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SCIENCE & TECHNOLOGY

GLOBAL

[Brain–spine Interface Enables Natural Walking](#)

Researchers at Ecole Polytechnique Fédérale de Lausanne (EPFL) in Switzerland have now developed a brain–spine interface (BSI) that can restore communication between the brain and neurons located in the lumbosacral spinal cord. The BSI comprises two fully implantable systems that record cortical activity and stimulate the lumbosacral spinal cord in real time. To monitor electrocorticographic (ECoG) signals from the brain, the team used a 64-channel electrode grid embedded in a 50 mm diameter titanium case with the same thickness as the skull. A processing unit uses ECoG signals recorded from brain regions that control movement to predict the user’s motor intentions, and then converts these intentions into stimulation commands that activate leg muscles. Electrical stimulation is delivered to the targeted region using an implantable pulse generator connected to a 16-electrode paddle lead. The whole system operates wirelessly, allowing the user to move around independently. The team developed a dedicated algorithm based on artificial intelligence methods able to decode in real time the intention of movement of the patient. The BSI was tested with a 38-year-old male who had an incomplete cervical spinal cord injury from a bike accident 10 years earlier. After several minutes of training with the BSI, the participant was able to walk naturally and independently. When the BSI was turned off, he instantly lost the ability to take steps; walking resumed as soon as it was turned back on. The BSI remained reliable and stable for over one year of use, including at home without supervision. After completing 40 sessions of neurorehabilitation the participant was able to walk with crutches, even when the implant was switched off, and exhibited improvements in all conventional clinical assessments.

[Gene Engineered Cell Therapy for Metastatic Melanomas](#)

Brigham and Women’s Hospital researchers have developed a ‘twin stem cell model’ therapy to treat melanoma brain metastases. One stem cell releases a tumor-attacking virus while the other, genetically modified to resist the virus, strengthens the immune system. This locally delivered therapy, successful in preclinical mouse models, holds promise for future clinical

trials. One stem cell releases a cancer-killing (oncolytic) virus, a strategy that has previously shown promise in reducing tumor growth. Using stem cells to deliver the virus amplifies the amount of virus that can be released and ensures that the virus will not be degraded by circulating antibodies before it is released on the cancer cells. The team used CRISPR/Cas9 gene editing to create a second stem cell that cannot be targeted by the oncolytic virus, and which instead releases proteins (immunomodulators) that fortify the immune system to help fight off the cancer. The twin stem cells can be delivered via intrathecal injection, a technique already used in the treatment of other diseases. Unlike other immunotherapies that have emerged in recent years, it does not need to be repeatedly administered. The scientists consider that this approach can be used in other cancers with brain metastasis, such as lung and breast cancer, and are working to design similar treatments for these cancers.

3D Printing for “Designer” Titanium Alloys

Researchers led by RMIT University Australia, have developed a new class of ductile and strong titanium alloys using a combination of alloy design and 3D printing. The development could revolutionize applications in various sectors, including aerospace and energy, and promote sustainability by enabling the production of these alloys from industrial waste and low-grade materials. These alloys consist of a mixture of two forms of titanium crystals, called alpha-titanium phase and beta-titanium phase. The research team investigated the use of oxygen and iron and used Laser Directed Energy Deposition (L-DED), a 3D printing process to print their alloys from metal powder. The new titanium alloy system is capable of a wide and tunable range of mechanical properties, high manufacturability, enormous potential for emissions reduction, and insights for materials design in similar systems. There is a potential opportunity for industry to reuse waste sponge titanium-oxygen-iron alloy, recycled high-oxygen titanium powders or titanium powders made from high-oxygen scrap titanium using this approach. This work may provide a template to mitigate oxygen embrittlement issues through 3D printing and microstructure design in other alloys.

AI Innovation Decodes Electrocardiograms

Mount Sinai researchers have developed an innovative artificial intelligence (AI) model for electrocardiogram (ECG) analysis that allows for the interpretation of ECGs as language. This approach can enhance the accuracy and effectiveness of ECG-related diagnoses, especially for cardiac conditions where limited data is available on which to train. The team’s new deep learning model, known as HeartBEiT, forms a foundation upon which specialized diagnostic models can be created. The team noted that in comparison tests, models created using HeartBEiT surpassed established methods for ECG analysis. Researchers are using a related image-generating model to create discrete representations of small parts of the ECG, enabling analysis of the ECG as language. These representations may be considered individual words, and the whole ECG a single document. The model was tested on patients having a heart attack, if they have a genetic disorder called hypertrophic cardiomyopathy, and how effectively their heart is functioning. In each case, our model performed better than all other tested baselines. This method could augment the ability of ECGs to detect heart problems and monitor the heart’s health.

