



Current Affairs - March 2021 to August 2021

Month

Type



- ▶ **55** Current Affairs were found in **Last Six Months** for Type - **Science and Technology**.

Science

- ▶ Russian Space agency Roscosmos launched its first ever Arctic-monitoring satellite, to monitor Arctic's climate and environment, named **Arktika-M**.
 - ▶ Arktika-M satellite is one among series of planned Russian remote-sensing and emergency communications satellites. Constellation of 2 Arktika-M satellites has also been designed to monitor high-latitude areas of Earth.
- ▶ A New new species of wētā – a giant flightless cricket that is endemic to New Zealand, has been named *Hemiandrus jacinda*, in name of New Zealand's prime minister Jacinda Ardern.
- ▶ American spacecraft launch service provider *United Launch Alliance* launched *SBRIS (Space-Based Infrared System) Geo-5* Missile Warning Satellite, onboard Atlas V rocket. It is designed for missile warning, missile battlespace and defence characterization.
- ▶ Andhra Pradesh-born astronaut **Sirisha Bandla** became 2nd Indian-born woman astronaut to fly to space (Kalpana Chawla was first), to take care of researcher's experience on Unity22 mission, aboard 'VSS Unity' of Virgin Galactic, a company founded by British billionaire Richard Branson.
- ▶ Bengaluru based Jawaharlal Nehru Centre For Advanced Scientific Research (JNCASR) has been placed in top 50 institutions worldwide for advances in materials science by *Nature Index*.
 - ▶ The list places JNCASR at 23rd position globally in *50 Rising Institutions* list. It includes 18 institutes from China and 12 from US.

 JNCASR is only Indian institute on list.

6. ▶ China announced building first-of-its-kind *molten-salt nuclear reactor*, that will not require water for cooling. It will run on liquid thorium rather than uranium.
 -  It will be expected to be safer than traditional reactors, as molten salt cools and solidifies quickly when exposed to air, insulating thorium.
 -  Hence, any potential leak would spill much less radiation into the surrounding environment in comparison to leaks from traditional reactors.
7. ▶ China launched 8th group of 3 Yaogan-30 satellites into orbit, onboard a Long March 2C rocket.
 -  Yaogan are earth-observing and remote-sensing satellites, also including Jianbing sub-family reconnaissance satellites.
8. ▶ China launched core module of its space station into orbit, with Long March-5B Y2 rocket carrying *Tianhe* module. It will be part of Tiangong space station, to be completed by 2022.
 -  Also, Chinese space-mining start-up *Origin space* launched a robot prototype called *NEO-01* into low orbit, that can scoop up space debris, using a big net.
9. ▶ China launched ocean observation satellite **Haiyang-2D** into orbit, onboard Long March-2C rocket.
10. ▶ China officially begun construction of world's first commercial modular small reactor **Linglong One**, at Changjiang Nuclear Power Plant in Hainan Province.
 -  Multipurpose small modular reactor (SMR) Linglong One (also called ACP100), was first such SMR which was approved by International Atomic Energy Agency in 2016.
 -  ACP100 has generation capacity of 125000 kilowatt hours, extendable up to 1 billion kilowatt hours.
11. ▶ China unveiled maglev train which is capable of a top speed of 600 kmph, termed as fastest ground vehicle globally. It uses electro-magnetic force, which makes it levitate above track, with no contact between body and the rail.
12. ▶ China's first Mars rover has been named *Zhurong*, after a traditional fire god. The rover, currently aboard China's Mars probe Tianwen-1, will land on Mars in May 2021.
13. ▶ Chinese Mars Mission *Tianwen-1's* Lander successfully landed on surface of Mars, making China 2nd Country (After US), to land a rover on Mars.
 -  The rover part has been named *Zhurong*, after a traditional fire god.
 -  Tianwen-1 mission was 2nd of 3 Martian missions launched during July 2020, after UAE's Hope orbiter, and before NASA's Mars 2020 mission, which landed *Perseverance* rover with attached *Ingenuity* helicopter.

