

If you can't see this message, [view it in your browser.](#)

Science Diplomacy News Alert  
*Forum for Indian Science Diplomacy*  
[www.fisd.in](http://www.fisd.in)

**1-15 DECEMBER 2023**

**ISSUE 123**

RIS Science Diplomacy News Alert is your fortnightly update on Indian and global developments in scientific research, technological advancements, and G-20, global challenges, science diplomacy, policy and governance. The archives of this news alert are available at <https://fisd.in/en/alerts-archives>. Please email your valuable feedback and comments to [science.diplomacy@ris.org.in](mailto:science.diplomacy@ris.org.in).

**CONTENTS**

**SCIENCE AND TECHNOLOGY**

**GLOBAL**

[First CRISPR Gene Editing Therapy Approved in the U.S](#)

[Non-invasive Technology for Characterization of Cancer Cells](#)

[CAR T Cell Therapy with New Mechanism Shows Promise](#)

[Plant Hormone that Can Boost Plant Growth Uncovered](#)

[Blood Tests to Help Predict Organ Failure](#)

[New Medical Imaging Facility to Revolutionise Research and Patient Care](#)

[Biopolymers to Replace Synthetic Plastic Films](#)

[Bimetallic Alloy Nanocatalyst Shows Promise for Carbon Free Energy](#)

[New, Better Way to Develop Vaccines Discovered](#)

**INDIA**

[Aditya-L1 Solar Observatory Captures Solar Images](#)

[Detection of Anticancer Drug Methotrexate known for Toxicity at High Dosage](#)

[National Circular Economy Roadmap for Reduction of Plastic Waste in India](#)

[Paleoseismic Investigations Can Help Trace and Better Prepare for Future Earthquakes](#)

[New Ways to Make Non-responsive Cancer Cells Respond to Immunotherapy](#)

[Sensor to Monitor Water Quality in Real Time Developed](#)

**G-20 AND GLOBAL CHALLENGES**

[President Lula on priorities for G20 at Sherpas meeting](#)

**IN BRIEF**

[Harvesting Water from Air with Solar Power](#)

[New Conductive Cotton-based Fiber Developed for Smart Textiles](#)

[Extracting uranium from seawater as a source of nuclear fuel](#)

**RESOURCES AND EVENTS**

[French Science System Reforms](#)

[US Group Endorses Major Physics Projects](#)

## SCIENCE POLICY AND DIPLOMACY

[The EU New Rules to Regulate AI](#)  
[Three-Day GPAI Summit concludes](#)

## SCIENCE & TECHNOLOGY

### GLOBAL

#### [First CRISPR Gene Editing Therapy Approved in the U.S](#)

On December 8, the U.S. Food and Drug Administration approved a gene-editing therapy for use in patients age 12 years and older. In addition to offering hope of relief for people with severe forms of the painful blood disorder, the treatment, called Casgevy, is the world's first to genetically tweak cells using the Nobel Prize-winning molecular scissors CRISPR/Cas9. Another gene therapy for sickle cell disease, called Lyfgenia and developed by biotech company Bluebird Bio, was also approved December 8. Casgevy is like a transplant, but instead relies on a patient's own cells. Using CRISPR, the treatment alters the genetic blueprint of bone marrow cells that give rise to blood cells. The edited cells make fetal hemoglobin, a type normally made by fetuses and young babies that doesn't make red blood cells sickle and gum up vessels. Patients first receive chemotherapy to wipe out existing bone marrow cells so the new ones, which are edited in a lab, have a chance to thrive in the body. After editing, the cells are given back to the patient through an IV. Both steps require hospitalization. In a clinical trial, 29 out of 30 patients given Casgevy and followed for at least 16 months didn't have pain crises for at least a year. At the Oct. 31 meeting, advisors to the FDA also discussed the potential for unintended edits, or "off-target effects." An analysis by Vertex found no evidence of such unwanted changes in treated patients. Another concern is that the therapy is expensive, perhaps as much as \$2 million per patient. On November 16, officials in the United Kingdom became the first to approve Casgevy's use in sickle cell patients as well as people with beta-thalassemia, a blood disorder in which the body doesn't make enough hemoglobin. The FDA will decide by March 30 whether the CRISPR therapy can also be used to treat beta-thalassemia.

