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NEWS ALERT

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CORONAVIRUS PANDEMIC

[PM announces special economic package of Rs 20 trillion](#)

Prime Minister Shri Narendra Modi addressing the nation on 12 May, said that the crisis that has emerged due to COVID-19 is unprecedented, but in this battle, we not only need to protect ourselves but also have to keep moving forward, through ensuring that the country becomes self-reliant. He clarified that self-reliance, is different from being self-centered. He said that a self-reliant India will stand on five pillars viz. Economy, which brings in quantum jump and not incremental change; Infrastructure, which should become the identity of India; System, based on 21st century technology driven arrangements; Vibrant Demography, which is our source of energy for a self-reliant India; and Demand, whereby the strength of our



Prime Minister announced a special economic package of Rs 20 trillion which is equivalent to almost 10% of India's GDP. He said that the package will provide a much needed boost towards achieving 'Atmanirbhar Bharat'. The package will also focus on land, labour, liquidity and laws. It will cater to various sections including cottage industry, MSMEs, labourers, middle class, and industries, among others. Prime Minister remarked that self-reliance will prepare the country for tough competition in the global supply chain, and it is important that the country wins this competition. The same has been kept in mind while preparing the package. It will not only increase efficiency in various sectors but also ensure quality. He observed that the crisis has taught us the importance of local manufacturing, local market and local supply chains. All our demands during the crisis were met 'locally'. Now, it's time to be vocal about the local products and help these local products become global.

[CSIR-National Aerospace Laboratories \(NAL\) develops BiPAP Non Invasive Ventilator](#)

CSIR - National Aerospace Laboratories (NAL) Bangalore, a constituent of lab of CSI has developed a Non Invasive BiPAP Ventilator in a record time of 36 days to treat COVID-19 patients. BiPAP Non-Invasive ventilator is a microcontroller-based precise closed-loop adaptive control system with a built-in biocompatible "3D printed manifold & coupler" with HEPA filter (Highly Efficient Particulate Air Filter). These unique features help to alleviate the fear of the virus spread. It has features like Spontaneous, CPAP, Timed, AUTO BIPAP modes with provision to connect Oxygen concentrator or Enrichment unit externally. The system has been certified for safety and performance by NABL accredited agencies. The system has undergone stringent biomedical tests and beta clinical trials at NAL Health Centre. The major advantage of this machine is that it is simple to use without any specialized nursing, cost effective, compact and configured with majority of indigenous components. This is ideal for treating COVID -19 patients in Wards, Make shift Hospitals, dispensaries and home in current Indian COVID 19 scenario. CSIR-NAL is in process of taking it forward with the regulatory authorities for the approval and expected to get shortly. CSIR-NAL has already initiated dialogue with major public/private industries as a partner for mass production.

[DST gives nod to mathematical study of COVID-19](#)

Science and Engineering Research Board (SERB) have approved funding for 11 projects for studying Mathematical modelling and computational aspects to tackle the COVID 19 pandemic. Most of these studies attempt to propose mathematical/ simulation models to account for various factors relevant to COVID 19 by including factors such as heterogeneity of population, the role of asymptomatic population, migration and quarantine, effect of social distancing and lockdown, socioeconomic factors. These studies will be done by groups from IIT Kanpur, IIT Guwahati, IIT Kharagpur, IIT Roorkee, IIT Bhilai, Jadavpur University,



Indian conditions and will provide an estimate of Basic Reproduction Number- the qualitative indicator of the degree of contagiousness of the disease. These will be helpful to forecast future pandemic by using the data available and provide fundamental insights into kinetics and management of infectious diseases, and lead to an outcome consisting of a packaged solution in the form of usable software which may be made available for ready use by the Government of India. The methodology and results could be relevant to many other countries.

[SCTIMST develops 2 types of swabs for COVID-19 testing.](#)

Researchers at the Thiruvananthapuram based Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), have developed two types of nasal and oral swabs and viral transport medium for COVID-19 testing. Chitra EmBed flocked nylon swabs, and Chitra EnMesh, polymeric foam-tipped, lint-free swabs with flexible plastic handles developed have both proven efficiency in the adequacy of specimen collection and rapid elution (extracting one material from another by washing with a solvent) of specimen into the liquid viral medium. They also have good recovery of viral RNA collected using these swabs and medium. The swabs will be available as sterile, ready-to-use devices. The swabs are designed for efficiency and comfort in the working environment and help in improved specimen collection with minimum discomfort to patients. Their safe and convenient breakpoint ensures minimal contact of the health worker with the sample during packing. The second innovation, Chitra Viral Transport Medium, is specifically designed to retain the virus in its active form during its transportation from the collection point to the laboratory. Technologies for both swabs and viral transport medium have been transferred to two industries for immediate manufacture and sales - Mallelil Industries, Origin diagnostics, and Levram Life sciences.

