Leixlip. Italy is set for a €4.5 billion investment to create a new manufacturing facility. The chipmaker also announced big investments in R&D. The Plateau de Saclay innovation cluster near Paris will be the site of Intel's European R&D hub. France will also get Intel's foundry design centre, and Gdansk in Poland will see a 50 percent increase in lab space. The EU's Chips Act, launched last September, aims to more than double Europe's share of the world market for semiconductors by 2030. The goal is not just economic growth, but an attempt to boost the EU's "strategic autonomy" in the field of technology.

[UK lays out Science Strategy for 2022-27](#)

The UK government has renewed its commitment to reaching a public and private R&D spending target of 2.4 percent of GDP by 2027, in a new five-year strategy 2022-27 aimed at strengthening the country's R&D system. After breaking away from the EU, the UK wants to continue fostering outstanding research institutions and infrastructures, as well as strengthening international R&D cooperation. The UK and EU are still negotiating terms for participation of the UK in the EU's €95.5 billion research programme, Horizon Europe. In the new strategy, the government puts a lot of emphasis on attracting talent from abroad and notes it needs to "grow and diversify" its R&D workforce by 150,000 people over the next eight years.

[India's Arctic Policy released](#)

Union Minister of State Dr Jitendra Singh, released [India's Arctic policy titled 'India and the Arctic: building a partnership for sustainable development'](#) on 17 March. India's Arctic policy will be implemented through an action plan, and an effective governance and review mechanism involving the inter-ministerial Empowered Arctic Policy Group. Implementing India's Arctic policy will involve multiple stakeholders, including academia, the research community, business, and industry. India's engagement with the Arctic dates back to a century when 'Svalbard Treaty' was signed in February 1920 in Paris and, today India is undertaking several scientific studies and research in the Arctic region. Over twenty-five Institutes and Universities are currently involved in Arctic research in India. About a hundred peer-reviewed papers have been published on Arctic issues since 2007. India is an observer in the Arctic Council. Until 2022, India has successfully conducted thirteen expeditions to the Arctic. India's Arctic policy has six pillars: strengthening India's scientific research and cooperation, climate and environmental protection, economic and human development, transportation and connectivity, governance and international cooperation, and national capacity building in the Arctic region. Implementing India's Arctic policy will involve multiple stakeholders, including academia, the research community, business, and industry. The National Centre for Polar and Ocean Research (NCPOR) in Goa, an autonomous institute under the Ministry of Earth Sciences, is the nodal institution for India's Polar research programme, which includes Arctic studies.

[IAEA on Nuclear Safety and Security in Ukraine](#)

The Director General of IAEA has proposed a seven point plan for dealing with the situation - (1) The physical integrity of the facilities must be maintained; (2) All safety and security systems and equipment must be fully functional at all times; (3) The operating staff must be able to fulfil their safety and security duties and have the capacity to make decisions free of undue pressure; (4) There must be secure off-site power supply from the grid for all nuclear sites; (5) There must be uninterrupted logistical supply chains and transportation to and from the sites; (6) There must be effective on-site and off-site radiation monitoring systems and emergency preparedness and response measures; and (7) There must be reliable communications with the regulator and others. Earlier, the IAEA 35 member Board of Governors had adopted a resolution on 3 March that 'deplores' Russia's invasion of Ukraine and urges it to let Ukraine control all its nuclear facilities. Russia and China voted against the resolution, while 26 countries voted in favour of the resolution, and 5 abstained - Pakistan, India, South Africa, Senegal and Vietnam. Mexico and Burundi were absent.

SCIENCE POLICY AND DIPLOMACY

[India to build Solar Power Plant in Sri Lanka](#)

India and Sri Lanka have signed an agreement for developing a 100 megawatt solar power plant at Sanpur near the eastern port district of Trincomalee under the Trincomalee Power Company Limited (TPCL), a joint venture between National Thermal Power Corporation (NTPC) Limited from India and the Ceylon Electricity Board (CEB). The project is financed under the USD 100 million Line of Credit offered by India to Sri Lanka for development of solar power projects.