#### [Non-invasive Technology for Characterization of Cancer Cells](#)

Researchers from the Tokyo University of Science have successfully developed a high-throughput device that measures the electrical properties of cancer cells through continuous flow electrorotation. The new platform offers a high degree of automation and can simultaneously analyze several cells. The method uses Electrorotation (ROT) which infers permittivity and conductivity from a cell's movement in an electric field. This allows the characterization of the cell type and state by profiling its frequency-dependent rotational movement under a modulated electric field. The team developed a continuous flow ROT (cROT) using microfluidics to continuously measure cellular dynamics and simultaneously capture cells to collect measurements on one device. The researchers fabricated the new device with redesigned interdigitating electrodes that induce cell rotation and a microchannel for cell passage. The electrode geometry increases the number of cells that can be analyzed and reduces the time required to replace a cell as measurements are collected. The electrical field applied within the microchannel enables analyzing rotational behavior from a continuous flow of cells. Together, these improvements increase the automated system's throughput. They could increase measurement throughput to 2,700 cells per hour with our cROT technique. The device does not require precise cell manipulation and takes advantage of rapid image processing when

processing the cells' electrical data. This development could enable substantial advancements in cancer drug development, diagnosis, and novel cell-based therapies.

### **CAR T Cell Therapy with New Mechanism Shows Promise**

Researchers from the University of Pennsylvania have reported that a Phase I clinical trial of AT101, a new CAR T cell therapy that uses a distinct binding mechanism to target CD19, show a 100 percent complete response (CR) rate at the higher dose levels studied in the trial. The team developed a CAR T product (AT101), using cells originating from the same patient, that targets CD19 through a different epitope, located closer to the cell membrane, via a novel antibody (h1218). In preclinical studies, the team previously demonstrated that h1218-CART19 had decreased T cell exhaustion and improved control compared to FMC63-CART19. The Phase I first-in-human clinical trial (NCT05338931) was conducted in South Korea and enrolled 12 patients with relapsed or refractory B cell non-Hodgkin's lymphoma (NHL). The study was designed to increase the dose level of AT101 after safety was confirmed in the first six patients. After a median follow-up of 6.5 months, all six patients who received dose level 2 or higher experienced a complete response and their cancer has not relapsed. The initial results seem very promising, and a Phase II portion of the study is planned. The drug was found to be safe, with manageable side effects, including cytokine-release syndrome in four patients and immune-cell-related neurotoxicity syndrome in three patients. The Phase II trial will also include patients who have previously received CAR19 therapy.

### **Plant Hormone that Can Boost Plant Growth Uncovered**

Scientists from NUS and the Singapore Centre for Environmental Life Sciences Engineering (SCELSE) have uncovered one of nature's most potent tool in an arsenal to combat today's agricultural challenges: agro-microbials – or agro-chemicals of natural origin – that can enhance the synergy between crops and microbes, and ultimately improve crop yield and productivity. They discovered that a well-known protective hormone typically released by plants above ground during periods of stress – a volatile organic compound (VOC) known as methyl jasmonate (MeJA) – possessed a hitherto unknown function. They found that MeJA served as a shared, possibly secret, language that allows the plant to communicate with the surrounding layers of microorganisms embedded in the soil. The research team has filed a patent for the use of this novel application to enhance it to improve the resilience and productivity of agricultural systems. The upshot of this could be a new generation of agro-chemicals or nature-structured chemicals which can be used to enhance the benefits for plants. The team will further investigate the exact chemical nature of the compounds released by the soil microbial environment that stimulates plant growth. The team will also design an ecology-inspired microbial community to harness the new discovery of how plants enlist the help of beneficial soil microbes to trigger plant growth.