Megawatt Electrical Motor Could Help Electrify Aviation

MIT engineers are now creating a 1-megawatt motor that could be a key stepping stone toward electrifying larger aircraft. The team has designed and tested the major components of the motor, and shown through detailed computations that the coupled components can work as a whole to generate one megawatt of power, at a weight and size competitive with current small aero-engines. For all-electric applications, the team envisions the motor could be paired with a source of electricity such as a battery or a fuel cell. The motor could then turn the electrical energy into mechanical work to power a plane's propellers. The electrical machine could also be paired with a traditional turbofan jet engine to run as a hybrid propulsion system, providing electric propulsion during certain phases of a flight. The team can demonstrate the electric motor as a whole, they say the design could power regional aircraft and could also be a companion to conventional jet engines, to enable hybrid-electric propulsion systems. The team also envisioned that multiple one-megawatt motors could power multiple fans distributed along the wing on future aircraft configurations. Looking ahead, the foundations of the one-megawatt electrical machine design could potentially be scaled up to multi-megawatt motors, to power larger passenger planes.

[Air Pollution May Increase Risk of Dementia](#)

Scientists at the Harvard T.H. Chan School of Public Health have done a new meta-analysis which suggests that exposure to fine particulate air pollutants (PM_{2.5}) may be linked to an increased risk of dementia. The results can be used by organizations like the Environmental Protection Agency, which is currently considering strengthening limits on PM_{2.5} exposure. The study is the first systematic review and meta-analysis to use the new Risk of Bias In Non-Randomized Studies of Exposure (ROBINS-E) tool, which addresses bias in environmental studies in greater detail than other assessment approaches. The majority of the research was about PM_{2.5}, with nitrogen dioxide and nitrogen oxide being the next most common pollutants studied. The researchers found consistent evidence of an association between PM_{2.5} and dementia, even when annual exposure was less than the current EPA annual standard of 12 micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$). In particular, among the studies using active case ascertainment, the researchers found a 17 per cent increase in risk for developing dementia for every 2 $\mu\text{g}/\text{m}^3$ increase in average annual exposure to PM_{2.5}.

[Aluminium-ion batteries with Improved Storage Capacity](#)

A research team led by University of Ulm has developed a positive electrode material consisting of an organic redox polymer based on phenothiazine. In the experiment, aluminium batteries with this electrode material stored a previously unattained capacity of 167 milliampere hours per gram (mAh/g). The organic redox polymer thus surpasses the capacity of graphite, which has mostly been used as an electrode material in batteries to date. The researchers used the ionic liquid ethylmethylimidazolium chloride as electrolyte with added aluminium chloride. After 5,000 charge cycles at 10 C, battery retains 88 percent of its capacity. The electrode material represents a major advance in the development of rechargeable aluminium batteries and thus of advanced and affordable energy storage solutions.

INDIA

[Li-ion Battery Recycling Technology Transferred](#)

Ministry of Electronics and Information Technology (MeitY) transferred cost effective Li-ion battery recycling technology to nine recycling industries and start-ups today as part of Mission

LiFE under “Promote circularity campaign”. The indigenously developed technology could process assorted types of discarded Li-ion batteries, recovering more than 95 per cent Lithium (Li), Cobalt (Co), Manganese (Mn) and Nickel (Ni) contents in the form of their corresponding oxides/carbonates of about 98 per cent purity. The recycling process involves leaching followed by hierarchical selective extraction of metals through solvent extraction process. These secondary raw materials could be used for battery manufacturing or in other potential applications. The technology was developed by the Centre for Material for Electronics Technology (C-MET), Hyderabad.

Restoring Wastewater from Crude Oil Excavation and Processing

Scientists of the Institute of Advanced Study in Science and Technology (IASST), have developed a green process for the treatment of formation water. Formation water is disposed in huge volumes during crude oil excavation and processing. They used a mixture consisting of plant-based biomaterial, biosurfactant, which are secondary metabolites of microbes, and NPK fertilizer, to efficiently restore formation water. Around 2.5 gm of the formulation could treat one litre of formation water in 12 hours. The team has filed an Indian patent on the development. The “wonder mixture” can help prevent pollution of the environment from forming water and render it reusable for maintaining the green revolution. This can help enhance crop production to meet the ever-growing food demand.

