



Current Affairs - July to December 2017

Month Type



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









(Showing **130** Important Ones)

Science

- ▶ 2 new ant species *Tetramorium krishnani* and *Tetramorium jarawa* discovered in islands of Andaman, named after late scientist K.S. Krishnan of NCBS, and Jarawas – indigenous people of Andaman.
- ▶ Government launched Noxeno, a nasal foreign body removal device developed by start-up InnAccel Technologies, under Biodesign program. Noxeno is first dedicated tool for anterior nasal foreign body (NFB) removal that allows doctors in any setting to quickly and safely remove objects that people (mostly children aged 2 to 10 years) put into their noses.
- ▶ 2 new species of Cycas Tree discovered by researchers in Acharya Jagadish Chandra Bose Indian Botanic Garden (West Bengal), taking Total number of Cycas species found in India to 14. Cycas are among most ancient plants whose fossils date to the Jurassic period.
- ▶ A Group of USA Scientists has developed an artificial womb that can be used to save extremely premature human babies. Research showed that preterm lambs were successfully maintained in a healthy condition with significant growth for upto a week, using ex-vivo uterine environment (EVE) therapy.
- ▶ A group of scientists started a new expedition aimed at unlocking secrets of lost continent 'Zealandia', which is mostly submerged and believed to have sunk after breaking away from Australia 60 - 85 million years ago.
 - ▶ Expedition is called Expedition 371 and is funded by National Science Foundation and the International Ocean Discovery Program.
 - ▶ Team includes over 30 scientists aboard JOIDES Resolution, a massive scientific drilling ship. Duration of trip will be approx 2 months.
- ▶ A new LIGO (Laser Interferometer Gravitational-Wave Observatory) gravitational wave detector will be built in India by 2025 (world's 3rd after 2 in USA).
 - ▶ In 2016, LIGO detectors discovered gravitational waves produced by two giant merging blackholes. LIGO detector in India will help to pinpoint origin of gravitational waves that are detected in future.
- ▶ A new species of non-venomous aquatic snake named *Aquatic Rhabdops* has been described as new species from northern Western Ghats in Maharashtra, Goa and North Karnataka. Earlier this species was considered as variant of Olive Forest Snake, first described in 1863.
- ▶ According to Japanese scientists, delicate mosses found on rocks and trees in cities can be used as low-cost bioindicator to monitor urban pollution and to measure impact of atmospheric change. Mosses respond to pollution or drought-stress by changing its shape, density or disappearing.
 - ▶ Mosses are a common flowerless plant found in all cities especially in damp (humid) or shady locations. It generally absorb water and nutrients from their immediate environments, so it can reflect changes to ecosystems.
- ▶ According to researchers from University of Southampton (UK), extreme global warming event named Palaeocene-Eocene Thermal Maximum (PETM) that occurred 56 million years ago was driven by massive CO₂ emissions from volcanoes during formation of North Atlantic Ocean.
 - ▶ This caused doubling of CO₂ in less than 25 thousand years because of CO₂ emissions from volcanoes. PETM was most rapid and extreme natural global warming event of last 66 million years and lasted for around 150 thousand years. It increased global temperatures by at least 5 degrees Celsius.
- ▶ According to study at University of Hyderabad, Castor bean plants can prove very useful in fighting soil pollution as these plants can absorb toxic heavy metals from soil from these polluted areas due to industrial pollution.










