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NEWS ALERT

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NASA's SpaceX Crew-1 astronauts headed to international space station

In the first NASA-certified commercial human spacecraft system in history, NASA's SpaceX Crew-1 mission lifted off at 7:27 p.m. EST Sunday from Launch Complex 39A at the agency's Kennedy Space Center in Florida. The SpaceX Falcon 9 rocket propelled the Crew Dragon spacecraft with astronauts from NASA and the Japan Aerospace Exploration Agency (JAXA), into orbit to begin a six-month science mission aboard the space station. The crew will conduct science and maintenance during a six-month stay aboard the orbiting laboratory and will return in spring 2021. It is scheduled to be the longest human space mission launched from the United States. The crew will carry out various experiments during the six-month mission on the effect of microgravity on human health and diseases and translate those findings to improve human health on Earth, growing plants to produce food in space, and testing a new system to remove heat from NASA's next generation spacesuit. At the conclusion of the mission, the Crew-1 astronauts will board Crew Dragon, which will then autonomously undock, depart the space station, and re-enter Earth's atmosphere. Crew Dragon also will return to Earth important and time-sensitive research. NASA and SpaceX are capable of supporting seven splashdown sites located off Florida's east coast and in the Gulf of Mexico. Upon splashdown, the SpaceX recovery ship will pick up the crew and return to shore.The space station remains the springboard to NASA's next great leap in space exploration, including future missions to the Moon and, eventually, to Mars. For more than 20 years, humans have lived and worked continuously aboard the International Space Station, advancing scientific knowledge and demonstrating new technologies, making research breakthroughs not possible on Earth. As a global endeavor, 242 people from 19 countries have visited the unique microgravity laboratory that has hosted more than 3,000 research and educational investigations from researchers in 108 countries and areas.

and less use of materials can be key to enable countries to meet their carbon emissions targets. Focusing on two carbon-intensive sectors: residential buildings and passenger vehicles, the report presents a first comprehensive scientific analysis of potential GHG emission savings from material efficiency. According to Edgar Hertwich, a lead author of the study, the emissions from the production of materials production have grown fast and yet the current climate policy ignores them as a source of carbon emission. The study found that 80% of emissions from the production of materials come from the construction and manufacturing sectors, in particular from homes and cars and that applying material efficiency strategies can reduce GHG emissions from the life cycle of construction, operation, and deconstruction of homes by an average of 40% in seven major developed countries and by 70% in China and India.

New electronic chip delivers smarter, light-powered AI

The international team researchers from Australia, America and China led by RMIT University have developed artificial intelligence technology that brings together imaging, processing, machine learning and memory in one electronic chip, powered by light. The prototype shrinks artificial intelligence technology by imitating the way that the human brain processes visual information, and it could enable the development of smarter and smaller autonomous technologies like drones and robotics, plus smart wearables and bionic implants like artificial retinas. The new technology radically boosts efficiency and accuracy by bringing multiple components and functionalities into a single platform and taking the researchers closer to an all-in-one AI device inspired by nature's greatest computing innovation - the human brain. The researchers, in principle, aim to replicate core features of brain learning, through imprinting vision as memory. The prototype is regarded as a major leap forward towards neurorobotics, better technologies for human-machine interaction and scalable bionic systems.

Research creates hydrogen-producing living droplets

Scientists from UK and China have built tiny droplet-based microbial factories that produce hydrogen, instead of oxygen, when exposed to daylight in air. The team trapped ten thousand or so algal cells in each droplet, which were then crammed together by osmotic compression. By burying the cells deep inside the droplets, oxygen levels fell to a level that switched on special enzymes called hydrogenases that hijacked the normal photosynthetic pathway to produce hydrogen. In this way, around a quarter of a million microbial factories, typically only one-tenth of a millimetre in size, could be prepared in one millilitre of water. To increase the level of hydrogen evolution, the team coated the living micro-reactors with a thin shell of bacteria, which were able to scavenge for oxygen and therefore increase the number of algal cells geared up for hydrogenase activity. Although still at an early stage, the work provides a step towards photobiological green energy development under natural aerobic conditions. The methodology is capable of scale-up without impairing the viability of the living cells. It also seems flexible; for example, use of yeast cells in the droplets and for ethanol production.