14. ▶ Chinese Researchers produced lightest version of a uranium atom ever. It has 122 neutrons, compared with 146 neutrons found in most of naturally occurring uranium, known as uranium-238.
 - ✎ Isotopes of an element have same number of protons (92 in uranium's case), but differing numbers of neutrons. New Uranium isotope has lowest number of Neutrons and Protons ever at 214, making it uranium-214.
15. ▶ Elon Musk led Space X won \$2.89 billion contract by NASA to build a spacecraft that would carry astronauts to the moon by 2024.
 - ✎ Lander would be used as a part of NASA's Artemis Programme, which would safely land two astronauts on lunar surface.
 - ✎ Also, NASA will land first person of color (term used for non-whites) in addition to the first woman on the moon with Artemis program.
16. ▶ European Space Agency (ESA) announced new Venus Mission, named *EnVision*, to be launched in 2030. EnVision probe will determine how and why Venus and Earth evolved so differently, even while being in habitable zone to the Sun.
17. ▶ European Space Agency (ESA) reported breaking off of world's largest iceberg from Antarctica, Named *A-67*, which measures 4320 square kilometres (half the size of the Andaman and Nicobar Islands).
 - ✎ The finger-shaped iceberg broke off from the Ronne Ice shelf, a massive ice shelf that encompasses an area of more than 400,000 square kilometres located in the Weddell sea in Antarctica.
 - ✎ Another iceberg *A-74*, sized 1270 square kilometres which is smaller than one-third of *A-76*, broke off the Brunt Ice shelf in Antarctica.
18. ▶ European Space Agency (ESA)'s **Jupiter Icy Moons Explorer (JUICE)** interplanetary spacecraft entered crucial testing phase.
 - ✎ It will study Jupiter's Galilean moons - Ganymede, Callisto, and Europa. These are thought to have significant liquid water beneath their surfaces, making them potentially habitable environments.
 - ✎ It is set for launch in June 2022 and will reach Jupiter in October 2029 after five gravity assists and 88 months of travel.
19. ▶ European Space Agency launched world's first commercial fully re-programmable satellite, named ***Eutelsat Quantum***. It has been launched from French Guiana, on board an Ariane 5 rocket.
 - ✎ Eutelsat Quantum has been developed as world's first reprogrammable commercial satellite under an ESA Partnership Project with satellite operator Eutelsat and manufacturer Airbus.
 - ✎ Eutelsat Quantum, unlike convention satellite models that cannot be repurposed once in orbit, works on software-defined technology that offers flexible communications so that it can adapt to the demands of customers and markets in real-time.
20. ▶ Finnish Space Exploration Firm Arctic Astronautics will Launch world's first wooden satellite into space by end of 2021, named WISA Woodsat. This wooden satellite will help scientists monitor how does wood reacts in the cold, heat, radiation, and the vacuum of space.