[Prime Minister Modi at video conference of NAM Contact Group on COVID-19](#)

To counter COVID-19, India promoted coordination in our immediate neighbourhood and is organising online training to share India's medical expertise with many others. Despite its own needs, India has ensured medical supplies to over 123 partner countries, including 59 members of NAM. India is active in global efforts to develop remedies and vaccines. He spoke against the spread of other deadly viruses, such as terrorism, fake news, and doctored videos to divide communities and countries. He said that NAM should urge the international community and the WHO to focus on building health-capacity in developing countries. Equitable, affordable and timely access to health products and technologies for all should be ensured. He called for a platform for all NAM countries, to pool experiences, best practices, crisis-management protocols, research, and resources.

[Portable, reusable test-kits for Covid-19 developed](#)



COVID-19. With just a drop of saliva it can detect COVID-19 within 60 seconds. The sensor would use single-strand DNA called aptamers in the sensor that would attach to the proteins in the COVID-19 virus molecule and an electrical resistance is measured in the device, signaling a positive result, if it is present. A small sensor connects into the cellphone's power jack and an app is launched. A drop of saliva is dropped on the sensor, and the results would appear on the phone. It is designed to also test for the virus on the surface, brushing a swab on the surface and then on the sensor. It might also be able to detect the presence of COVID-19 in floating microscopic particles in the air and in enclosed spaces such as an elevator. The sensor is designed to be reusable as it can destroy the previous sample by producing a small electrical current that could heat up and remove or disintegrate the virus. The NSF has granted USD 200000 to support development.

[DRDO develops UV Disinfection Tower](#)

Defence Research and Development Organisation (DRDO) has developed an Ultra-Violet (UV) Disinfection Tower for rapid and chemical-free disinfection of high infection prone areas. The equipment named UV blaster is a UV based area sanitiser useful for high-tech surfaces like electronic equipment, computers and other gadgets in laboratories and offices that are not suitable for disinfection with chemical methods. The product is also effective for areas with large flow of people such as airports, shopping malls, metros, hotels, factories, offices, etc. The UV based area sanitiser may be used by remote operation through laptop/mobile phone using wifi link. The equipment has six lamps each with 43 watts of UV-C power at 254 nm wavelength for 360-degree illumination. For a room of about 12 x 12 feet dimension, the disinfection time is about 10 minutes and 30 minutes for a 400 square feet area by positioning the equipment at different places within the room. This sanitiser switches off on accidental opening of room or human intervention. One more salient safety feature of the product is the key to arm operation.

[Ventilator designed by particle physics community gets FDA approval](#)

A team of international particle physicists and engineers from Italy, Canada and the United States have designed a mechanical ventilator made from readily available components. The ventilator known as Mechanical Ventilator Milano is made from a small number of off-the-shelf components in order to facilitate rapid production. It was developed in six weeks and has been approved by the U.S. Food and Drug Administration for emergency use with COVID-19 patients. The team is now working to ensure quality assurance of the controlling software and to work with U.S. manufacturers.

[COVID-19 testing in India hits 1 million](#)

India has crossed the one million mark in testing people for novel coronavirus disease (COVID-19). These are the RT-PCR tests which are the gold standard for diagnosing the



country. Several tests have been developed indigenously now. As of May 1, 2020, the Indian Council of Medical Research has validated a total of 45 RT-PCR kits. Ten of these are from India. The testing kits developed in India are much cheaper and cost about Rs 1,000 compared to imported ones at the Rs 4,500. The India kits include those developed by Ahmedabad-based CoSara and Sree Chitra Tirunal Institute for Medical Sciences and Technology under the Department of Science and Technology, which developed two types of nasal and oral swabs and viral transport medium for COVID-19 testing too.