Upgraded radar can enable self-driving cars for safe navigation in bad weather

Electrical engineers at the University of California San Diego developed an innovative way of improving the imaging capability of radars for accurate prediction of the shape and size of objects in the scene. For self-driving cars, which rely on technology like LiDAR and radar to "see" and navigate, pose a serious challenge of overcoming inclement weather conditions.

radar involves an inexpensive approach to overcome bad weather perceptions in self-driving cars. The system consists of two radar sensors placed on the hood, which allows the system to see more space and detail than a single radar sensor. This new kind of radar could make it possible for self-driving cars to navigate safely in bad weather and worked well when tested at night and in foggy conditions.

COVID-19

COVID-19 (WORLD)

Primate model to identify features of SARS-CoV-2 virus

The Korea Research Institute of Bioscience and Biotechnology (KRIBB) has identified features of SARS-CoV-2 virus causing COVID-19, which could be useful for developing vaccines and treatment strategies, using a nonhuman primate model. The nonhuman primate model of COVID-19 infection developed by KRIBB is the fourth model reported worldwide following China, the Netherlands, and the US. The results of the study were part of a larger research project aiming to identify key features of severe acute respiratory syndrome coronavirus-2(SARS-CoV-2), the virus causing COVID-19, and to test the efficacies of COVID-19 vaccines and treatments using the primate model. The primate study investigated, among other, vascular abnormalities due to the infection, reasons underlying fatality of COVID-19 infection, particularly in immunocompromised patients, sites of SARS-CoV-2 multiplication inside the human body, and the time-course. The findings are expected to provide novel insights regarding the diagnostic challenges associated with a false positive test for an asymptomatic.

Phase 2 trial of Oxford COVID-19 vaccine

The phase 2 trial involving 560 healthy adults - including 240 over the age of 70 years - for the ChAdOx1 nCoV-19 vaccine shows that the vaccine causes few side effects and induces immune responses in both parts of the immune system in all age groups. At low and standard dose, it provokes a T-cell response within 14 days of the first dose of vaccination, and an antibody response within 28 days of the booster dose of vaccination. Phase 3 trials are ongoing to confirm these results - as well as how effective the vaccine is in protecting against infection with SARS-CoV-2 - in a broader range of people, including older adults with underlying health conditions. The authors of the study noted that new findings could be encouraging if the immune responses found in their study are associated with protection against infection with SARS-CoV-2, but this study did not assess efficacy and phase 3 trials are ongoing to confirm this.

Researchers identify three drugs as possible therapeutics for COVID-19

Researchers at the University of Tennessee Health Science Center (UTHSC) and University of New Mexico have identified three drugs, namely zuclopenthixol, nebivolol, and amodiaquine as promising therapeutics for treating COVID-19 infections. These drugs have already been approved for other uses in humans. For instance, Amodiaquine is an older antimalarial, zuclopenthixol is an antipsychotic, and nebivolol is a blood pressure medication. Based on virtual and in-vitro antiviral screening that began in the earlier months of the COVID-19 pandemic, the UTHSC researchers used a computational workflow that included independent in vitro validation and assessment of emerging candidates in the context of available clinical pharmacology data. Based on the studies, the researchers found these three drugs to act similarly to the hydroxychloroquine, and in some cases, more safely. The research indicates they may also improve efficacy when combined in lower doses with

Algorithm accurately predicts COVID-19 patient outcomes

In a recently published research, the team of biomedical engineers at Rensselaer Polytechnic Institute, have explained the development of a new algorithm which predicts whether or not a COVID-19 patient would need ICU intervention. This AI-based approach combines chest computed tomography (CT) images that assess the severity of a patient's lung infection with non-imaging data, such as demographic information, vital signs, and laboratory blood test results. By combining these data points, the algorithm is able to predict patient outcomes, and to determine a proper course of treatment for patients including the need for ICU intervention. The algorithm was tested on datasets collected from a total of 295 patients from three different hospitals and researchers were able to compare the algorithm's predictions to what kind of treatment a patient actually ended up needing. The research is offering an actionable solution to clinicians' world over and according to researchers, its impact could go well beyond COVID diseases.

