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NEWS ALERT

Forum for Indian Science Diplomacy

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CONTENTS

RESOURCES AND EVENTS

SCIENCE POLICY AND DIPLOMACY

GLOBAL

Advanced Cooling Technique Developed

An innovative system developed at MIT offers a way to use passive cooling to preserve food crops and supplement conventional air conditioners in buildings, with no need for power and only a small need for water. The system, which combines radiative cooling, evaporative cooling, and thermal insulation in a slim package that could resemble existing solar panels, can provide up to about 19 degrees Fahrenheit (9.3 degrees Celsius) of cooling from the ambient temperature, enough to permit safe food storage for about 40 percent longer under very humid conditions. It could triple the safe storage time under dryer conditions. It could play a significant role in meeting the cooling needs of many parts of the world where a lack of electricity or water limits the use of conventional cooling systems. By combining evaporative cooling, radiative cooling, and insulation, it has a better cooling performance and can be effective in a wider range of climates than evaporative cooling or radiative cooling alone. The work could attract significant practical applications, such as in food preservation, if the system can be made at reasonable cost.

Silicon Nanopillars for Quantum Communication

A team led by the Helmholtz-Zentrum Dresden-Rossendorf (HZDR) presented an appropriate production technology using silicon nanopillars: a chemical etching method followed by ion bombardment. Single-photon sources have been fabricated in materials like diamonds; only silicon-based sources generate light particles at the right wavelength to propagate in optical fibers - a considerable advantage for practical purposes. The researchers achieved this technical breakthrough by choosing a wet etching technique - what is known as MacEtch (metal-assisted chemical etching) - rather than the conventional dry etching techniques for processing the silicon on a chip. These standard methods, which allow the creation of silicon photonic structures, use highly reactive ions. These ions induce light-emitting defects caused by the radiation damage in the silicon. They aim to integrate all the elementary building blocks, from a single photon source via photonic elements through to a single photon detector, on one single chip and then connect lots of chips via commercial optical fibers to form a modular quantum network.

In-Home Device Tracks Parkinson's Progression

Researchers from MIT and elsewhere demonstrated an in-home device that can monitor a patient's movement and gait speed, which can be used to evaluate Parkinson's severity, the progression of the disease, and the patient's response to medication. The device, which is about the size of a Wi-Fi router, gathers data passively using radio signals that reflect off the patient's body as they move around their home. The patient does not need to wear a gadget or change their behavior. The researchers used these devices to conduct a one-year at-home study with 50 participants. They showed that, by using machine-learning algorithms to analyze the troves of data they passively gathered (more than 200,000 gait speed measurements), a clinician could track Parkinson's progression and medication response more effectively than they would with periodic, in-clinic evaluations.

New Wearable Device to Monitor Tumor Size

Engineers at Stanford University have created a small, autonomous device with a stretchable and flexible sensor that can be adhered to the skin to measure the changing size of tumors below. The non-invasive, battery-operated device is sensitive to one-hundredth of a millimeter (10 micrometers) and can beam results to a smartphone app wirelessly in real time with the press of a button. The device – dubbed FAST for "Flexible Autonomous Sensor measuring Tumors" – represents a wholly new, fast, inexpensive, hands-free, and accurate way to test the efficacy of cancer drugs. On a grander scale, it could lead to promising new directions in cancer treatment.

Single Crystal Organometallic Perovskite Optical Fibers Created

Queen Mary University of London researchers have invented a brand-new application of perovskites as optical fibres. The perovskite optical fibre made by the team consists of just one piece of a perovskite crystal. The optical fibres have a core width as low as 50 μm (the size of a human hair) and are very flexible – they can be bent to a radius of 3.5mm compared to their polycrystal counterparts, single-crystal organometallic perovskites are more stable, more efficient, more durable and have fewer defects. Scientists have therefore been seeking to make single-crystal perovskite optical fibres that can bring this high efficiency to fibre optics. This technology could also be used in medical imaging as high-resolution detectors. The small diameter of the fibre can be used to capture a much smaller pixel compared to the state of the art, so that the fibre could give a much higher resolution image for doctors to make better and more accurate diagnosis. This could also be used in textiles that absorb the light. They could convert the solar energy into electrical power.

