



Current Affairs - May to October 2018

Month Type



- [147 Current Affairs were found in Last Six Months for Type - Science and Technology.](#)

(Showing **78** Important Ones)

Science

- ▶ NASA confirmed that there are frozen water deposits in darkest and coolest parts of Moon's Polar Regions, using data from India's Chandrayaan-I spacecraft.
 - ▶ Chandrayaan-I spacecraft was launched in 2008 by the Indian Space Research Organisation (ISRO).
 - ▶ At the southern pole of moon, most of ice is concentrated at lunar craters, while northern pole's ice is more widely and lightly spread.
 - ▶ Most of the newfound water ice lies in shadows of craters near poles, where warmest temperatures never reach above minus 156 degrees Celsius (-250 degrees Fahrenheit).
- ▶ 6 new species of minute goblin spiders discovered in forests of Sri Lanka, named after fictional characters described by English children's writer Enid Blyton. Names given are - goblins Bom, Snooky and Tumpy and the brownies Chippy, Snippy and Tiggy.
- ▶ *IceCube*, a small NASA satellite has developed first global map of ice clouds. Ice clouds start as tiny particles high in atmosphere. They absorb moisture, and become heavier. This make them to fall to lower altitudes. Ice clouds affect Earth's energy budget by absorbing Sun's energy and by affecting emission of heat from Earth into space. IceCube will operate for a year, and then it will reenter Earth's atmosphere and burn up.
- ▶ A Massive underground lake has been detected for first time on Mars, discovered by European Space Agency's Mars Express orbiter (launched in 2003). It is about 20 kilometres wide, located under a layer of Martian ice and is largest body of liquid water ever found on Red Planet.
 - ▶ It lies almost 1.5 km beneath the icy surface and water is not drinkable. Tool that detected this is called Mars Advanced Radar for Subsurface and Ionosphere Sounding (MARSIS).
- ▶ A new Clot buster, PEGylated Streptokinase - a Novel Biological Entity developed by CSIR (Council of Scientific & Industrial Research) has been developed, to revolutionize treatment of ischemic strokes, a condition caused by a dysfunction in the supply of blood to the brain. Prevalence of stroke is much higher in India than West and about 87% of all strokes are ischemic strokes.
 - ▶ CSIR-IMTECH and Epygen Biotech Mumbai signed an agreement to develop PEGylated Streptokinase for treatment of Ischemic Stroke.
 - ▶ PEGylated Streptokinase (novel recombinant protein Thrombolytic molecule) is engineered for enhanced proteolytic stability and extended plasma half-life, with reduced immuno-reactivity which would have significant clinical advantages.
- ▶ A rare blood group named "pp" or "P null" phenotype has been identified by doctors from Kasturba Medical College (KMC) in Mangaluru, Karnataka. ABO and Rh D are the most common blood group systems. Doctors confirmed that a needy patient's cells contained rare "pp" phenotype, making it first time that P blood group null phenotype is detected in India.
- ▶ A swimming pool type research reactor *Apsara-upgraded* became operational in Trombay campus of Bhabha Atomic Research Centre.
 - ▶ *Apsara*, first research reactor in Asia became operational in Trombay campus of Bhabha Atomic Research Centre in August 1956. After providing more than five decades of dedicated service to the researchers, the reactor was shut down in 2009.
 - ▶ The Upgraded version uses plate type dispersion fuel elements made of Low Enriched Uranium (LEU). By virtue of higher neutron flux, this reactor will increase indigenous production of radio-isotopes for medical application by 50 % and would also be extensively used for research in nuclear physics, material science and radiation shielding.
- ▶ According to a new study by BirdLife International, 8 avian species was declared "extinct" in this decade. It was carried out to analyse 51 Critically Endangered birds six statistical methods to assign to the IUCN Red List Category to determine which of them qualify as

