Current Affairs - February to July 2018

Month May 2018 **Type** Science and Technology

- *156 Current Affairs were found in **Last Six Months** for Type - **Science and Technology***

*(Showing **97** Important Ones)*

Science

1. 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.
2. *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.
3. 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).
4. A long-lost NASA satellite - *Imager for Magnetopause-to-Aurora Global Exploration (IMAGE)* has been spotted back.
    - Engineers from NASA's Goddard Space Flight Center used NASA's Deep Space Network which consists of a series of ground-based radio telescopes to study signals, only to discover that these signals were from IMAGE satellite.
    - IMAGE satellite was launched in March 2000, and exceeded its initial 2 year mission by operating through 2005. NASA lost contact with It in December 2005.
5. A new species of Himalayan Butterfly named *Eucyclodes gavissima* discovered in Papikonda National Park in Andhra Pradesh.
6. 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.
7. According to a new study by Swedish scientists, small molecules that specifically restrain a selenium-containing enzyme in the human body may become an important tool to fight cancer. Researchers at Karolinska Institute (Sweden) treated cancer in mice with these molecules and observed rapid tumor-killing effects.
    - Selenium is a chemical element that is an essential micronutrient. A selenium-containing enzyme, called TrxR1, can be used to support growth of various cells and protect them from oxidative stress (*imbalance between production of free radicals, which are highly reactive with other molecules, and body's ability to counteract or repair resulting damage*).
8. According to study based on data from India's Chandrayaan-1 mission and NASA's Lunar Reconnaissance Orbiter (LRO), Moon's water may be widely distributed across its surface and not confined to particular region. It contradict earlier studies that suggested that more water was detected at Moon's polar latituds.
    - Researchers after analyzing data from Moon Mineralogy Mapper spectrometer onboard Chandrayaan-1 spacecraft, suggested that water may be present primarily as OH, a more reactive form of normal water (H2O). OH also called hydroxyl does not stay in its form for long, and attaches itself chemically.
9. American Spzce Exploration Firm SpaceX launched twin NASA satellites GRACE-FO (Follow-On) that will track Earth's water Cycle i.e. water movement and icemelt.

- GRACE-FO (Gravity Recovery and Climate Experiment Follow-On) is joint project between NASA and German Research Center for Geosciences (GFZ), as as 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.

10. An International team of scientists provided first proof of an exotic new state of matter, known as Rydberg polarons. It can be created, by essentially putting atoms inside other atoms.
    - *Rydberg polarons* basically involves making use of the space between electron and nucleus inside an atom, enough to fit other atoms inside. Goal was to hit it in precisely right way to boost one or more of its electrons into an orbital far from nucleus, creating an excited state called a Rydberg atom.
11. 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 Vepa Chettu.
    - State animal - Black-buck (Antilope 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.
12. 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.
13. As per a recent study, 26 % of nitrogen on Earth comes from weathering of planet's bedrock, as against current belief that all of nitrogen on Earth available to plants comes from atmosphere. Ecosystems need nitrogen and other nutrients to absorb carbon dioxide (CO_2) pollution and there is limited amount of it available from plants and soils.
    - Geology and carbon sequestration - Rock-derived nitrogen may fuel growth of forests and grasslands, and allow them to sequester more CO_2 than previously thought.
    - This discovery can improve climate change projections, which rely on understanding carbon cycle. Mapping nutrient profiles in rocks for their carbon uptake potential can help drive conservation efforts. For decades, scientists recognized that more nitrogen accumulates in soils and plants than can be explained by input from atmosphere alone, but they couldn't find missing sources of Nitrogen.
14. As per new study at University of Colorado (USA) based on 25 years of satellite data, It is found that global sea level rise rate is accelerating a little every year.
    - Sea level rate is increasing by about 0.08 millimeters per year (mm/year). It means annual rate of sea level will rise to 10 mm/year by 2100, mainly driven by rapid melting in Antarctica and Greenland.
    - If oceans keep on to growing at this pace, sea level will rise 65cm by 2100, causing trouble for several coastal cities.
15. Astronomers from Arizona State University (USA) discovered signals from period when universe's earliest stars emerged, named *Cosmic Dawn*. It could provide insights into elusive 'dark matter', believed to form a fundamental part of our universe. A radio telescope called *Experiment to Detect the Global Epoch of Reionization Signature (EDGES)* based in Western Australian desert, was used in this research.
16. Australian scientist of Indian origin Veena Sahajwalla launched world's first microfactory that can transform components from electronic waste items into valuable materials for re-use. It uses green manufacturing technologies to turn many types of consumer waste such as glass, plastic and timber into commercial materials and products. Transformed materials from micro-factory includes metal alloys and range of micromaterials.
17. Bhabha Atomic Reseach Centre (BARC) developed Bhabha Kavach, a next-generation cheaper and lighter bulletproof jacket, named after Dr. Homi J. Bhabha, father of Indian nuclear programme.
    - Bhabha Kavach is made of boron carbide and carbon nanotube polymer composite and weighs just 6.6 kg, reducing weight by 50%.
    - It will cost Rs 60,000-70,000, compared to imported bulletproof jackets costing around Rs 1.5 lakh.
18. CSIR - National Institute of Oceanography Goa announced discovery of methane gas flares and active cold seeps from seabed in Krishna Godavari basin in Bay of Bengal, distributed over water depth of 900 - 1900 metres. Gas hydrates are a potential source of alternate energy.
19. 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.