COVID-19

COVID-19 (WORLD)

COVID-19 Infections Increase Risk of Long-term Brain Problems

A comprehensive analysis of federal data by researchers at Washington University School of Medicine in St. Louis shows people who have had COVID-19 are at an elevated risk of developing neurological conditions within the first year after infection. Movement disorders, memory problems, strokes and seizures are among the complications. Those who have been infected with the virus are at increased risk of developing a range of neurological conditions in the first year after the infection, new research shows. Such complications include strokes, cognitive and memory problems, depression, anxiety and migraine headaches, according to a

comprehensive analysis of federal health data by researchers at Washington University School of Medicine in St. Louis and the Veterans Affairs St. Louis Health Care system. Additionally, the post-COVID brain is associated with movement disorders, from tremors and involuntary muscle contractions to epileptic seizures, hearing and vision abnormalities, and balance and coordination difficulties as well as other symptoms like those in Parkinson's disease.

COVID-19 Infection May Increase Risk of Type 1 Diabetes

Testing positive for SARS-CoV-2, is associated with an increased risk of new-onset type 1 diabetes in children and adolescents, according to new research presented at this year's European Association for the Study of Diabetes (EASD) Annual Meeting in Stockholm, Sweden held during 19-23 September. The study used national health registers to examine new onset type 1 diabetes diagnoses made in all youngsters aged under 18 in Norway (over 1.2 million individuals) over the course of 2 years, starting on March 1, 2020, comparing those who contracted COVID-19 with those who did not. Their nationwide study suggests a possible association between COVID-19 and new-onset type 1 diabetes. It is important that clinicians and parents are aware of the signs and symptoms of type 1 diabetes. Constant thirst, frequent urination, extreme fatigue, and unexpected weight loss are tell-tale symptoms. The authors acknowledge that the study was statistical and does not prove cause and effect and has limitations.

DNA Nets Capture COVID-19 Virus in Low-cost Rapid-Testing Platform

Researchers at the University of Illinois Urbana-Champaign and collaborators demonstrated the DNA nets' ability to detect and impede COVID-19 in human cell cultures. This platform combines the sensitivity of PCR and the speed and low cost of antigen tests. Such tests are required to prepare for the next pandemic and to track ongoing viral epidemics – not only coronaviruses, but also other deadly and economically impactful viruses like HIV or influenza. The DNA nets the Illinois group developed were designed to bind to the coronavirus spike protein – the structure that sticks out from the surface of the virus and binds to receptors on human cells to infect them. Once bound, the nets give off a fluorescent signal that can be read by an inexpensive handheld device in about 10 minutes. The researchers demonstrated that their DNA nets effectively targeted the spike protein and were able to detect the virus at very low levels, equivalent to the sensitivity of gold-standard PCR tests that can take a day or more to return results from a clinical lab. The technique does not need any special preparation or equipment, and can be performed at room temperature, so all a user would do is mix the sample with the solution and read it. The researchers estimated in their study that the method would cost $1.26 per test. This not only gives patients and physicians better understanding of whether they are infectious, but it could greatly improve community-level modeling and tracking of active outbreaks, such as through wastewater.