Desiccation-tolerant Vascular Plant Species Discovered

A recent study by scientists from Agharkar Research Institute (ARI) Pune, has identified 62 Desiccation-tolerant vascular (DT) plant species in the Western Ghats, many more than the earlier known nine species. 16 species are Indian endemic, and 12 are exclusive to the Western Ghats outcrops, highlighting the area's importance as a global DT hotspot. In addition to rock outcrops, tree trunks in the partially shaded forests were also found to be crucial habitats for DT species, as per the study. The team of researchers scrutinized outcrop species for their DT properties by seasonal field observations, followed by relative water content estimation protocols. This work could have applications in agriculture, particularly in areas with scarcity of water.

Solution for Plastic Pollution of the Environment

Institute of Chemical Technology (ICT) Mumbai developed a process called ICT-Poly Urja which uses indigenously prepared patented Cu@TiO₂ catalyst for CTL (Catalytic Thermo Liquefaction) of several types of poly-olefinic plastic waste into HC-Oil 300 C in 30 min. The process leads to more than 85% feedstock conversion, and high-quality C and H elements enriched HC-Oil with a calorific value of 42 MJ/kg. The fuel can be burned to generate steam and power. In comparison to traditional technologies such as pyrolysis and gasification, the CTL process requires significantly less energy due to moderate operating conditions. Besides, the plant can also be mounted on a mobile vehicle and the mobile plant provides several benefits in terms of operation and overall process economics. The Poly-Urja process provides a long-term, resilient, convenient, energy-efficient, and environmentally responsible method of transforming plastic waste into electricity. The Pilot scale vehicle mounted plant to convert 100kg/day of plastic waste into hydrocarbon oil is under fabrication and is scheduled to be ready by the end of 2023.

Diagnosis of Peptic Ulcer & Disease Stage by Breath Patterns

A research team at S. N. Bose National Centre for Basic Sciences, Kolkata has developed a non-invasive method of recognising breath patterns that can help rapid, one-step diagnosis and classification of various gastric disorders like dyspepsia, gastritis, and gastroesophageal reflux disease (GERD). The team used machine learning (ML) protocol to extract information from the large complex breathomics datasets generated from exhaled breath analysis and can distinguish three different risk zones for early and late-stage gastric conditions and precise transition from one disease state to another state. The scientists have developed a prototype device called "Pyro-Breath" clinically validated it in a hospital environment and patented it. The relevant technology has been transferred through NRDC, New Delhi to a startup company for potential commercialization.

Agni Prime' Ballistic Missile Successfully Flight-tested

The New Generation Ballistic Missile 'Agni Prime' was successfully flight-tested by the Defence Research and Development Organisation (DRDO) on June 07, 2023. During the flight test, all objectives were successfully demonstrated. This was the first pre-induction night launch conducted by the users after three successful developmental trials of the missile, validating the accuracy and reliability of the system. Range Instrumentation like Radar, Telemetry and Electro Optical Tracking Systems were deployed at different locations, including two down-range ships, at the terminal point to capture flight data covering the entire trajectory of the vehicle. This flight-test has paved the way for induction of the system into the Armed Forces.

Tactical LAN Radio for Indian Army

The Indian Army has signed a procurement contract through Innovations for Defence Excellence (iDEX) on 09 June 2023 with M/s Astrome Tech Pvt Ltd, Bangalore for procurement of indigenously developed Tactical LAN Radio. The system is being developed indigenously for creating secure tactical LAN in remote and difficult terrain. 'Tactical LAN Radio' is a state of the art high bandwidth backhaul wireless radio equipment for provisioning of reliable and failsafe communication. The solution offers an enhanced range of communication and embedded frequency hopping mechanism to preclude chances of interception and long-range point-to-multipoint high-bandwidth communication. The system also incorporates the enhanced safety features and can operate continuously for 48 hours on a single set basis without any breakdown.

Low-cost Method to Secure Long-distance Communication

Scientists at the Quantum Information and Computing (QuIC) lab at the Raman Research Institute (RRI) have devised a method to overcome distortion due to photon-polarization posed by the constant movement of satellites as well as scrambling of polarization in optical fibres and achieved secure long-distance communication without use of conventional active-polarization tracking devices which are costly. In order to counter possible data breaches by miscreants and secure communication for both personal and strategic purposes like defence and national security, they have tried to solve the problem using a method to perform entanglement-based QKD called BBM92 QKD protocol. Using this approach, the need for having resource-intensive and complex conventional active-polarization tracking is negated, wherein all real-time polarization tracking is done by placing feedback-based mechanisms at regular intervals. Their approach uses novel optimization methods to achieve the best trade-off between the key rate,

the quantum-bit-error-rate (QBER-- indicative of the errors in the protocol), and a balanced key symmetry. The solution could be cost-effective.

