

# SCIENCE AND TECHNOLOGY

## OAS PRELIMS 2020 CURRENT AFFAIRS

### January 2020

- Indian Space Research Organisation (ISRO) launch GSAT-30 satellite onboard Ariane-5 launch vehicle (VA 251) from French Guiana, overseas department of France.
- Indian Space agency Indian Space Research Organisation (ISRO) has unveiled 'Vyommitra' or "friend in the sky" a half-humanoid robot for Gaganyaan Space Mission.
- France will train Indian flight surgeons for the ambitious human space mission Gaganyaan.
- The 'Innovation Festival' kicked off at the Science Centre in Itanagar, Arunachal Pradesh. The festival is being organized by the Arunachal Pradesh State Council for Science & Technology in collaboration with the National Innovation Foundation.
- The Indian Space Research Organisation (ISRO) has announced that it is preparing low-cost satellite launch vehicles costing around 30-35 crores each.



### February 2020

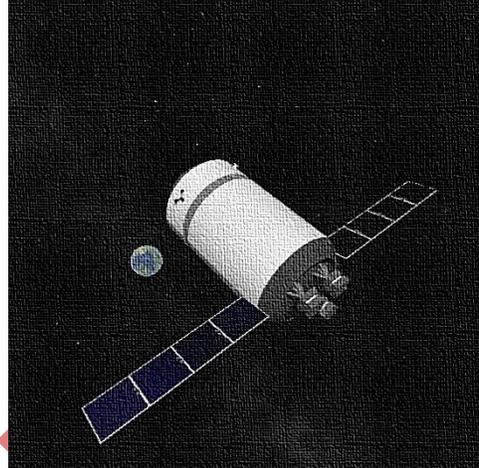
- NASA's astronaut Christina Koch has returned to Earth after her record stay of 328 days in space and surpassed Peggy Whitson's record for an American woman on a single spaceflight at 289 days.
- The scientists from Rochester Institute of Technology has discovered the nearest-known 'baby giant planet' which is named as "2MASS 1155-7919 b". The newly discovered baby giant planet which is named as "2MASS 1155-7919 b" lies about 330 light-years from our solar system.
- The Department of Telecommunications (DoT) has launched the '5G Hackathon' in association with the government of India, academia and industry stakeholders to shortlist India's focused cutting edge ideas that can be converted into workable 5G products and solutions.



- The Indian Space Research Organisation has revealed in its annual report for 2019-20 that it will launch 10 Earth Observation Satellites in 2020-21.

### March 2020

- Google Cloud announced its plans to open a Delhi Cloud Region. This will be the company's second cloud region in India since it launched one in Mumbai.
- The International Advanced Research for Powder Metallurgy & New Materials (ARCI), Hyderabad has developed a fuel cell technology called Polymer Electrolyte Membrane fuel cells (PEMFC).
- NASA (National Aeronautics and Space Administration) announced the name of the 5<sup>th</sup> Mars (red planet) rover as Perseverance. Previously the rover was known by its codename as Mars 2020.
- The Indian Institute of Technology (IIT) Mandi will establish a Technology Innovation Hub (TIH) under the National Mission on Interdisciplinary CyberPhysical Systems (NM-ICPS). The Technology Innovation Hub will be established with the help of Rs 7.25 crore sanctioned by the Department of Science and Technology (DST) to IIT Mandi.
- A starch-based 'hemostat' material which concentrates the natural clotting factors in blood that are critical for stopping the blood flow, has been developed by the Institute of Nano Science and Technology (INST).
- A team at IIT Bombay has developed a mobile app named 'CORONTINE'. The 'CORONTINE' app aims to help the authorities in tracking the asymptomatic carriers and prevent the spread of the COVID-19 disease.
- A new space capsule from SpaceX has been picked up by National Aeronautics and Space Administration (NASA) to ferry cargo and supplies to the agency's planned lunar space station. Hence, with a \$7 billion NASA contract, SpaceX will use its biggest rocket, Falcon Heavy to send spacecraft named as "Dragon XL" to the Lunar Gateway.