21. ▶ First-of-its-kind research initiative called **Fund for Industrial Research Engagement (FIRE)** has been launched by Science and Engineering Research Board (SERB), in collaboration with **Intel India**.
 - ✎ It will increase research opportunities in space of AI/ML, platform systems, circuits & architecture, Internet of Things (IoT) etc.
 - ✎ SERB-FIRE aims at bringing together industry and academia on a common platform to exchange ground-breaking ideas and co-promote innovative research.
22. ▶ France launched its first military exercises in space, amid growing competition between world powers in Earth's orbit. The exercise codenamed *AsterX*, was organized by France's newly created Space Command.
 - ✎ It commemorates Astérix or A-1, the first French satellite, which was launched in 1965.
23. ▶ IBM introduced world's first 2-nanometer chipmaking technology, claiming to 45% faster than mainstream 7-nanometer chips in common use and up to 75% more power efficient.
24. ▶ IISc Researchers for the first time discovered two species of few electron bubbles in superfluid helium gas, which can serve as a model to study how energy states of electrons and interactions between them influence properties.
 - ✎ An electron injected into a superfluid form of helium creates a single electron bubble (SEB) - a cavity that is free of helium atoms and contains only the electron. Shape of bubble depends on the energy state of the electron. There are also MEBs - multiple electron bubbles that contain thousands of electrons.
 - ✎ FEBs, on the other hand, are nanometre-sized cavities in liquid helium containing just a handful of free electrons. Studying FEBs can help better understand how some of these properties emerge when a few electrons present in a material interact with each other.
25. ▶ IIT Bombay researchers come up with an innovative hydrogen manufacture route which increases its production three times and lowers energy required, which could pave path towards environment-friendly hydrogen fuel at a lower cost.
 - ✎ Hydrogen can play critical role in shift towards green economy, as combustion of hydrogen to release energy produces water, making it non-polluting. However, higher costs and time taken to produce it has been main barrier in its large scale commercial production.
 - ✎ New IIT Bombay research involves electrolysis of water in presence of an external magnetic field. In this, the same system that produces 1 ml of hydrogen gas required 19% lower energy to produce 3 ml of hydrogen in same time, by synergistically coupling electric and magnetic fields at catalytic site.
26. ▶ ISRO successfully demonstrated its free-space Quantum Communication for a distance of 300 metres for the first time in India. It was demonstrated at the Space Applications Centre (SAC) in Ahmedabad.
 - ✎ This space quantum communication includes use of indigenously developed NAVIC receiver for the time synchronisation in between the transmitter and receiver modules.

- ✎ It included live video conferencing using quantum-key-encrypted signals, as a major milestone to achieve unconditionally secured satellite data communication using quantum technologies.
27. ▶ ISRO's second lunar mission Chandrayaan-2 detected presence of water molecules on moon, as per Data from Chandrayaan-2 payload *imaging infrared spectrometre (IIRS)*, which is placed in a 100 km polar orbit.
- ✎ Data from IIRS demonstrates presence of widespread lunar hydration and unambiguous detection of OH and H₂O signatures on Moon.
28. ▶ India's Inter-University Centre for Astronomy and Astrophysics (IUCAA) is leading *Polar-Areas Stellar-Imaging in Polarisation High-Accuracy Experiment (PASIPHAE)* international collaborative sky surveying project, to study polarisation in light coming from millions of stars.
- ✎ Name is inspired from Pasiphae, the daughter of Greek Sun God Helios.
 - ✎ Survey will use two high-tech optical polarimeters to observe the northern and southern skies, simultaneously, with focus on capturing starlight polarisation of very faint stars.
 - ✎ By combining data, astronomers will perform magnetic field tomography mapping of interstellar medium of very large areas of sky using WALOP (Wide Area Linear Optical Polarimeter).
29. ▶ Indian Oil Corporation will build India's first *green hydrogen* plant at its Mathura refinery, to prepare for growing demand for cleaner forms of energy.
30. ▶ Indian Space Research Organisation (ISRO) completed development of a **Synthetic Aperture Radar (SAR)** capable of producing extremely high-resolution images for a joint earth observation satellite mission with U.S. space agency NASA.
- ✎ NASA-ISRO SAR (NISAR) is a joint collaboration for a dual-frequency L and S-band SAR for earth observation.
 - ✎ NISAR is first satellite mission to use two different radar frequencies (L-band and S-band) to measure changes in Earth's surface less than a centimetre across. It is targeted to be launched in early 2022.
31. ▶ Indigenously developed optical spectrograph **Aries-Devasthal Faint Object Spectrograph & Camera (ADFOSC)**, developed by Nainital based Aryabhata Research Institute of observational sciences (ARIES) has been commissioned.
- ✎ The spectroscope has been commissioned on 3.6-m Devasthal Optical Telescope (DOT), as largest reflecting telescope in Asia.
 - ✎ It can locate sources of faint light from distant quasars and galaxies in a very young universe, regions around supermassive black-holes around the galaxies, and cosmic explosions.
32. ▶ JP Morgan successfully tested a blockchain transaction in space using Danish space firm GomSpace's satellites, as world's first bank-led tokenised value transfer in space, executed via smart contracts on a blockchain network, established between two GOMX-4 satellites.