- 'potentially extinct' and 'extinct'. 5 of 8 extinctions were from the South American mainland due to deforestation resulting in habitat loss.
9. ▶ Aditya-L1, India's first mission to study solar corona, will be launched in 2019-2020, by Polar Satellite Launch Vehicle (PSLV-XL).
 - ✍ Aditya – L1 will be inserted in a halo orbit around the Lagrangian point 1 (L1), 1.5 million km from Earth. Solar corona is outer layers of the Sun.
 - ✍ Lagrangian point where attraction by Sun and Earth becomes equal. This point does not experience gravitational force. It will observe Sun's Photosphere and Chromosphere and will also conduct additional experiments.
 - ✍ It will have 6 additional payloads -
 - ✍ Visible Emission Line Coronagraph (VELC)– to study the diagnostic parameters of solar corona and dynamics and origin of Coronal Mass Ejections.
 - ✍ Solar Ultraviolet Imaging Telescope (SUIT)– to image the Solar Photosphere and Chromosphere in near Ultraviolet (200-400 nm) and measure solar irradiance variations.
 - ✍ Aditya Solar wind Particle Experiment (ASPEX) – to study the variation of solar wind properties and its distribution and spectral characteristics.
 - ✍ Plasma Analyser Package for Aditya (PAPA)– to understand the composition of solar wind and its energy distribution.
 - ✍ Solar Low Energy X-ray Spectrometer (SoLEXS)– to monitor the X-ray flares to study the heating mechanism of solar corona.
 - ✍ High Energy L1 Orbiting X-ray Spectrometer (HEL1OS)– to observe the dynamic events in the solar corona and estimate the energy used to accelerate the particles during eruptive events.
 - ✍ Magnetometer– to measure the magnitude and nature of the Interplanetary Magnetic Field.
 10. ▶ American Pharmaceutical Company Abbott will introduce a high-sensitive troponin-I blood test in India, that can predict chances of a heart attack or other cardiac event months to years in advance.
 - ✍ Troponin-I test provides better predictive information for determining a person's chances of developing future heart disease when added to current standard of care.
 11. ▶ American Space Exploration Firm SpaceX launched twin NASA satellites GRACE-FO (Follow-On) that will track Earth's water cycle i.e. water movement and ice melt.
 - ✍ GRACE-FO (Gravity Recovery and Climate Experiment Follow-On) is joint project between NASA and German Research Center for Geosciences (GFZ), as a follow-on mission to GRACE mission, which mapped Earth's water and ice by measuring changes in Earth's gravity field from 2002 to 2017.
 - ✍ To measure Earth's gravity, 2 GRACE-FO satellites will orbit around Earth together, with one trailing behind other at distance of 220km.
 12. ▶ Andhra Pradesh Government notified its new state symbols, after bifurcation of undivided Andhra Pradesh in 2014 that led to formation of New State Telangana. New state symbols -
 - ✍ State bird - Rose-ringed parakeet (*Psittacula krameri*). Locally known as Rama Chiluka.
 - ✍ State tree - Neem (*Azadirachta indica*). Locally known as Vepa Chettu.
 - ✍ State animal - Black-buck (*Antelope cervicapra*). Locally known as Krishna Jinka.
 - ✍ State flower - Jasmine (*Jasminum officinale*).
 - ✍ State symbols of Telangana - Bird - Indian Roller (It also state bird of Odisha and Karnataka), Tree: Jammi Chettu, Animal - Spotted deer. Flower - Tangidi Puvvu.
 13. ▶ Antarctica has reportedly lost about 3 trillion tonnes of sea ice since 1992 contributing to a global sea-level rise of 7.6 mm. Antarctica has enough ice to raise seas by 58 metres if it ever all melted.
 14. ▶ As a first such mission, European and Japanese space agencies launched Bepi Colombo spacecraft, for a joint mission to Mercury, planet closest to the sun. Spacecraft will arrive at Mercury in 2025.
 - ✍ It has named after Italian scientist Giuseppe "Bepi" Colombo. During its 5.2 billion miles journey, spacecraft will several fly-bys of Earth, Venus and Mercury, to slow down enough to avoid huge gravitational pull of Sun.
 15. ▶ CSIR Indian Institute of Toxicology Research (CSIR-IITR) Lucknow has developed an innovative technology for "Drinking Water Disinfection System" with Trade name "Oneer™", transferred to Bluebird Water Purifiers.
 - ✍ This system will provide safe and clean drinking water at a cost of just 2 Paise / Ltr. Community level model is of 450 LPH capacity which can be scaled up to 5000 to 1 lakh L/day.
 - ✍ Smaller unit of Oneer is particularly suitable for homes, street food vendors, and small establishments.
 16. ▶ China launched relay satellite *Queqiao (Magpie Bridge)* to establish communication with its planned Chang'e-4 lunar probe (rover) that will explore dark side of moon.

- ✍ Queqiao (meaning bridge of magpies) will serve as communications relay for future Chang'e-4 rover that will explore in South Pole-Aitken Basin in moon's far side. It will be world's first communication satellite operating in halo orbit - Earth-moon Lagrange point L2, a gravitationally stable spot located 64,000 kilometers beyond lunar far side.
- ✍ Need for relay Satellite -
 - ✍ Moon is tidally locked to Earth, it always shows same face (near side) to Earth. So, relay link is necessary to communicate with spacecraft on far side, which will otherwise have to send their signals through moon's rocky bulk.
 - ✍ Under China National Space Administration (CNSA)'s Chang'e program (Chinese Lunar Exploration Program), Chang'e 1 and Chang'e 2 probes already have reached lunar orbit in 2007 and 2010 respectively. Chang'e 3 mission is in process to put lander and rover on moon's near side.
- 17. ▶ China will launch a 300-satellite array known as *Hongyan constellation*, with 1st launch scheduled in end of 2018. The constellation will provide worldwide communication services, allowing a mobile phone to be connected anywhere on planet, including remote deserts or middle of an ocean.
 - ✍ Low-orbit satellites have stronger signals and a shorter signal delay than synchronous orbit satellites, which are 36,000 kilometers above equator.
- 18. ▶ Flower *Impatiens dorjekkhandui* has been named after former Arunachal Pradesh Chief Minister Dorjee Khandu. It was discovered at a forest in Zemithang area of Tawang in September 2017.
- 19. ▶ Germany rolled out world's first hydrogen-powered passenger train, manufactured by French TGV-maker Alstom. These locomotives named *iLint trains* emit zero emissions, offering greener and quieter alternative to diesel on non-electrified railway lines.
 - ✍ Hydrogen trains are equipped with fuel cells that produce electricity by combining hydrogen with oxygen. This conversion process only emits steam and water, thus producing zero emissions.
 - ✍ Excess energy produced is stored in ion-lithium batteries on board train. Hydrogen fuel cells have advantages over batteries. Instead of recharging, they can easily be refueled like gas or diesel engine.
 - ✍ These trains can run for around 1,000 km on a single tank of hydrogen, similar to the range of diesel trains.
- 20. ▶ ISRO conducted its first PAT (pad abort test), through Crew Escape System that provides an escape mechanism for astronauts if the launch operation is aborted. Once deployed, India will become 4th nation (after USA, Russia and China), to have human space flight programmes.
 - ✍ Only Indian to ever travel to space was fighter pilot Rakesh Sharma who flew aboard Soyuz T-11, a spacecraft of the former USSR in 1984. India currently does not have a human space flight programme.
- 21. ▶ ISRO postponed Chandrayaan-2, India's second mission to moon to January 3, 2019, as 2nd time the mission is postponed. Chandrayaan 2 is advanced version of Chandrayaan-1 mission (launched in 2008) which only involved orbiting around moon.
 - ✍ Chandrayaan-2 involves an orbiter, lander and rover. In this, ISRO will for first time attempt to land rover on moon's south-pole. It involves soft-landing on lunar surface and rover that will walk and analysis content on moon's surface. It will be launched on board of Geosynchronous Satellite Launch Vehicle Mk III (GSLV-F10).
 - ✍ Soft-landing on moon surface will be most complex part. Only US, Russia and China have been able to soft-land spacecraft on lunar surface.
 - ✍ Space Commission also approved ISRO's proposal of naming Chandrayaan-2 lander 'Vikram' after Vikram Sarabhai, father of Indian space programme.
- 22. ▶ ISRO successfully conducted ground test of its high thrust version of Vikas Engine at ISRO Propulsion Complex (IPRC) in Mahendragiri (Tamil Nadu).
 - ✍ Vikas belongs to family of liquid fuelled rocket engines conceptualized and designed by ISRO's Liquid Propulsion Systems Centre in 1970s. It is workhorse liquid rocket engine powering second stage of PSLV, second stage and four strap on stages of GSLV and is part of first stage twin engine core liquid stage (L110) of GSLV Mk-III.
 - ✍ Tested high thrust version of Vikas engine will improve payload capability of PSLV, GSLV and GSLV Mk-III launch vehicles.
- 23. ▶ ISRO's Liquid Propulsion Systems Centre (LPSC) is developing environment-friendly propellant blend based on hydroxylammonium nitrate (HAN) to power satellites and spacecrafts, aiming to replace conventional hydrazine fuel, which has dominated space industry as choice of propellant for over six decades despite hazards.
 - ✍ HAN-based monopropellant formulation consists of HAN, ammonium nitrate, methanol and water. Monopropellant is chemical propulsion fuel which does not require separate oxidizer. It is used extensively in satellite thrusters for orbital correction and orientation control.
 - ✍ HAN-based monopropellant will replace conventional hydrazine rocket fuel, a highly toxic and carcinogenic chemical, with greener propellant for future missions. It will also ensure cost effective re-usable, recoverable, re-startable and reliable space launches of