[IICT transfers Favipiravir production process to Cipla](#)

The Hyderabad-based Indian Institute of Chemical Technology (IICT) under the Indian Ministry of Science and Technology has developed a convenient and cost-effective synthetic process for producing antiviral drug Favipiravir as part of the collaborative effort with the industry. The IICT has transferred the entire process and significant quantities of pharma-grade API of Favipiravir to the pharmaceutical major Cipla, with whom it had tied up earlier to develop drugs which can prove effective against Covid-19. Cipla would be conducting investigations on this drug in India for which it has approached the regulatory authority, DCGI, for approval. Favipiravir is in the clinical trials for Covid-19 and is under use for treatment of influenza in many countries. The IICT has also been working on another antiviral drug named Bolaxavir, which is expected to be ready by January next year. Apart from this, the institute has also been working on the production of other drugs, including Arbidol and Triazavarin apart from Hydroxychloroquine intermediates, the RT PCR enzyme and viral transport medium for hospitals.

[New vaccine platform applicable to various viruses](#)

A Korean research team has developed a new vaccine platform which uses RNA as an immunostimulatory agent known as an adjuvant and consists of compounds that maintain the stability of the RNA and spike protein that the virus uses to invade the host cell. The team mixed the RNA of the cricket paralysis virus, and an RNA stabilizer containing zinc complex. A vaccine was created using the mixture, along with the spike protein of the MERS-CoV, and administered to a group of mice. After just one inoculation, the vaccine was shown to have adequate protective efficacy (100% protective efficacy against lethal doses of the virus). The MERS-CoV infection was also suppressed through the induction of high neutralizing antibodies (PRNT80 titer > 1:2,560) when the same vaccine was administered to macaque monkeys, which are nonhuman primates. RNA adjuvant and stabilizer mixed together can be applied to most vaccine types, including protein-based vaccines and inactivated vaccines, meaning that they have a wide range of potential uses. The team measured the amount of antibodies (neutralizing-antibody values) and conducted a virus challenge experiment. The research team has formed a consortium with SK Bioscience, to manage the development of a COVID-19 vaccine.



Institute of Genomics and Integrative Biology (CSIR-IGIB) and TATA Sons signed a MoU for licensing of know-how for FNCAS9 editor linked uniform detection assay (FELUDA) for rapid diagnosis of Covid-19, and for scaling up the 'knowhow' in the form of a kit that can be deployed for COVID-19 testing on ground as early as end of May. A completely indigenous scientific invention by the CSIR IGIB, FELUDA's main advantages is its affordability, relative ease of use and non-dependency on expensive Q-PCR machines. This innovative CRISPR 'Feluda' test uses cutting-edge CRISPR technology for detection of genomic sequence of novel coronavirus. It uses a test protocol that is simple to administer and easy to interpret, enabling results to be made available to the medical fraternity relatively quickly. The technology is based on an indigenously developed cutting edge CRISPR Cas9 technology to specifically recognize COVID-19 sequence in a sample. A combination of CRISPR biology and paper-strip chemistry leads to a visible signal readout on a paper strip that can be rapidly assessed for establishing the presence of viral infection in a sample.

[CSIR launches Compendium of Indian Technologies for Combating COVID-19](#)

The National Research Development Corporation (NRDC) has released a "Compendium of Indian Technologies for Combating COVID-19 (Tracing, Testing and Treating)". The compendium carries information about 200 COVID-19-related Indian technologies, ongoing research activities, technologies available for commercialisation, initiatives and efforts taken by the Government of India. Most of these technologies are proof-of-concept (POC) tested and can help the entrepreneurs to take the product to market faster as they do not have to reinvent the wheel and would benefit the MSMEs, Startups and the public at large. NRDC has made an attempt to compile most relevant and emerging indigenously developed technological innovations, including those which are at research stage, to fight COVID-19 for the benefit of all stakeholders and this compendium will serve as a ready-reference for policy makers, industries, entrepreneurs, startups, MSMEs, research scholars, scientists and others. Several of these technologies compiled are approved by ICMR.

[CSIR submits 53 genome sequences of coronavirus in Indians to global body](#)

The Council for Scientific and Industrial Research (CSIR), has submitted as many as 53 genome sequences of the virus to a global genome database GISAID (Global Initiative on Sharing All Influenza Data). The CSIR is also planning to submit additional 450 genome sequence data of coronavirus by May 15. CSIR's Institute of Genomics and Integrative Biology (IGIB), Delhi, Centre for Cellular and Molecular Biology (CCMB), Hyderabad and Institute of Microbial Technology, Chandigarh are currently sequencing the genomes of the novel coronavirus. The GISAID promotes the rapid sharing of data from all influenza viruses and the coronavirus causing COVID-19. This enables researchers to understand how viruses evolve and spread during epidemics and pandemics. Genome sequencing helps in understand the origins and evolution of the virus and is helpful in making the vaccines and



in the understanding of the new COVID-19 disease and in the research and development of medical countermeasures.