20. 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.
21. Chinese Researchers developed a new 3D conic device that can greatly increase solar-thermal conversion efficiency, Named *Artificial Transpiration* and inspired by transpiration process of trees. It is fixed with a special 1D water path which can reduce energy loss in conduction.
    - As 10 to 50 % of sunlight is diffusive, the cone structure of the device could collect more sunlight throughout the day, compared with a flat device. It can enhance solar-thermal conversion rate to 85 percent (up from 40% Currently).
    - It will also open new possibilities to utilise solar energy in several sectors, which was discontinued due to its low conversion rate caused by losses in radiation, convection and conduction.
22. Flower *Impatiens dorjeekhanduii* 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.
23. 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.
24. 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.
25. ISRO successfully launched GSAT-6A Satellite, onboard Geosynchronous Satellite Launch Vehicle (GSLV-F08). This is 5th consecutive successful launch achieved by GSLV carrying indigenously developed Cryogenic Upper Stage. GSAT-6A is a communication satellite built to provide mobile communication services through multi beam coverage, equipped with S and C band transponders.
26. ISRO's Liquid Propulsion Systems Centre (LPSC) is developing environment-friendly propellant 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.
27. ISRO's Polar Satellite Launch Vehicle PSLV-C41 successfully launched 1425 kg IRNSS-1I Navigation Satellite. IRNSS-1I is latest member of *Navigation with Indian Constellation (NavIC)* system (also known as Indian Regional Navigation Satellite System (IRNSS)).
    - NAVIC is an independent regional navigation satellite system designed to provide position information in Indian region and 1,500 km around Indian mainland.
    - The constellation consists 7 Satellites, planned to be expanded to 11.
28. 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).

29. 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.
30. 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.
31. 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.
32. 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.
33. Indian Space Research Organisation (ISRO) lost contact with recently launched India's communication GSAT-6A satellite. The second orbit raising operation of GSAT-6A was successfully carried out on March 31, 2018, but during third and final firing scheduled on April 1, 2018, communication with satellite was lost. Efforts by ISRO are on to re-establish communication with the satellite.
34. Indian Space Research Organisation (ISRO) will launch several satellites in coming month.
    - GSAT 7A - It will enable for Indian Air Force (IAF) to interlink different ground radar stations, airbases and Airborne Warning and Control System (AWACS) aircraft. It will be similar to Gsat-7 or Rukmini, launched in September 2013 for Indian Navy.
    - RISAT - 2A - It is an advanced remote sensing satellite and will boost India's surveillance capabilities.
35. 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.
36. Indian Space and Research Organisation (ISRO) postponed launch of India's second lunar mission 'Chandrayaan-2' from April 2018 to October-November 2018 -
    - Chandrayaan 2 is India's second mission to Moon, developed indigenously by ISRO with Orbiter, Lander and Rover configuration.
    - It is ISRO's first inter-planetary mission to land rover on any celestial body, to be launched on board Geosynchronous Satellite Launch Vehicle Mk III (GSLV-F10). Orbiter weighs around 3,290 kg and it will orbit around moon and perform objectives of remote sensing moon.
37. Indian Space and Research Organisation (ISRO) postponed launch of India's second lunar mission 'Chandrayaan-2' from April 2018 to October-November 2018.
    - It will be launched on board of Geosynchronous Satellite Launch Vehicle Mk III (GSLV-F10).Chandrayaan 2Chandrayaan 2 is India's second mission to Moon and is advanced version of previous Chandrayaan-1 mission (launched in 2008).
    - It consists of Orbiter, Lander and Rover configuration. In this mission, ISRO will for first time attempt to land a rover on moon's south pole.
38. Japan Aerospace Exploration Agency (JAXA) launched world's smallest rocket with ability to put a tiny satellite into orbit. It carried a microsatellite TRICOM-1R, a three-unit CubeSat weighing about 3 kilograms.
39. 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.
40. 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.