### April 2020

- Bio suit named as "Personal Protective Equipment" has been developed by the Defence Research and Development Organisation (DRDO) to keep the medical, paramedical and other personnel engaged in combating COVID-19 safe from the deadly virus.
- National Aeronautics and Space Administration (NASA) has selected mission "Sun Radio Interferometer Space Experiment (SunRISE)" to look into how the Sun generates and releases solar particle storms into planetary space.

- Amidst the rising cases of COVID-19 in India, IIT Kanpur has started developing portable ventilators which will be significantly cheaper than the ones available in the market.
- A team of Indian IIT Guwahati has developed a drone with "automated sprayer" to sanitise large areas such as roads, parks and footpaths in order to prevent the spread of COVID-19.
- Genrich Membranes has developed a 'Membrane Oxygenator Equipment' for the treatment of COVID-19 patients. The device has been developed to treat breathlessness which is one of the critical symptoms of COVID-19. The device is based on innovative & indigenous hollow-fiber membrane technology and can enrich oxygen in the air up to 35%.
- NASA unveils plan to setup Artemis, the first human base camp on Moon's south pole by 2024. NASA is working on the Artemis program that aims to land humans on the moon by 2024.
- Google has announced the launch of a virtual Braille keyboard for Android users with low vision or blindness. This new keyboard will enable these people to type on their phones without additional hardware.
- The scientists of Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST) have designed and developed an highly efficient super absorbent material titled "Chitra Acrylosorb Secretion Solidification System".
- DRDO has rolled out new products namely "Automatic Mist Based Sanitiser Dispensing Unit" and "UV Sanitisation Box and Hand-held UV device" to enable COVID-19 disinfection process.
- A compact and portable solid-state sensor has been developed by the Centre for Nano and Soft Matter Sciences (CeNS) to detect the heavy metal ions in water.
- Department of Science and Technology, Government of India, has rolled out an Integrated Geospatial Platform known as "SAHYOG" to help in decision making during the present COVID-19 outbreak and support with area-specific strategies in order to handle the socio-economic impact in the recovery phase.
- "COVSACK" is a kiosk developed by the Defence Research and Development Organisation to make the process of collecting COVID-19 samples free of infection spread and to help in combatting the COVID-19.
- IIT-Bombay has developed a digital stethoscope called "AyuSynk" to check patients who are infected with COVID-19.
- Google and Apple collaborates to fight against COVID-19 via contact tracing technology, enabling the use of Bluetooth technology to help governments and health agencies reduce the spread of the Corona Virus.
- CSIR-National Aerospace Laboratories has developed Personal Protective Coverall Suit in association with MAF Clothing Pvt. Ltd., Bengaluru. The polypropylene spun laminated multi-layered non-woven fabric based suit has been developed for the front line health workers in order to fight against COVID-19.