ISRO.

24. ▶ ISRO's Vikram Sarabhai Space Centre (VSSC) will transfer its own in-house lithium ion (Li ion) cell technology to successful Indian industries and start-ups on non-exclusive basis in automobiles for INR 1 crore. It aims to accelerate development of indigenous electric vehicle (EV) industry and reduce dependence of imported lithium ion cell technology.
 - ✍ Transfer of ISRO's technology will help in establishing production facilities in country that can produce cells of varying size, capacity, energy density and power density catering to entire spectrum of power storage requirements of electric vehicles (EVs).
25. ▶ India Meteorological Department (IMD) will use flash flood guidance system for the first time, to forecast floods. Currently, Central Water Commission issues flood warnings. Different kinds of soil from various parts of country have been studied to find out how absorbent each variety was.
26. ▶ India and France have signed agreement to collaborate for ISRO's first human space mission Gaganyaan to be launched in 2022. The announcement was made 6th edition of Bengaluru Space Expo (touted to be largest space conference in Asia and held in Bengaluru).
 - ✍ ISRO and French space agency CNES will form working group to exchange expertise in fields of astronaut life support, radiation protection, space debris protection and personal hygiene systems among others.
 - ✍ During same event, ISRO displayed a space suit developed for Gaganyaan Mission 2022. It is an orange-coloured prototype space suit developed at Vikram Sarabhai Space Centre in Thiruvananthapuram. It can hold one oxygen cylinder, allowing an astronaut to breathe in space for 60 minutes.
 - ✍ ISRO also displayed a crew model and crew escape model, with thermal shield and temperature inside maintained at 25 degree Celsius.
 - ✍ Gaganyaan Mission astronauts will be living for five to seven days in a 400-km orbit from the Earth's surface as they would conduct micro-gravity experiments.
 - ✍ Theme for Bengaluru Space Expo 2018 was *Creating dynamism in Indian space ecosystem*.
27. ▶ India will start producing first indigenous Lithium Ion batteries, after an MoU for transfer of technology for India's first Lithium Ion (Li-ion) Battery project was signed between CSIR Central Electrochemical Research Institute (CECRI) and RAASI Solar Power Pvt Ltd. India imported Li-Ion batteries worth 150 million dollars in 2017 and is one of its largest importers in the world.
28. ▶ Indian Institute of Science Education and Research (IISER) developed a *Arsenic Sensor and Removal Media* device to remove arsenic content from water and make it safe for use. It is capable of sensing soluble arsenic which cannot be easily removed. It is highly sensitive as it can sense up to parts per billion (ppb) levels, compared to currently available techniques that sense parts per million (ppm).
 - ✍ Arsenic is a natural component in earth's crust, widely distributed and highly toxic in its inorganic form.
29. ▶ Indian Institute of Technology (IIT)-Madras commissioned world's first remotely operable Local Electrode Atom Probe (LEAP) microscope, which is operatable through special terminal by researchers divided geographically. LEAP can provide a precise atom-by-atom view of materials, providing atomic-scale insights into metallic.
30. ▶ Indian Space Research Organisation (ISRO) successfully launched its PSLV-C42 rocket carrying two British Earth observation satellites - NovaSAR and S1-4, intended to improve UK's disaster management capabilities.
31. ▶ Indian Space Research Organisation (ISRO)'s heaviest satellite so far - GSAT-11 (weighing over 5700 kg), will take off a spaceport in French Guiana on 30 November. GSAT-11 is capable of providing high bandwidth connectivity with up to 14 GB per second data transfer speed.
 - ✍ ISRO will also launch incubators across India to support startups working on building newer solutions in rocketry, communication satellites and applications based on remote sensing data.
32. ▶ Indian Space Research Organization (ISRO) unveiled details of its first indigenous human space mission dubbed as Gaganyaan to be launched in 2022, announced by PM Narendra Modi during his 72nd Independence Day speech.
 - ✍ Indian Space Research Organisation (ISRO) will outsource production of the Polar Satellite Launch Vehicles (PSLV) and Small Satellite Launch Vehicles (SSLVs) to private Industries.
 - ✍ 3 Indian astronauts will be taken to space on board Gaganyaan spacecraft by 2022, as first human space mission to be indigenously developed by ISRO.
 - ✍ India will become fourth nation in the world to send astronaut into space after US, Russia and China.
 - ✍ Rakesh Sharma was first Indian to travel to space, as part of the Soviet Union's Soyuz T-11 expedition, launched on April 2, 1984, of the Intercosmos programme.
 - ✍ Cost of Gaganyaan mission will be less than Rs 10,000 crore. Prior to actual launch, ISRO will launch two unmanned Gaganyaan missions (first in 30 months' time and then 36 months).
 - ✍ GSLV Mk-III launch vehicle will be used to launch Gaganyaan as it has necessary payload capability for mission.