### **Blood Tests to Help Predict Organ Failure**

Researchers from Stanford Medicine at Stanford University have revealed a new, simple way of studying organ ageing using a blood test to predict individuals' risk of diseases associated with organ failure. Scientists analysed 5,678 people and identified that organs age at different rates. Researchers assessed the levels of thousands of proteins in people's blood using commercially available technologies and an algorithm of their own design to make predictions using blood test results and patient data. The study revealed that around one in five healthy adults aged 50 or older may have an organ ageing at an accelerated rate. They determined that around 1,000 of those proteins were associated with one or another single organ and identified aberrant levels of proteins that corresponded to the accelerated ageing of organs and the susceptibility to disease and mortality. After checking the levels of nearly 5,000 proteins in the

blood of nearly 1,400 people aged 20 to 90, researchers found nearly 858 organ-specific proteins. Further analysis in 50,000 to 100,000 might help in finding organs that are undergoing accelerated ageing in people's bodies, and doctors may be able to treat people before they get sick

### **New Medical Imaging Facility to Revolutionise Research and Patient Care**

The Australian National Total Body PET Facility has the potential to drive advancements in cancer studies, neurological disorders, cardiovascular disease and drug development, and reduce scanning time and radiation doses to transform patient care. It is the first Total Body Positron Emission Tomography (TB-PET) scanner for Australia-wide open access research, as well as clinical use. The \$15 million facility is a collaborative venture between the University of Sydney, the National Imaging Facility and Northern Sydney Local Health District to benefit Australian patients, clinicians, researchers and industry partners. It is a revolutionary leap forward in nuclear medical imaging. This cutting-edge device enables comprehensive whole-body imaging in a single scan, significantly reducing radiation exposure and cutting down scanning time from 20 minutes to as little as three, all while delivering higher-quality images. It is a critical tool for clinical trials and industry collaborations. The ability to image the entire human body allows researchers to observe drug absorption, accumulation and elimination processes in all organs simultaneously.

### **Biopolymers to Replace Synthetic Plastic Films**

According to new research from North Carolina State University, materials with enhanced structure derived from crustaceans and seaweed could be part of a next-generation answer to the challenge of replacing petroleum-based plastic films. Combining chitosan, a biopolymer that makes crab shells hard, with agarose, a biopolymer extracted from seaweed that is used to make gels, creates unique biopolymer composite films with enhanced strength. The films are also biodegradable, have antibacterial properties, repel water and are transparent. The findings could eventually lead to sustainable packaging films for food and consumer goods. The paper also showed that a sheet made from biopolymer composite films greatly degraded after a month underground, while, for comparison, a common plastic sandwich baggie remained completely intact after the same period underground.

### **Bimetallic Alloy Nanocatalyst Shows Promise for Carbon Free Energy**

A research team led by City University of Hong Kong (CityU) recently engineered a bimetallic alloy as an ultrathin nanocatalyst that can deliver greatly improved electrochemical performance for generating ammonia from nitrate ( $\text{NO}_3^-$ ), offering great potential for obtaining carbon-neutral fuel in the future. The team introduced another metal—iron (Fe)—to modulate the atomic coordination environment of the active sites. By changing the coordination environment of the Ru sites, the electronic structures and surface properties of Ru and hence their catalytic activity for producing ammonia are optimized. To further enhance the electrocatalyst performance, the team developed a one-pot synthesis approach for making ultrathin nanosheets that are assembled as a flowerlike structure—called RuFe nanoflowers. The novel bimetallic alloy made-electrocatalyst possesses a highly stable electronic structure due to the complementary orbitals that reach efficient electron transfer and robust valence states, which also suppresses the competitive HER and lowers the energy barriers for  $\text{NO}_3\text{RR}$ . RuFe nanoflowers demonstrated much better electrochemical performance, with an outstanding charge transfer efficiency, known as faradaic efficiency, which has potential for next-generation electrochemical energy systems.

### **New, Better Way to Develop Vaccines Discovered**

German researchers have developed a new system to display epitopes in mammal cells for immunization studies, which can help scientists greatly in immunization efforts. Scientists developed a new method to induce target-specific immune responses. By fusing antigen proteins into a tetraspanin-derived anchor membrane-bound protein, the researchers created fusion proteins that are displayed predominantly on the surface of human cells. The new display technology could be a potentially much more reliable immunization technique. The researchers were able to induce antibodies against different proteins with a focus on the receptor-binding domain of SARS-CoV-2, the virus that causes Coronavirus Disease 2019 (COVID-19). The developed anchor protein allows scientists to target a specific disease for immunization purposes without the need to purify the antigen. The researchers are convinced that this technique can speed up the immunization process enormously.