COVID-19 (INDIA)

Pfizer or Moderna COVID vaccines may not be apt for India, oxford may be right'

India's well-known vaccine scientist Dr Gagandeep Kang in a recent interview noted that Pfizer vaccine, which is 90% effective and shelf life as little as 24-48 hours is "very unlikely to be a solution for India" since the country does not have the cold storage capacity to be able to store and transport this vaccine at -70° or -80° Celsius temperatures. Similarly, the Moderna vaccine, with 94.5% of efficacy rate; storage requirement at -20° Celsius and a shelf life of up to 30 days, currently costs around $37.50 a dose which is unaffordable for India. According to Dr Kang, India cannot afford $37.50 a dose and never paid more than $3 per dose for any vaccine in the past. Although prices of these vaccines can come down given the size of Indian market, she noted that the Oxford-AstraZeneca vaccine could be 'right' or 'best' one for India. The Oxford vaccine requires storage at -2° to -8° Celsius temperature that can be provided by an ordinary refrigerator.

ICMR approves CSIR-CCMB's Dry Swab direct RT-PCR method for COVID detection

The ICMR has approved a new simple and fast method of Dry Swab-Direct RT-PCR test developed by CSIR's constituent lab Centre for Cellular and Molecular Biology (CCMB) Hyderabad. This new test method is a simple variation of the existing gold standard RT-PCR method and can easily scale up the testing by 2 to 3-fold with no new investment of resources. While testing COVID-19 samples since April 2020, the CSIR-CCMB has identified several factors that slow the testing process and developed the Dry Swab RNA-extraction free testing method which involves collecting and transporting the nasal swab in dry state which makes the transportation and handling of the samples easy. The step of RNA isolation is omitted in the new method which offers a huge benefit in terms of time, cost and trained manpower. After finding an overall concordance of 96.9% with lesser cost and quick turn-around time, ICMR has issued an advisory for the use of dry swab method.

INDIA – SCIENCE & TECHNOLOGY

Expert group recommends 5 technologies for drinking water, sanitation

A high level multi disciplinary technical government group has recommended five

Grundfos AQpure, a solar energy-based water treatment plant based on ultra-filtration, Janajal Water on Wheel, an Internet of Things (IoT) based electric vehicle to deliver safe water to households and Presto Online Chlorinator, a non-electric online chlorinator for disinfection of water for removal of bacterial contamination. The other two are Johkasou technology, an inbuilt packaged black (sewage) and greywater (kitchen and bath water) treatment system having advanced anaerobic-aerobic configuration that can be installed underground, while FBTec is a site assembled decentralised sewage treatment system using fixed filter media. The panel was headed by K Vijay Raghavan, the principal scientific adviser to the government. These technologies could be potentially applicable in other developing countries

NITI Aayog Proposes Overseeing Body for Responsible Management of AI in India

For responsible management of Artificial Intelligence in India, the Government policy research institution Niti Aayog has proposed setting up an oversight body which will play an enabling role regarding technical, legal, policy and societal aspects of artificial intelligence (AI). In its draft 'Working Document: Enforcement Mechanisms for Responsible #AIforAll', Niti Aayog said the oversight body must have industry representatives as well as experts from legal, humanities and social science fields. The oversight body may identify design standards, guidelines and acceptable benchmarks for priority use cases with sectoral regulators and experts. These may be made mandatory for public sector procurement. The oversight body must play an enabling role under the following broad areas -Principles for responsible AI. Technical, legal, policy, societal issues of AI, Responsible behaviour through design structures, standards, guidelines, etc, enable access to Responsible AI tools and techniques, Education and Awareness on Responsible AI, coordinate with various sectoral AI regulators, identify gaps and harmonize policies across sectors, and Represent India in International AI dialogue. Besides this, Niti Aayog has also proposed highly participatory advisory body called Council for Ethics and Technology, with a multi-disciplinary composition including Computer Science and AI experts, Legal and relevant sectoral experts, Humanities and Social Science experts, among few others. The Aayog has invited comments on the draft document by stakeholders by December 15. The Niti Aayog had in June 2020 released a draft paper titled “Towards Responsible #AIForAll” and had said there is a potential of large-scale adoption of AI in a variety of social sectors.

India’s IRNSS is now part of World Wide Radio Navigation System

The Indian Regional Navigation Satellite System (IRNSS) has been accepted as a component of the Worldwide Radio Navigation System (WWRNS) for operation in the Indian Ocean Region by the International Maritime Organization (IMO). This will enable merchant vessels to use IRNSS for obtaining position information similar to GPS and GLONASS to assist in the navigation of ships in ocean waters within the area covered by 50°N latitude, 55°E longitude, 5°S latitude and 110°E longitude (approximately up to 1500 km from Indian boundary).