- ✎ ISRO also announced to outsource production of the Polar Satellite Launch Vehicles (PSLV) and Small Satellite Launch Vehicles (SSLVs) to private Industries.
- 33. ▶ Indian Space Research Organization developed an atomic clock to be used in navigation satellites to measure clear-cut location data. Currently ISRO imports atomic clocks from European aerospace manufacturer Astrium for navigation satellites.
 - ✎ It will be used on seven navigation satellites of India as part of Indian Regional Navigation Satellite System (IRNSS) or NavIC. Currently 3 NAVIC satellites have 3 imported Rubidium atomic clocks.
- 34. ▶ India's Mars mission Mangalyaan, successfully completed four years around Mars, despite being designed to last only six months. ISRO inserted Mangalyaan into Mars' orbit in its first attempt on September 24, 2014.
 - ✎ Also, ASTROSAT, India's first multi-wavelength space observatory will complete 3 years in Earth's orbit (Launched on September 28, 2015). ASTROSAT has helped scientists confirm the presence of younger stars in globular clusters, earlier believed to contain only old stars.
- 35. ▶ India's biggest cyclotron facility named Cyclone-30 became operational at Department of Atomic Energy (DAE)'s Kolkata-based Variable Energy Cyclotron Centre (VECC).
 - ✎ Cyclotron is used to produce radioisotopes for diagnostic and therapeutic use for cancer care. Radiations from these isotopes are used to destroy cancer cells.
 - ✎ Cyclone-30 will produce radioisotopes vital for diagnosis and treatment of cancer. It will be only cyclotron facility in country to produce Germanium 68 radioisotopes, used in diagnosis of breast cancer.
 - ✎ It will also produce Palladium 103 isotopes, which is used for the treatment of prostate cancer. In its future stages, it will also produce Iodine 123 isotopes, which can help detect thyroid cancer.
- 36. ▶ Institute of Nuclear Medicine and Allied Sciences (INMAS) developed India's first indigenous medical kit for protection against nuclear warfare or radioactive leakage. It has 25 items which include radioactive protectors which can absorb 80-90% of radiation, nerve gas agents, bandages that absorb radiation as well as tablets and ointments. Its important parts are -
 - ✎ Prussian blue tablet - Highly effective in incorporating Radio Cesium (Cs-137) and Radio Thallium, among most feared radioisotopes in nuclear bombs that destroy human body cells.
 - ✎ Ethylenediaminetetraacetic acid (EDTA) injection - Traps uranium in the guts and blood of victims during a nuclear accident or warfare.
 - ✎ Ca-EDTA Respiratory Fluid - Inhalation formula for chelation, or grabbing of heavy metals and radioactive elements deposited in lungs through inhalation at nuclear accident sites. It reduces the body burden of radioactivity by 30-40% in controlled conditions.
 - ✎ Radioactive Blood Mopping Dressing - Special bandage that absorbs radiation to prevent spread of radiation from radioactive patients to others.
 - ✎ Radioactive urine/biofluid collector - It can safely dispose of urine of person affected by radiation.
 - ✎ Anti-gamma ray skin ointment - Heals radiation damage on skin.
 - ✎ Amifostine injection - This conventional radiopharmaceutical that limits damage from gamma radiation.
 - ✎ Indranil 150 mg tablet.
- 37. ▶ Ministry of Earth Science (MoES) launched Ensemble Prediction System (EPS), as a new system to generate more area specific forecast of extreme weather events.
 - ✎ EPS system has been developed by Indian Meteorological Department (IMD), National Centre for Medium Range Weather Forecasting (NCMRWF) and Indian Institute of Tropical Meteorology.
 - ✎ EPS is special for its high resolution short-medium range weather forecasts. Under it, area of spatial resolution (currently 23 km grid scale) will come down to 12 km.
 - ✎ In its calculations, system will use a newly procured 8 petaflops high-power computing system.
 - ✎ Forecasts of severe weather events at 12 km grid scale would greatly help in making better emergency response decisions.
- 38. ▶ Ministry of Earth Sciences announced that Century's (2001 AD to 2100 AD) longest total lunar eclipse of 1 hour 43 minutes will occur on July 27-28, 2018, to be visible from all parts of India.
 - ✎ Moon will be gradually covered by Earth's shadow and totality phase will begin on July 28 and total eclipse will last up to 2h 43m.
 - ✎ Longest Total Lunar Eclipse - Moon will be passing through central part of Earth's umbral shadow. During this, Moon is located at apogee (farthest from Earth) and will be moving at slower speed in its orbit. It will take longer time for Moon and greater distance of Earth's umbral shadow to travel, making it longest duration of total eclipse of century.
 - ✎ Such long duration of total lunar eclipses earlier had occurred on July 16, 2000 for totality duration of 1 hour 46 minutes.
- 39. ▶ NASA announced that first crewed test flight by a SpaceX rocket to ISS will take place in June 2019. SpaceX will use its Falcon 9 rocket for launch with a Crew Dragon capsule attached on top.