Fast, Sensitive Test for COVID-19

Researchers in the US have further engineered the RNA-editing CRISPR-Cas13 system to boost their power for detecting minute amounts of the SARS-CoV-2 virus in biological samples without the time-consuming RNA extraction and amplification step necessary in gold-standard PCR testing. The new platform was highly successful compared to PCR, finding 10 out of 11 positives and no false positives for the virus in tests on clinical samples directly from nasal swabs. The researchers showed their technique finds signs of SARS-CoV-2 in attomolar (10-18) concentrations. The researchers fused seven different RNA binding domains to the well-

hidden, flexible hairpin loop near Cas13's active site. Two of the complexes were clearly superior and could fluoresce, revealing the presence of the virus. The team used an electrochemical sensor, which has higher sensitivity and can be used for point-of-care diagnostics. The team is seeking to use this technology in paper strips for home COVID-19 antibody tests, but with much higher sensitivity and accuracy, and for improved detection of the Zika, dengue and Ebola viruses and predictive biomarkers for cardiovascular disease. The guide RNA can be designed to target a specific sequence that can be detected, which is the power of the CRISPR-Cas13 system. The technology is widely applicable.

Khosta-2: New Covid-like Virus Found in Russian Bats

Scientists have discovered a new coronavirus in bats named "Khosta-2" in Russian bats which can infect human cells. It belongs to the same sub-category of coronaviruses as SARS-CoV-2- and it displays "troubling traits". In 2020, a group of coronaviruses like SARS-CoV-2 that were initially discovered living in bats in Russia. Another virus found in Russian bats, Khosta-1, cannot enter human cells readily, but Khosta-2 could. Khosta-2 attaches to the same protein, ACE2 that coronavirus uses to penetrate human cells. Further, when scientists combined serum from people who have been vaccinated against Covid-19 with Khosta-2, the antibodies in the serum did not neutralize the virus. The same thing happened when they combined the Khosta-2 with the serum from people who had recovered from Omicron infection. The virus emerged in the human population after cross-species transmission from an animal source. It is resistant to Covid-19 vaccine.

COVID-19 (INDIA)

India Set to Roll Out Two Covid Vaccines

India is set to introduce new vaccines that may later be added as boosters to top up protection against Covid-19. Dr NK Arora, chairperson of the National Technical Advisory Group on Immunization (NTAGI), told TOI on Tuesday that two new "made-in-India" vaccines will soon be available on CoWIN — an mRNA shot and an intranasal vaccine. The Indian mRNA shot is the only one in its category that can be stored and transported at 2-8°C. Similarly, the intranasal vaccine is easier to administer. These vaccines can be given as the primary doses and, when we get enough data, can also be introduced as heterologous boosters. People who have taken two doses of Covishield or Covaxin have the option of taking a different vaccine as the third shot. Dr. Arora, however, said booster coverage needs to improve in the country. Data has shown that nearly 90 per cent of people who were admitted to hospitals with Covid recently had not taken the booster.

Bhutan, Nepal Thank India for COVID-19 Vaccine

Bhutan and Nepal expressed gratitude and appreciation for India at the UN General Assembly for its "heartwarming goodwill" and "valuable support" in supply of COVID-19 vaccines under New Delhi's Vaccine Maitri initiative' that enabled the neighbouring countries to vaccinate their populations as the pandemic raged across the world. Nepal's Foreign Secretary Bharat Raj Paudyal also expressed appreciation in his address to the General Assembly for the vaccines provided to his country by India. Under the Vaccine Maitri initiative of the Indian government, more than 250 million COVID-19 vaccine doses have been supplied to over 100 countries, including nearly 95 lakh doses to Nepal and 5.5 lakh doses to Bhutan.

INDIA–SCIENCE & TECHNOLOGY

INPI-France and CSIR to Cooperate on TKDL Access

The *Institut National de la Propriété Industrielle* (INPI; the National Industrial Property Institute), France and the Council of Scientific and Industrial Research (CSIR) entered a cooperation on the Traditional Knowledge Digital Library (TKDL) Access through an Agreement giving INPI, France access to the complete TKDL database for the purposes of patent grant procedure. Access to the TKDL database would be an important instrument not only for the INPI but also for the traditional industrial entities in France. The signing of the TKDL Access Agreement with the INPI, France marks the beginning of a new partnership and cooperation in the domains of Intellectual Property Rights as well as traditional knowledge between France and India.