India’s renewable future

Being the second most populated country on the planet, India has growing energy demands. However, coal remains a dominant energy resource that leaves India a third-most CO2 emitter following China and the US. While India has set an ambitious goal of transitioning to 60 percent renewable energy in its electricity sector by 2030; the recent research from the

solar energy could meet 80 percent of anticipated electricity sector demand in India in 2040 and could reduce CO2 emissions by as much as 85 percent. The research concludes that investments in renewables today would reduce India's overall energy costs by as much as $50 billion in the future and this has clear policy implications for India's electricity sector in planning for a low-carbon future.

The synthesized hydrogel for rapid recovery in internal injuries and in diabetic patients

Scientists at the Institute of Nano Science and Technology (INST), Mohali developed an injectable hydrogel from ?appa-carrageenan, a water-soluble polysaccharide found in edible red seaweeds and a pigmented protein called C-phycocyanin found in spirulina for accelerated repair in internal injuries and rapid would healing in diabetic patients. Repeated dressing of diabetic wound badly affects its healing process, and it is difficult to assess wound repair in internal injuries due to treatment complications. The injectable hydrogel invention provides a cure for this. The researchers used the gelling property of ?-carrageenan along with C-phycocyanin as an injectable and regenerative wound dressing matrix for rapid healing of wound and to monitor its progress in real-time. The matrix was highly biocompatible and established the superior haemostatic (blood flow retarding) capabilities of the combination in traumatic injury conditions and according to INST researchers, the synthesized hydrogel will be highly beneficial for people of all age groups in wound healing applications.

India's AI supercomputer ranks 63rd among world's non-distributed computer systems

India's high-performance computing-artificial intelligence (HPC-AI) supercomputer, Param Siddhi has secured 63rdglobal rank among top 500 most powerful non-distributed computer systems. Developed under India's National Supercomputing Mission (NSM) by C-DAC, the supercomputer has Rpeak of 5.267 Petaflops and 4.6 Petaflops Rmax (Sustained) and is built on the NVIDIA DGX SuperPOD reference architecture networking along with C-DAC's indigenously developed HPC-AI engine, software frameworks and cloud platform. The AI system will strengthen development of packages in areas such as advanced materials, computational chemistry & astrophysics, platform for drug design and preventive health care system, as well as flood forecasting package for metro cities like Mumbai, Delhi, Chennai, Patna and Guwahati. The system will also accelerate COVID-19-related R&D through faster simulations, medical imaging, genome sequencing and forecasting. The system is likely to be a boon for application developers, and for start-Ups and MSMEs, in particular for testing a variety of packages through accelerated computing, and graphics virtualization.

The chirp of the crickets may soon be their species' I-cards

Since the traditional morphology-based taxonomy is insufficient to delimit cryptic species, the Indian scientists are developing an acoustic signal library that can be used as a non-invasive tool to estimate and monitor species diversity. For instance, the chirp of the cricket may soon be used to monitor their species diversity. The digital library of field crickets' is used through mobile phone applications for automated species recognition and discovery as well as documentation of new species of crickets from India. The research shows that the issue of cryptic species can be addressed economically with the basic skill of bioacoustic signal and statistical analyses and led to the discovery of several cryptic and new cricket

AI and robotics park at IISc to boost R&D

The Indian Institute of Science (IISc) sets-up an AI and Robotics Technologies Park (ARTPARK) to enable development of technologies and products within the country. The new park will promote technology innovations in artificial intelligence (AI) and robotics leading to societal impact by executing mission-mode R&D projects in healthcare, education, mobility, infrastructure, agriculture, retail and cybersecurity, focusing on problems unique to India. The ARTPARK is set-up as a not-for-profit public-private model by IISc and AI Foundry to bring about a collaborative consortium of partners from industry, academia and government bodies. With DST providing Rs 170 crore seed funding for the park as part of its national mission on interdisciplinary cyber-physical systems (NM-ICPS) and Karnataka state providing Rs 60 crore over the next five years, the park is regarded as a template for centre-state partnership in frontier areas of technology that will lead to cutting-edge innovations in terms of new technologies, standards, products, services and intellectual properties.