41. 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.
42. 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.
43. 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.
44. NASA partnered with space launching firm SpaceX to launch Transiting Exoplanet Survey Satellite (TESS) to search for exoplanets using transit method. TESS is designed to carry out first spaceborne all-sky transiting exoplanet survey. It is planned to be launched in April 2018 on board of SpaceX's Falcon 9 rocket.
    - Primary objective of TESS is to survey brightest stars near Earth for transiting exoplanets over 2 years. It will use array of wide-field cameras to perform all-sky survey. It will create catalog of thousands of exoplanet candidates using transit photometry method.
45. NASA successfully conducted Advanced Supersonic Parachute Inflation Research Experiment (ASPIRE) to test supersonic parachute that will help its space exploration missions to land on Mars.
    - NASA's Mars rover mission is set to launch in 2020 to deploy six-wheeled vehicle on martian surface to study rocks on site and cache samples for eventual return to Earth. It will rely on special parachute to slow spacecraft down when it is entering Martian atmosphere at over speed of 12,000 mph (5.4 kilometers per second).
46. NASA will launch humanity's first mission Parker Solar Probe (PSP) to Sun on July 31, 2018. After launch, probe will orbit directly through solar atmosphere (the corona), closer to surface than any human-made object has ever gone.
    - It has been designed and built by Johns Hopkins University Applied Physics Laboratory. It is named after solar astrophysicist Eugene Parker, first spacecraft of NASA to be named after living person.
    - Probe will be fitted with thermal protection system (TPS) or heat shield made of reinforced carbon-carbon composite that will allow it to survive temperatures in Sun's corona.
47. 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.
48. 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.
49. NASA will send first-ever mission named as InSight (Interior Exploration using Seismic Investigations, Geodesy and Heat Transport) dedicated to exploring deep interior of Mars, in May 2018. It will be first NASA mission since Apollo moon landings to place seismometer, a device that measures quakes on the soil of another planet.
50. NASA's Hubble Space Telescope discovered most distant star ever seen named 'Icarus, officially named *MACS J1149+2223 Lensed Star 1*. It took nine billion years for Icarus' light to reach Earth, captured through a phenomenon called 'Gravitational Lensing' that enormously intensifies star's feeble glow.
51. 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.