[Around 30 Indian institutions are working to develop CoV-19 vaccine](#)

Indian pharma companies and research groups are working on as many as 30 different novel Coronavirus (nCoV-19) vaccines. A few of them are in advanced stages of development on which most initial developmental work was carried out elsewhere, using information sourced from multiple sources. For instance, the Pune-based Serum Institute is a manufacturing partner for a promising vaccine called ChAdOx1 nCoV-19 developed by the Oxford University. The vaccine is already undergoing limited clinical trials in Oxford and is in an advanced stage of development. Hyderabad-based Bharat-Biotech International Limited in association with two US universities is developing two different vaccines. Cadila Healthcare is gearing up to test a DNA vaccine for COVID-19 by November this year. Indian Immunological Limited has a tie-up with Australian Griffith University, for developing a live attenuated vaccine expected to be ready for testing in mid-2022. Other tie ups include Aurobindo Pharma Limited with Aurovaccines US and Biological E with a team at Massachusetts Institute of Technology.

[IIT Kanpur partners with Bharat Dynamics for manufacturing ventilators](#)

The Indian Institute of Technology in Kanpur (IIT-K) will work with Bharat Dynamics Limited (BDL) to manufacture ventilators under a memorandum of understanding (MoU) signed between BDL, IIT Kanpur's incubator Foundation for Innovation and Research in Science and Technology (FIRST) and Nocca Robotics Private Limited (NRPL), (an incubated startup of the Institute). Bharat Dynamics will scale up production and make the ventilator widely available as a 'Make in India' product. Nocca Robotics had designed and developed a high-end yet affordable indigenous ventilator for providing life support to critically ill covid-19 patients under the supervision of IIT Kanpur team. Apart from providing support to critical patients, the ventilator's design has unique features to safeguard frontline healthcare workers from exposure to the virus. According to IIT Kanpur, the fully functional ventilator prototype is in conformity with standing technical features and specifications.

[Bharat Biotech to lead monoclonal antibodies project for Covid-19 therapy](#)

The Council of Scientific and Industrial Research (CSIR) under its New Millennium Indian Technology Leadership Initiative has granted support to vaccine manufacturer Bharat Biotech for project to develop human monoclonal antibodies as therapy for Covid-19 infections. This project involves collaboration between National Centre for Cell Science (NCCS), Pune; Indian Institute of Technology, Indore, and Gurgaon-based PredOmix Technologies, and will fast-track the development process to make the antibodies available



highly effective and specific human monoclonal antibodies that are capable of neutralising the SARS-CoV2 virus by binding to the virus and rendering it ineffective.

[Panjab University develops spray to disinfect PPEs](#)

Panjab University's department of chemistry has developed an antimicrobial copper-based nano-coating spray for masks and personal protective equipment (PPE) kits, which kills microbes like the novel coronavirus on the outer surfaces of masks. Nano-copper ensures limited penetration and accumulation of microbial contaminants on coated surfaces. The coating also has the potential to reduce the risk of secondary infection by limiting transmission of microbes. Unlike common disinfecting methods such as diluted bleach and alcohol, this innovative antiviral nano-coating is boosted by heat sensitive polymers that encapsulate and inactivate virus. Also, it is non-toxic and environment friendly. This spray coating can protect surfaces from coronavirus for up to 45 days.

[Hewlett Packard Enterprise deploys COVID-19 test labs, OPD centres in India](#)

Hewlett Packard Enterprise (HPE) has deployed four COVID-19 test labs and four outpatient department (OPD) centres across the country to assist the central and state governments in their efforts to contain the COVID-19 pandemic. These facilities set up in Delhi, Chennai, Lucknow, and Dehradun have been set up to provide additional authorised testing facilities and isolation beds to manage the increased demand across the country. The HPE COVID-19 test labs are designed to enable quick and clean testing of individuals who suspect they may have contracted COVID-19, and will be based on the specifications provided by the Ministry of Science and Technology. Developed and deployed in 40-foot refurbished negative air pressure containers, these labs are equipped with biometrics, blood pressure apparatus, spirometer, serum analyser, pulse oxymeter, glucometer, pulse reader, and ECG. All this equipment will be integrated with EMR (electronic medical record) applications, and an online dashboard will be provided to monitor the related OPDs.