11. ▶ According to study by a Group of Indian Scientists, black carbon (BC) ejected by aeroplanes is affecting monsoon, depleting ozone layer and quickening glacier melt.
 - ✎ Earlier it was believed that airborne BC is unlikely to travel upward of 4 km and dissipate and settle down in few months under influence of wind and rain. However, this study shows that such particles exist up to 18 km into the stratosphere, a stable region of the atmosphere.
12. ▶ After successful launch of India's first indigenously developed robot *BRABO*, TATA Motors Owned TAL Manufacturing launched *Robo Whiz*. It will provide students hands-on experience and help develop skills needed for effective use and management of Robotics and Automation Technology.
13. ▶ An unusual breed of fruit bat (discovered in Papua New Guinea) is now officially recognised as a new species. This bat was previously nicknamed 'Yoda and has now been renamed happy (Hamamas) tube-nosed fruit bat.
14. ▶ As per Massachusetts Institute of Technology (USA)'s study titled *Thresholds of catastrophe in the Earth System*, Earth's sixth mass extinction may become a reality by 2100 due to increasing carbon pressure on oceans.
 - ✎ In past 540 million years, Earth has seen 5 mass extinction events. By 2100, about 310 gigatons of carbon will have been added to oceans, a potential 'tipping point' for ecological disaster.
15. ▶ As per study, newly found solar system TRAPPIST-1 star is between 5.4 and 9.8 billion years old, twice as old as our own solar system (4.5 billion years). TRAPPIST-1 is a system of 7 Earth-size planets orbiting an ultra-cool dwarf star about 40 light-years away.
16. ▶ Australian Researchers discovered a new water-adapted species of spiders named 'Desis bobmarleyi' in Queensland, named after noted singer and songwriter Bob Marley.
17. ▶ Australian scientists of University of New South Wales (UNSW) discovered a new species of marsupial lion which has been extinct for at least 19 million years. Named *Wakaleo schouteni*, it was a predator about the size of a border collie dog.
18. ▶ Bengaluru-based biotech startup *Bugworks Research* became India's and Asia's first to receive international CARB-X (Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator) grant for its antibiotic research and development.
 - ✎ CARB-X is an international partnership set up in 2016 to focus on innovations to improve diagnosis and treatment of drug-resistant infections. It grew out of Barack Obama's 2015 Combating Antibiotic Resistant Bacteria (CARB) initiative.
19. ▶ Botanical Survey of India (BSI) scientists discovered two new species of Ginger - *Hedychium chingmeianum* (Nagaland) and *Caulokaempferia dinabandhuensis* (Manipur).
20. ▶ Botanists discovered new species of wild banana named *Musa paramjitiana* in Andaman and Nicobar Islands, named in honour of Paramjit Singh, director of Botanical Survey of India (BSI).
21. ▶ Breakthrough Listen project detected 15 Fast Radio Bursts (FRBs) coming from a dwarf galaxy about 3 million light years away from earth, with help of Green Bank Telescope (GBT) in West Virginia.
 - ✎ FRB is brief, bright pulse of radio emission from distant galaxies. It was first detected in 2007 with help of Parkes Telescope in Australia.
22. ▶ CSIR scientists developed an ultra-thin wireless device that mimics plant leaves to produce hydrogen fuel using water and sunlight, paving way for clean energy for powering eco-friendly cars in future.
 - ✎ At present, hydrogen is produced from fossil fuels by steam reforming. In this process large amount of CO₂ is emitted. This new green method of generating Hydrogen from Water may be a great reform in coming times.
 - ✎ When visible light strikes semiconductors, electrons move in one direction and produce electric current. The current almost instantaneously splits water into hydrogen making it one of cleanest forms of fuel as its main byproduct is water.
23. ▶ California Institute of Technology, USA (CALTECH) scientists made world's smallest recreation of Leonardo da Vinci's Mona Lisa, through a technique dubbed as *DNA origami*. Scientists folded DNA into desired self-assembling structures using 64 tiles, which were 100 nanometers wide.
24. ▶ *Chilesaurus* (Dinosaur species recently discovered in southern Chile) has been reported to be missing link that fills gap between 2 of major dinosaur groups - plant-eating herbivores and carnivores.
25. ▶ China began test runs of world's first track-less train in Zhuzhou city, that runs on virtual track and is being considered *World's First smart train*. This train could travel at the speed of 70 kmph and is called Autonomous Rail Transit (ART).
26. ▶ China launched world's largest human genome research project to document genetic makeup of 1 lakh people, to detect genetic links between health and sickness and use that information to generate precision medicines for future.
27. ▶ China tested its first photovoltaic (solar) highway in Shandong province, becoming 2nd country (after France) to construct a photovoltaic highway.
 - ✎ China's photovoltaic highway is constructed using solar panels with thin sheet of transparent concrete on top of them.
 - ✎ The photovoltaic panels of the highway are built to transfer energy to electric vehicles passing on top of them.