52. 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.
53. National Aeronautics and Space Administration (NASA) announced its plan of creating a manned supersonic aircraft with no ear-shattering sonic boom. NASA will grant $247.5 million contract to American aerospace Firm Lockheed Martin, to build the new plane called X-plane.
    - X-Plane is expected to cruise at an elevation of more than 16,700 meters, at a speed of more than 1,500 km per hour but not make a sonic boom.
    - Under NASA's plan, beginning mid-2022, It will fly X-plane over select US cities and collect data about community responses to flights.
54. 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.
55. National Aeronautics and Space Administration (NASA) launched Colorado High-resolution Echelle Stellar Spectrograph (CHESS 4) from Kwajalein Atoll in Marshall Islands, onboard a NASA Black Brant IX sounding rocket to study interstellar medium (matter between stars).
    - Space between distant stars contains drifts of vast clouds of neutral molecules and charged plasma particles called interstellar medium, which may evolve into new stars and even planets with time.
    - CHESS mission will focus on these floating interstellar reservoirs or translucent clouds of gas, which provide fundamental building blocks for stars and planets.
    - CHESS 4 will study interaction of stellar wind with surrounding interstellar medium to study excitation of atoms and molecules in interface region. It will enable researchers to study catalysts of galactic chemistry and raw materials for future generations of stars and planets.
56. National Aeronautics and Space Administration (NASA) launched Transiting Exoplanet Survey Satellite (TESS), a new planet-hunting spacecraft onboard of SpaceX's Falcon 9 rocket. TESS 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.
57. National Aeronautics and Space Administration (NASA) will launch 2 new satellite missions and conduct an array of field research in 2018 to enhance understanding of Earth's ice sheets, glaciers, sea ice, snow cover and permafrost (collectively called cryosphere).
    - Changes in cryosphere have shown impact on people all around world like sea level rise affects coastlines globally and melting of snowpack affects billions of people who rely on the water.
    - Missions Include -
        - *Gravity Recovery and Climate Experiment Follow-On (GRACE-FO)* which would be launched by NASA along with the German Research Centre for Geosciences. Twin satellites will continue original GRACE mission's legacy of tracking fluctuations in Earth's gravity field in order to detect changes in mass, including the mass of ice sheets and aquifers.
        - *Ice, Cloud, and land Elevation Satellite-2 (ICESat-2)*, which will use a highly advanced laser instrument to measure changing elevation of ice around the world, providing a view of the height of Earth's ice with greater detail than previously possible.
        - Together, two missions will make critical, complementary measurements of Earth's glaciers and ice sheets. GRACE-FO will also measure groundwater reserves and deep ocean currents and ICESat-2 will measure sea ice thickness and vegetation height.
58. 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.
    - Norther 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.

59. Oil and Natural Gas Corporation (ONGC) will introduce carbon dioxide (CO_2) injection technology in its Gandhar oil field in Gujarat, as first large scale CO_2-injected project in Asia. It aims to recover extra 20 million barrels of crude oil under enhanced oil recovery (EOR) programme.
    - CO_2 injection technology is a proven concept in West, especially USA and Canada. Under it, CO_2 gas is injected with residual oil in ageing field in which total oil production has been declining. It reduces its viscosity and makes it easier to displace oil from rock pores.
60. RH-300 MKII sounding rocket developed by IRSO's Vikram Sarabhai Space Centre (VSSC) has been launched from Thumba Equatorial Rocket Launching Station in Thiruvananthapuram (Kerala), under Sounding Rocket Experiment (SOUREX) programme for atmospheric studies.
    - Objective is to measure neutral wind in dynamo region (80-120 km) of equatorial ionosphere using indigenously developed Electron Density and Neutral Wind Probe (ENWi).
    - It will also perform cross-validation using an independent Tri Methyl Aluminium (TMA) release technique.
61. Researchers at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) Bengaluru have developed silver copper telluride (AgCuTe), a novel compound that exhibits poor thermal conductivity but shows good electrical conductivity.
    - AgCuTe has good thermoelectric properties and is made from silver, copper, and tellurium. It exhibits poor thermal conductivity in 25-425 degree C range but shows good electrical conductivity.
    - Due to this property, one end of 8 mm-long AgCuTe rod which is contact with waste heat remains hot while other end maintains cold temperature. This temperature difference results in generation of electrical voltage.
    - This compound shows ideal promise as thermoelectric material for converting waste heat into electricity. Its applications are in automobile, thermal, chemical and steel power plants where large quantities of heat are wasted.
62. Researchers discovered new grass-like plant species named Fimbristylis agasthyamalaensis in Ponmudi hills within Agasthyamala Biosphere Reserve in Western Ghats biodiversity hotspot (Spread across Kerala and Tamilnadu). New species of plant belongs to Cyperaceae family.
63. Researchers from Britain's University of Portsmouth and US Department of Energy's National Renewable Energy Laboratory (NREL) developed a plastic-eating enzyme. Called Ideonella sakaiensis 201-F6, this enzyme is able to eat polyethylene terephthalate (PET), which was patented as plastic in 1940s. It can be used to fight one of world's biggest pollution problems, called Plastic.
    - Enzyme can also degrade polyethylene furandicarboxylate (PEF), a bio-based substitute for PET plastics that is being called as a replacement for glass beer bottles.
    - Though PEF plastics are bio-based, they are not biodegradable and end up as a waste.
64. 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.
65. Researchers from Surat's Veer Narmad South Gujarat University discovered world's smallest land fern in Ahwa forests of the Western Ghats in Gujarat's Dang district. New Malvi's adder's-tongue fern Ophioglossum malviae is just one centimetre in size.
66. Researchers identified a new shark species in Atlantic Ocean, named *Atlantic sixgill shark*. They are very different from ones in Indian and Pacific Oceans on a molecular level. New species of sharks have six-gill slits, while most sharks have five-gill slits.
67. 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.
68. 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.