✍ This opens door to a potential peer-to-peer satellite marketplace in the long term, allowing data transfers between satellites against payment, as private companies prepare to launch their own constellations.

33. ▶ Japanese Supercomputer *Fugaku*, developed by scientific research institute RIKEN and Fujitsu, is ready for deployment.

✍ It is said to be world's most powerful supercomputer, named after an alternative name for Mount Fuji.

34. ▶ Marine research organization ProMare (US) in collaboration with IBM built world's first AI ship, *Mayflower 400*.

35. ▶ Misc. Science News / Events (August 2021) -

✍ Indian Space Research Organisation (ISRO) lost earth observation satellite EOS-03 (Geo-Imaging Satellite (GISAT-1)), due to a launch Failure, after GSLV-F10 rocket carrying it malfunctioned about five minutes after lift-off.

✍ Agriculture Minister Narendra Singh Tomar inaugurated world's second-largest refurbished National Gene Bank at National Bureau of Plant Genetic Resources, Pusa in New Delhi.

✍ Swedish green steel venture HYBRIT (Hydrogen Breakthrough Ironmaking Technology), began delivery of world's first steel that was manufactured without using coal, to its client Volvo.

✍ IIT Madras developed India's first indigenous motorized wheelchair vehicle named 'NeoBolt', which can be used not only on roads but on uneven terrains also, with maximum speed 25 kmph.

✍ Researchers from Indian Institute of Astrophysics discovered three supermassive black holes from three galaxies merging together to form a triple active galactic nucleus, a compact region at the center of a newly discovered galaxy that has a much-higher-than-normal luminosity.

✍ This indicates that small merging groups are ideal laboratories to detect multiple accreting supermassive black holes.

✍ Supermassive black holes are difficult to detect because they do not emit any light. But they can reveal their presence by interacting with their surroundings.

36. ▶ Misc. Science News (July 2021) -

✍ UN World Meteorological Organization (WMO) confirmed a new record high temperature of **18.3 degrees Celsius** in Antarctica, getting past earlier record of 17.5 degrees Celsius . Antarctica has registered rise of almost 3 degrees Celsius in average temperature, in last 50 years.

✍ Jacobabad city in Pakistan's Sindh province recorded world's highest temperature at 52°C. It is located on the Tropic of Cancer, which means that the sun is in close proximity during summers.

✍ Hyderabad-based *Grene Robotics* developed India's first indigenous drone defence dome called *Indrajaal*, with capability to protect an area of 1000-2000 sq km against aerial threats by assessing and acting threats such as UAVs and Low- Radar Cross Section (RCS) targets.