28. ▶ Tested 1 KM segment of solar highway can generate 817.2 KW of electricity and can generate 1 million KW hours of electricity yearly.
29. ▶ China's Three Gorges Corp. started building world's biggest floating solar power plant in Anhui Province, expected to be launched by May 2018.
30. ▶ China's AG600n (also known as Kunlong), world's largest amphibious aircraft took off its first flight from Zhuhai City. It has huge wingspan of 38.8 metres and can land and take off from water.
31. ▶ Columbia University (USA) researchers converted a bacterial immune system into world's smallest data recorder, by modifying an ordinary laboratory strain of human gut microbe *Escherichia coli*, using CRISPR gene-editing method. It enabled bacteria to record their interactions with environment and also time-stamp the events. It has several possible applications such as disease diagnosis, environmental monitoring and basic studies in ecology and microbiology.
32. ▶ Department of Science and Technology (DST) will fund a project to develop quantum computers in order to tap into next big advance in computing technology.
- ▶ Quantum computer uses principles of quantum physics to increase computational power beyond attainable limits of traditional computer. It employs complex principles of quantum mechanics to store information in 'qubits' (quantum bit) instead of the typical binary 'bits' of 1 and 0.
33. ▶ European Space Agency (ESA) and NASA Researchers discovered that Sun's core is rotating four times faster than its surface, using 16 years of observations from an instrument called GOLF (Global Oscillations at Low Frequency) on a spacecraft called Solar and Heliospheric Observatory (SOHO).
34. ▶ Geologists for first time discovered 152 million-year-old fossil of Ichthyosaur, an extinct marine reptile in in Kutch desert region of Gujarat. The specimen belongs to Ophthalmosauridae family of ichthyosaurs that lived in oceans between 165 and 90 million years ago.
35. ▶ Hyderabad based Centre for Cellular and Molecular Biology (CCMB) and Indian Institute of Rice Research (IIRR) developed Improved Samba Masuri (ISM) variety rice with low Glycemic Index (50.99 against normal value of 53 - 70).
- ▶ Rice with low GI is considered suitable for people with diabetics and it results in slow release of glucose into blood.
36. ▶ ISRO's Mars Orbiter Mission (Mangalyaan) completed 3 years in Martian orbit, already having outlived its original lifespan. Mangalyaan was launched on board of PSLV C25 rocket on November 5, 2013 and entered Mars orbit on September 24, 2014.
37. ▶ India has been declared free from infective Trachoma which is a contagious bacterial infection of the eye, that causes inflamed granulation on inner surface of lids. It was stated in National Trachoma Survey Report 2014-17 released by Minister of Health and Family Welfare J P Nadda.
38. ▶ India's First wave-powered navigational buoy developed by National Institute of Ocean Technology (NIOT), has been deployed at Ennore Kamarajar Port (Chennai) to guide ships in and out of ports. Buoy's ship guiding beacon is powered by wave energy while conventional ones use solar power.
- ▶ National Institute of Ocean Technology (NIOT) will also build India's first offshore desalination plant about 40km from Chennai coast, with capacity of 10 million litres water / day.
39. ▶ Indian Institute of Science (IISc) Bengaluru researchers developed a highly sensitive and low cost nanometre-scale carbon monoxide (CO) sensor, with potential applications in environmental pollution monitoring. Carbon Monoxide is a colorless, odorless gas and is harmful when inhaled in large amounts.
40. ▶ Indian Space Research Organisation (ISRO) will launch a niche Earth observation (EO) satellite - *Hyperspectral Imaging Satellite (HySIS)*, with critical chip called *optical imaging detector array*. Its will allow ISRO to enter operational hyperspectral imaging from earth orbit.
- ▶ Hyperspectral imaging or hypspec imaging combines power of digital imaging and spectroscopy. It collects and processes information from across the electromagnetic spectrum. It enables distinct identification of objects, materials or processes on Earth by reading spectrum for each pixel of a scene from space.
- ▶ HySIS satellite of ISRO can see in 55 spectral or colour bands from 630 km above ground. It can be used for a range of applications from monitoring environment, crops, looking for oil and minerals, military surveillance.
41. ▶ Indian Space Research Organization (ISRO) will set up a research centre in Guwahati (Assam) for exploring possibility of using geospatial technology and geographical information systems (GIS).
42. ▶ Indian astronomers from Pune Based Inter University Centre for Astronomy and Astrophysics (IUCAA) and Indian Institute of Science Education and Research (IISER) identified extremely large supercluster of galaxies located in the direction of constellation Pisces, named as *Saraswati*. Saraswati supercluster is 4 billion light years away from Earth and may contain mass equivalent of 20 million billion suns.
43. ▶ India's First mission to Sun will be launched in 2019, aiming to improve our understanding of dynamical processes of the sun and help resolve some outstanding questions in solar physics. It will be launched from Sriharikota in Andhra Pradesh on PSLV- XL launch vehicle.