69. 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 Northgripppian stages are defined at specific levels in Greenland ice cores.
70. 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.
71. Scientists discovered a giant mosquito with a wingspan of 11.15 centimetres in China's Sichuan province, belonging to world's largest mosquito species Holorusia mikado. This species was first found in Japan and normally has wing span of 8 centimetres.
72. Scientists discovered massive reserves of mercury hidden in permafrost (*thick subsurface layer of soil that remains below freezing point throughoutthe year, occurring primarily in polar regions*).
    - Study says that that all frozen and unfrozen soil in northern permafrost regions contain a combined 1656 gigagrams of mercury, making it largest known reservoir of mercury on planet.
    - This discovery may have significant implications on human health and ecosystems worldwide as exposure to mercury can cause serious health problems. There would be severe environmental problems if these reservoirs do not remain frozen, as evident by Warming temperatures. Melting permafrost could release a large amount of mercury that could potentially affect ecosystems around the world.
73. 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 wurrounded by seaport, petrochemical, chemical and refinery industries. It is small in size measuring just 2 cm long.
74. Scientists discovered new organ in human body and have named it as 'interstitium', as 80th organ in human body.
    - It might be might be also the biggest organ in human body. It was discovered while doctors were investigating patient's bile duct, searching for signs of cancer. Discovery of interstitium will help to explain how cancer spreads in body and pave way for new ways to detect and treat the disease.
    - Interstitium is network of interconnected, fluid-filled spaces all over the body. It is found everywhere in human bodies, acting as shock absorber in all places where tissues are moved or subjected to force. It is made up of both flexible (elastin) and strong (collagen) connective tissue proteins, with interstitial fluid moving throughout.
    - It also acts as fluid 'highway' i.e. thoroughfares to transport critical fluids within organs and around body. It also plays important role in carrying lymph, a fluid that supports immunity and also travels through lymphatic vessels.
    - It lies beneath top layer of skin, but is also in tissue layers lining gut, lungs, blood vessels, and muscles.
75. 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.