Sustainable Biofuels to Reduce Green House Gas (GHG)

Dr Jitendra Singh, who is leading a high-level Joint Indian Ministerial Delegation of Ministry of Power, New & Renewable Energy and Ministry of Science & Technology at the "Global Clean Energy Action Forum-2022" at Pittsburgh, Pennsylvania in the United States said that sustainable biofuels play key role to reduce Green House Gas (GHG) emissions from the transport sector. India has been supporting R&D innovations in Advanced Biofuels and Waste to Energy technologies and has established 5 Bioenergy Centers with an interdisciplinary team working on advanced sustainable biofuels using modern biotechnology tools. Mission Integrated Biorefineries was launched by India and Netherlands to accelerate innovation for renewable fuels, chemicals, and materials for a low-carbon future. India has a Cooling Action Plan (CAP) with a long-term vision (spanning a 20-year period from 2017-18 to 2037-38) that addresses cooling requirements across sectors. India is also implementing the largest Renewable Energy (RE) expansion program in the world envisaging a 5-fold increase in the overall RE capacity in the country from 32 GW in 2014 to 175 GW by 2022, and further to 500 GW of renewable power in the country by 2030.

IISc Partners with Shell India for Climate Research

The Indian Institute of Science (IISc) and Shell India have joined hands to promote research and development in energy and environment being carried out at the Interdisciplinary Centre for Energy Research (ICER), IISc. The key aspects of the partnership agreement will include reducing greenhouse gas emissions and promoting decarbonisation through innovations such as low-carbon fuels, distributed electrification, carbon sinks, hydrogen generation, efficient power and refrigeration cycles using supercritical carbon dioxide and so on.

Paper Based Pressure Sensors Fabricated

Researchers at the Indian Institute of Science (IISc) have fabricated pressure sensors that use paper as the medium. Several industrial, automotive, and healthcare applications rely on accurate and precise measurement of pressure. The researchers have proposed a design for the paper sensor that, by virtue of its structure and multilayering, achieves high sensitivity and can detect a broad range of pressures (0-120 kPa) with a response time of one millisecond. The sensor is made of plain and corrugated cellulose papers coated with tin-monosulfide (SnS) stacked alternatively to form a multi-layered architecture. SnS is a semiconductor that conducts electricity under specific conditions. The team aims to work towards increasing the stability and

durability of these sensors and possibly collaborate with industries to manufacture them in large numbers.

ICMR, IISc to Create Medical Datasets

The Indian Council of Medical Research (ICMR) and Indian Institute of Science (IISc) have signed an MoU to collaborate on a national initiative towards the creation of high-quality medical datasets representing India's diversity. ICMR and IISc will develop a technology-enabled hubs-and-spokes system of collecting and curating data through institutions across the country. Their goal is to bring together the best of technology, data science, and medical research to improve healthcare. This will help create invaluable datasets to propel the next generation of innovations for India and the world. It will also help curate that data and aim to make them available in accordance with applicable policies and laws, to the broader community of researchers and innovators.

Two Diving Support Vessels Launched

Two Diving Support Vessels (Nistar & Nipun) built by Hindustan Shipyard Ltd, Visakhapatnam were launched on 22 September. Indigenously designed and built at HSL, these ships are a true testimonial to 'Aatmanirbharta'. They are self-sustaining platforms which can operate at sea for prolonged durations. DSVs equipped with an array of complex Diving Support systems and Deep Submergence Rescue Vessel (DSRV) will be deployed for deep sea diving and submarine rescue operations. Furthermore, the ships will be capable of conducting Search and Rescue operations and carrying out Helicopter Operations at sea. The project is being executed with support from Indian industry primarily MSME firms who have supplied Yard material, equipment, and services with approx. 80 per cent indigenous content.