[Gilead signs licensing agreement for remdesivir with Indian companies](#)

US drug maker Gilead Sciences has signed non-exclusive voluntary licensing agreements with five generic drug makers based in India and Pakistan on anti-viral drug Remdesivir, seen as a potential therapy for COVID19. Indian companies Cipla Ltd, Hetero Labs Ltd, Jubilant Life Sciences and Mylan and Pakistani firm Ferozsons Laboratories has signed the commercial agreement that allows the companies to manufacture remdesivir for distribution in 127 countries, including India. A statement from the US drug maker says the 127 nations include nearly all low-income, lower middle-income & several upper-middle and high-income countries that face significant obstacles to healthcare access. The USFDA has granted Emergency Use Authorization (EUA) for remdesivir to treat Covid-19, despite limited trial data to prove safety and efficacy of Remdesivir. Japan has approved the drug for



to scale up production and make the drugs available. Gilead says the licensees also set their own prices for the generic product they produce. The licenses are royalty-free until the World Health Organization declares the end of the Public Health Emergency of International Concern regarding COVID-19 or until a pharmaceutical product other than remdesivir or a vaccine is approved to treat or prevent COVID-19, whichever is earlier, according to the Gilead statement. The remdesivir licensing agreement is on lines of the voluntary licences Gilead had signed in 2014 with 9 Indian companies for its blockbuster Hepatitis drug Sofobuvir

GLOBAL

[Next-generation solar cells can withstand heat, maintain efficiency](#)

Iowa State University researchers have found a way to exploit perovskite's useful properties while stabilizing the cells at high temperatures. First, the team did away with organic components in the material, particularly cations, materials with a positive charge, and substituted inorganic materials such as cesium. That made the material stable at higher temperatures. And second, they developed a fabrication technique that builds the perovskite material one thin layer - just a few billionths of a meter - at a time. This vapor deposition technique is consistent, leaves no contaminants, and is already used in other industries so it can be scaled up for commercial production. The new perovskite solar cells show no thermal degradation even at 200 degrees Celsius for over three days, temperatures far more than what the solar cell would have to endure in real-world environments. The new inorganic perovskite solar cells have a photoconversion efficiency of 11.8 percent. Further developments include using new combinations of materials. The greater thermal stability of inorganic perovskite materials and solar cells at higher temperatures and over extended periods of time are promising for the commercialization of perovskite solar cell materials.

[New technology revolutionizes 3D metal printing](#)

A team at TU Graz has developed Selective LED-based melting (SLEDm) i.e. the targeted melting of metal powder using high-power LED light sources for 3D metal printing and has now applied for a patent. The technology is similar to selective laser melting (SLM) and electron beam melting (EBM), in which metal powder is melted by means of a laser or electron beam and built up into a component layer by layer. However the SLEDm process uses a high-power LED beam to melt the metal powder. The light-emitting diodes were specially adapted and equipped with a complex lens system by which the diameter of the LED focus can be easily changed between 0.05 and 20 millimetres during the melting process. This enables the melting of larger volumes per unit of time, reducing the production time of components for fuel cell or medical technology, for example, by a factor of 20 on average. This technology is combined with a newly designed production plant which adds



fractures. SLEDM enables the production of such implants directly in the operating theatre. The second focus is on production of components such as bipolar plates for fuel cells or components for battery systems.

[Supercapacitor promises storage, high power and fast charging.](#)

Researchers at Penn State and two universities in China have developed a new supercapacitor by combining Manganese oxide with cobalt manganese oxide, forming a hetero-structure which when coupled to a semiconductor, makes a conductive interface with a low resistance to electron and ion transport. They used an easy, low-cost, two-step method to controllably grow MnO₂ nanorods directly on CoMn₂O₄ nanosheets (i.e., MnO₂@CoMn₂O₄) with robust adhesion. The controllable heterostructures exhibit significantly improved electrochemical capacitive performance, including remarkable specific capacitance, excellent rate capability, and cycling stability. Furthermore, exploring MnO₂@CoMn₂O₄ as positive electrode and N-doping 3D reduction of graphene oxide (N-3DrGO) as negative electrode yielded an asymmetric supercapacitor with high energy density (230.57 mWh cm⁻²), remarkable power density (3.91 mW cm⁻² at 149.99 mWh cm⁻²), and excellent cycling stability (81.3% capacitance retention after 5000 cycles at 3 mA cm⁻²). This work offers new opportunities to explore high-performance electrode materials by providing methods to control the interface in nano-heterostructures.