40. ▶ NASA discovered 12 new moons around Jupiter, where one of them is on a collision course which could create a crash large enough to be visible from Earth. This brings total number of Jovian moons to 79, most for any planet.
41. ▶ NASA discovered a special kind of neutron star outside the Milky Way galaxy for first time. Neutron stars are highly dense cores of massive stars that collapse and go through a supernova explosion. It was spotted via NASA's Chandra X-ray Observatory and European Southern Observatory's Very Large Telescope (VLT) in Chile.
42. ▶ NASA extended Juno's science operations until July 2021, providing it additional 41 months in orbit around Jupiter. Larger orbits will also allow scientists to further explore far reaches of the Jovian magnetosphere, region of space dominated by Jupiter's magnetic field.
43. ▶ NASA has retired Kepler space telescope after it ran out of fuel needed for further science operations, bringing end of 9.5 year mission of Kepler space telescope in which it had discovered over 2,600 intriguing exoplanets from outside our solar system some.
 - ✍ It was launched in 2009 on 3.5-year mission, but operated for 9 years. It was NASA's first planet-hunting mission. It was named after German mathematician and astronomer Johannes Kepler.
44. ▶ NASA launched its most advanced space laser, ICESat-2, a \$1-billion mission that will shoot lasers towards Earth to track changes in Earth's ice sheets, glaciers, sea ice and vegetation around the world. The preceding mission, ICESat, which lasted from 2003-2009 revealed that ice cover was disappearing from Greenland and Antarctica. The new laser will fire 10,000 times per second, whereas ICESat fired 40 times a second.
45. ▶ NASA will launch mission InSight (Interior Exploration using Seismic Investigations, Geodesy and Heat Transport) to study deep interior of Mars on May 5, 2018. Rocket will also launch two mini-spacecraft called Mars Cube One (MarCO), NASA's technology experiment. InSight is stationary lander that will be first NASA mission since Apollo moon landings to place seismometer, a device that measures quakes on soil of another planet.
46. ▶ NASA will launch world's lightest satellite in August 2018, which is developed by engineering students from Hindustan Institute of Technology and Science in Tamil Nadu. It is 4cm 'cube' satellite named 'Jaihind-1S', with a 3D printed outer casing from polylactic acid (PLA) nylon material, making it weigh just 33.39 grams.
47. ▶ NASA's First asteroid sampling spacecraft OSIRIS-REx captured first images of its target asteroid Bennu (from a distance of 2.1 million KMs) and began its final approach towards it after almost two-year journey.
 - ✍ OSIRIS-Rex stands for Origins, Spectral Interpretation, Resource Identification, Security-Regolith Explorer. kilometre. It was launched in September 2016 for studying 101955 Bennu, a carbonaceous asteroid.
 - ✍ It is scheduled to reach asteroid in 2018 and return to Earth after collecting some of its gravels by 2023.
 - ✍ Bennu is near-Earth carbonaceous asteroid about the size of a small mountain in the Apollo group. It was discovered in September 1999 by the LINEAR Project. It is carbon-rich asteroid and believed to be the type of asteroids that may have chemical building blocks of life, along with lots of water.
48. ▶ NASA's Focusing Optics X-ray Solar Imager (FOXSI) took its third flight from the White Sands Missile Range in White Sands, New Mexico.
 - ✍ It is first instrument built specially to image high-energy X-rays from Sun, that will capture nanoflares (miniature explosions invisible to naked eye).
 - ✍ First FOXSI flight was in 2012, during which it successfully viewed a small solar flare in progress, and its second in 2014, when it detected best evidence at the time of X-ray emission from nanoflares.
49. ▶ NASA's Parker Solar Probe, mission to get closest to Sun than ever by any human-made object has got its revolutionary heat shield "Thermal Protection System or TPS" permanently attached to spacecraft.
 - ✍ Parker Solar Probe will be launched in August 2018, after been in making for 60 years. Spacecraft's orbit will carry it to within 4 million miles of Sun's surface with the help of its heat shield, and will collect data about the inner workings of the corona.
 - ✍ Heat shield's diameter is 8 feet and weighs 72.5 KG.
 - ✍ As Probe approaches Sun, temperatures on heat shield will reach around 1,371 degrees Celsius. But, spacecraft and its instruments will be maintained at a relatively comfortable temperature of nearly 29.4 degrees Celsius.
 - ✍ Sun-facing side of heat shield is sprayed with a specially formulated white coating to reflect most of Sun's energy away.
 - ✍ Parker Solar Probe will travel at a speed of 69,2018 km per hour at its closest approach to Sun.
50. ▶ NASA's Transiting Exoplanet Survey Satellite (TESS) become operational, after its launch in April 2018. It will look for potential exoplanets in a strip of sky running from the far south to near equator.
 - ✍ TESS mission is led by Massachusetts Institute of Technology's (MIT) Kavli Institute for Astrophysics and Space Research.
 - ✍ It is designed to find potential planets orbiting stars close to Earth. It will identify such planets by spotting decreased brightness of stars after planet passes in front of it.
 - ✍ It is successor to Kepler, space observatory which is responsible for detecting most of the currently known exoplanets.