Semiconductors and Display Manufacturing Boosted

The Cabinet, chaired by Prime Minister, Shri Narendra Modi, has approved changes to the Programme for development of semiconductors and display manufacturing ecosystem in India. A uniform fiscal support of 50 per cent of Project Cost will be provided across all technology nodes for setting up of Semiconductor Fabs. and provide fiscal support of 50 per cent of Capital Expenditure for setting up of compound semiconductors / silicon photonics / sensors / Discrete semiconductors fabs and ATMP/OSAT. The programme has already attracted many global semiconductor players for setting up fabs in India. The changes will stimulate investments in semiconductor and display manufacturing in India. The technology nodes of 45nm and above have high demand from sectors such as Automotive, Power and Telecom and constitute around 50 per cent of the total semiconductor market.

Dual Role Surface-to-Surface BrahMos Missile

The Ministry of Defence (MOD) signed a contract today with M/s BrahMos Aerospace Pvt. Ltd. (BAPL) for acquisition of additional dual-role capable Surface to Surface BrahMos missiles at an overall approximate cost of ₹ 17 billion under “Buy-Indian” Category. Induction of these dual-role capable Missiles is going to significantly enhance the operational capability of Indian Navy (IN) fleet assets. BAPL is a Joint Venture (JV) between India and Russia making a crucial contribution to augment the new generation Surface-to-Surface Missiles (SSMs) with enhanced range and dual role capability for land as well as anti-ship attacks. This contract is going to give

further boost to indigenous production of critical weapon systems and ammunition with active participation of indigenous industry.

Sugar-Coated Pouches in Body Fluids Can Help Detect Cancer

Researchers at the Shiv Nadar Institute of Eminence, Delhi, in collaboration with others have unravelled the contour lengths of hyaluronan (HA) on a single cancer cell-derived extracellular vesicles (EV) surface. Cancer cells secrete EVs covered with HA, which is considered a potential biomarker for early diagnosis of colon cancer. Cancer cells secrete at least two times more EVs into the body fluids than normal cells. and could enable early cancer diagnosis. Their study showed that a single cancer cell-derived EV is coated with very short chain HA molecules (contour length less than 500 nanometers) and found that these short-chain HA-coated EVs are significantly more elastic than the normal cell-derived EVs. This higher elasticity of HA-coated EVs in cancer helps them to withstand multiple external forces during extracellular transportation, uptake, excretion by cells, adhesion to cell surfaces, etc. Detection of the cancer microenvironment may soon become much easier with the help of a new molecular biosensor.

IN BRIEF

New Holographic Microscope to Image the Brain

Researchers from South Korea have developed a new type of holographic microscope which sees through the intact skull and is capable of high-resolution 3D imaging of the neural network within a living mouse brain without removing the skull. The researchers devised a method to preferentially select single-scattered waves by taking advantage of the fact that they have similar reflection waveforms even when light is input from various angles. This is done by a complex algorithm and a numerical operation. This enabled the new microscope to focus more than 80 times of light energy on the neural fibers than before, while selectively removing unnecessary signals. The research team went on the demonstration of this new technology by observing the mouse brain. The new microscope succeeded in obtaining a high-resolution image of the mouse brain's neural network under the skull. This was all achieved in the visible wavelength without removing the mouse skull and without requiring a fluorescent label.

Cobalt-free Cathode for Lithium-ion Batteries

Researchers at the University of California, Irvine and four national laboratories have devised a way to make lithium-ion battery cathodes composed substantially of nickel, without using cobalt, a mineral plagued by price volatility and geopolitical complications. The researchers used high-entropy doping using HE-LMNO, an amalgamation of transition metals magnesium, titanium, manganese, molybdenum and niobium in the structure's interior, with a subset of these minerals used on its surface and interface with other battery materials. The highly stable structure is capable of withstanding more than 1,000 cycles and high temperatures, which makes it comparable to cathodes with much lower nickel content. They found a trapping effect of oxygen vacancies and defects inside the material, which effectively stabilizes the structure during cycling. This research could enable the development of an alternative to existing batteries.