## **INDIA**

### **Aditya-L1 Solar Observatory Captures Solar Images**

The Aditya-L1 spacecraft has exited Earth's sphere of influence and is about a month away from reaching its destination at L1. The Solar Ultraviolet Imaging Telescope (SUIT) payload onboard Aditya-L1 spacecraft captured the sun's full disk earlier this week. The pictures reveal a handful of features on the sun's surface, including a few sunspots, a solar "plage" and some silent, inactive areas. Scientists turned on the instrument on Nov. 20, according to the Indian Space Research Organisation (ISRO), which is operating the Aditya-L1 solar observatory in collaboration with multiple institutions located in Ahmedabad, Pune and Kerala.

### **Detection of Anticancer Drug Methotrexate known for Toxicity at High Dosage**

Scientists of the Institute of Advanced Study in Science and Technology (IASST) have found a new highly fluorescent material with exceptional optical properties, developed using phosphorene, cystine, and gold (Ph-Cys-Au) which can be used as a visual sensing platform for detecting anti-cancer drug MTX. The overdosage of MTX has toxic effects on lungs, stomach, and heart. Methotrexate (MTX) is a widely used anti-cancer drug. This non-enzymatic approach for the detection of anticancer drug Methotrexate can help cytotoxicity screening for therapeutic analysis. The developed sensing platform outperforms all former systems as the materials are biocompatible with an appreciable detection limit. The material shows a detection limit of about 0.0266 nM (for a linear range of 0–140  $\mu$ L) and 0.0077 nM (for a linear range of 160–260  $\mu$ L). Moreover, the nanocomposite exhibited in vitro cytotoxicity towards cancerous cells, but it was non-cytotoxic for non-cancerous cells.

### **National Circular Economy Roadmap for Reduction of Plastic Waste in India**

Union Minister Dr Jitendra Singh released a flagship document on 'National Circular Economy Roadmap for reduction of Plastic waste in India', a collaborative exercise between leading research institutions from India and Australia. The document aims to foster research and industry partnerships between the two countries and co-develop a roadmap for India's transition to a circular economy in the Plastics sector. India and Australia are active participants in the negotiations for formulation of a Global Plastics Treaty to be finalized next year. Both countries aim to leverage their respective strengths in waste management, recycling policies, and environmental initiatives to foster a circular economy that prioritizes resource efficiency and environmental protection. India remains committed to address the plastic waste challenges and consequential human health and ecological impact concerns. Reducing Plastic Waste in India will help drive the transformation of the plastic waste economy in India into a circular economy. The introduction of the Plastic Waste Management Rules in 2016 for India has led to a raft of measures directed at municipal, industry, residential and commercial actors.



### **Paleoseismic Investigations Can Help Trace and Better Prepare for Future Earthquakes**

Scientists from Indian Institute of Geomagnetism (IIG), identified seismogenic liquefaction features at three trench sites in the floodplain deposits of Kolong River, near Kopili fault (KF) zone which is known to have experienced large earthquakes in 1869 and 1943. The liquefaction features include multiple sand dykes and sand sills and are a direct response to liquefaction of saturated sediment induced during past seismic activity. A total of seven samples from marker horizons have been processed to constrain the chronology of liquefaction features using a technique called optically stimulated luminescence (OSL) dating technique. The OSL age constraints indicate two earthquakes induced liquefaction in the vicinity of the KF during the past around 480 years. These details in turn will help in interpretation of long-term rupture history of faults and intraplate seismicity. The study demonstrates that the paleoseismic investigations can provide useful information on past earthquakes through recognition of liquefaction features in the absence of surface rupture.

### **New Ways to Make Non-responsive Cancer Cells Respond to Immunotherapy**

Researchers at the Indian Institute of Science (IISc), in a new study, have tried to understand how different types of cancer cells respond to Interferon-gamma (IFN- $\gamma$ ) activation. In the study they found that only some types of cancer cells respond well to IFN- $\gamma$  activation, while others don't. They also suggest some approaches that can be used to make these non-responsive cancer cells better respond to immunotherapy. IFN- $\gamma$  is produced by immune cells such as T cells or natural killer cells. It binds to tumours, and induces apoptosis (cell death). Reports in the literature have shown earlier that if there are lower amounts of IFN- $\gamma$  or defects in its signalling, then the tumours don't respond well to the immunotherapy processes. They found that the higher amounts of lactic acid produced in the cell culture medium was due to increased glycolysis, a series of chemical reactions that extracts energy from glucose. The team found that cancer cell lines derived from the liver and the kidney showed increased production of nitric oxide (NO) and lactic acid upon IFN- $\gamma$  activation. This, in turn, increased the production of toxic reactive oxygen species (ROS) leading to oxidative damage, which eventually kills the cancer cells. However, cancer cell lines derived from the colon and skin did not produce NO or lactic acid even after being treated with IFN- $\gamma$ , indicating that they might respond poorly to immunotherapy.