- ✎ TESS will be able to observe about 85% of sky over its expected two-year mission.
 - ✎ Data collected by TESS will help to study mass, size, density and orbit of large cohort of small planets, including sample of rocky worlds in habitable zones (goldilocks zone) of their host stars.
51. ▶ NASA's Transiting Exoplanet Survey Satellite, known as TESS, has spotted "hot Earth" and "super-Earth" planets in solar systems 49 and 60 light-years away, marking its first discovery since April launch. TESS is designed to build on the work of its predecessor, Kepler space telescope, which discovered over 2,500 confirmed exoplanets in 20 years and is now running out of fuel.
52. ▶ National Aeronautics and Space Administration (NASA) demonstrated that Its Kilopower portable nuclear fission reactor could enable crewed missions to Moon, Mars and beyond.
- ✎ Kilopower Reactor Using Stirling Technology (KRUSTY) experiment was conducted by NASA at in November 2017 - March 2018, established that this system can create electricity with fission power.
 - ✎ KRUSTY is a small, lightweight fission power system which is capable of providing up to 10 kilowatts of electrical power continuously for at least 10 years. This prototype uses a solid uranium-235 reactor core.
53. ▶ National Board for Wildlife (NBWL) added 4 species (*Northern River Terrapin*, *Clouded Leopard*, *Arabian Sea Humpback Whale* and *Red Panda*) into Centre's Recovery Programme for Critically Endangered Species.
- ✎ Northern River Terrapin - Species of riverine turtle found in rivers that flow in Eastern India.
 - ✎ Clouded Leopard - Found in Himalayan foothills. It is threatened due to habitat loss, poaching for its skin and is also as a live pet trade.
 - ✎ Arabian Sea Humpback Whale - Migrates from Oman coast through Arabian sea, along Indian coasts till Sri Lankan coast.
 - ✎ Red Panda - Closely associated with montane forests with dense bamboo-thicket. It is found in Sikkim, West Bengal and Arunachal Pradesh.
54. ▶ National Wildlife Genetic Resource Bank inaugurated at Centre for Cellular and Molecular Biology's (CCMB) Laboratory of Conservation of Endangered Species (LaCONES) facility in Hyderabad (Telangana), as India's first genetic resource bank where genetic material will be stored for posterity which will further the cause of conservation of endangered and protected animals.
- ✎ It is equipped with sophisticated equipment to preserve the genetic resources that could be utilised to virtually resurrect an animal species in case it goes extinct. It will cryopreserve living cell lines, gametes and embryos of endangered wild animal species in India.
55. ▶ Researchers at Shizuoka University (Japan) developed a space elevator, a miniature version on satellites.
- ✎ 2 ultra-small cubic satellites will be used for demonstration, being released from International Space Station (ISS) and container acting like elevator car will be moved on cable connecting satellites using motor. The movement of motorised elevator box will be monitored with cameras in the satellites.
 - ✎ Space elevator is a proposed type of planet-to-space transportation system. It will permit vehicles to travel along cable from planetary surface, such as Earth's, directly into space or orbit, without use of large rockets. The idea of space elevator was first proposed in 1895 by Russian scientist Konstantin Tsiolkovsky.
56. ▶ Researchers from China's Centre for Excellence in Molecular Plant Sciences created the world's first single-chromosome yeast, while not affecting the majority of its functions. Experiment was conducted on Brewer's yeast having 16 chromosomes and which shares its one-third genome ancestry with humans. Researchers were able to fit nearly all genetic material of Brewer's yeast into just one chromosome.
57. ▶ Researchers from City University of Hong Kong (CityU) developed world's first-ever 4D printing for ceramics that can be used to create complex, shape-changing objects.
- ✎ 4D printing is conventional 3D printing combined with the additional element of time as the fourth dimension, where printed objects can re-shape or self-assemble themselves over time with external stimuli, such as mechanical force, temperature, or a magnetic field.
 - ✎ Existing 3D-printed ceramic precursors, which are usually difficult to deform, also hinder the production of ceramics with complex shapes. To overcome these, researchers developed a novel 'ceramic ink', a mixture of polymers and ceramic nanoparticles.
 - ✎ Applications include Printed ceramic precursors can be used in manufacturing of electronic devices. Ceramic materials have much better performance in transmitting electromagnetic signals than metallic materials.
 - ✎ The artistic nature of ceramics and their capability to form complex shapes also provide the potential for consumers to tailor-make uniquely designed ceramic mobile phone back plates.
58. ▶ Researchers from Northumbria University (UK) found out mountain ranges and three vast, deep sub-glacial valleys hidden under Antarctica ice. This is first finding observed from ice penetrating radar data collected in Antarctica as part of European Space Agency PolarGAP project. Largest valley, named Foundation Trough, is over 350 kilometres long and 35 kilometres wide. Other 2 are Patuxent Trough and Offset Rift.
59. ▶ Researchers from over 20 nations have first time have decoded wheat genome, with highest quality genome sequence generated to date for such wheat variety. Reference genome decoded covers 94% (14.5 Gb) of decoding of Chromosome 2A of wheat genome.