Modified Silk Proteins for Nonstick Surfaces

Researchers at Tufts University have developed a method to make silk-based materials that can be molded into forms like plastic, or coated onto surfaces as a film, has non-stick properties that surpass those of nonstick surfaces typically used on cookware, and it could see applications that extend into a wide range of consumer products, as well as medicine. The team covered the surface of the silk fibroin with short chemical chains containing perfluorocarbons which are very stable and do not react with other chemicals, nor do they interact with proteins and other biological chemicals in the body. Changing the number and length of perfluorocarbon chains on the silk protein can adjust how it behaves including exhibiting nonstick behavior. The chemical synthesis can be done under mild conditions, safer, both for workers and the environment and uses a renewable biological source of material. Possible uses include automotive windshields where rainwater just rolls off without using wipers, coatings on metals that help prevent rust, or on fabrics to make them easier to clean.

Wearable Sensors Integrated into Clothing

Researchers at Imperial College, UK have embedded new low-cost sensors that monitor breathing, heart rate, and ammonia into t-shirts and face masks. Potential applications range from monitoring exercise, sleep, and stress to diagnosing and monitoring disease through breath and vital signs. Spun from a new Imperial-developed cotton-based conductive thread called PECOTEX, the sensors cost little to manufacture. Just $0.15 produces a metre of thread to seamlessly integrate more than ten sensors into clothing, and PECOTEX is compatible with industry-standard computerised embroidery machines. The team embroidered the sensors into a face mask to monitor breathing, a t-shirt to monitor heart activity, and textiles to monitor gases like ammonia, a component of the breath that can be used to track liver and kidney function.

Extracting Magnesium from Seawater

US researchers have found a simple way to isolate a pure magnesium salt, a feedstock for magnesium metal, from seawater. Their new laminar co-flow method flows two solutions side-by-side in a long stream. The seawater flows alongside a solution with hydroxide. The magnesium-containing seawater quickly reacts to form a layer of solid magnesium hydroxide. This thin layer acts as a barrier to solution mixing. The flow process produces dramatically different results than simple solution mixing. The initial solid magnesium hydroxide barrier prevents calcium from interacting with the hydroxide enabling production of pure solid magnesium hydroxide without needing additional purification steps. The selectivity of this process makes it particularly powerful, highly sustainable. This new approach has many additional potential applications such as creating new energy materials and achieving selective separation of hard-to-separate ions for water treatment and resource recovery.

3D-Printing of Strongest Stainless Steels

Researchers from the US have been able to 3D print a remarkably strong and corrosion-resistant alloy called 17-4 precipitation hardening (PH) stainless steel. They identified 17-4 steel compositions that, when printed, match the properties of the conventionally manufactured version. The new findings could help producers of 17-4 PH parts use 3D printing to cut costs and increase their manufacturing flexibility. The approach used to examine the material in this study may also set the table for a better understanding of how to print other types of materials and predict their properties and performance. 3D-printing of metal is particularly challenging because of very rapid temperature changes during the process with extreme nonequilibrium conditions. The team used synchrotron X-ray diffraction, or XRD to examine steel samples

during printing and were able to fine-tune the makeup of the steel to find a set of compositions including just iron, nickel, copper, niobium and chromium that worked. Testing showed that the 3D-printed steel, with its martensite structure and strength-inducing nanoparticles, matched the strength of steel produced through conventional means. The XRD-based approach could have wider applications.

RESOURCES & EVENTS

Climate Science Report Warns About "Tipping Points"

A group of global partner organizations, coordinated by the World Meteorological Organization (WMO), under the direction of the UN Secretary-General, issued a report titled, 'United in Science', compiling the most recent science related to climate change impacts and responses. The publication highlights "the huge gap between aspirations and reality," and calls for "much more ambitious action" to thwart the increasingly devastating physical and socioeconomic impacts of global warming. The report warns that "urgent action is needed to mitigate emissions and adapt to our changing climate." It also notes that climate-related disasters "set back progress towards achieving the SDGs and exacerbate existing poverty and inequality." The report provides unified scientific information on some of the current and projected climate change impacts to inform decision makers. The report, addresses greenhouse gas (GHG) concentrations, global GHG emissions and budgets, the state of the global climate in 2018-2022, global climate predictions for 2022-2026, the emissions gap, tipping points in the climate system, climate change in cities, extreme weather events and socioeconomic impacts, and supporting adaptation and disaster risk reduction (DRR) through early warning systems.