[Filtering out toxic chromium from water](#)

Chemists at EPFL Switzerland are developing energy efficient processes for removing hexavalent chromium from water, using sponge-like materials called metal-organic frameworks (MOF) that can collect specific substances from solution. The materials are extremely porous and offer very great contact surface area. The target substance then enters these pores and sticks to the internal surface area in a process called adsorption. The scientists have previously shown that their materials can efficiently adsorb other substances dissolved in solution, like gold, mercury and lead. For instance, 1 gram of MOF yields almost 1 gram of gold. The team has now demonstrated the extraction of hexavalent chromium from water and the MOFs can extract approximately 208 milligrams per gram of MOF. Also, when light is shined on the MOF, it then transforms the highly toxic hexavalent chromium into relatively nontoxic trivalent chromium. Further developments are required in order to implement the technology for decontaminating water outside of the laboratory. The sponges are they are relatively easy and cheap to make. The cost of 1 kg of MOFs to cost roughly 15 CHF. This development could lead to better access to clean water and extraction of valuable metals from seawater.

[Wuhan Lab develops Fossil-Fuel Jet Propulsion with Air Plasmas](#)

A team of researchers at Wuhan University has demonstrated a prototype device that uses



causes no carbon emissions. The researchers created a plasma jet by compressing air into high pressures and using a microwave to ionise the pressurised air stream. The plasma jet thruster generates the high-temperature, high-pressure plasma in-situ using only injected air and electricity. The results demonstrated the jet engine based on microwave air plasma was a potentially viable alternative to the conventional fossil fuel jet engines. The prototype plasma jet device can lift a 1 kg steel ball over a 24mm diameter quartz tube, where the high-pressure air is converted into a plasma jet by passing through a microwave ionisation chamber. By building a large array of these thrusters with high-power microwave sources, the prototype design can be scaled upto a full-sized jet.

[UOC research improves the quality of CT scan imagery.](#)

Computed tomography, or CT is among the most common imaging tools used to guide biopsy and radiation therapy as well as monitoring the effectiveness of treatments like cancer treatment, internal injuries, and bleeding detection. However, CT scan involves the risk due to the exposure of the body to high-dose X-rays. Scientists at the University of Catalonia (UOC) have developed a new post-processing algorithm which increases the quality of reconstructed CT images. The method increases the capacity to distinguish between tissues by 60% in simulations compared to conventional CT. The post-processing approach did not require substantial hardware reconfiguration and gave more freedom to imaging scientists for further exploration. The examination of the findings of the study in a clinical setting could reduce the radiation exposure to X-rays

[NTU Singapore develops sustainable way to extract chitin](#)

Scientists at the Nanyang Technological University, Singapore (NTU Singapore) have developed a cost effective, environment-friendly method to extract chitin from prawn shells and discarded fruit waste, through natural fermentation process. Chitin serves a wide variety of uses in the food industry, such as food thickeners and stabilisers, and as antimicrobial food packaging. NTU method of extracting chitin is more sustainable and creates high-quality chitin using accumulated crustacean waste, reducing overall waste. NTU research team also found they could ferment chitin further into chitosan, which can be used as a growth enhancer in plant fertilisers, or as a controlled drug delivery system in pharmaceutical treatments. They are also exploring ways to use chitosan which can potentially lead to the development of a more durable cellulose film with anti-microbial and anti-bacterial properties.

[EU commits €675M of Horizon 2020 money to coronavirus R&D](#)

The European Commission announced an additional €675 million of Horizon 2020 funding for research on vaccines, diagnostics and therapeutics against COVID-19, bringing the total investment in pandemic R&D from the programme to €1 billion. As part of its contribution to



of which €325 million from Horizon 2020 has previously been announced, and the balance of €400 million comes from other EU programmes. In addition to donating money, leaders stated their commitment to international cooperation and the work that is being done by the World Health Organisation (WHO). France pledged €500 million; the UK has committed up to £744 million, while Germany added another €525 million and promised a total of €1.3 billion in funding for GAVI, the vaccine alliance founded by the Bill and Melinda Gates Foundation. Japan has pledged \$834 million, including a new contribution of approximately \$234 million to GAVI and CEPI. China pledged €45.6 million and Australia, Canada, Mexico, South Africa and Saudi Arabia have also announced donations.