- ✎ A rare species of snake, *black-bellied coral snake (Sinomicrurus nigriventer)*, has been discovered by Wildlife Institute of India (WII) in Benog Wildlife Sanctuary of Mussoorie. This is an extremely rarely-found and venomous snake.
- ✎ Botanists from Central University of Punjab discovered a new native plant species of moss from Eastern Antarctica, on rocks near Bharati station at Larsemann Hills. Botanists named it *Bryum Bharatiensis*.
- ✎ DBT-National Institute of Biomedical Genomics (NIBMG) created world's first database of genomic variations in oral cancer, named dbGENVOC.
- ✎ Mizoram University researchers discovered a new snake species in a dried-up area of Tuinghaleng river bed, as a new species of *Stoliczka* genus and third species of *Stoliczka* from India. It has been named *Stoliczka vanhnuailianai*, in honour of Vanhnuailiana, a famous Mizo warrior.
- ✎ Central University of Punjab Researchers discovered a new native species of moss from continental Antarctica, named *Bryum bharatiensis*, as a tribute to India's Antarctic station Bharati.
- ✎ June 19, 2021 marked 40 years of launch of India's First Communication Satellite *Ariane Passenger Payload Experiment (APPLE)*, as an experimental communication satellite launched by Ariane-1, from French Guiana.
- ✎ ISRO conducted 3rd long-duration hot test (240 seconds) of liquid propellant Vikas Engine for core L110 liquid stage of human-rated GSLV Mk III vehicle, at engine test facility of ISRO Propulsion Complex (IPRC) at Mahendragiri (Tamil Nadu). It was done as part of engine qualification requirements for Gaganyaan Programme.
- ✎ IIT Ropar Researchers developed a first-of-its-kind Oxygen Rationing Device - AMLEX , aimed at increasing life of medical oxygen cylinders by 3 fold.
 - ✎ It supplies a required volume of oxygen to patient during inhalation and trips when patient exhales CO₂, saving oxygen which otherwise unnecessarily gets wasted.
- ✎ IIT Madras Researchers developed an AI based Mathematical Model called 'NBDriver' to identify cancer-causing alterations in cells, to help identify most appropriate treatment strategy for a patient in an approach known as 'precision oncology'.
- ✎ Science and Engineering Research Board (DST-SERB) and GE's John F Welch Technology Centre (JFWTC) collaborated to promote synergy between academic institutes, labs and industries for research across energy, healthcare and aviation sectors.
- ✎ Argentine Museum of Natural Sciences stated that 150-million years old fossilized skeleton of species named *Burkesuchus mallingrandensis*, which was discovered in Southern Chile in 2014, has been determined to be ancestor of modern crocodile.
- ✎ Indian researchers from IISER Kolkata and IIT Kharagpur developed piezoelectric molecular crystals that repair themselves from mechanical damages without need for any external intervention.
 - ✎ Piezoelectric crystals are a class of materials that generate electricity when it undergoes a mechanical impact.

- ✎ This may soon make it possible for damaged electronic components, such as in space crafts, to mend themselves.
 - ✎ IIT Kanpur launched first technology innovation hub to find cyber security solutions for anti-drones technologies, intrusion detection system, block-chain and cyber physical system.
 - ✎ World's largest star sapphire cluster has been found in Ratnapura (Sri Lanka), and has been named *Serendipity Sapphire*, valued approx 100 Million USD.
 - ✎ By analysing data from NASA's Hubble Space Telescope, researchers found first evidence of water vapour in atmosphere of Ganymede, Jupiter's largest moon.
 - ✎ NASA Awarded Elon Musk led SpaceX a \$178 million Launch services contract for NASA's first mission focusing on Jupiter's icy moon Europa. The Europa Clipper mission is due for launch in October 2024 on a SpaceX Falcon Heavy rocket.
37. ▶ Misc. Science News (May 2021) -
- ✎ Scientists discovered smallest known black hole in Milky Way galaxy, which is closest to our solar system (approx 1500 light years from Earth), nicknaming it as *Unicorn*. It is considered three times mass of our sun.
 - ✎ Researchers identified fossil bone fragments of long-necked dinosaurs, known as Sauropods, around West Khasi Hill Districts in Meghalaya, dating back to 100-million years.
 - ✎ NASA and aerospace Firm *Axiom Space* partnered to send four people in a first private astronaut mission to International Space Station (ISS) by 2022, known as AX-1 mission.
 - ✎ Elon Musk-owned SpaceX will launch *DOGE-1* Mission in 2022, which will first-ever commercial lunar payload, paid entirely in cryptocurrency Dogecoin.
 - ✎ IIT Ropar Researchers and Monash University (Australia) developed a detector named 'FakeBuster' to identify imposters attending virtual conferences.
 - ✎ IIT Ropar developed a first-of-its-kind IoT device *AmbiTag* that records real-time ambient temperature during transportation of perishable products, vaccines, body organs and blood, to help in knowing if transported item is still usable.
38. ▶ Misc. Science News / Events (April 2021) -
- ✎ New novel bacterial strain discovered aboard International Space Station (ISS) has been named *Methylobacterium ajmalii*, in honour of renowned Indian biodiversity scientist Ajmal Khan.
 - ✎ Researchers discovered a new species of butterflies namely *sinhala ramaswamii sadasivan 2021*, as new taxon of Lycaenid butterfly belonging to Nacaduba genus. It is first time a butterfly species was discovered by an all-Indian research team from Western Ghats.
 - ✎ Education Minister Ramesh Pokhriyal 'Nishank' launched NanoSniffer, world's first Microsensor based Explosive Trace Detector (ETD) developed by NanoSniff Technologies, an IIT Bombay incubated startup.