### **Sensor to Monitor Water Quality in Real Time Developed**

IIT Delhi has developed a sensor for real-time water quality monitoring using electricity-generating microorganisms. Known as "electroactive microorganisms", these microbes generate electric current and are widely researched for power generation but can also be used for bio-sensing. The bio-electrochemical sensor developed used "weak electricigens", a category of electroactive microbes that are known for generating low electric charges. When they encounter a pollutant, their output decreases. By measuring their extracellular current continuously, the approach facilitates real-time monitoring of water quality. Such technology could act as an early-warning system to be used in tandem with conventional monitoring methods that can be expensive or not amenable to 24/7 operation. In future, such technology may also be useful for detecting emerging contaminants that are not typically covered in routine tests. Such technology could act as an early-warning system to be used in tandem with conventional monitoring methods that can be expensive or not amenable to 24/7 operation. In future, such technology may be useful for detecting emerging contaminants, not usually identifiable.

### **President Lula on priorities for G20 at Sherpas meeting**

Presiding over the G20, Brazilian President Luiz Inácio Lula da Silva advocated the creation of international tax mechanisms to help finance sustainable development and reduce the inequality among nations. The motto of the Brazilian presidency is “Building a just world and a sustainable planet.” President Lula said he intends to encourage international financial institutions to cut surcharges, increase the volume of concessional resources, and devise formulas to reduce risks. He spoke at the joint meeting of the tracks for Finance and Sherpas of the bloc, which Brazil has been chairing since December 1, 2023, and will chair until November 30, 2024. One of the priorities of the Brazilian mandate is the defense of the reform of global governance and financing institutions aimed at reflecting present geopolitics. President Lula has argued that the current governance model, created after the Second World War, is anachronistic and no longer represents 21st century dynamics. In his view, there needs to be adequate representation of emerging countries in bodies such as the United Nations Security Council and in financing institutions such as the World Bank and the International Monetary Fund (IMF). Brazil’s second priority at the helm of the G20 is tackling climate change with a focus on the energy transition, as well as the promotion of sustainable development in its economic, social, and environmental dimensions. He said that access to technology is fundamental not only for a just energy transition, but also in the digital field. Brazil’s work ahead would include an initiative for bioeconomy and a task force against climate change. The focus of the task force, the president said, will be to promote national plans for ecological transformation, taking into account the impact of global warming on the most vulnerable. Bioeconomy, on the other hand, is a “promising avenue” for a number of developing countries. The third and final priority in the Brazilian mandate is social inclusion and the fight against inequality, hunger, and poverty. Brazil will also create a task force against hunger, with the proposal of a global alliance based on three pillars: national commitments, to promote public policies with proven effectiveness; and finances. The meeting of the sherpas discussed the items that make up the summit’s agenda. The Finance Track meeting, which gathers deputy finance ministers and vice-presidents of G20 central banks. Brazil has been proposing a rapprochement between these two bodies, so they can work in a more coordinated way. The G20 Leaders Summit will be held on 18-19 November 2024 in Rio de Janeiro.

## **IN BRIEF**

### **Harvesting Water from Air with Solar Power**

Researchers from China have developed a promising new solar-powered atmospheric water harvesting technology that could help provide enough drinking water for people to survive in difficult, dryland areas: They synthesized a super hygroscopic gel using plant derivatives and hygroscopic salts capable of absorbing and retaining an unparalleled amount of water. One kilogram of dry gel could adsorb 1.18 kilograms of water in arid atmospheric environments and up to 6.4 kilograms in humid atmospheric environments. This hygroscopic gel was simple and inexpensive to prepare and would consequently be suitable for large-scale preparation. The team built a prototype device with desorption and condensation chambers, configured in parallel. They employed a turbofan in the condensation chamber to increase the recovery of desorbed water to more than 90%. In an outdoor demonstration, the team found it released adsorbed water even in the morning or afternoon when the sun is weak. The system could also achieve simultaneous adsorption and desorption during the daytime. The team will work to achieve simultaneous adsorption and desorption using renewable energy to maximize daily water yield per unit mass of adsorbent to further optimize the system's performance for

practical applications in water generation. In addition to daily water production, sorbent materials that harvest atmospheric water could also play an important role in future applications such as dehumidification, agriculture irrigation, and thermal management for electronic devices.