[High Seas Treaty talks fail to reach a deal](#)

The 4th round of intergovernmental negotiations (IGC-4 of UNC-BBNJ) to forge a legally binding treaty to protect open oceans beyond national jurisdictions, under UNCLOS failed to reach agreement, with no schedule set for prolonging the discussions. The talks were meant to create vast marine reserves to prevent biodiversity loss, oversee industrial-scale fisheries and share out the "genetic resources" of the sea. It now rests with the United Nations General Assembly to give the green light for another round of talks. The High Seas Alliance, a coalition of more than forty major NGOs and the International Union for the Conservation of Nature (IUCN) and the High Ambition Coalition of European Union nations and 13 other countries, including India, Australia, Canada and Britain, have called for the treaty to be finalised by end of 2022. Some nations and many environmental groups have called for at least 30 percent of the world's oceans to be granted protected status, a target also to be on the table at UN biodiversity talks later this year. Today, a patchwork of agreements and regulatory bodies govern shipping, fishing, and mineral extraction, while the UN Convention on the Law of the Sea, negotiated in the 1970s, lays out rules for how far a nation's zone of influence extends beyond its shores. But despite two decades of consultations, there is still no treaty protecting international waters beyond national jurisdiction, accounting for about two-thirds of the world's oceans. Another contentious question is who gets a share of the benefits from the exploitation of what are known as "marine genetic resources". These could lead to the new wonder ingredients for the pharmaceutical, chemical or cosmetic industries. The treaty covers the so-called high seas, which begin beyond national exclusive economic zones that extend 200 nautical miles (370 kilometres) from their shores. Read detailed report here

Joint Declaration issued on privacy and the protection of personal data

India, the European Union, Australia, Comoros, Japan, Mauritius, New Zealand, the Republic of Korea, Singapore, Sri Lanka have issued a Joint Declaration on protection of personal data. This seeks to promote high data protection and privacy standards based on certain core elements increasingly shared across the Indo-Pacific region, Europe and beyond, such as: Comprehensive legal frameworks and policies; Core principles; Enforceable rights of individuals; Safeguards for international data transfers; and Independent oversight mechanisms. The group will continue to work on policy and cooperation regarding data protection and cross-border data flows with trust, both bilaterally and multilaterally, in order to promote this shared vision and increase convergence amongst their data protection frameworks.

Scientific and Technological Cooperation between India and Oman

India and Oman signed a Programme of Cooperation (POC) in the fields of Science and Technology. The POC document was signed on 23rd March 2022. The areas of cooperation for the period 2022 – 2025 are Medicinal Plants and processing, Real-time Air Quality Monitoring, Development of an electronic platform for knowledge sharing in the field of Genetic Resources, Technical expertise for SMEs in the field of sustainability (Eco-Innovate) Accelerator, Plastic Bio-fuel, and Bio-diesel Research, Software development for Graduate Programs – Linking Industry with Academia, Blockchain and FinTech solutions, Training programmes – Big-data, coding & testing, STEM teaching and other areas of S&T cooperation added by mutual consent. Under the agreement, both countries will support joint scientific projects based on mutual interest, developed jointly by the Indian and Omani institutions. They will encourage exchange of scientists, researchers, experts, and specialists for the implementation of selected joint projects aimed at developing applicable technology. This will lead to the dissemination of research results and establishing contacts with industry for the follow-up of research and development work.

IGSTC sign MoU with Tata Steel

A new MoU and Letter of Intent (LoI) has been signed to foster science and technology led innovations. The partnership has been established between bilateral Indo-German Science and Technology Centre (IGSTC) and Tata Steel Ltd through the MoU instituting a joint collaborative Research & Innovation (R&I) framework to facilitate new technologies development, conduct thought leadership workshops, and support human capital development. The cooperation with Tata Steel Ltd will focus on globally relevant technology & Innovation areas of Climate change, Greening of the Industrial sector, Emerging technologies in new materials, joint research & innovation for emerging technologies, and technology development for scaling-up. A LoI was also signed with BASF for scientific cooperation partnerships to foster science and technology led innovations and research partnerships in PPP mode.

India, South Korea develop training system for robot-assisted surgeries

India and South Korea have jointly developed an efficient, user-friendly, affordable and real-time training system for robot-assisted surgeries under a bilateral industrial research and development (R&D) programme. The real-time training system has been jointly developed by L&T Technology Services, Bengaluru, along with PSG College of Technology and PSG Institute of Medical Science and Research, Coimbatore, and Korea Advanced Institute of Science and Technology (KAIST). The programme was supported by Global Innovation &

Technology Alliance (GITA), which is a Public-private Partnership between Technology Development Board (TDB) of the ministry and Confederation of Indian Industry (CII).

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