- ✎ It will help to identify genes controlling complex agronomic traits such as yield, grain quality, resistance to diseases and pests as well as tolerance to drought, heat, water logging and salinity.
 - ✎ Availability of high quality reference genome will accelerate breeding of climate-resilient wheat varieties to feed ever-increasing world population and help address global food security in decades to come.
60. ▶ Russian researchers created a battery based on radioactive isotope nickel-63 that has a half-life of 100 years, which could help power deep space missions. The prototype packs about 3,300 kilowatt-hours of energy per gram, which is more than any other nuclear battery based on nickel-63 and 10 times more than commercial electrochemical cells.
61. ▶ Satellite named RemoveDEBRIS was successfully deployed from International Space Station (ISS), to clean up space debris orbiting Earth. It was transported to ISS via SpaceX CRS-14 launch in early April 2018. Satellite was built by consortium of space companies and research institutions led by Surrey Space Centre at University of Surrey (United Kingdom).
- ✎ Satellite is aimed at performing key Active Debris Removal (ADR) technology demonstrations (e.g capture, deorbiting) representative of operational scenario during low-cost mission using novel key technologies for ADR.
62. ▶ Scientists approved three new ages on geologic time scale of Holocene Epoch - Meghalayan Age, Middle Holocene Northgrippian Age and Early Holocene Greenlandian Age.
- ✎ These new ages of Holocene Epoch are represented by wealth of sediments that accumulated worldwide on sea floor, on lake bottoms, as glacial ice, and as calcite layers in stalactites and stalagmites.
 - ✎ Meghalayan Age -
 - ✎ Named after cave in Indian state of Meghalaya. It helped to define climatic events 4,200 years ago, marking beginning of phase that continues till today. Meghalayan Age was part of longer period known as Epoch, which reflects everything that has happened over past 11,700 years.
 - ✎ It began with mega global drought that devastated ancient agricultural civilisations from Egypt to China. Droughts over 200-year period resulted in human migrations in Egypt, Syria, Palestine, Mesopotamia, Greece, Indus valley and Yangtze river valley.
 - ✎ Middle Holocene Northgrippian Age and Early Holocene Greenlandian Age -
 - ✎ These 2 ages are defined with beginnings at climatic events that happened about 8,300 years and 11,700 years ago, respectively.
 - ✎ Lower boundary of Greenlandian and Northgrippian stages are defined at specific levels in Greenland ice cores.
63. ▶ Scientists at Ahmedabad Physical Research Laboratory have discovered an exoplanet, Taking India into a select group of countries which have found planets outside the solar system. The 'super-Neptune' is about 27 times mass of Earth and six times its radius. It is 600 light-years away from Earth. It is named as EPIC 211945201b (or K2-236b) and host star has been named EPIC 211945201 (or K2-236).
- ✎ Discovery was made by measuring mass using indigenously designed "PRL Advance Radial-velocity Abu-sky Search" (PARAS) spectrograph integrated with 1.2m Telescope at PRL's Gurushikhar Observatory in Mount Abu (Rajasthan). PARAS is first of its kind spectrograph in Asia, which can measure the mass of a planet going around a star.
64. ▶ Scientists at European Southern Observatory (ESO) discovered a galaxy proto-supercluster named "Hyperion", the largest and the most massive structure in early universe known so far. Hyperion was found using data from VIMOS Ultra-Deep Survey done by VIMOS instrument on European Southern Observatory's (ESO) Very Large Telescope in Chile.
- ✎ Hyperion's mass is estimated to be a million billion times that of our own Sun (nearly 1,048 Jupiters, or 333,000 Earths). v. Hyperion is located in the constellation of Sextans.
65. ▶ Scientists discovered new frog species named *Microhyla kodial* or Mangaluru narrow-mouthed frog in a region in coastal Karnataka. It is seen only in small industrial region which was former timber dumping yards surrounded by seaport, petrochemical, chemical and refinery industries. It is small in size measuring just 2 cm long.
66. ▶ Scientists discovered world's second oldest grain of magmatic zircon (mineral that contains traces of radioactive isotopes) from Champua from Singhbhum rock sample in Odisha's Kendujhar district. It is oldest magmatic zircon on earth.
- ✎ Isotopic analysis of Singhbhum rock sample with magmatic zircon was done used Sensitive High Resolution Ion Microprobe (SHRIMP) at Chinese Academy of Geological Sciences. It confirmed presence of two zircon grains that aged 4240 million and 4030 million years.
 - ✎ Oldest zircon on earth was found in Jack Hill (Western Australia), which is 4400 million years old. It is metamorphosed sedimentary rock.
67. ▶ Scientists from Bombay Natural History Society (BNHS) and IISc Bangalore discovered 2 new species of lizards in Western Ghats. The Lizards are: Montane forest lizard and Spiny-headed forest lizard. They were wrongly identified under genus Calotes for over 150 years.