#### **New Conductive Cotton-based Fiber Developed for Smart Textiles**

Washington State University have developed a fibre which has the flexibility of cotton and the electric conductivity of a polymer, called polyaniline. The newly developed material showed good potential for wearable e-textiles. The researchers used polyaniline, also known as PANI, a synthetic polymer with conductive properties and dissolved cotton cellulose from recycled t-shirts into a solution and the conductive polymer into another separate solution. These two solutions were then merged together side-by-side, and the material was extruded to make one fiber. The result showed good interfacial bonding, meaning the molecules from the different materials would stay together through stretching and bending. Achieving the right mixture at the interface of cotton cellulose and polyaniline was a delicate balance. The WSU researchers tested the fibers with a system that powered an LED light and another that sensed ammonia gas. This could enable integrating fibers like these into apparel as sensor patches with flexible circuits in uniforms for firefighters, soldiers or workers who handle chemicals to detect for hazardous exposures. Other applications include health monitoring or exercise shirts that can do more than current fitness monitors.

#### **Extracting uranium from seawater as a source of nuclear fuel**

Researchers from China have developed an electrode material that could be used in the electrochemical capture of uranium ions from seawater. To make the electrodes, the team began with flexible cloth woven from carbon fibers. They coated the cloth with two specialized monomers that were then polymerized. Next, they treated the cloth with hydroxylamine hydrochloride to add amidoxime groups to the polymers. The natural, porous structure of the cloth created many tiny pockets for the amidoxime to nestle in and easily trap the uranyl ions. In experiments, the researchers placed the coated cloth as a cathode in either naturally sourced seawater, added a graphite anode and ran a cyclic current between the electrodes. Over time, bright yellow, uranium-based precipitates accumulated on the cathode cloth. In the tests using seawater collected from the Bohai Sea, the electrodes extracted 12.6 milligrams of uranium per gram of water over 24 days. The researchers say that this work offers an effective method to capture uranium from seawater, which could open up the oceans as new suppliers of nuclear fuel.

### **RESOURCES & EVENTS**

#### **French Science System Reforms**

The French government has announced a series of measures to overhaul the country's organization of research, which President Emmanuel Macron claims will reduce bureaucracy and place science at the heart of political decision-making. They include the creation of a Presidential Science Council, a group of 12 leading scientists that will meet several times a year and advise the president on research strategy and key issues facing scientists. Macron presented the billion-euro plan to around 300 researchers, politicians and business leaders on 7 December. Over the next 18 months, the country's seven national research institutes will be transformed into 'programme agencies', each responsible for the strategy and coordination of all research on a particular theme. Under the reformed system, the Alternative Energies and Atomic Energy Commission will oversee all research on low-carbon energy technology, digital



systems and infrastructure, the biomedical institute Inserm will be in charge of health research and the national research agency CNRS will oversee marine, climate and biodiversity research in collaboration with French Research Institute for Exploitation of the Sea and the Research Institute for Development. Macron also promised further reforms that will improve the autonomy of universities, giving them oversight of university-based research groups that include researchers from the national agencies. He also pledged measures to save researchers' time, such as cutting the number of quality assessments, making grant-funding decisions within six months instead of a year and encouraging collaborations between universities and public research institutions "to increase fluidity".