- Indian Institute of Technology (IIT) Ropar (Punjab) has developed & designed a 'WardBot' to deliver medicines and food to COVID-19 patients in isolation wards without human intervention.
- For the rapid detection of pathogens, a device named "bug sniffer" has been developed by the researchers at the Agharkar Research Institute (ARI), Pune.
- A low-cost electro-catalyst has been developed with "Fish gills" by the scientists at the Institute of Nano Science and Technology (INST), an autonomous institute under the Department of Science and Technology.
- IIT Mandi, Himachal Pradesh has developed a highspeed magnetic Random Access Memory (RAM) which is faster, energy-efficient and stores more data in a smaller volume as compared to existing data storage technologies.
- Scientists from International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) has developed an advanced tool "NanoBlitz 3D" in collaboration with Nanomechanics Inc., USA. NanoBlitz 3D can be used for the mapping of nanomechanical properties of materials such as multiphase alloys, composites, and multi-layered coatings.
- Raksha Mantri, Rajnath Singh has launched India's 1st COVID-19 sample collection mobile Lab through video conference. India's 1st COVID-19 sample collection mobile Lab has been named as "Mobile BSL-3 VRDL Lab".
- National Aeronautics and Space Administration has announced that they will launch astronauts Bob Behnken and Doug Hurley to International Space Station (ISS) on May 27, 2020. A SpaceX rocket will carry two astronauts to the International Space Station (ISS) in Crew Dragon spacecraft.
- National Aeronautics and Space Administration has developed a high-pressure ventilator called VITAL (Ventilator Intervention Technology Accessible Locally) to treat COVID-19 patients.
- Scientists from Jawaharlal Nehru Centre For Advanced Scientific Research has developed "Berberine" based Alzheimer inhibitor. Scientists modified berberine to "Ber-D" which is a soluble (aqueous) and acts as antioxidant.
- A low-cost robotic device named as "Hospital Care Assistive Robotic Device (H-CARD)" has been developed by CSIR-Central Mechanical Engineering Research Institute. It will be used in the collection of samples of people exhibiting symptoms of COVID-19, and will also be useful in treating COVID-19 patients.
- Scientists who have been observing the ozone hole at Copernicus' Atmospheric Monitoring Service has announced that the Ozone layer hole is now closed in the North Pole.
- A low-cost mechanical ventilator "Ruhdaar" has been developed by team of engineering students from IIT Bombay, NIT Srinagar and Islamic University of Science & Technology, Jammu and Kashmir.
- National Aeronautics and Space Administration (NASA) Hubble Space Telescope, has completed 30th year in orbit on 25 April 2020.

- Indian Institute of Information Technology and Management, Kerala has developed an AI Semantic search engine called 'Vilokana' to enable researchers to get deeper insights into scientific studies, especially when they need to find an early solution to the COVID-19 crisis.

### May 2020

- The Defence Institute of Advanced Technology, Pune has developed microwave steriliser named as "ATULYA" to disintegrate the COVID-19 virus with the help of differential heating.
- Council of Scientific and Industrial Research, CSIR's Scientific Instruments Organisation, Chandigarh has developed an Electrostatic Disinfection Machine which is effective in the disinfection and sanitization and has been developed to fight with COVID-19 pandemic.
- 17-year-old, Indian-origin girl, Vaneeza Rupani has been honoured of naming the NASA's 1st Mars helicopter 'Ingenuity'. she submitted her essay into NASA's "Name the Rover" contest.
- An Ultra Violet (UV) Disinfection Tower has been developed by the Laser Science & Technology Centre (LASTEC), a premier laboratory of Defence Research and Development Organisation. It has been developed to achieve rapid and chemical free disinfection of high infection prone areas.
- Bharat Dynamics Ltd. (BDL) has inked pact with IIT Kanpur to make large-scale ventilators developed by NOCCA Robotics (incubated start-up of IIT Kanpur).
- Indian Council for Medical Research (ICMR) has tied up with Bharat Biotech to develop indigenous COVID-19 vaccine.
- DRDO's Research Centre Imarat lab, Hyderabad has developed an automated contactless UVC sanitization cabinet named Defence Research Ultraviolet Sanitiser (DRUVS) to sanitise mobile phones, iPods, laptops, currency notes, cheque leaves etc.
- India's first indigenous antibody testing kit "ELISA" has been successfully developed by the National Institute of Virology, Pune. It consists of a blood test which detects antibodies in the blood to find out if an individual was infected with COVID-19 infection or not. Hence, the test has been named as "COVID KAVACH ELISA".
- A Non Invasive BiPAP Ventilator "SwasthVayu" has been developed by CSIR-National Aerospace Laboratories, Bangalore to treat COVID-19 patients.
- The Sundaram Ventago is a low-cost, automated respiratory assist device which has been developed jointly by the TVS group, Sundaram Medical Foundation and IIT-Madras.
- An interactive dashboard "MIR AHD Covid-19 Dashboard" has been developed by the researchers at IIT Gandhinagar, to provide key information to stakeholders and the public in order to make research-backed decisions during the time of crisis.