INDIA

[India's 1st Portable Multi-Functional UV Sterilizer](#)

To cater the need of disinfecting daily used accessories, and Indian company Daily Objects has launched India's first portable multifunctional UV Sterilizer using UV-C light which will help to disinfect Smartphone, tech-gadgets and personal accessories to destroy 99.9% of the germs in just 5 minutes. The product does not use any additional chemicals or cause any harm to the accessories and gadgets, thus making it a safe way to disinfect. It is made to quickly disinfect small accessories and tech gadgets like rings, mobile phones, face masks, spectacles, watches, cash, baby products, wallets, jewellery, and many more.

[India's R&D expenditure & scientific publications on the rise](#)

As per the R&D Statistics and Indicators 2019-20, India's gross expenditure in R&D has tripled between 2008 & 2018 driven mainly by the Government sector, and scientific publications have risen placing the country internationally at the 3rd position on this score as per the NSF database, 3rd in the number of Ph.D. in science & engineering. The number of researchers per million population has doubled since 2000. The survey included more than 6800 S&T Institutions spread across varied sectors like central government, state governments, higher education, public sector industry, and private sector industry in the country, and a response rate of more than 90% was achieved. Prof. Ashutosh Sharma, Secretary DST, said the report on R&D indicators for the nation is an extraordinarily important document for the evidence-based policymaking and planning in higher education, R&D activities and support, intellectual property, and industrial competitiveness.

[A blueprint for future weather system observation](#)

A joint India-U.K. research project, has found that large-scale weather events such as monsoons and tropical cyclones can now be more accurately predicted. The findings show that oceanic processes play a crucial role in monsoon development through modulation of sea surface temperature (SST). The researchers created a blueprint for future weather



properties, including temperature, salinity, velocity, underwater radiation and subsurface mixing, along with surface fluxes of heat, from shipboard measurements during the boreal summer monsoon of 2016. The study in the Bay of Bengal serves as a blueprint for future observational campaigns that aim to determine the processes that affect the variability of SST and its impact on weather systems.

[JNCASR scientists fabricate energy-efficient photodetector for security application](#)

Scientists from Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) have fabricated an economical and energy-efficient wafer-scale photodetector (thin slice-based) using a gold (Au) – silicon (n-Si) interface, which showed high sensitivity towards light demonstrating the photodetection action. The Au–Si interface was brought about by galvanic deposition, a technique for electroplating of metals, wherein water-based solutions (electrolytes) are used, which contain the metals to be deposited as ions. In addition, a nanostructured Au film also was deposited on top of p-type silicide (having an excess of positive charges), which acts as a charge collector. Being a solution-based technique, the method is highly economical and enables large-area fabrication without compromising the detector response. The process is quick, taking only minutes to fabricate a detector of any arbitrary area. With a commonly available protective coating, excellent environmental stability is shown for the device under the harsh conditions for several days.

[Styrene gas leak: NGT slaps interim penalty of Rs 500 million on LG Polymers](#)

Leakage of hazardous gas, Styrene, took place on May 7 at 0230 hrs from a chemical factory owned by the South Korean company LG Polymers India Pvt Ltd, at R.R. Venkatapuram village, near Vishakhapatnam, resulting in the death of 11 persons and over 1000 persons exposed. The major early morning chemical leak impacted villages in a five-km radius, leaving many people dead and scores of citizens suffering from breathlessness and other problems. The leak was noticed by company staff who were reportedly inspecting machines to restart the factory and raised an alarm. Following the incident the National Green Tribunal (NGT) took up the matter suo moto and has set up a 5-member Committee to probe the incident, and submit a report before the next hearing on May 18 and directed LG Polymers India Pvt Ltd to deposit an initial amount of Rs 500 million with the District Magistrate, Vishakhapatnam. The committee has to submit its report on the sequence of events, causes of failure and persons and authorities responsible, extent of damage to life among others.

IN BRIEF

[Water-splitting module captures solar energy](#)

Rice University researchers have created an efficient, low-cost device that splits water to



into hydrogen and oxygen, with a sunlight-to-hydrogen efficiency as high as 6.7%. The system encapsulates the perovskite layer with a Surlyn (polymer) film. The patterned film allows sunlight to reach the solar cell while protecting it and serves as an insulator between the cells and the electrodes. Even when there's no sunlight, stored energy in the form of hydrogen and oxygen products can be used like a fuel cell to turn those fuels back into electricity. The researchers will continue to improve the encapsulation technique as well as the solar cells themselves to raise the efficiency of the modules.