-  The mission will put 1500-kg heavy class Aditya-L1 satellite into halo orbit around Lagrangian point L1, a point between Sun and Earth.
43. ▶ India's first dedicated space observatory AstroSat along with Chandra and Hubble Space Telescope have detected a massive coronal explosion on Proxima Centauri, sun's closest star neighbour.
44. ▶ India's multi-wavelength space telescope *AstroSat* accomplished difficult task of measuring X-ray polarisation. It did 18 month long study of Crab pulsar in Taurus Constellation and measured variations of polarisation as this highly magnetised object spins 30 times per second. This measurement puts up a strong challenge to prevailing theories of high energy X-ray emission from pulsars.
45. ▶ Indonesian scientists from Lambung Mangkurat University found world's smallest squirrel in Borneo rain forest, named *Bornean pigmy*. It is 73 mm long and weighs about 17 grams.
46. ▶ International Astronomical Union (IAU) named 2 mountain ranges on icy dwarf planet *Pluto* as Tenzing Montes and Hillary Montes, after Tenzing (Nepal) Norgay and Edmund Hillary (New Zealand) who were first mountaineers to reach summit of Mount Everest in 1953. These are among 14 other names officially approved for naming 14 geographical features on Pluto.
47. ▶ International Conference of heads of Metrology Institutes held in Sevres (France) decided that measure of kilogram will no longer be pegged to cylinder. From 2019 onwards, it will be set by value of Planck constant in combination with definitions of meter and second.
-  Till now, kilogram is only unit of measures pegged to a real object. But cylinder's weight in kilogram fluctuates due to surface contamination with time, making it tricky to define its exact mass.
48. ▶ International Union for Conservation of Nature (IUCN) has downgraded conservation status of snow leopard from "endangered" to "vulnerable", that was continuing since 1972.
-  Species are *endangered* if they are fewer than 2,500 with high rate of decline. Vulnerable Species are those with population under 10,000 and declining at rate of 10% over 3 generations.
49. ▶ Mainstream space agencies in world proposed creation of a climate observatory to combine acquired data and share it with scientists around globe, during *One Planet Summit* in Paris (France).
50. ▶ Ministry of Human Resource Development (HRD) launched *Swasth Bachche, Swasth Bharat* Programme, as an initiative of Kendriya Vidyalaya Sangathan (KVS) to prepare a physical Health and Fitness Profile Card for more than 12 lakhs of Kendriya Vidyalaya students.
51. ▶ Ministry of Science and Technology launched SOHUM, an indigenously developed low-cost hearing screening device for newborns. It has been developed by School of International Biodesign (SIB) startup *Sohum Innovation Labs India*. Sohum aims to minimise or reverse hearing loss damage and uses brain-stem auditory evoked response.
52. ▶ NASA is developing Double Asteroid Redirection Test (DART) as first-ever mission that will deflect a near-Earth asteroid, to be built and managed by John Hopkins Applied Physics Laboratory (APL).
-  It will work on kinetic impactor technique, that involves sending one or more large, high-speed spacecraft into path of an approaching near-earth object to shift its orbit to defend against future impact.
-  Target for DART is an asteroid called Didymos that will have a distant approach to Earth in October 2022 and then again in 2024. Asteroid Didymos (Greek word for twin) is an asteroid binary system that consists of Didymos A (780 metres), and Didymos B (160 metres).
53. ▶ NASA revealed that a mysterious world called *Planet Nine* does exist in solar system-
-  It might be lingering on icy outer edges of solar system hiding in dark, but stretching out orbits of distant bodies.
-  It is very distant and is 10 times mass of Earth and 20 times farther from sun than Neptune.
54. ▶ NASA rocket named WINDY (Waves and Instabilities from a Neutral Dynamo) will form night-time white artificial clouds visible by residents of Republic of Marshall Islands. It will study a phenomenon that occurs in Ionosphere (Layer of charged particles in upper atmosphere).
55. ▶ NASA will launch SuperTIGER Balloon in Antarctica, to study heavy cosmic particles, collect information on cosmic rays that enter Earth's atmosphere every day.
-  SuperTIGER stands for Super Trans-Iron Galactic Element Recorder (SuperTIGER) and is balloon-borne instrument to study rare heavy nuclei, which hold clues about where and how cosmic rays attain speeds up to nearly the speed of light.
56. ▶ NASA's Cassini spacecraft started its final mission - five ultra-close orbits around Saturn. It would be spacecraft's last mission of its 20-year-long journey, before plunging into atmosphere of Saturn.
57. ▶ NASA's \$3.9 bn Cassini spacecraft ended its 20-year-long journey after Plunging into Saturn's atmosphere. Cassini's mission to Saturn began in 1997, reaching it in 2004.
58. ▶ NASA's Hubble Space Telescope has discovered strongest evidence to date for a stratosphere on a planet outside our solar system, WASP-121b. Stratosphere is a layer of atmosphere in which temperature increases with higher altitudes.
59. ▶ NASA's Juno spacecraft became first space probe to successfully complete a flyby into Jupiter's giant storm known as Great Red Spot.

- Great Red Spot on Jupiter is a massive storm (cyclone) measuring about 16,000 km in diameter. It is largest known storm in solar system.
60. ▶ NASA's Solar Dynamics Observatory (SDO) captured images of 2 significant Solar Flares emitted by Sun, powerful bursts of radiation classified as X2.2 flare and 2nd is X9.3 flare.
 - ▶ X9.3 flare was the largest flare in the current solar cycle which began in December 2008 and heading towards 'Solar Minimum'.
 - ▶ Solar Minimum is such phase of the solar cycle when these eruptions on the sun are increasingly rare, but they can be intense.
 61. ▶ NASA's asteroid-chasing spacecraft Osiris-Rex (*Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer*) successfully swung by Earth to put it on desired trajectory towards near earth asteroid Bennu using Earth's gravity.
 - ▶ OSIRIS-REx mission was launched in September 2016 for studying 101955 Bennu, a carbonaceous asteroid as NASA's first asteroid sampling mission.
 62. ▶ NVIDIA unveiled world's first Artificial Intelligence (AI) computer designed to drive fully autonomous robotaxis, named Pegasus. It be available to NVIDIA automotive partners in the second half of 2018. It will help to create a new class of vehicles that can operate completely without a driver.
 63. ▶ National Aeronautics and Space Administration (NASA) launched Joint Polar Satellite System-1 (JPSS-1) as first of 4 multi-day weather forecasts satellites.
 - ▶ JPSS-1 is joint venture between NASA and NOAA (National Oceanic and Atmospheric Administration). It will be renamed NOAA-20 when it reaches its final orbit. It is designed to monitor weather around world and help improve forecasts.
 64. ▶ New species of blind fish "Schistura larketensis" has been discovered in East Jaintia Hills district of Meghalaya. The fish had lost its pigments and eye sight after living in darkness of the cave.
 65. ▶ Palaeontologists from University of Portsmouth (UK) discovered remains of humankind's oldest mammal ancestor — a tiny rat-like creature that lived 145 million years ago.
 66. ▶ Paleontologists from Chinese Academy of Sciences discovered approx 300 fossilised eggs of Pterosaurs, a group of extinct winged dinosaur. It is world's first such mass dinosaur egg discovery.
 67. ▶ Researchers at *Swiss Federal Laboratories for Materials Science and Technology* have developed a flexible material that generates electricity when stretched or compressed, paving way for smart clothing or self-powered pacemakers -
 - ▶ It is a composite material made of polar nanoparticles and an elastomer - silicone and can convert mechanical movements into electrical charges. Trick is internal polarisation that changes while rubber film is being mechanically stressed.
 68. ▶ Researchers at UK's Cardiff University have produced world's most detailed scan of brain's internal wiring -
 - ▶ Scan shows fibres in white matter called axons (brain's wiring which carry billions of electrical signals).
 - ▶ Scan showed direction of messaging and also density of brain's wiring.
 - ▶ This detailed scan of brain's wiring will help increase understanding of a range of neurological disorders and can be used instead of invasive biopsies.
 69. ▶ Researchers discovered new species of Gecko at Chhattisgarh's Kanger Ghati National Park in Eastern Ghats. Its common name is *Kanger valley rock gecko* and scientific name is *Hemidactylus kangerensis*.
 70. ▶ Researchers discovered species of ant in Periyar Tiger Reserve (Kerala), as one of world's 'hottest hotspots' of biological diversity. It has been named *Tyrannomyrmex alii* (or *T. alii*), after eminent myrmecologist Musthak Ali, who is regarded as the India's 'ant man'.
 71. ▶ Researchers from CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB) and National Centre for Disease Control (NCDC) have developed an ultrasensitive DNA chip based sensor for quick pathogen detection. The sensor can detect *S. pyogenes* bacterium in about 30 minutes, that causes a wide range of diseases.
 72. ▶ Researchers from Brunel University (UK) developed first 3D printed wearable 'battery' that stacks silicone, glue and gel electrolyte, layer by layer to make a supercapacitor. It stores energy on its surface without chemical reactions and could be used to power smartphones, electric cars, medical implants like pacemakers etc.
 73. ▶ Researchers from Indian Institute of Technology (IIT) Guwahati created an implantable bioartificial pancreas model grown within 3D silk scaffold, that encapsulates insulin-producing beta cells and is capable of naturally producing insulin in sustained manner. After Trials, it can be used for treating people with Type 1 diabetes that arises when body's immune system kills insulin-producing beta cells.
 74. ▶ Researchers from Massachusetts Institute of Technology (USA) developed low-cost rapid test that can quickly and accurately detect Zika and dengue viruses from blood. Test is conducted through a strip which contains gold nano particles and antibodies that react to the presence of Zika or dengue virus.
 75. ▶ Researchers from US-based Rice University have found new tectonic microplate off Ecuador's coast in the eastern Pacific Ocean. It has been named Malpelo plate, after a Colombian island and an oceanic ridge it contains. It is overall 57th tectonic microplate to be discovered so far and the first in nearly a decade. Microplates are tectonic plates with an area less than 1 million km².