- International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) and Sree Chitra Tirunal Institute of Medical Sciences and Technology (SCTIMST), Thiruvananthapuram have jointly developed new generation IronManganese based alloys for biodegradable metal implants for use in humans.
- Two mobile indoor Disinfection Sprayer units namely Pneumatically Operated Mobile Indoor Disinfection (POMID), and Battery Powered Disinfectant Sprayer (BPDS) have been developed by the scientists at CSIR-Central Mechanical Engineering Research Institute (CMERI), Durgapur.
- An accelerator programme branded as “H.A.C.K” has been launched by the Karnataka’s Centre of Excellence in cyber security (CySecK).
- NASA has renamed its next-generation space telescope “Wide-Field Infrared Survey Telescope (WFIRST)”, which is set to launch in 2025, in honour of Nancy Grace Roman.

### June 2020

- NASA astronauts Robt Behnken and Douglas Hurley docked the SpaceX capsule with the International Space Station (ISS). SpaceX’s Falcon 9 with Crew Dragon capsule – Endeavour launched from Pad 39A at NASA’s Kennedy Space Center, Cape Canaveral, Florida. Now SpaceX became the first private company to fly astronauts into orbit.
- A disinfection unit named as “Ultra Swachh” has been developed by the Defence Research and Development Organisation (DRDO) to disinfect a wide range of materials such as electronics items, fabrics, Personal Protective Equipment (PPEs) etc.
- Used mask disposal device based on Internet of Things (IoT) “BIN-19” and UV light-based multipurpose disinfector “UV SPOT” has been launched in Kerala by VST Mobility Solutions.
- A robot named as ‘Coro-bot’ has been developed by an engineer Pratik Tirodkar from Thane district of Maharashtra, in order to reduce the physical contact of care-givers with COVID-19 patients.
- UVC-based Cabinet has been co-developed by the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI) and the MEKINS Industries. It will disinfect non-critical hospital items, laboratory wear, and PPEs in order to prevent surface contamination of COVID 19.
- Magnetocaloric material, a rare-earth-based material that can be effectively used for cancer treatment, has been developed by scientists at the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI).



- ISRO has signed an agreement with Aryabhata Research Institute of Observational Sciences (ARIES) for cooperation in the field of Space Situational Awareness (SSA) and Astrophysics.
- Indian Space Research Organisation (ISRO) has received a patent for its Liquid Cooling and Heating Garment (LCHG). LCHG is a protective garment for human spaceflight.
- IIT-Bombay has created Indian beneficiary chip “Dhruva”. This chip can be utilized in cell phones and route gadgets to discover locations and route inside the nation. Dhruva will get signals from India’s NAVIC group of navigation satellites just as the US Global Positioning System-based satellites to decide these precisely under every single climate condition.
- Union Cabinet chaired by Prime Minister Shri Narendra Modi has approved the establishment of Indian National Space Promotion and Authorization Centre (IN-SPACe).
- NASA has announced that its headquarters in Washington, D.C., will be named after Mary W. Jackson, one of its history-making engineers.
- GermiBAN, a device capable of killing 99.9% of surface and air microbes, has been launched. The device has been developed by Atal Incubation Centre & Association of Lady Entrepreneurs of India (ALEAP) Women Entrepreneurs (WE) HUB. It would be useful for quarantine centres, isolation wards, hospitals and all general places for killing viruses like coronavirus.