['Microscope on a chip' could bring medical expertise to distant patients](#)

Researchers from the University of Barcelona, Spain are developing ChipScope, a device potentially compact enough to fit in a pocket. It may be possible for a modified mobile phone to have images of the nano-world. ChipScope which seeks to go beyond the optical diffraction limit and with no need of altering the sample. ChipScope's prototype illuminates a tissue sample using an array of minute (50 nanometres in size) light emitting diodes (LEDs)—to create shadow images of the specimen. These images are then captured using a detector sensitive enough to detect single photons and processed to produce a complete picture. Through very precise control of these tiny LEDs, the ChipScope imaging system has a spatial resolution of just below 200 nanometres—which is the usual limit with visible light. By triggering these tiny LEDs individually, and in sequence, the shadow images can be added to build up a picture of the sample.

RESOURCES AND EVENTS

[AOSIS Forum Calls for “Year of Ambition” on Climate Action](#)

In an effort to ensure momentum on climate action despite the COVID-19 pandemic, the Alliance of Small Island States (AOSIS) convened the Placencia Ambition Forum virtually from 20-22 April 2020, hosted by the Government of Belize, currently serving as AOSIS Chair. The Forum resulted in a Declaration titled, ‘2020 – Our Year of Ambition,’ which calls for: (1) ambitious, detailed, new or updated nationally determined contributions (NDCs) that will close the gap between where we are now and where we need to be to limit global warming to 1.5°C; (2) new financial commitments that deliver on support and reflect ambition, including deeper discussions at COP 26 on the long-term finance goal to provide certainty for more ambitious mid- to long-term climate actions; and (3) enhanced near-term action to protect the vulnerable, including short-term action and domestic reform within the context of building long-term resilience. The Declaration also urges countries to follow through with COVID-19 recovery plans that incorporate policies and measures that help jump start NDC implementation and lead to enhanced ambition and action. It calls for a ‘Roadmap for Political Momentum’ towards COP 26, and welcomes the Group of 20 (G20) commitment to use the SDGs and other international commitments to guide recovery



DST observes 50th Foundation Day; launches a multimedia guide on COVID-19

On the occasion of 50th DST Foundation Day Union Minister of Science & Technology, Health & Family Welfare and Earth Sciences, Dr. Harsh Vardhan interacted virtually with Heads of all Autonomous Institutions of Department of Science & Technology (DST) about their S&T initiatives, particularly in relation to their endeavours for combating the COVID-19 outbreak. On this occasion, Secretary (DST), Professor Ashutosh Sharma highlighted the major initiatives of DST, its vision for next five years and the steps DST is taking to identify and map technologies from R&D labs, academic institutions, start-ups, and MSMEs to fund nearly market-ready solutions for diagnostics, testing, health care delivery, equipment and supplies to combat COVID-19. The Minister praised the Indian scientists about their timely response in tackling COVID-19 and noted that the National policy on Scientific Social Responsibility which is being worked out by DST should be an embodiment of the principles of responsible innovation and social entrepreneurship which DST has imbibed over its 49-year journey.

National Technology Day: Rebooting the economy through S&T

The Technology Development Board (TDB) and Confederation of Indian Industry (CII) held a high-level digital conference on 'Rebooting the Economy through Science, Technology and Research Translations titled RESTART' on May 11, 2020 to celebrate the National Technology Day. Union Minister for Science & Technology, Health and Family Welfare and Earth Sciences, Dr. Harsh Vardhan delivered the National Technology Day address. The programme also included special addresses by Member, Science, NITI Aayog Dr V K Saraswat; Principal Scientific Advisor to Government of India, Prof. K. Vijay Raghavan; Chief Scientist, WHO, Dr. Soumya Swaminathan; DST Secretary Prof. Ashutosh Sharma. National Technology Day is celebrated on 11 May to commemorate achievements of innovations and technological excellence in the country. It was on May 11, 1998, that India achieved a major technological breakthrough by successfully carrying out nuclear tests at Pokhran.

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Tel:-011- 24682176, E-mail: science.diplomacy@ris.org.in

Website: www.fisd.in

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