- ✎ A New species of flowering plants belonging to genus `Argyreia', recently discovered in south Maharashtra's Kolhapur district, has been named after NCP chief Sharad Pawar, as *Argyreia sharadchandrajii*.
- ✎ Scientists from Nainital based Aryabhata Research Institute of observational sciencES (ARIES) discovered farthest gamma-ray emitting Narrow-Line Seyfert 1 (NLS1) galaxy known so far.
 - ✎ Researchers studied around 25000 Active Galactic Nuclei (AGN) from Sloan Digital Sky Survey (SDSS) and devised a method to find high-z NLS1 galaxies, that were unknown till now.
 - ✎ Upon observation, researchers confirmed that they have found a genuine NLS1 galaxy at a high redshift of 1.34, which is about 31 billion light-years away from us.
 - ✎ Researchers confirmed that newly found farthest gamma-ray emitting NLS1 galaxy was formed when Universe was 4.7 billion years old, which is currently 13.8 billion years old.
- ✎ UAE named Noura al-Matroushi as its first female astronaut.
- ✎ Foundation stone for an Integrated Solar Dryer and Pyrolysis pilot plant has been installed at CSIR- Central Leather Research Institute (CLRI) Chennai, to offer an innovative approach for smart cities to transform urban organic waste into biochar and energy.
 - ✎ Pilot is part of Indo-German project 'Pyrasol', which was awarded to CSIR-CLRI by Indo-German Science & Technology Centre.

39. ▶ Misc. Science News / Events (June 2021) -

- ✎ *Jayanti* became 12th subgenus of cricket identified under genus *Arachnomimus* Saussure, 1897. It was Found in Kurra caves of Chhattisgarh, and was named after Noted Cave Explorer Jayant Biswas.
- ✎ Germany-based HeidelbergCement (world's second-largest cement maker), will turn its Swedish factory in Slite into world's first CO₂-neutral cement plant by 2030, via carbon capture technology.
- ✎ IIT Ropar developed a device 'Jivan Vayu' which can be used as a substitute of CPAP machine. It is India's first such device which functions even without electricity and is adapted to both kinds of oxygen generation units - O₂ cylinders and oxygen pipelines in hospitals.
- ✎ China's Experimental Advanced Superconducting Tokamak (EAST) generated a plasma temperature of 126 million Fahrenheit (120 million C) for 101 seconds, also cranking up device to achieve 160 million Celcius for 20 seconds. The previous record for a maintained plasma temperature was 180 million F (100 million C) for 100 seconds.
- ✎ Researchers from Telomere-to-Telomere (T2T) consortium sequenced first truly complete human reference genome, which can possibly be largest improvement to human reference genome, since its initial release approx 20 years ago.

 Celera Genomics and International Human Genome Sequencing, in 2001, published first drafts of human genome and revolutionized genomics.

 Israeli researchers discovered remains belonging to a *new type of early human* who was previously unknown, near city of Ramla.

 A newly discovered spider species from Thane-Kalyan region has been named *Icius Tukarami*, after Tukaram Omble, Mumbai Cop who laid down his life to help capture terrorist Ajmal Kasab during 26/11 terror attacks.