#### July 2020

- IIT Kanpur has developed a classroom-to-home teaching setup ‘Mobile Masterjee’. It can record the lectures or instructions by the teachers while using their available smartphones.
- IIT Gandhinagar has developed an Artificial Intelligence (AI)-based deep learning tool for detection of Covid-19 from Chest X-ray images.
- The researchers at IIT Roorkee has developed “Unisaviour”, a disinfection box which can be used to sterilize personal belongings, apparels, PPE, medical equipment among others from the COVID-19.
- Mylab Discovery Solutions has launched the ‘Compact XL’ system for conducting a wide range of tests, including RT-PCR tests for COVID-19. This is India’s first machine to automate the manual processes of molecular diagnostic tests such as RNA/DNA-based tests including COVID-19 RT-PCR tests.
- Indian Space Research Organization will launch Brazil’s Amazonia-1 satellite. This satellite is onboard the Polar Satellite Launch vehicle (PSLV) as a primary payload by August 2020.
- IIT Kanpur has developed an Ultraviolet (UV) sanitizing device named Smartphone operated Handy Ultraviolet Disinfection Helper (SHUDH). It will help in killing the spread of coronavirus at the highly prone places such as hospitals, hotels, malls, offices and schools.
- Indian Institute of Technology, Delhi has developed the world’s most affordable COVID-19 Diagnostic Kit “Corosure”.

- Indian Institute of Technology Madras (IIT-M) start-up Modulus Housing, has developed a portable hospital unit called 'MediCAB'. It was launched recently in Wayanad District of Kerala.
- COVID Protection System (COPS) for Workplace has been unveiled by the CSIR-CMERI, Durgapur. It comprises of three units namely contactless Solar Based Intelligent Mask Automated Dispensing Unit cum Thermal Scanner (IntelliMAST), Touchless Faucet (TouF) and 360° Car Flusher.
- Kakrapar Atomic Power Plant, Unit-3 (KAPP-3), Gujarat has attained criticality at around 09:36 Hrs on 22 July 2020. It is India's first 700 MWe (megawatt electric) Pressurized Heavy Water Reactor (PHWR) with innovative features.
- AIIMS, Nagpur has designed and developed a 'smart wristband' in collaboration with IIT Jodhpur and IIT Nagpur, for effective tracking and monitoring of Covid-19 positive and suspect patients.
- Acculi Labs, a Bangalore based startup has been selected by Centre for Augmenting WAR with COVID-19 Health Crisis (CAWACH), an initiative by the Department of Science and Technology (DST) to develop "Lyfas COVID score", a COVID risk assessment profile.
- The Indian Institute of Management Kozhikode has developed a wearable hand band named as the "Veli Band". It helps in maintaining social distancing by sending out an alarm in case of proximity with another person.
- Defence Institute of Advanced Technology (DIAT) has developed 'Aashray', a medical bed isolation system to combat COVID-19 by preventing or minimising the spread of the virus.



### August 2020

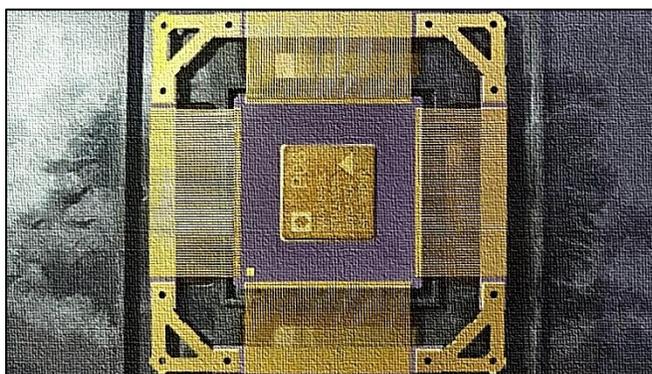
- The National Aeronautics and Space Administration has launched "Mars 2020 Perseverance rover mission" with United Launch Alliance (ULA) Atlas V rocket to the Red Planet "Mars".
- Skyroot Aerospace, a Spacetech startup has successfully test fired an upper stage rocket engine "" and has become the first Indian private firm to exhibit the potential to build a homegrown rocket engine. "Raman" is a 3-D printed rocket engine which has been named after Nobel laureate CV Raman.
- Air Unique-quality Monitoring (AUM) Photonic System has been indigenously developed with the prime objective of real-time remote monitoring of air quality. It has been developed by Prof. Rao Tatavarti along with the support of Department of Science and Technology's Clean Air Research Initiative.