68. ▶ Scientists from Newcastle University (UK) created world's first 3D printed human corneas that could solve problem of shortage of available eye donors and help millions of blind people gain sight again.
- ✎ Cornea is outermost layer of the human eye. Its key function is to focus vision. It also barricades eyes against harmful dirt and bacteria.
 - ✎ 3D printed human corneas were produced using bio-ink solution consisting of healthy corneal stem mixed together with alginate and collagen.
69. ▶ Scientists from Tohoku University in Japan found mineral called moganite in lunar (Moon's) meteorite that points presence of abundant hidden reserves of water ice under surface of moon. The mineral discovered in a desert in northwest Africa could be potentially useful for future human exploration of moon.
- ✎ Moganite is a crystal of silicon dioxide (SiO₂), known to form on earth in specific circumstances in sedimentary settings from alkaline fluids.
 - ✎ Researchers believe that mineral formed on surface of moon in area called Procellarum Terrane as water was present in lunar dirt, that evaporated due to strong sunlight. But in subsurface, water remains in form of ice.
70. ▶ Scientists from University of Minnesota (USA) discovered that chemical element ruthenium (Ru(44)) is fourth element to have unique magnetic properties (ferromagnetism) at room temperature, after Iron (Fe), Cobalt (Co), and Nickel (Ni). The discovery will help to improve sensors, devices in computer memory and logic industry or other devices using magnetic materials. It was discovered in 1844 by Russian-born scientist Karl Ernst.
71. ▶ Scientists have developed world's fastest rotor, which will help in studying quantum mechanics. It can spin at more than 60 billion revolutions per minute, making it world's fastest man-made object. Spinning dumbbell functions as rotor, and vibrating dumbbell functions like instrument for measuring tiny forces and torques, known as a torsion balance.
72. ▶ Scientists identified new shape called *scutoid* while studying epithelial cells.
- ✎ Scutoid shape has five sides on one end and six on the other and a triangular surface on one of its longer edges. and It is completely new to geometry and resembles beetle's scutellum (shield-like structure) from top-down view.
 - ✎ It will help to explain how cells arrange themselves in tightly packed three-dimensional (3D) structures that serve as protective barriers in body. It will contribute to tissue engineering specifically development of artificial organs.
73. ▶ Tapanuli Orangutan, the rarest ape species on Earth, is on verge of extinction with only approx 800 members of the species alive. This species was discovered in 2017 in Sumatra (Indonesia).
74. ▶ Two new species of cricket frogs named Kalinga and Krishnan discovered in the Odisha (Eastern Ghats) and Karnataka (Western Ghats) respectively. The other species has been named Krishnan. Kalinga has been named after ancient kingdom of Kalinga. The other species from Karnataka has been named after eminent biologist, Dr. K Subramanian Krishnan.
75. ▶ USA Scientists claimed to have developed world's first bioelectronic medicine which is implantable, biodegradable wireless device that speeds nerve regeneration and improves healing of damaged nerve.
- ✎ It is controlled wirelessly by transmitter outside body that acts much like cellphone-charging mat. It operates for about two weeks before naturally absorbing into the body.
 - ✎ During its animal test on rats with injured sciatic nerves, it was found that this bioelectronic medicine device delivers regular pulses of electricity to damaged peripheral nerves in rats after surgical repair process. This results in accelerating regrowth of nerves.
 - ✎ Researchers envision that such transient engineered technologies can replace pharmaceutical treatments for a variety of medical conditions in humans.
76. ▶ USA's National Aeronautics and Space Administration (NASA) launched Parker Solar Probe, a \$1.5 billion spacecraft, aimed at looking after several factors of sun which are crucial to protect Earth by unveiling mysteries of dangerous solar storms.
- ✎ It is Humanity's first-ever mission to Touch the Sun. It will fly through Sun's atmosphere as close as 3.8 million miles from its surface, much closer than any spacecraft has come before.
 - ✎ Parker Solar Probe launched aboard a Delta IV-Heavy rocket from Cape Canaveral (USA).
 - ✎ It will use Venus' gravity during seven flybys over nearly seven years to gradually bring its orbit closer to Sun. Earth's average distance to Sun is 93 million miles.
 - ✎ Why won't it Melt -
 - ✎ Parker Solar Probe will provide unprecedented observations of what drives the wide range of particles, energy and heat that course through Sun's Corona, which has temperature of approx 6000 Degrees and sends particles outward into solar system.
 - ✎ Parker Solar Probe has can withstand extreme temperature and fluctuations, with its custom heat shield that helps protect mission it from Sun's intense light emission.
 - ✎ The key Lies in **concept of heat versus temperature** -

- ✎ High temperatures do not always translate to actually heating another object. In space, temperature can be thousands of degrees without providing significant heat to a given object or feeling hot, as Temperature measures how fast particles are moving, whereas heat measures total amount of energy they transfer.
- ✎ Particles may be moving fast (high temperature), but if there are very few of them, they won't transfer much energy (low heat). Since space is mostly empty, there are very few particles that can transfer energy to spacecraft.
- ✎ Sun's Corona has an extremely high temperature but very low density, so spacecraft interacts with fewer hot particles and doesn't receive as much heat.
- ✎ It Means that while Parker Solar Probe will be travelling through space with temperatures of several million degrees, surface of heat shield that faces the Sun will only get heated to about 1,400 degrees Celsius. Shield uses a Thermal Protection System, (8 feet (2.4 meters) in diameter and 4.5 inches (about 115 mm) thick), allowing the other side of shield, the spacecraft body to be at comfortable 30 C.

✎ Other Facts about mission -

- ✎ Naming - Eugene Newman Parker is person on whose name the Mission is named. In mid 1950s, he proposed a number of concepts about how stars – including our sun – give off energy. He called this cascade of energy the solar wind.
 - ✎ Cost is approx \$1.5 Billion USD.
 - ✎ In its seven-year mission, Probe will make six more Venus flybys and 24 total passes by Sun, journeying steadily closer to Sun until it makes its closest approach at 3.8 million miles (6.16 million km). It will be moving at roughly 430000 miles per hour, setting record of being the fastest human-made object ever.
 - ✎ It is expected to transmit its first science observations in December 2018.
77. ▶ University of Chicago (USA) identified a 'zombie' gene that makes elephants nearly immune to cancer. In response to DNA damage, a tumour-suppressing protein wakes up the non-functioning gene called LIF6 to kill cancer-prone cells.
78. ▶ *Uropeltis bhupathyi*, a new snake species has been discovered in the Anaikatty hills, Coimbatore, Tamil Nadu. It has been named after late herpetologist S. Bhupathy. They are non-venomous, burrowing, mostly earthworm-eating.

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