Prelim Bits 19-08-2018

Curiosity

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- It is a rover deployed by NASA in its Mars Exploration Program.
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- It assesses whether Mars ever had an environment able to support small life forms called microbes.
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- The rover has recently spotted a “foreign object debris”, a very thin flake of rock in Mars surface.
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- It carries a radioisotope power system that generates electricity from the heat of plutonium's radioactive decay.
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- Previously, it captured **mesas and buttes** on mars geological layer called as Murray formation, which is formed from the lakebed mud deposits.
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- Butte otherwise called as Murray Butte is an isolated hill with steep, flat top side and with often vertical sides.
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- Mesa is an elevated area that has wider top than its height, while Butte has a top that is narrower than its height.
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Chang’e 4

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- Chinese space agency has recently revealed images of the exploration vehicle which will carry Chang’e 4 by the end of this year.
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- Chang'e 4 is a Chinese lunar exploration mission.
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- The mission will incorporate an orbiter, a robotic lander and rover.
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- It will be China's second lunar lander and rover.

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- It will reach the far side of the Moon, not visible from the Earth, a feat no country has ever achieved.
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- Chang'e-4 will follow China's successful Chang'e-3 mission which soft-landed on the visible side of the Moon in 2013.
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- The exploration vehicle is similar to Yutu, China’s first lunar rover launched in 2013 along with Chang’e 3.
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Wheat Genome

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- A team of international researchers, including 18 from India decoded the wheat genome.
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- It is considered as a breakthrough which will help to identify genes controlling complex agronomic traits such as yield, grain quality, resistance to diseases and pests, as well as tolerance to drought, heat, water logging and salinity.
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- It would accelerate the breeding of climate-resilient wheat varieties to help address global food security.
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Gravitational Waves

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- A gravitational wave (GW) is a concept, predicted by Einstein through his theory of general relativity.
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- General relativity states that mass distorts both space and time.
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- When an object accelerates, it creates ripples in space-time, just like a boat causes ripples in a pond. These space-time ripples are gravitational waves.
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- They are caused by cataclysmic events that result in high-energy explosions, such as collision of black holes or neutron stars.
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- They are extremely weak and so are very difficult to detect.
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- Strength of the wave depends on the mass of the object and require extremely sensitive detectors to sense them.
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- Missions like LIGO (Laser Interferometer Gravitational–wave Observatory) helps to spot gravitation waves, detecting small changes in the distances between objects at set distances.
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LIGO-India Project

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- Laser Interferometer Gravitational–wave Observatory (LIGO) is the ambitious project by U.S to detect the faintest ripples from cosmic explosions millions of light years away.
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- The LIGO project operates three gravitational-wave (GW) detectors - two at Hanford in the State of Washington, and one is at Livingston in Louisiana.
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- The LIGO-India project is an international collaboration between the LIGO Laboratory and three Indian lead institutions.
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- The project is piloted by the Department of Atomic Energy (DAE) and Department of Science and Technology (DST).
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- It is expected to be ready by 2025.
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- The project involves constructing a network of L-shaped arms, each four kilometres long, which can detect gravitational waves.
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- The Environment Ministry has allowed scientists to test the suitability of land in Maharashtra’s Hingoli district to host the LIGO-India project.
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- Indian scientists would provide the infrastructure to install the detector and it would be operated jointly by LIGO-India and the LIGO-Lab.
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Source: Indian Express, PIB

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