Reduce Harm from Highly Hazardous Pesticides

The Strategic Approach to International Chemicals Management (SAICM) has published a factsheet about highly hazardous pesticides (HHPs) to enable all SAICM National Focal Points (NFPs) and other stakeholders to make effective and informed decisions, as well as play an active role in reducing the health and environmental risks associated with HHPs, and to move towards phasing out HHPs and implementing more sustainable alternatives. HHPs are a group of pesticides that must be handled differently than other pesticides given their high toxicity. HHP residues are found in food, putting consumers at risk, and are dangerous for farmers and workers handling them. NFPs: are urged to promote registration of and access to alternatives in their own countries; raise awareness of risks from HHPs; promote the development of low-toxic alternatives that reduce reliance on pesticides.

Indian-American to head US Office of Science & Technology

Indian-American Arati Prabhakar was confirmed by the U.S. Senate to take over as Director of the Office of Science & Technology Sept. 22, 2022, a historic moment for the Indian-American community. Her confirmation as Director automatically makes her the Assistant to the President for Science and Technology, making her the President's Chief Advisor for Science and Technology, a co-chair of the President's Council of Advisors on Science and Technology, and a member of the President's Cabinet. She also becomes the first woman, immigrant, or person of color to serve as OSTP director. Dr. Prabhakar is a brilliant and highly respected engineer and applied physicist. She has led two different federal R&D agencies and worked with startups, large companies, universities, government labs, and nonprofits across a wide variety of sectors.

Prabhakar served as director of DARPA, the Defense Advanced Research Projects Agency, from 2012 to 2017.

SCIENCE POLICY AND DIPLOMACY

Stalemate over UK Bid to Join Horizon Europe

The UK is "urgently" considering its options on whether to continue efforts for association with the EU's Horizon Europe programme, after the 22 September meeting with the EU failed to resolve the deadlock. The UK negotiated terms of participation in Horizon as part of the 2020 EU–UK Trade and Cooperation Agreement (TCA) covering the UK exit from the EU overall. Horizon Europe is one of the few EU programmes that the UK wanted to continue with; it had in the past been the second largest winner of EU research grants, after Germany. But the Commission has since tied association to the programme to the wider political dispute over the Northern Ireland Protocol. The UK now has two options – assuming there is still no breakthrough in the Northern Ireland Protocol dispute, or willingness by the EU to budge on Horizon. The UK could launch an alternative domestic research programme or take the EU to arbitration. Arbitration is the legal step taken if consultations, which ended this week, fail to produce results. It would create an independent arbitration tribunal consisting of one UK nominee, one EU nominee and a jointly agreed chair. Under the TCA rules, the tribunal has to come up with a binding solution to the disagreement within 130 days, with a possibility to extend to 160 days.The UK could decide to launch its Plan B programme, unveiled in July, but this would mean diverging from the joint European research framework. The UK's preference continues to be full association to EU programmes, including Horizon Europe, Euratom nuclear research programme, and the Copernicus earth observation programme.

Plant Genetic Resources Treaty for Food and Agriculture

The 9th session of the Governing Body (GB9) of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) was held from 19-24 September 2022, in New Delhi. It discussed items related to farmers' rights, and cooperation with the CBD, including on the thorny issue of "digital sequence information/genetic sequence data" on genetic resources and related benefit-sharing obligations. On the Treaty's Multilateral System (MLS) of access and benefit-sharing (ABS), it was agreed to re-establish the relevant Working Group with a view to finalize the enhancement of the functioning of the MLS. On the issue of farmers' rights an assessment of the implementation of the set of options for encouraging, guiding, and promoting the realization of farmers' rights will be done. A global symposium will be held in India in 2023 to share relevant experiences.

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