40. ▶ Misc. Science News /Events (March 2021) -

 Dinosaur fossils been found in Argentina belonging to oldest-known member of dinosaur group known as titanosaurs, that includes largest land animals in Earth's history.

 Russia and China signed agreement to develop a joint lunar space station.

 ISRO launched sounding rocket (RH-560) to study altitudinal variations in the neutral winds and plasma dynamics.

 Indian and Japanese space agencies reviewed cooperation in earth observation, lunar cooperation and satellite navigation, which includes ongoing *Joint Lunar Polar exploration (LUPEX)* mission, which aims to send a lander and rover to Moon's south pole around 2024.

 Russian scientists launched one of world's biggest underwater space telescopes, named *Baikal-GVD*, to peer deep into universe from pristine waters of Lake Baikal. The deep underwater telescope is designed to observe neutrinos, the smallest particles currently known.

 Baikal telescope will rival Ice Cube which is a giant neutrino observatory under Antarctic ice at US research station at South Pole.

 Three ISRO Space Technology Incubation Centres (S-TIC) inaugurated at National Institute of Technology (NIT) at Nagpur, Bhopal and Rourkela, to encourage students to explore their entrepreneurship skills in space domain.

 Botanists discovered new rattlepod species in Sadasivakona grove area of Chittoor district in Andhra Pradesh, Named as *Crotalaria lamelliformis*.

 Russia launched 38 foreign satellites onboard Soyuz-2.1a launch vehicle, as First fully commercial launch of Soyuz-2 launch vehicle.

 Astrome, a women-led IISC Incubated startup, developed an innovative wireless product that gives fibre like bandwidth at fraction of cost of fibre to help telecom operators deliver reliable low-cost internet services to suburban and rural areas.

41. ▶ NASA announced designing an Earth System Observatory, to provide key information related to climate change, fighting forest fires, and improving real-time agricultural processes.

 Among its first integrated parts is NASA's partnership with ISRO, which brings together 2 different kinds of radar systems that can measure changes in Earth's surface less than a half-inch.

- ✎ This capability will be utilized in one of observatory's first missions intended as a pathfinder, called NISAR (NASA-ISRO synthetic aperture radar). It will measure some of most complex processes such as ice-sheet collapse and natural hazards.
- 42. ▶ NASA announced its first mobile robot to moon in late 2023, Titled *VIPER (Volatiles Investigating Polar Exploration Rover)*.
 - ✎ It will be tasked with prospecting for lunar resources in permanently shadowed areas in lunar south pole region, by mapping distribution and concentration of water ice.
 - ✎ It builds on a previous NASA rover concept called Resource Prospector, which was cancelled in 2018, to search for ice and other resources on and below lunar surface.
- 43. ▶ NASA's OSIRIS-REx spacecraft began its 2-year mission back to Earth after collecting samples from asteroid Bennu, as NASA's first asteroid sample return mission. Bennu is 4.5 billion-year-old asteroid is around 320 million km from Earth.
- 44. ▶ NASA's new spacecraft NEA Scout (Near-Earth Asteroid Scout) has reportedly undergone all required tests and has been placed inside Space Launch System (SLS) rocket.
 - ✎ NEA Scout will be flying to space on Artemis I, which will be the first uncrewed test flight of SLS rocket and Orion spacecraft. Artemis I is scheduled to be launched in November 2021.
 - ✎ NEA Scout is size of a shoebox, that will be propelled by a solar sail measuring 925 sq ft. The camera fitted on the spacecraft will take pictures to help in determining the physical properties of a near-Earth asteroid.
- 45. ▶ NASA's **Perseverance** Rover successfully generated oxygen from thin atmosphere of Mars for first time ever.
 - ✎ Mars Oxygen In-Situ Resource Utilization Experiment (**MOXIE**) instrument aboard NASA's Perseverance Rover, generated about 5 grams (equivalent to 10 minutes of breathable oxygen).
 - ✎ It came a day after first flight of NASA's Ingenuity helicopter on MARS.
 - ✎ It is part of NASA's Mars 2020 mission, that includes rover Perseverance and small robotic helicopter Ingenuity.
- 46. ▶ NASA's Mars helicopter *Ingenuity* became first aircraft to take a flight on Mars, when it hovered in Mars air up to 10 feet, for around 39 seconds.
 - ✎ It is part of NASA's Mars 2020 mission, that includes rover Perseverance and small robotic helicopter Ingenuity.
- 47. ▶ National Aeronautics and Space Agency (NASA) announced 2 new scientific missions to Venus between 2028 and 2030, named *DAVINCI+ (Deep Atmosphere Venus Investigation of Noble gases, Chemistry, and Imaging)* and *VERITAS (Venus Emissivity, Radio Science, InSAR, Topography, and Spectroscopy)*.
 - ✎ DAVINCI+ will measure composition of dense Venusian atmosphere and will seek to improve understanding of how it evolved. It will also consist of a fly-by spacecraft and an atmospheric descent probe. It will return high-resolution images of unique geological characteristics on Venus called 'tesserae'.