76. ▶ Researchers from University of British Columbia (Canada) developed earthquake-proof fibre-reinforced concrete that can enhance earthquake resistance of seismically vulnerable structures.
- ✎ Cement Material is made of eco-friendly ductile cementitious composite (EDCC) which combines cement with polymer-based fibres, flyash and other industrial additives, making it highly sustainable.
77. ▶ Researchers from University of California and University of Illinois confirmed existence of new form of matter called excitonium, made up of excitons and exhibits macroscopic quantum phenomena just like a superconductor.
- ✎ Technique called momentum-resolved electron energy-loss spectroscopy (M-EELS) was used by researchers to prove existence of excitonium.
78. ▶ Researchers from University of Tasmania (Australia) discovered rare, living specimens of stromatolites, oldest evidence of life on Earth, deep within a remote and protected World Heritage Area in Australia.
79. ▶ Researchers in UK produced specific human antibodies in laboratory by treating patient-derived B cells with tiny nanoparticles coated with both CpG oligonucleotides and an antigen, paving way for rapid development of new vaccines to treat a wide range of infectious diseases.
80. ▶ Samsung developed world's smallest 8-gigabit DRAM chip, with improved energy efficiency and data processing performance. In these chips, only 1 transistor and a capacitor are required per bit, compared to 4 to 6 in SRAM.
81. ▶ Scientists ETH Zurich in Switzerland successfully created the world's shortest X-ray laser pulse with a duration of just 43 attoseconds.
- ✎ Its significance lies in fact that to fully understand dynamics during a chemical reaction, scientists must be able to study all movements of atoms and molecules on their basic time scale.
 - ✎ Molecules rotate in range of picoseconds, their atoms vibrate in the range of femtoseconds, and electrons move in the range of attoseconds.
 - ✎ This laser pulse is shortest controlled event that has ever been created by humans. Researchers can now observe in high detail how electrons move within a molecule or how chemical bonds are formed.
82. ▶ Scientists at Indian Institute of Technology (IIT) Guwahati developed a 3D cardiac tissue patch using silk protein membranes seeded with heart muscle cells. The patch can be used for regenerating damaged heart tissues and sealing holes in heart.
83. ▶ Scientists at Los Alamos National Laboratory (USA) discovered a potential new state of matter that may help explain phenomena like superconductivity. It was discovered in the high-magnetic-field state of the heavy fermion superconductor CeRhIn₅.
- ✎ In new state, material's electrons are aligned in such a way that they reduce symmetry of original crystal. This electronic alignment in a prototypical heavy-fermion superconductor is called *nematic behaviour*, common among superconducting materials in high magnetic fields.
 - ✎ Superconductivity is ability of certain materials to conduct electric current with zero resistance. For a material to behave as a superconductor, critically low temperatures are required. Superconductivity was first observed in 1911 by H. K. Onnes (Dutch physicist)
84. ▶ Scientists at Purdue University in USA (including Karthik Ramani of India) have developed new artificial intelligence (AI) software called *SurfNet* that can create three dimensional (3D) models from 2D photographs. It can be of great use in robotics, object recognition and even self-driving cars.
85. ▶ Scientists at Stanford University (USA) developed a cost-effective and highly sensitive blood test to detect cancer, Called single colour digital PCR. It can detect genetic mutations in minute amounts of DNA released from cancer cells into blood.
86. ▶ Scientists discovered most ancient spiral galaxy known as A1689B11, recorded so far in universe. It was detected using powerful technique that combines gravitational lensing with Near-infrared Integral Field Spectrograph (NIFS) on Gemini North telescope in Hawaii.
- ✎ A1689B11 galaxy was born 11 billion years ago and existed just 2.6 billion years after Big Bang, when universe was only one-fifth of its present age.
87. ▶ Scientists discovered new scorpion species named Schaller's wood scorpion (*Liocheles schalleri*) from at Trishna Wildlife Sanctuary, Tripura. It has been named in honour of celebrated wildlife biologist George Schaller who has studied wildlife across world.
88. ▶ Scientists discovered new species of frog named Mewa Singh's night frog (*Nyctibatrachus mewasinghi*) in Kozhikode's Malabar Wildlife Sanctuary, Kerala in Western Ghats.
89. ▶ Scientists discovered new species of glow-in-the-dark shark living 1,000 feet below Pacific Ocean off coast of northwestern Hawaiian islands. It is named *Etmopterus lillae* and belongs to lanternshark family.
90. ▶ Scientists for first time observed Optical polarisation phenomenon (polarised light emitted by rapidly rotating stars), using High Precision Polarimetric Instrument (HIPPI).
- ✎ It was predicted by Indian astrophysicist and Nobel laureate Subrahmanyan Chandrasekhar in 1946.
 - ✎ Optical polarisation phenomenon is a measure of the orientation of the oscillations of a light beam to its direction of travel.