76. Scientists from Botanical Survey of India (BSI) identified new plant species named Drypetes kalamii from Buxa and Jaldapara National Parks in West Bengal, named after former President Dr. APJ Kalam. It is close relative of medicinal plant known in Sanskrit as Putrajivah.
77. Scientists from Britain and USA for first time grew human eggs in laboratory from earliest stages in ovarian tissue all way to full maturity. This is first time human eggs have been developed outside human body. It can widen scope of available fertility treatments and can help in developing regenerative medicine therapies and new infertility treatments.
78. Scientists from China Academy of Launch Vehicle Technology (CALT) developed artificial heart using rocket technology, currently being tested on animals. The artificial heart uses magnetic and fluid levitation from rocket system. This technology can reduce friction in device to increase working efficiency and extend life span of power generator. It can reduce damage to the blood and enable blood pump to work longer.
79. Scientists from Indian Institute of Science (IISc) Bengaluru indigenously developed country's first super critical carbon dioxide (S-CO_2) Brayton Test Loop facility. It is first test loop technology coupled with solar heat source in world that will generate clean energy from power plants, including solar thermal, as part of Indo-US consortium- Solar Energy Research Institute for India and United States (SERIIUS).
    - It uses supercritical CO_2 (SCO_2) instead of steam to generate more power. Supercritical refers to state of CO_2 above its critical temperature of 31 C and critical pressure of 73 atmospheres, which makes it twice as dense as steam.
    - This Next generation and waterless super critical CO_2 Brayton cycle test loop for power generation will be useful for meeting energy needs. It has potential to replace steam based nuclear and thermal power plants, reducing carbon foot print significantly.
80. 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.
81. Scientists from Pennsylvania State University (USA) discovered signs of life in a massive cave in Italy, located about 1300 feet below ground. It may help detect life on other planets like Mars. Identification was made by researchers while exploring Frasassi Caves in central Italy. Scientists found variations in isotopic content of atoms in mineral gypsum, a weathering product of cave's formation.
    - Study stated that not all gypsum is formed by microbes, but gypsum formed by microbes will have a different ratio of isotopes in atoms.• This isotopic variation indicates that life played an active role in producing gypsum.
82. Scientists from Rockefeller University (USA) discovered of a new class of antibiotics called malacidins, produced by microorganisms living in soil and dirt and is capable of killing off several antibiotic-resistant pathogens.
    - Malacidins are distinctive class of antibiotics that are commonly encoded in soil microbiomes. They have never been reported in culture-based NP (Natural Products) discovery efforts.This discovery could be a useful weapon in field of medicines.
83. 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 (SiO), 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.
84. 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.
85. Scientists from Zoological Survey of India (ZSI) discovered 3 new species of eel along northern Bay of Bengal coast - *Gymnothorax pseudotile, Gymnothorax visakhaensis and Enchelycore propinqua*.
    - There are about 1,000 species of eels identified so far across the world. In India, there are around 125 species of eels identified.
86. Scientists from Zoological Survey of India (ZSI) discovered new species of water strider named Ptilomera nagalanda Jehamalar and Chandra in Nagaland. It was found in river Intanki in Peren district of Nagaland.This newly discovered species belongs to Ptilomera agriodes genus.
87. 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.

88. Scientists identified a new species of frog called Fejervarya goemchi,in highland plateaus of Western Ghats parts of Goa. It was identified using combination of morphology, geographic distribution range and molecular methods to distinguish from other Fejervarya species found in South and South-East Asia.
89. 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.
90. Sudan, the last surviving northern white male rhinoceros of the world, died in Laikipia national park of Kenya. He was 45 years old and was only surviving male northern white rhin. Now, only 2 female rhinoceros of that sub-species are living. Genetic material from Sudan was collected when he was healthy. Through advanced cellular technologies, this sub-species might be prevented from extinction.
91. 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).
92. 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.
93. US Food and Drug Administration (FDA) approved use of Acuvue Oasys Contact Lenses with Transitions Light Intelligent Technology, world's first contact lens that automatically darkens when exposed to bright light. These contact lens are soft contact lenses indicated for daily use to correct vision of people with non-diseased eyes who are nearsighted (myopic) or farsighted (hyperopic).
94. USA space flight company SpaceX launched he world's most powerful operational rocket 'Falcon Heavy' into space, carrying a red Tesla Roadster car belonging to SpaceX and Tesla founder Elon Musk.
    - The car was outfitted with a mannequin dressed in a spacesuit, a high-data storage unit containing Isaac Asimov's science fiction book series, Foundation Trilogy, and a plaque bearing names of 6000 SpaceX employees.
95. 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.
96. Vodafone Germany, Nokia and Audi are jointly working to support project to implement first mobile phone network on Moon by 2019. PTScientists, a Berlin-based company, is also working on this project.
97. Weather scientists predicted normal monsoon in June-September 2018 monsoon season as prevailing conditions as well as neutral ENSO were favourable for good monsoon rainfall.
    - India receives 89 cm of rainfall during four-month monsoon season, which is almost 75% of its annual rainfall.
    - Most important favourable condition for good monsoon is near-neutral to neutral ENSO (El Nino Southern Oscillation) in equatorial Pacific Ocean, off coast of South America.
    - Moreover, La Niña conditions are present and equatorial sea surface temperatures (SSTs) are below average across central and eastern Pacific Ocean. Transition from La Niña to ENSO-neutral is likely during March-May season, with neutral conditions to continue in second half of year.

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