- Google and Central Water Commission(CWC) of India have launched the flood forecasting initiatives across India for the past several months.
- Defence Institute of Advanced Technology, DIAT (DU) has launched two products namely "Pavitrapati" & "Aushada tara" to fight against COVID-19.
- "Swadeshi Microprocessor Challenge– Innovate Solutions for #Aatmanirbhar Bharat" has been launched by the Union Minister of Law & Justice, Communications and Electronics & Information Technology, Ravi Shankar Prasad. It aims to invite innovators, startups and students to use two microprocessors namely "SHAKTI (32 bit) and VEGA (64 bit)" to develop various technology products. SHAKTI & VEGA microprocessors have been developed by IIT Madras and Center for Development of Advance Computing (CDAC) respectively.
- Indian Space Research Organisation and Veer Surendra Sai University of Technology (VSSUT), Odisha, have signed a MoU to set up the first of its kind innovation cum incubation centre, VSSUT Space Innovation Centre (VSSIC) to promote space research.
- Indian Institute of Technology's Alumni Council has signed an agreement with Russia's Lomonosov Moscow State University (MSU) and Russoft to build the world's largest and fastest hybrid quantum computer in India.



### September 2020

- World's largest Solar Tree has been developed by the CSIR-CMERI and has been installed at the Residential Colony of CSIR-CMERI in Durgapur, West Bengal.
- Indian Institute of Technology (IIT) Bombay, students have launched a free-of-cost mobile cancer application "AIR Scanner". The app is developed by Rohit Kumar Chaudhary and Kavin Agrawal.
- The IIT Delhi incubated startup Chakr Innovation has launched a special decontamination device called 'Chakr DeCoV', to decontaminate N95 masks. The Chakr DeCoV device is designed in the shape of a cabinet.
- Defence Research and Development Organisation (DRDO) has successfully flight-tested a Hypersonic Technology Demonstrator Vehicle (HSTDV), which is an unmanned scramjet vehicle with the ability to travel at six times the speed of sound. The test was conducted from Dr A P J Abdul Kalam Launch Complex at Wheeler Island, off the coast of Odisha. Now,

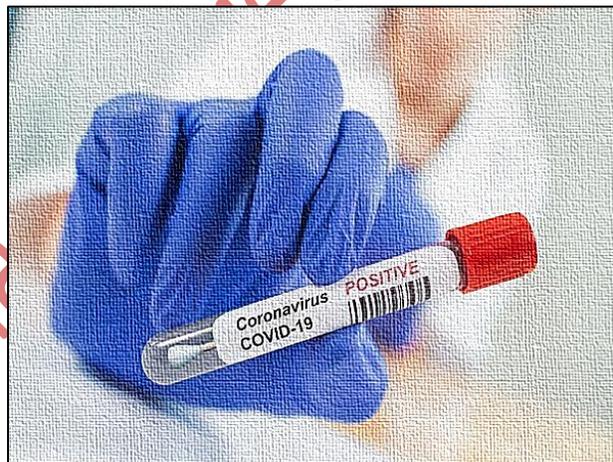


India has joined the elite club of the United States, Russia and China to develop and successfully test Hypersonic Technology.

- A 17-year-old girl, Khushi Chindaliya has been appointed as Regional Ambassador for India by the United Nations Environment Programme (UNEP)- Tunza Eco-Generation. In her new role, Khushi will raise awareness about climate change and the importance of environmental conservation and the need to safeguard environmental treasures.
- The Indian Institute of Technology (IIT) Madras has successfully developed 'MOUSHIK', an indigenously-made microprocessor for the Internet of things (IoT) devices.