-  HIPPI was used to detect polarised light from Regulus, one of brightest stars in night sky about 79 light years away. It was observed that Regulus is rotating so quickly with a spin rate of 96.5% of angular velocity (approximately 320 kilometres per second).
-  Subrahmanyan Chandrasekhar was awarded the 1983 Nobel Prize for Physics with William A. Fowler for his theoretical studies of physical processes of importance to structure and evolution of stars.
91. ▶ Scientists found that parasite called *Leptomonas seymouri* hosting virus *Lepsey NLV1* may be also responsible for spread of kala-azar (visceral leishmaniasis). Earlier it was believed that parasite *Leishmania donovani* (sandfly) alone is responsible for spread of kala-azar.
92. ▶ Scientists from Botanical Survey of India (BSI) discovered a new species of parasitic flowering plant named *Gleadovia konyakianorum* near Tobu town of Mon district in eastern Nagaland, named in honour of Konyak tribe of Nagas.
93. ▶ Scientists from Broad Institute and Massachusetts Institute of Technology in USA developed RNA Editing for Programmable A to I Replacement (REPAIR), a new gene editing tool therapies that can reverse disease-causing mutations in humans.
-  REPAIR can tweak individual RNA 'letters' in human cells without making changes to entire genome and can have profound potential as a tool for both research and disease treatment.
-  REPAIR is based on gene editing tool CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) that can be used to modify DNA in cells.
94. ▶ Scientists from Brown University (USA) created first map of water trapped in uppermost layer of Moon's soil, using NASA's Moon Mineralogy Mapper onboard of India's Chandrayaan-1 spacecraft. Map builds on initial discovery of water and related molecule – hydroxyl (consists 1 atom each of hydrogen and oxygen) in lunar soil in 2009.
95. ▶ Scientists from CSIR's National Institute for Interdisciplinary Science and Technology (Thiruvananthapuram) developed new technique to produce bioethanol from discarded cotton-stalks. It will help produce bioethanol (a clean fuel) from cotton stalk wastes.
-  It is vital as India has about 9.4 million hectares under cotton cultivation and every hectare generates 2 million tonnes of cotton stalk wastes.
96. ▶ Scientists from Cardiff University (UK) discovered a new way to produce methanol from methane using oxygen from the air. Methanol is an important chemical often used as fuel in vehicles. New technique uses freely available air, inexpensive chemicals and an energy efficient methanol production process.
97. ▶ Scientists from Cornell University (USA) announced that world's 6 smallest spacecrafts dubbed as Sprites ever launched are successfully travelling in low Earth orbit and communicating with systems on Earth.
-  Sprites were launched on June 23, 2017 by Indian rocket Polar Satellite Launch Vehicle (PSLV) as part of Breakthrough Starshot project designed to test technologies that would eventually be used for interstellar missions. These are smallest spacecrafts to establish contact with ground stations. Sprites are built on a single 3.5*3.5 centimeter circuit board and weigh 4 grams each.
-  Breakthrough Starshot space program is launched under US \$100 million Breakthrough Initiatives, announced by Yuri Milner and Stephen Hawking to develop and launch practical interstellar space missions. It aims to demonstrate proof of concept for light-propelled spacecraft that could fly at 20 % of light speed. Its main objective is to send one-gram chips to star systems beyond the solar system in search of extraterrestrial intelligence.
98. ▶ Scientists from ETH Zurich in Switzerland developed a 3D-printed soft silicone heart that closely resembles and functions like human organ. It is not exact biological replica of actual, but can help to save lives of people who suffer from cardiac failure.
99. ▶ Scientists from Edinburgh University (UK) uncovered largest volcanic region (91 Volcanoes) discovered on earth so far, under west Antarctica. Largest volcano stands at almost 4000 metres.
100. ▶ Scientists from Florida State University (USA) developed new tool for objectively defining onset and demise of Indian Summer Monsoon (ISM). The new method uses rainfall rates to mark span of ISM at any given location throughout affected region.
101. ▶ Scientists from Indian Institute of Science, Education and Research (IISER) Thiruvananthapuram have developed gelator that can suck up oil and congeal it. Gelator is a hydrophobic material with property of oleophilic (oil-loving) and takes up oil when it comes in contact with it. It can be used to recover marine oil spills with a simple, efficient and cost-effective method.
102. ▶ Scientists from Massachusetts Institute of Technology (USA) found a novel way to induce plants to give off dim light by embedding specialised nanoparticles into their leaves.
-  It has great significance as it will make plants function as a desk lamp, powered by energy metabolism of the plant itself and not by electricity connection.
-  To create glowing plants, scientists has used to luciferase, an enzyme that gives fireflies their glow. Luciferase acts on molecule called luciferin, causing it to emit light.
103. ▶ Scientists from NASA for first time will chase shadow of moon using two of NASA's WB-57F research jets during upcoming total solar eclipse in USA, to capture clearest ever images of Sun's outer atmosphere (Corona).

