Prelim Bits 26-09-2021 & 27-09-2021 | UPSC Daily Current Affairs

Social Bonds in Vampire Bats

Scientists have shown how the Vampire bats that have forged "friendships" with others will rendezvous with these friends while foraging for a meal.

- Each of these blood-feasting vampire bats in the colony has its own network of close cooperative social bonds.
- Vampire bats that roost in trees can form long-term social bonds with each other through grooming, sharing regurgitated blood meals and generally hanging out together at the roost.
- The study has found that the social bonds formed in roosts extended into the hunt. It also showed that the female bats have stronger social relationships than males.

Vampire Bats

- Vampire bats are the only mammals with a blood-only diet. They reside in colonies of thousands.
- Habitat - Tropical and subtropical regions
- Locations - Warmer regions of Latin America (Central America and South America).
- Specialty - Vampire Bats are amazing runners. They have heat sensors in their snouts that help them find a spot to make a bite.
- IUCN Status - Least Concern
- Threat - Habitat loss

Mangalyaan Mission

India's Mars Orbiter spacecraft has completed seven years in its orbit, well beyond its designed mission life of six months.

- Also known as Mangalyaan, Mars Orbiter Mission (MOM) is the maiden interplanetary mission of the Indian Space Research Oranisation (ISRO).
- Launched in 2013, the probe was successfully inserted into Martian orbit on September 24, 2014 in its first attempt.
- The spacecraft has already covered 3 Martian years (1 Martian year = 2 Earth years or 687 days).

- **Purpose** - MOM is primarily a technology demonstration venture and all the mission objectives were successfully met.
- MOM will explore and observe Mars surface features, morphology, mineralogy and the Martian atmosphere.
- Further, a specific search for methane in the Martian atmosphere will provide information about the possibility or the past existence of life on the planet.

- **Launch** - PSLV-C25, the 25th flight of PSLV launched MOM Spacecraft.
- PSLV was used to launch MOM as GSLV was not in operational condition then. So, ISRO could apportion only about 15 kg for scientific instruments.

Scientific Instruments	Purpose
Mars Exospheric Neutral Composition Analyzer (MENCA)	To study neutral gas atoms in the Martian atmosphere
Lyman Alpha Photometer (LAP)	To quantify hydrogen & deuterium
Thermal Infrared Imaging spectrometer (TIS)	To study mineral resources of Mars
Methane Sensor for Mars (MSM)	To search for methane
Mars Color Camera (MCC)	To capture the images of the Martian Surface

GI tag for Assam's Rice Wine Judima

Judima has become the first beverage from the north-eastern region to earn the geographical indication (GI) tag.

- Judima is a rice wine made from sticky rice, which is steamed and mixed with traditional herbs.
- The wine is brewed by the Dimasa tribal community in Assam. It is traditionally made by women.
- The wine has a distinct sweet taste and takes around one week to prepare and it can be stored for years.

Arjun Mark-1A

Ministry of Defence has placed an order to Heavy Vehicles Factory (HVF), Chennai for 118 units of the Main Battle Tank Arjun's Mark-1A variant for the Army.

- **Origin** - The development of Arjun was started by the DRDO in 1980s, primarily to augment the predominantly Russian-made armoured fleet until then. Work on the variant Mark-1A, or Mk-1A, began in 2010.
- **Advantages** - Mark-1A variant adds 72 new features to the previous variant Mark-1. These additions have resulted in
    1. Better all-terrain mobility and manoeuvrability in different modes of operation,
    2. Better target acquisition, and precision firing during both day and night with a 360° view,
    3. Suitability for the 4-member crew, who operate in tough conditions when deployed,
    4. Suitability for effective use of IT and computer networking in the battlefield, and
    5. Multi-layered robust protective armour named 'Kanchan'.
- These additions, along with its 120 mm rifled gun, have contributed to its categorisation as the 'hunter killer'.
- Arjun Mark-1A is ideally suited for desert terrain, and even more effective and lethal compared to earlier variant due to the new additions.
- **Limitation** - Weight of the tank puts a limitation on its deployability in high-altitude terrains.

Detection of Dark Energy

A team of researchers have made the first putative direct detection of dark energy using the XENON1T experiment (to detect dark matter).

- XENON1T experiment is the world's most sensitive dark matter experiment and operated deep underground at INFN Laboratori Nazionali del Gran Sasso, Italy.
    - Other similar experiments include LUX-Zeplin, a next generation dark matter experiment at Sanford Underground Research Facility, and PandaX-xT at China Jinping Underground Laboratory.
- XENON1T have been designed to directly detect dark matter, by searching for signs of dark matter 'hitting' ordinary matter.
- A physical model, which used chameleon screening, can be used to show that dark energy particles produced in the Sun's strong magnetic fields could explain the signal seen in XENON1T.

Dark Matter & Dark Energy

- Everything we see - the planets, moons, galaxies, organisms - makes up less than 5% of the universe.
- About 27% is dark matter and 68% is dark energy.
- Dark matter's existence was suggested as early as the 1920s, while dark energy wasn't discovered until 1998.
- **Dark energy** is an unknown form of energy that is hypothesized to permeate all of space, tending to accelerate the expansion of the universe.
- Dark matter is a hypothetical form of matter thought to account for approximately 85% of the matter in the universe.
- Dark matter works like an attractive force that holds our universe together.
- This is because dark matter does interact with gravity, but it doesn't reflect, absorb or emit light.
- Meanwhile, dark energy is a repulsive force that causes the expansion of our universe.

Dark Matter	**Dark Energy**
Dark matter is a hypothetical form of matter thought to account for approximately 85% of the matter in the universe.	Dark energy is an unknown form of energy that is hypothesized to permeate all of space, tending to accelerate the expansion of the universe.
27% of the universe is dark matter	68% of the universe is dark energy
Dark matter works like an attractive force that holds our universe together.	Dark energy is a repulsive force that causes the expansion of our universe.

Source: PIB, The Hindu, The Indian Express, Times of India, Hindustan Times, ISRO, NASA

SHANKAR IAS PARLIAMENT
Information is Empowering