[IISc Develops Test for Early Detection of Diabetes](#)

The Indian Institute of Science (IISc), along with collaborators from the University of Gothenburg, Sweden, has developed a novel assay that can help detect diabetes early. The team is currently working with an industry collaborator to develop the kit into a handheld device, which can eventually be mass-produced. Using the assay they developed, the team was able to detect somatostatin levels in the pancreatic cells extracted from mice and humans. They also found that the number of delta cells was drastically reduced in diabetic patients compared to healthy people. The new test kit can replace Radioimmunoassay, which is a difficult method currently used to detect somatostatin levels.

G-20 AND GLOBAL CHALLENGES

[3rd G20 Health Working Group Meeting](#)

The 3rd G20 Health Working Group Meeting, Hyderabad (4-6 June), focused on several key priorities - (1) health emergencies prevention, preparedness and response with a focus on antimicrobial resistance, (2) One Health framework, (3) strengthening cooperation in the pharmaceutical sector with a focus on access and availability to safe, effective, quality and affordable medical countermeasures (Vaccines, Therapeutics and Diagnostics), and (4) Digital Health innovations and solutions to aid universal health coverage and improve healthcare service delivery. Side events covered Medical Value Travel, Impact of Climate Change on Health, the application and relevance of Traditional Medicine in the Health Sector today. A field trip was organized for the G20 delegates to visit the Genome Valley which is India's first organized cluster for Life Sciences R&D located in Hyderabad, including Bharat Biotech International which had rolled out Covaxin, India's indigenous Covid-19 vaccine in collaboration with the Indian Council of Medical Research (ICMR).

[G20 Development Ministers' Meeting in Varanasi](#)

The G20 Development Ministers' Meeting was held between June 11 - 13 in Varanasi, Uttar Pradesh. Union Minister of External Affairs Dr S. Jaishankar chaired the meeting which addressed major developmental challenges. The meeting follows the Voice of the Global South Summit that was hosted by India in January 2023, and the decisions taken at the Varanasi meeting will also contribute to the United Nations SDG Summit which will take place in September in New York. The meeting consisted of two main sessions, one on "Multilateralism: Collective Actions for Accelerating Progress towards SDGs" and another on "Green Development: A LiFE (Lifestyle for Environment) Approach". PM Modi addressed the meeting, and underlined that India is willing to share its experience with partner countries and expressed hope that discussions will result in tangible actions to promote data for discourse, development and delivery in developing countries. The meeting agreed unanimously on a G20 action plan on accelerating progress towards the SDGs, and G20 High level principles on Lifestyle for Sustainable Development.

IN BRIEF

[Hydrogels for Drug Release and Cell Culture](#)

Researchers at Karolinska Institute have found that recombinant spider silk protein hydrogels allow encapsulation of cells and bioactive molecules. The mechanical properties of these hydrogels match those of different tissues, and the gels can be used for continuous drug release. They have previously developed a biomimetic spider silk production method, which enables the production of artificial spider silk proteins and fibers, without involving harsh organic solvents. Recently, the team discovered that recombinant mini-spidroins form hydrogels within minutes, if incubated at 37°C, i.e., without the use of crosslinkers. The temperature and time range for gel formation are compatible with most bioactive agents and living cells, and the gels are composed of a nano-sized fibrillar network, opening-up possibilities of developing a novel hydrogel system for cell culture and tissue engineering. The hydrogels have potential applications in drug delivery. Encapsulated ARPE-19 cells are viable and continuously produce the growth factor progranulin, which is released from the cells, then diffuses through the hydrogel and is detected in the cell culture medium over the study period of 31 days.

Herbal Compound to Help Fight Arthritis

A team of researchers at Osaka University has discovered a protein complex that plays a role in accelerating rheumatoid arthritis. This complex consists of two proteins, specifically COMMD3 and COMMD8. Furthermore, they discovered that celastrol, a compound extracted from the root of a medicinal plant *Tripterygium wilfordii*, commonly referred to as the “Thunder God vine”, is an effective inhibitor of the COMMD3/8 complex. Celastrol is known to have anti-inflammatory properties, though its mechanism of action is not fully elucidated. The study showed that celastrol binds to COMMD3 covalently and prevents the formation of the COMMD3/8 complex, thus impairing the antibody response and blocking the progression of rheumatoid arthritis in the mouse model. Celastrol could have potential for developing treatments against rheumatoid arthritis and other autoimmune diseases in the future.