✎ It is needed as Corona of sun (gaseous envelope surrounding sun) is heated to millions of degrees, but lower atmospheric layers like photosphere are only heated at a few thousand degrees.

✎ Total solar eclipse will provide rare opportunity for scientists to study the sun's atmosphere. During this eclipse, moon will completely cover the sun and perfectly blocking its light so that faint corona is easily seen against dark sky.

104. ▶ Scientists from New Zealand claimed that vaccine can protect against the sexually transmitted infection gonorrhoea. They found that Men B jab vaccine originally developed to stop an outbreak of meningitis B can protect from gonorrhoea.

105. ▶ Scientists from Northwestern University (USA) created miniature versions of Saturn, complete with rings, by electrifying tiny droplets of fluids.

✎ When a drop of electrically conductive liquid is exposed to an electric field, droplet forms two electrically charged poles that can get pulled towards sources of electric field, taking on cone shapes. If pull is strong enough, tips of the cones can spray jets of droplets. This effect is known as electrospraying.

106. ▶ Scientists from Oregon Health and Science University (USA) successfully edited genes of human embryos to correct defective DNA that cause inherited diseases, using CRISPR-Cas9 genome editing technology to alter human DNA in single-cell embryos, which allows specific sections of DNA to be altered or replaced.

107. ▶ Scientists from Physikalisch-Technische Bundesanstalt (PTB) in Germany developed world's Most sharpe and Precise laser, that can be useful for various applications such as optical atomic clocks, radioastronomy, precision spectroscopy, testing theory of relativity and carry out new precision measurements on ultracold atoms.

✎ Theoretically, laser light has only 1 colour, wavelength or frequency. In reality, however, there is always a certain linewidth. This newly developed laser has linewidth of only 10 miliHertz (0.01 Hz), closer to ideal laser than ever before.

108. ▶ Scientists from Thiruvananthapuram based CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST) have developed organic filter that allows only near-infrared (NIR) light to pass through it. It was found to absorb light from 300-850 nm (both ultraviolet, visible and part of NIR light) and transmit NIR light from 850-1500 nm.

✎ Its Significance lies in fact that Currently available inorganic filters are expensive and brittle whereas organic filters are easy to process and flexible too. The filter can be used for night vision glasses, night photography. It will also have applications in security and forensics such as identifying blood stains on dark fabric which are invisible to naked eyes.

109. ▶ Scientists from USA developed the world's first plant-based mosquito-borne Zika virus, using proteins derived from Tobacco plant.

110. ▶ Scientists from USA found that curcumin (bioactive component of turmeric) that is widely used in Indian cuisine can treat cancer in children. They found that nanoparticles loaded with curcumin can target and destroy neuroblastoma tumour cells, which commonly affects children aged under 5.

111. ▶ Scientists from USA have discovered an inexpensive prevention therapy against sepsis in new born babies, led by US-based Indian doctor Pinaki Panigrahi.

✎ Globally, over 600000 infants die of sepsis annually (mostly in developing countries).

112. ▶ Scientists from USA's Harvard Medical School for first time encoded a small movie clip in DNA of living bacterial cells and then played it back. They used CRISPR gene-editing technique to encode and retrieve reconstructed frames of a classic 1870s racehorse in motion sequence of photos into genome of common bacteria *E. coli*. Film stored in DNA of bacteria was also well preserved and was intact even in new generation of bacteria.

113. ▶ Scientists from USA's Harvard University have developed a super strong, flexible adhesive material inspired by glue secreted by slugs that sticks to biological tissues without causing toxicity. It is biocompatible and binds to tissues with a strength comparable to the body's own resilient cartilage.

