Prelim Bits 17-06-2019

International Pulsar Timing Array (IPTA)

- National Centre for Radio Astrophysics (NCRA) will be hosting the five-day annual International Pulsar Timing Array (IPTA) meet from June 17 to 21.
- Radio astronomy is a subfield of astronomy that studies celestial objects at radio frequencies.
- The meet is a collaboration of radio astronomers from a dozen countries across the globe.
- It uses more than 12 radio telescopes all over the world with an aim to detect ultra-low frequency gravitational waves.
- Ultra-low frequency Gravitational Waves are wrinkles in space-time produced by two massive black holes, each revolving around the other.
- Such black holes, which weigh billion times more than Sun, are found in the centres of colliding galaxies.
- These waves affect radio pulses from 10km size stars called radio pulsars by changing ever so slightly the period of radio pulsation of these stars.

NCRA

- The National Centre for Radio Astrophysics (NCRA) of India is a premier research institution in India in the field of radio astronomy is located in the Pune.
- It is part of the Tata Institute of Fundamental Research, Mumbai, India.
- NCRA has an active research program in many areas of Astronomy and Astrophysics, which includes studies of the Sun, Interplanetary scintillations, pulsars, the Interstellar medium, Active galaxies and cosmology and particularly in the specialized field of Radio Astronomy and Radio instrumentation.
- NCRA has set up the Giant Metre-wave Radio Telescope (GMRT), the world's largest telescope operating at meter wavelengths located at Khodad, 80 km from Pune.

- NCRA also operates the Ooty Radio Telescope (ORT), which is a large Cylindrical Telescope located near Udhagamandalam, India.

PC4 Protein

- Autophagy Pathway is a molecular mechanism which recycles unnecessary or dysfunctional cell components.
- When a cell experiences stress, its DNA gets damaged, Cells with damaged DNA can either die or can activate the autophagy pathway and recycle the damaged cell components and survive.
- According to recent discovery absence or downregulation of a particular protein positive co-activator 4 (PC4) is responsible for enhanced autophagy.
- Lack of PC4 protein leads to irregular nuclear shape and defects in chromosome distribution in daughter cells.
- However, these changes do not lead to cell death but enhanced autophagy which allows cells to withstand the stress caused by gamma radiation.
- Thus the absence/downregulation of PC4 Protein will help cancer patients to survive and recover soon from cancer.

Circadian Rhythm

- A circadian rhythm is a roughly 24-hour cycle in the physiological processes of living beings, which are important in determining the sleeping and feeding patterns of all animals, including human beings.
- There are clear patterns of brain wave activity, hormone production, cell regeneration and other biological activities linked to this daily cycle.
- In vertebrate animals, including humans, the master clock is a group of about 20,000 nerve cells (neurons) that form a structure called the Supra Chiasmatic nucleus, or SCN.
- The SCN is located in a part of the brain called the hypothalamus and receives direct input from the eyes.

- In mammals, in addition to the master clock present in the brain, peripheral circadian clocks too operate, which means that the cells and tissues throughout the human body have their own individual clocks.
- This peripheral circadian clock can be affected by temperature changes but our master clock in the brain is resistant to temperature changes.
- The human brain has evolved to even override the peripheral circadian clock, so temperature changes (unless very extreme) cannot affect the human body clock.

Ugra Tara Temple

- Ugra Tara Temple is a temple dedicated to Tara (Devi) is an important Shakti shrine, located in Guwahati, Assam.
- The present temple of Ugra Tara was built by Ahom King Siva Singha in 1725 AD.
- In the garbhagriha of Ugra Tara there is no image or idol of her, a small pit filled with water is considered as the Goddess.
- Recently black softshell turtle conservation was conducted in the temple pond.

Black Softshell Turtle

- The black softshell turtle or Bostami turtle is a species of freshwater turtle found in India and Bangladesh.
- It is the close relative of Indian peacock softshell turtle, but it is a distinct species.
- As of 2002, the IUCN classified the species as Extinct in the Wild.
- The turtle is originally native to the lower Brahmaputra River.

Source: The Hindu