### **US Group Endorses Major Physics Projects**

The United States should fund proposed projects to dramatically scale up its efforts in five areas of high-energy physics, an influential panel of scientists has concluded. Topping the ranking is the Cosmic Microwave Background–Stage 4 project, or CMB-S4, which is envisioned as an array of 12 radio telescopes split between Chile's Atacama Desert and the South Pole. It is designed to look for indirect evidence of physical processes in the instants after the Big Bang — processes that have been mostly speculative so far. The other four priorities are experiments to study the elementary particles called neutrinos, both coming from space and made in the laboratory; the largest-ever dark-matter detector; and strong US participation in a future overseas particle collider to study the Higgs boson. An ad hoc group called the Particle Physics Project Prioritization Panel (P5) presented the recommendations on 7 December. The committee, which is convened roughly once a decade, was charged to make recommendations for the two main US agencies that fund research in high-energy physics, the Department of Energy (DoE) and the National Science Foundation (NSF). In addition to the five key recommendations, the report says that the United States should embark on a programme to demonstrate the feasibility of two completely new kinds of particle accelerator. The P5 also endorsed smaller-scale projects. But its strongest recommendation is for uninterrupted US funding of experiments that are either ongoing or under construction. These include the first major upgrade of the Large Hadron Collider (LHC), which will keep the collider — at CERN, Europe's high-energy physics lab near Geneva, Switzerland — going throughout the 2030s. The P5's priorities were selected from proposals presented by the broader research community, balanced against realistic funding levels.

## **SCIENCE POLICY AND DIPLOMACY**

### **The EU New Rules to Regulate AI**

The European Union has agreed on the details of the AI Act, a far-reaching set of rules for the people building and using artificial intelligence. It's a milestone law that, lawmakers hope, will create a blueprint for the rest of the world. After months of debate about how to regulate companies like OpenAI, lawmakers from the EU's three branches of government—the Parliament, Council, and Commission—spent more than 36 hours in total thrashing out the new legislation. The EU AI Act is the most sweeping rulebook of its kind for the technology. It includes bans on biometric systems that identify people using sensitive characteristics such as sexual orientation and race, and the indiscriminate scraping of faces from the internet. Lawmakers also agreed that law enforcement should be able to use biometric identification systems in public spaces for certain crimes. New transparency requirements for all general purpose AI models, like OpenAI's GPT-4, which powers ChatGPT, and stronger rules for "very powerful" models were also included. Companies that don't comply with the rules can be fined up to 7 percent of their global turnover. The bans on prohibited AI will take effect in six months,

the transparency requirements in 12 months, and the full set of rules in around two years. Measures designed to make it easier to protect copyright holders from generative AI and require general purpose AI systems to be more transparent about their energy use were also included. The major point of disagreement during the final discussions was whether law enforcement should be allowed to use facial recognition or other types of biometrics to identify people either in real time or retrospectively.

### **Three-Day GPAI Summit concludes**

India, the Chair of the Global Partnership on Artificial Intelligence (GPAI), successfully hosted the GPAI Summit from December 12 - 14, 2023, at New Delhi. Over 30 sessions were organized, which were graced by the global AI experts from GPAI, International Organisations, Industry / Startups, and Academia. Some of these sessions were held in closed door meetings having delegates and experts of GPAI. Other sessions were held in public and live streamed for the wider participation. More than 22,000 persons attended the summit and out of these 15,000+ AI enthusiasts participated in the summit virtually. The GPAI New Delhi Declaration was based on the consensus among GPAI members on advancing safe, secure, and trustworthy AI and commitment to supporting the sustainability of GPAI projects. The event brought together all major initiatives for AI – UN Advisory Group on AI, and the UK AI Safety Summit. 29 countries of the GPAI have unanimously adopted the GPAI New Delhi Declaration, which promises to position GPAI at the front and center of shaping the future of AI in terms of both innovation and creating collaborative AI between the partner nations. Countries agreed to create applications of AI in healthcare, agriculture, and many other areas that concern all our countries and all of our people. The detailed information on the summit is available at <https://gpaidelhi2023.indiaai.gov.in/>.

We welcome your comments and valuable suggestions. Please write to us for receiving publications, updates and notices regarding seminars, conferences etc. Contact us at [science.diplomacy@ris.org.in](mailto:science.diplomacy@ris.org.in)

### **NOTE TO OUR READERS AND STAKEHOLDERS:**

We request your cooperation to review the Alerts and improve its content. For this purpose please complete the form at <https://forms.gle/o4d869FxaM9t3KNw7>, and submit it. Your support and cooperation is appreciated. Access to previous issues of [this newsletter here](#).