IN BRIEF

A novel monoclonal antibody therapy cuts LDL cholesterol by half

A phase 2 study from the Icahn School of Medicine of Mount Sinai and other global academic sites has found that Evinacumab, a fully human monoclonal antibody can bring dangerously high cholesterol to normal levels when combined with maximally tolerated lipid-lowering therapies in people with familial hypercholesterolemia. The phase 2 multi-center, double-blinded, placebo-controlled study of evinacumab included 272 patients with primary hypercholesterolemia. The research team found that subcutaneous administration of the agent at 450 mg weekly resulted in LDL cholesterol lowering of 56 percent, and 52.9 percent at 300 mg weekly compared to the placebo group. Evinacumab is under regulatory review in the United States and the European Union as an adjunct to other lipid-lowering therapies.

Machine learning innovation to develop chemical library

Machine learning has been widely used in the chemical sciences for drug design and other processes. However, there are extremely limited models that are prospectively tested for new reaction outcomes and to enhance human understanding to interpret chemical reactivity decisions made by such models. Developing new and fast reactions is essential for chemical library design in drug discovery and Purdue University innovators have developed chemical reactivity flowcharts which help chemists to interpret reaction outcomes using statistically robust machine learning models trained on a small number of reactions. The researchers developed a new, fast and one-pot multicomponent reaction (MCR) of N-sulfonylimines as a representative case to generate training data for machine learning models, which predict reaction outcomes, and test new reactions in a blind prospective manner. The research is expected to bring a paradigm shift in developing accurate, human understandable machine learning models which interpret reaction outcomes; and augment creativity and efficiency of human chemists to discover new chemical reactions and to enhance organic and process chemistry pipelines.

New modified wheat could help tackle global food shortage

Researchers at the University of York have created a new modified wheat variety that increases grain production by up to 12%. They directly modified the growth of the young developing grain by increasing the amount of a protein called expansin that controls growth rates in plants. This resulted in plants that produced grain that are up to 12% bigger than in

are now looking at ways to make this research accessible to farmers and the wider industry to help inform their decisions on crop production.

New method to produce high performing lithium selenium batteries

Engineers from Surrey's Advanced Technology Institute (ATI) and University Technology of Sydney have used a single-atom catalyst to create highly effective cathodes for Li-Se batteries. The Surrey team used to delicately control Zeolitic Imidazolate Framework (ZIF) particles that were placed on the surface of polystyrene spheres. The core-shell of the ZIF was then converted into a hollow structured carbon material. Through further fine-tuning, the team from the ATI successfully produced atomic cobalt electrocatalyst, nitrogen-doped hollow porous carbon, nitrogen-doped hollow porous carbon and cobalt nanoparticles. By embedding selenium in hollow structured carbon particles, carbon/selenium composites were produced. The atomic cobalt electrocatalysts were used as cathode materials for Li-Se batteries and clearly showed superior electrochemical performance including a superior rate capability and outstanding long-term cycling performance. The Li-Se batteries are increasingly considered to be next-generation battery technology and the atomic cobalt-doped synthesized material could be a defining moment for sustainable battery technology development.

Scientists develop new gene therapy for eye disease

Scientists from Trinity College Dublin have developed a new gene therapy approach that offers promise for one day treating an eye disease Dominant optic atrophy (DOA), characterised by degeneration of the optic nerves. Mutations in a gene called OPA1 are responsible for the onset and progression of the disorder. The scientists developed a new gene therapy which improved mitochondrial performance in human cells that contained mutations in the OPA1 gene, offering hope that it may be effective in people. The results demonstrate that this OPA1-based gene therapy can potentially provide benefit for diseases like DOA, which are due to OPA1 mutations, and also possibly for a wider array of diseases involving mitochondrial dysfunction, such as Alzheimer's and Parkinson's disease.

RESOURCES AND EVENTS

PM Modi inaugurates Bengaluru Tech Summit

On 19th November, PM Modi inaugurated Bengaluru Tech Summit via video conference. Organised jointly by the Karnataka Government and other public and private organisations, the theme of the 2020 summit was “Next is Now”. In his address, PM Modi expressed satisfaction that ‘Digital India’ is no longer just a government scheme, but it has become a way of life for the poor, marginalised and for those in government and making development more human-centric. He noted that the government has not only created a market for digital and tech solutions, but also made it a key part of all schemes. Technology has enhanced human dignity for crores of farmers receiving monetary support in one click and successfully operating the world's largest Healthcare scheme, Ayushman Bharat. He stressed that technology ensured India’s poor received proper & quick assistance even at the peak of the lockdown and the scale of this relief has few parallels. He further noted that the government has used the power of data analytics to ensure better service delivery and efficiency which changed people’s lives at such a speed and scale. With technology, the country is now able to provide electricity to all, cross toll booths faster, and give confidence to vaccinate a large population in a short period of time.