 VERITAS will map surface of Venus from orbit to help determine its geological history and why it was developed so differently from Earth.

48. ▶ Nepalese Sherpa **Kami Rita** scaled Mount Everest for record 25th time, breaking his own record for most ascents of Everest.

49. ▶ Researchers discovered new Tardigrade species of genus Stygarctus, naming it as Stygarctus Keralensis, after Kerala state where it was found.

 Tardigrades are so small that high-end microscopes are required to study them. Commonly called ‘moss piglets’ and ‘water bears’.

50. ▶ Russian Space Agency *Roscosmos* will launch **Luna 25** Moon Mission on 1 October, 2021, towards icy South pole of Moon.

 This comes After 45 years since Russia's landing on Moon, when *Luna 24* Landed on moon in August 1976.

 Roscosmos also plans to Launch its Own Space Station in 2025.

51. ▶ Scientists from **Jawaharlal Nehru Centre for Advanced Scientific Research** designed an integrated catalytic system based on a metal-organic framework (MOF-808) comprising of a photosensitizer, that can harness solar power and a catalytic centre that can reduce CO₂.

 This can mimic nature's own process of reducing CO₂ in atmosphere, namely photosynthesis.

 This artificial photosynthesis (AP) harnesses solar energy and converts captured CO₂ to carbon monoxide (CO), which can be used as a fuel for internal combustion engines.

52. ▶ UN endorsed a multinational project called *Committee on Earth Observation Satellites Coastal Observations, Applications, Services, and Tools (CEOS COAST)*, co-led by ISRO (India) and NOAA (US).

 It aims to improve accuracy of coastal data on the basis of satellite and land-based observations.

53. ▶ US Based Space Exploration Firm SpaceX tested its Starship prototype rocket *SN10*, after launching it to altitude of 10000 kilometres and landing back on ground.

 SN10 is an early prototype of Starship Mars rocket of SpaceX, which aims to get people and payloads to moon, Mars and other distant destinations.

54. ▶ World's first 3D-printed steel pedestrian bridge has been opened on the Oudezijds Achterburgwal canal in Amsterdam (The Netherlands).

 The bridge has been created by Dutch company MX3D using a 3D printing technique called wire and arc additive manufacturing. The technique combines robotics with welding.

55. ▶ World's largest aeroplane, designed to transport hypersonic vehicles and facilitate easy access to space, completed Test Flight. It has been Built by Stratolaunch.

 Named ‘Roc’, It has twin-fuselage design and longest wingspan ever flown, at 385 feet (117 metres), surpassing the Hughes H-4 Hercules flying boat of 321 feet (98 m).

 It can carry 550,000-pound payload, and can launch rockets from high altitude.

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