### October 2020

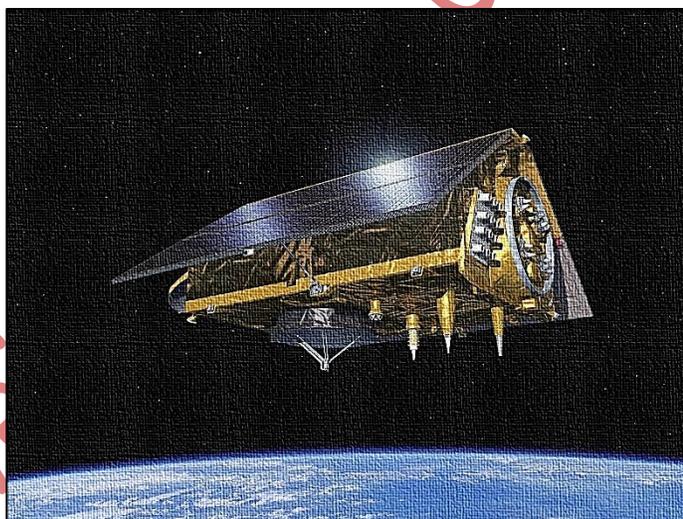
- World Space Week (WSW) is observed from October 4 to 10 every year to celebrate science and technology, and their contribution towards the betterment of the human condition. The 2020 theme is "Satellites Improve Life."
- National Aeronautics and Space Administration (NASA) has launched the Northrop Grumman Cygnus resupply spacecraft named "SS Kalpana Chawla" after its astronaut Kalpana Chawla.
- The Centre for Development of Advanced Computing (C-DAC) will be commissioning India's largest HPC-AI supercomputer 'PARAM Siddhi – AI'. This initiative will place India among the top countries in global AI supercomputing research and innovation. The initiative was headed by Abhishek Das, Scientist and Program Director (HPC-AI Infrastructure Development) at C-DAC, who conceived the idea and designed the architecture for the largest HPC-AI infrastructure in India.
- Nokia has been selected by NASA to build the first cellular network on the moon. NASA aims to return humans to the moon by 2024 and dig in for a longterm presence there under its Artemis programme. The first wireless broadband communications system in space would be built on the lunar surface in late 2022.
- The researchers at IIT Kharagpur have developed 'COVIRAP,' the Covid-19 diagnostic test technology, which is fairly easy to conduct and affordable as well and can produce results within one hour. This COVIRAP technology has been successfully validated for its efficacy in COVID-19 detection by the Indian Council of Medical Research (ICMR) and been granted certification, after rigorous testing with patient samples by an authorized ICMR laboratory.
- Two new studies published in Nature Astronomy suggest there could be much more water than previously thought, including ice stored in permanently shadowed "cold traps" at lunar



polar regions. Using data from the Stratospheric Observatory for Infrared Astronomy (SOFIA) Airborne Telescope, researchers scanned the lunar surface at a more precise wavelength than had been used before — six microns instead of three. This allowed them to distinguish the spectral fingerprint of molecular water.

### November 2020

- Indian astronomers have collaborated with the 2020 Physics Nobel Laureate Prof. Andrea Ghez for the design of back-end instruments and possible science prospects of the Thirty Meter Telescope (TMT) project. The Thirty Meter Telescope (TMT) is a proposed extremely large telescope (ELT) which is planned to be installed at Maunakea on the island of Hawaii.
- SpaceX has launched Four Astronauts (3 Americans, 1 Japanese) to the International Space Station on the first full-fledged taxi flight for NASA (National Aeronautics and Space Administration) by a private company. They were launched by Falcon Rocket from the Kennedy Space Center. The capsule has been named as "Resilience". The crew was led by Commander Mike Hopkins, Shannon Walker, Victor Glover (First Black Astronaut on a long-term space station) mission and Japan's Soichi Noguchi (First person in 40 years to launch on three types of spacecraft).
- China has sent into space the world's first 6G experiment satellite. The 6G satellite was among three Chinese satellites successfully launched into orbit, along with 10 commercial remote sensing satellites developed by Argentinian company Satellogic. This was the 351st rocket of China's Long March series.
- The US space agency NASA and the European Space Agency (ESA) successfully launched 'Copernicus Sentinel-6 Michael Freilich satellite', to monitor the rising global sea level. The joint US-European satellite lifted off on a SpaceX Falcon 9 rocket from Space Launch Complex 4E at Vandenberg Air Force Base in California.
- The Indian Regional Navigation Satellite System (IRNSS) has been recognised by the International Maritime Organisation (IMO) as a part of the World Wide Radio Navigation System (WWRNS) for operation in the Indian Ocean Region. India has become the fourth country in the world to have its independent regional navigation satellite system recognised by the International Maritime Organisation (IMO). The other three countries that have its navigation systems recognised by the IMO are the US, Russia and China.