Foldable Phased-array Transmitters for Small Satellites

A team from Tokyo Institute of Technology (Tokyo Tech) in Japan has developed a deployable foldable transmitter for small LEO satellites operating in the Ka band. The 64-element active phased-array transmitter, uses stacked liquid crystal polymer (LCP) layers to create foldable creases without hampering electrical connections. The new design could make research and implementation of space technologies more accessible to private companies and startups. By controlling each phase of antenna element independently, the proposed transmitter could work properly at bending angles ranging from -10° to 20° . After thorough testing, the team reported a high isotropic radiated power of 46.7 dBm for a remarkably lightweight antenna. With the flexible hetero-segment LCP board, the proposed phased-array transmitter weighed only 9.65 g with 64 antenna elements.

A New Magnetizable Shape Memory Alloy

Researchers from Tohoku University has made a significant breakthrough, developing a palladium-based (Pd) metamagnetic shape memory alloys (MMSMA) that exhibits low energy loss. Even at low temperatures of around 100 K this energy loss was lowered to only about 1/100 when compared to existing MMSMAs. X-ray diffraction measurements revealed that the crystals within these alloy structures could change easier and this explained why it displayed a smaller energy loss compared to existing Shape Memory Alloys (SMA).

[Juice from Japanese Fruit Benefits Cardiovascular Health,](#)

Researchers at Temple University have found that cardiovascular disease risk may be reduced with a simple juice concentrate from the Japanese plum (*Prunus mume*) – a fruit that is widely consumed in Asian countries and that is promoted as a health food in Japan. The raw fruit of the Japanese plum, traditionally referred to as “Ume” in Japan, contains toxins, and it is therefore often processed into juices or wine that are safe for consumption. The infused juice concentrate, known as bainiku-ekisu, has been consumed in Japan as a health supplement since at least the 18th century. In tests, mice given bainiku-ekisu did not develop hypertension, and in these animals tissue analysis indicated that the juice concentrate protected the vasculature from the effects of angiotensin II. The team plans to identify the specific compounds in bainiku-ekisu that are responsible for its protective effects.

RESOURCES & EVENTS

[WMO to Monitor GHG to Support Paris Agreement](#)

The World Meteorological Congress – the supreme body of World Meteorological Organization (WMO) – has approved a new greenhouse gas (GHG) monitoring initiative to support implementation of the Paris Agreement on climate change. The Global Greenhouse Gas Watch aims to “fill critical information gaps and provide an integrated, operational framework which brings under one roof all space-based and surface-based observing systems, as well as modelling and data assimilation capabilities.” The initiative seeks to facilitate comprehensive, timely, free, and unrestricted international exchange of surface- and space-based GHG observations and modeling products. It will build on WMO’s experience in coordinating collaborative efforts in weather prediction and climate analysis and on GHG monitoring and research carried out under the 1989 Global Atmosphere Watch and its Integrated Global Greenhouse Gas Information System. The Global Greenhouse Gas Watch will consist of four main components: (1) observations of carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) concentrations (2) Prior estimates of the GHG emissions (3) global high-resolution Earth System models representing GHG cycles and (4) model calculations to generate products of higher accuracy.

[Universities Call for an Africa-EU Science Fund](#)

Universities are calling on policymakers to pilot a science fund for research and innovation cooperation between the African Union and the EU. The two blocs are set to deepen their long-term R&I cooperation on 13 June with the signing of the AU-EU Innovation Agenda, which promises to accelerate talent circulation, help develop research infrastructures and foster the emergence of joint centres of excellence. Universities want the ambition to be backed with dedicated funding, but this isn’t likely to materialise in the next few years, because the EU does not start its next budget cycle until 2028. However, the universities hope a joint fund could be tried from 2023 onwards. There are four priority areas for science cooperation: the green transition; innovation and technology; public health; and capacities for science and higher education. But to make it a success, cooperation along three strands is needed - providing support to individual researchers; investment in joint centres of excellence; and investment in research infrastructures. The new innovation agenda could be a new way of managing science cooperation; if successful, it could apply beyond Africa.