Begaluru Tech Summit: promoting innovation and technology cooperation

The Bengaluru Tech Summit saw participation of around 25 countries under a single group called the 'Global Innovation Alliance'. At the summit, Australian Prime Minister Tony Morrison noted that the two countries plan to take bilateral relations to new heights by working in frontier technology areas. Noting that Australia and India have unlimited possibilities to work together in space research, critical minerals, 5G, AI, quantum computing, and more, he pointed to landmark Australia-India Technology Framework Agreement on cyber and cyber-enabled technology which commits two countries to work together for open, free, safe, and secure Internet. He further noted that two countries will soon launch Australia-India Cyber and Critical Technologies Partnership grant programme. At the conference, Finland announced the launch of institution-level collaboration between Business Finland and the Center of Excellence for Data Science and Artificial Intelligence. Data Science and AI, skilling programmes and start-up collaboration will be some of the few focus areas.

Tenth edition of National Science Film Festival kicks off in a virtual mode

The tenth edition of prestigious science film festival got off in a virtual mode. Jointly organised by Vigyan Prasar, and the Tripura State Council of Science and Technology, Govt. of Tripura, the festival is part of government's endeavour to popularize science and t total of 372 films in different languages have been received for participation in the festival this year. The festival offers a unique platform to showcase the science films made by professionals, amateur and student filmmakers under various themes. A total of 115 shortlisted films selected by the ten-member jury will be screened during the festival. These include films in Hindi, English, Urdu, Malayalam, Kashmiri, Bengali, Marathi, Punjabi and Tamil languages. Science and technology, environment, agriculture, renewable energy, water management, health and drugs and technological innovations are some of the most explored themes in the submitted films. The entries include documentaries, biography, short films, docu-dramas, science fiction and animation films.

SCIENCE POLICY AND DIPLOMACY

Meeting of Ad-hoc Open-ended Expert Group on Marine Litter and Microplastics

The ad-hoc open-ended expert group on marine litter and microplastics (AHEG-4) convened online for its 4thsession on 9-13 November. Their key task was to discuss and agree on a Chair's Summary to inform the fifth meeting of the United Nations Environment Assembly (UNEA-5) to be held virtually in February 2021 and February 2022 on how best to tackle marine litter and microplastics. There seemed to be support for a new global treaty and a more holistic approach to address the entire life cycle of plastics. It was noted that plastics are the largest, most harmful, and most persistent fraction of marine litter and the estimated annual loss in value to marine ecosystem services ranges from USD 500 to 2500 billion. The Chair's Summary presented for consideration by the UNEA-5 contains four sections: an introduction; a review of the current situation; potential national, regional, and international response options; and potential options for continued work for consideration by UNEA-5.

Australia to temporarily host ISRO satellite tracking facilities

The space agencies of India and Australia were working together to temporarily position Indian tracking facilities in Australia. This would support India's planned human space flight programme. These include earth observation and data analytics, robotics, and space life

cooperation is underpinned by a formal Memorandum of Understanding signed between the two countries in 2012.

Modi, Bhutanese PM jointly launch RuPay Card Phase-II

PM Modi and his Bhutanese counterpart Lotay Tshering virtually launched RuPay Card Phase II in Bhutan. During the launch ceremony, Mr Tshering said that RuPay arrangement is benefitting people of Bhutan and enhancing financial services in our region. He appreciated PM Modi's leadership in tackling the COVID-19 pandemic and lauded India's assurance to make the vaccine available for Bhutan, once they are ready for clinical use. Mr Tshering further informed that India and Bhutan have signed an MoU for cooperation in the space sector. Highlighting the success of the first phase of RuPay Card between the two nations, PM Modi noted that there have been 11,000 successful RuPay card transactions in Bhutan. PM Modi also informed that India would send Bhutan's satellite to space next year and also the South Asian Satellite has been put to better use for Bhutan Broadcasting and Disaster Management programs. He also welcomed BSNL's agreement with Bhutan regarding the 3rd International Internet Gateway.