**December 2020**

- Bharat Sanchar Nigam Limited (BSNL) has partnered with Skylotech India (Skylo), a global machine connectivity solutions company, to launch satellite-based narrow band-Internet of things (NB-IoT). This initiative is the world's first satellite-based NB-IoT network.
- The Bengaluru-based space-technology start-up "Pixxel", has signed a pact with the Indian Space Research Organisation (ISRO) to launch its first remote-sensing satellite on Isro's workhorse Polar Satellite Launch Vehicle (PSLV) rocket in early 2021. Earlier, the startup had planned to launch this satellite towards the end of 2020 and on a Russian Soyuz rocket. Pixxel aims to put a constellation of 30 earth observation micro-satellites into a sunsynchronous orbit by mid-2023.
- Indian Space Research Organisation (ISRO) will launch a communication satellite CMS-01, formerly named GSAT-12R, on December 17, using its Polar Satellite Launch Vehicle (PSLV) rocket's XL variant numbered as PSLV-C50. The CMS-01 will be a replacement for GSAT-12 that weighed 1,410 kg and was launched on July 11, 2011, with a mission life of eight years.
- The Indian Space Research Organization (ISRO) has set up a dedicated Space Situational Awareness (SSA) Control Centre named "NETRA", at its ISTRAC campus at Peenya, Bengaluru. The ISRO SSA Control Centre 'NETRA' was formally inaugurated by ISRO Chairman K Sivan.
- NASA and the European Space Agency (ESA) have selected Indian-American Raja Chari to be the Commander of the SpaceX Crew-3 mission to the International Space Station. Presently Raja Chari, is a colonel in the US Air Force. He will be the commander of SpaceX Crew-3 mission, while Nasa's Tom Marshburn will be pilot and ESA's Matthias Maurer will serve as a mission specialist. This mission is expected to be launched next year.
- USA's plan to set up the first nuclear reactor on the moon by the end of 2026. In early 2021, the US Department of Energy in collaboration with NASA intends to solicit industry design proposals. It also got an impetus with a recent White House directive. The outgoing President Donald Trump, issued the "National Strategy for Space Nuclear Power and Propulsion" on 16 December.
- Indian Space startup, Skyroot Aerospace has successfully test-fired a solid propulsion rocket engine, named Kalam-5. With this, it has become the first private company of India to successfully design, develop and test a full solid-fueled rocket stage. This crucial propulsion technology will be used for their maiden rocket Vikram-1, which is under active manufacturing and is targeted to be launched in December 2021 with the help of ISRO.



- The Union Health Minister Dr Harsh Vardhan launched India's first indigenously developed vaccine against pneumonia. The Pneumococcal Conjugate Vaccine (PCV) named 'Pneumosil' has been developed by Pune-based Serum Institute of India (SII) in collaboration with the Bill and Melinda Gates Foundation and PATH, an international, nonprofit global health organization based in Seattle.
- Union Minister of Education, Ramesh Pokhriyal 'Nishank' has virtually laid the foundation stone of "TiHAN-IIT Hyderabad", India's first Testbed for Autonomous Navigation Systems (Terrestrial and Aerial) at IIT Hyderabad. The Technology Innovation Hub on Autonomous Navigation Systems (TiHAN) for Unmanned Aerial Vehicles and Remotely Operated Vehicles at IIT Hyderabad.

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