[Spain Signs the Artemis Accords](#)

Spain became the 25th country to sign up, following recent signatories the Czech Republic in early May and Nigeria and Rwanda in December last year. The Artemis Accords are a broad, non-binding framework with the goal of fostering responsible and peaceful international exploration of the moon. The agreements are a key part of the United States' strategy for returning astronauts to the lunar surface and exploring Earth's nearest neighbourhood in a sustainable fashion over the long haul. The U.S. is not the only nation seeking support for moon projects. China is seeking to build support for its own lunar initiative, the International Lunar Research Station, and recently established an organization to help coordinate the project.

SCIENCE POLICY AND DIPLOMACY

[EU and US Transatlantic Plan for ChatGPT](#)

The EU is calling on companies to join an international push to self-regulate generative artificial intelligence (AI) products such as ChatGPT. With legislation to regulate AI lagging well behind advances in the capabilities of the technology, the European Commission wants to spearhead a joint initiative with the US to establish a code of conduct that companies would sign up to voluntarily. The proposal was put forward at the recent US/EU Trade and Technology Council (TTC) meeting. The new technology could pose serious risks to democratic society if weaponised to spread misinformation, or allowed to take decisions in peoples day-to-day lives. The EU hopes to seal an international agreement between the G7 countries and invited partners, such as India and Indonesia which could be effective if companies in those countries, which represent about one third of the world's population, sign up. The TTC had already set up three expert groups to work on the identification of standards and tools for trustworthy AI. This work will now include a focus on generative AI systems. The TTC will advance a draft of the code of conduct for AI with industry input “within the next weeks”, with the hope that Canada, UK, Japan, India and other countries would back the effort.

[US-India Defence Industrial Cooperation](#)

Defence Minister Rajnath Singh and US Secretary for Defence, Lloyd Austin, on 5 June concluded a new roadmap for US-India Defence Industrial Cooperation for fast-tracking technology co-operation and co-production in the existing and new systems. It will also facilitate increased collaboration between defence start-up ecosystems of the two countries. Both sides will identify opportunities for co-development of new technologies and co-production of new and existing systems and facilitate increased collaboration between defence start-up ecosystems of the two countries. The Cooperation will fast-track technology co-operation and co-production in areas such as air combat and land mobility systems; intelligence, surveillance, and reconnaissance; munitions; and the undersea domain. This initiative aims to change the paradigm for co-operation between US and Indian defence sectors, including a set of specific proposals that could provide India access to cutting-edge technologies and support India's defence modernisation plans. Both the leaders also pledged to review regulatory hurdles impeding closer industry-to-industry co-operation and to initiate negotiations on a Security of Supply Arrangement and a Reciprocal Defence Procurement agreement, which will promote long-term supply chain stability, said the US. The two sides also welcomed the inaugural dialogues held recently on Defence Artificial Intelligence and Defence Space. They also discussed the growing importance of defence innovation and co-operation in emerging domains such as space, cyberspace, and AI.

Nations Discuss Treaty on Fighting Plastic Pollution

The second session of the Intergovernmental Negotiating Committee (INC-2) to develop an international legally binding instrument (ILBI) on plastic pollution (mandated by UN Environment Assembly (Resolution 5/14), March 2022) met in Paris from 29 May to 2 June. Over 1,656 participants attended INC-2, from 169 countries and the EU, and over 300 observer organizations. Engaging in discussions based on an options paper, delegates considered multiple elements that could eventually be included in the future treaty. Having shared their views on the options paper, INC-2 concluded by setting out a path for the intersessional period leading to INC-3 (to be held in Nairobi, 13-17 November 2023) , mandating the preparation of a “zero draft” of the new treaty for consideration at INC-3, and allocating time for a one-day pre-meeting event to discuss a synthesis report of elements that were not considered during INC-2. They were also able to elect the remaining members of the INC bureau, through two votes, and to come to an understanding on the provisional application of the draft rules of procedure. There are over 7 billion tonnes of plastic waste, with between 8-12 million tonnes of plastic leaking into the marine environment each year. This number is expected to more than triple by 2050. Plastic pollution is a serious threat to human health as well as the health of terrestrial and marine ecosystems. In 2022, there were reports of plastic particles being found in human lungs and in human blood; and a 2021 report found microplastics in human placenta.

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

NOTE TO OUR READERS AND STAKEHOLDERS:

RIS Science Diplomacy Programme (fisd.in) is glad to present a new version of Science Diplomacy News Alerts, following India’s assumption of the Presidency of the G20. A new section G20 and global challenges has been added. 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.