114. ▶ Scientists from University of Cambridge (UK) developed super-stretchy and strong artificial (synthetic) spider silk, almost entirely (98 %) composed of water. Spider silk is one of strongest materials for applications such as making eco-friendly textiles and sensors.







115. ▶ Scientists from University of Cambridge (UK) spotted smallest star discovered so far, named as EBLM J0555-57Ab.

✎ It was identified by SuperWASP, a planet-finding experiment run by several universities. EBLM J0555-57Ab is located about 600 light years away and is slightly larger than Saturn in size.

✎ It is as small as stars can possibly become as it has just enough mass to enable the fusion of hydrogen nuclei into helium at its centre.

116. ▶ Scientists from University of Manchester (UK) created world's first *molecular robot - millionth of a millimetre in size*. It is made up of just 150 carbon, hydrogen, oxygen and nitrogen atoms which are basic building blocks required to form molecules. Such molecular robots can be used for medical purposes, advanced manufacturing processes and even building molecular factories and assembly lines.

117. ▶ Scientists from University of Michigan (USA) developed a new type of neural network chip using reservoir computing system to improve efficiency of teaching machines to think like humans.

-  Network developed using this system can predict words before they are said during conversation and help predict future outcomes based on present.
118. ▶ Scientists from University of Toronto (Canada) developed an injectable tissue bandage dubbed as AngioChip, that can repair damaged hearts. AngioChip is a tiny patch of heart tissue with its own blood vessels and heart cells beating with a regular rhythm.
-  It is useful as Repairing heart tissue destroyed by a heart attack or medical condition with regenerative cells usually requires invasive open-heart surgery which usually poses more risks.
119. ▶ Scientists from Zoological Survey of India (ZSI) discovered new frog species in the fast flowing streams in Talle Valley Wildlife Sanctuary (WLS) in Lower Subansiri district of Arunachal Pradesh. It is named *Odorrana arunachalensis*.
120. ▶ Scientists in Austria and China made first video call using quantum encryption, that is said to be unhackable. Encryption through quantum networks uses quantum particles to transfer information from one point to another and hacking Attempts would create detectable disturbances in system.
121. ▶ Scientists in UK have developed world's smallest surgical robot called *Versius*, that can mimic human arm and can be used to carry out a wide range of surgical procedures. It can make series of small incisions that will circumvent the need for traditional open surgery.
122. ▶ Tata Motors unveiled India's first Bio-CNG (bio-methane) bus at *Urja Utsav* bio-energy programme organised by Ministry of Petroleum and Natural Gas.
-  Biomethane is a naturally occurring gas which is produced by anaerobic digestion of organic matter such as dead animal and plant material, manure, sewage, organic waste, etc.
123. ▶ USA based National High Magnetic Field Laboratory tested world's strongest superconducting magnet 32 T, producing 32 teslas (a unit of magnetic field strength), 33% stronger than previous record.
-  32 T will allow physicists studying materials to explore how electrons interact with each other and their atomic environment.
124. ▶ USA's NASA discovered 8th planet in Our Solar System, circling Kepler-90, a Sun-like star which is 2545 light-years far from Earth.
-  Newly-discovered planet Kepler-90i was discovered in data from NASA's Kepler Space Telescope, using Machine Learning from Google.
125. ▶ USA's NASA tested supersonic landing parachute that will be deployed in its Mars rover mission set to launch in 2020, called Advanced Supersonic Parachute Inflation Research Experiment (ASPIRE). Mission will rely on special parachute to slow spacecraft down as it enters Martian atmosphere at over 5.4 kilometres per second.
126. ▶ USA's National Aeronautics and Space Administration (NASA) approved 2nd extension of Dawn mission at Ceres dwarf planet which is largest object in asteroid belt between Mars and Jupiter.
-  During this extension, Dawn will descend to lower altitudes than ever before at dwarf planet. Priority of second extension mission is to collect data with Dawn's gamma ray and neutron spectrometer, which measures number and energy of gamma rays and neutrons.
127. ▶ World's first floating wind farm located in Scotland started generating electricity, using five 6MW turbines procured from Norway. It is expected to generate 135GWh of electricity each year.
128. ▶ World's first hybrid electric tram powered by hydrogen fuel cells started running in Tangshan (north China's Hebei Province). It marks a big step in application of green energy in public transport as water is only emission of this Tram and it emits no pollutants.
-  It can can run for 40 kilometers at a maximum speed of 70 kilometers per hour after being refilled with 12 kilograms of hydrogen.
129. ▶ World's first negative emissions plant under CarbFix Project to turn atmospheric carbon dioxide (CO₂) into stone begun operations in Hellisheidi (Iceland), intended to lock away carbon dioxide by reacting it with basaltic rocks.
-  In CarbFix Project, CO₂ is captured from ambient air, bound to water, and sent 700 meters underground. There, CO₂ reacts with basaltic bedrock using enhanced weathering process and forms solid minerals, creating a permanent storage solution.
130. ▶ World's heaviest bony fish ever caught weighing 2,300 kilograms has been identified in Japan, confirmed by researchers from Hiroshima University. Bony fish have skeletons made of bone rather than cartilage.

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