G20 Summit declaration on Health, AI and Energy

The G20 Leaders statement adopted at Riyadh on 21 November, focusing on the C ovid-19 pandemic welcomed the start-ups of discussions on the need for long-term solutions to address gaps in global pandemic preparedness and response, including its proposal towards establishing access to pandemic tools. It agreed to promote multi-stakeholder discussions to advance innovation and a human-centered approach to Artificial Intelligence (AI), taking note of the Examples of National Policies to Advance the G20 AI Principles. It endorsed the Circular Carbon Economy (CCE) Platform, with its 4Rs framework (Reduce, Reuse, Recycle and Remove), recognizing the key importance and ambition of reducing emissions, taking into account system efficiency and national circumstances. The next G20 Summits will be held in Italy in 2021, Indonesia in 2022, India in 2023 and Brazil in 2024.

Indian Prime Minister at G20 Leaders' Summit

Prime Minister Narendra Modi participated in the 15th G20 Summit convened by Saudi Arabia in virtual format, on 21-22 November 2020. The Prime Minister further underscored the importance of the 2030 Agenda for Sustainable Development Goals aimed at 'leaving no one behind'. India, he said, will become an important and reliable pillar of the World Economy and Global Supply Chains. At a global level, India also took the initiative of establishing institutions such as the International Solar Alliance and the Coalition for Disaster Resilient Infrastructure. He said that India is not only meeting Paris Agreement targets but will be exceeding them. PM called for a new Global Index for the Post-Corona World that comprises four key elements – creation of a vast Talent Pool; ensuring that Technology reaches all segments of the society; Transparency in systems of governance; and dealing with Mother Earth with a spirit of Trusteeship. He also said that any assessment of new technology should be based on its impact on Ease of Living and Quality of Life. He called for dealing with environment and nature as trustees and a Holistic and Healthy Lifestyle, a principle whose benchmark could be a Per Capita Carbon Footprint. He also suggested creation of a G20 Virtual Secretariat as a follow up and documentation repository.

India-US extend MoU for cooperation on nuclear energy for 10 more years

India and the US have extended the Memorandum of Understanding for cooperation on

Partnership (GCNEP) India, signed on 7 November 2010 for 10 more years. The joint statement also recognizes India's important commitment in 2010 to establish the GCNEP with a vision to promote safe, secure, and sustainable nuclear energy for the service of mankind through global partnership. India and the United States have committed to promote cooperation on initiatives aimed at giving an impetus to nuclear safety and security, research and development in nuclear science and technology under various schools of GCNEP. They will deepen the dialogue on nuclear and other radioactive material security by collaborating on advanced projects in the field (eg future technology), with the goal of sharing the outcomes in the international arena. The two sides will cooperate in nuclear and radioactive material security by jointly developing and /or delivering training and other capacity-building opportunities for regional and international partners, including online content.

India and Finland cooperate in environmental protection and biodiversity conservation

India and Finland signed a MOU for developing cooperation in the field of Environment protection and biodiversity conservation to support, exchange best practices in areas like prevention of Air and water pollution; Waste management; Promotion of circular economy, low-carbon solutions and sustainable management of natural resources including forests; Climate change; Conservation of Marine and Coastal Resources; etc.

Technology for building better international collaborations

Speaking on the occasion of the 9th Foundation Day of Global Innovation and Technology Alliance (GITA), Prof. K Vijay Raghavan, Principal Scientific Adviser to Government of India, highlighted the challenge of being AtmaNirbhar in a world where India has to be interactive internationally and technology can be an enabler for the country to position itself as a global leader and build better international collaborations. Prof. VijayRaghavan noted that 'AtmaNirbharta' need to be viewed in the context of supply chains internationally and globally. He highlighted three pillars for addressing the framework of self-reliance including policy, regulation, examples of execution, which needs to be implemented with speed and a synergy. During panel discussion on 'Global Perspectives: Countries becoming 'Self-Reliant' in a collaborative world', the speakers iterated the need to come out of silos, work together in collaboration, opening innovation engagements internationally, enforcing certain local capacities and remaining open to FDI, technology transfers and technology engagements.

We welcome your comments and valuable suggestions. Please write to us for receiving publications, updates and notices regarding seminars, conferences etc.

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