Prelim Bits 02-12-2023 | UPSC Daily Current Affairs

XPoSat – POLIX and XSPECT

India is set to launch XPoSat (X-ray Polarimeter Satellite), its dedicated polarimetry mission to study various dynamics of bright astronomical X-ray sources in extreme conditions.

- **Launch vehicle** – Polar Satellite Launch Vehicle (PSLV).
- **Mission life** – Approximately ***5 years***.
- **Objective** – To study of temporal, spectral, and polarization features of the bright X-Ray sources.
- **2 scientific payloads** – POLIX and XSPECT.
- **Orbit** – The payloads are carried to the ***low earth orbit*** (non-sun synchronous orbit of ~650 km altitude, low inclination of approximately 6 degree).

POLIX (Polarimeter Instrument in X-rays)

- It is the primary payload to measure polarimetry parameters.
- **Developed by** – The Raman Research Institute (RRI), Bengaluru, with support from various ISRO centres.
- **Objective** – To specifically measure the degree and angle of polarization in the ***medium X-ray energy range of 8-30 keV photons*** originating from astronomical sources.

POLIX is the 1st payload in the medium X-ray energy band dedicated for polarimetry measurements.

- It is made of a collimator, a scatterer and 4 X-ray proportional counter detectors that surrounds the scatterer.
- **Scatterer** – It is made of low atomic mass material which causes anisotropic Thomson scattering of incoming polarised X-rays.
- **Collimator** – It restricts the field of view to 3 degree x 3 degree so as to have only 1 bright source in the field of view.
- It is expected to ***observer about 40 bright astronomical sources*** of different categories.

XSPECT (X-ray Spectroscopy and Timing)

- **Developed by** – The U.R. Rao Satellite Centre (URSC), ISRO.
- **Objective** – To do long-term spectral and temporal studies of ***cosmic X-Ray sources in the energy band of 0.8-15 keV***.
- **Passive collimators** – They are used to reduce the background by narrowing the field

of view of XSPECT.
- It would observe several types of sources viz X-ray pulsars, black hole binaries, low-magnetic field neutron star (NS) in LMXBs, AGNs and Magnetars.

References

1. The Hindu| India's First Polarimetry Mission
2. ISRO| X-Ray Polarimetry Satellite (XPoSat)

Role of Henry Kissinger in Indo-US relation

Henry Kissinger, known for his disdain for India's leadership in the 1970s, has died at the age of 100.

- **Strained relationship** – It happened primarily in 1970's during the rule of President Richard Nixon in USA.
- Both Kissinger and Nixon ***had shamed Indians and the then Prime Minister of India***, Indira Gandhi with derogatory terms.

Kissinger's disdained relation with India were covered in his book 'The Blood Telegram: Nixon, Kissinger and a Forgotten Genocide'.

- USA ***supported Pakistan during 1971 Indo-Pakistan war*** and even insisted on attacking India.
- **Improved ties** – His reaction changed after the Bangladesh liberation in 1971 and thereafter he insisted on ties with India.
- He also *apologized for his earlier derogatory comments* and based on his advice, the US Chambers of Commerce in the 70s established the ***US India Business Council (USIBC).***
- As per archival diplomatic conversations, as early as 1972 he had ***advocated for India and Japan to be the permanent member*** of the UN Security Council.
- He went on to become a great votary of Indo-US ties aftermath of 1998 nuclear tests and after Modi became the Prime Minister of India in 2014, he had ***advocated strong ties with India***.

*Kissinger received a **Nobel Peace Prize in 1973** for helping arrange the end of US military involvement in the Vietnam War. He is also credited to open communist China to the United States and the West.*

Reference

1. Times of India| Death of Kissinger
2. Deccan Herald| Role of Kissinger in Indo-US relationship

Voice over 5G (Vo5G/ VoNR)

Reports indicate Reliance Jio, India's largest mobile carrier, has been testing VoNR behind the scenes whose aim is to improve voice quality in calls.

- It is also known as ***Voice over New Radio (VoNR)***.
- VoNR is the IMS based voice calling services that use the 5G network for its source of Internet Protocol (IP) voice processing instead of the current standard that uses 4G.

> ***IMS (IP Multimedia Subsystem)*** *is a standards-based architectural framework for delivering multimedia communications services such as voice, video and text messaging over IP networks.*

- **Pre-requisite** - A phone that supports Vo5G, a carrier that offers Vo5G and a 5G signal in your area.
- It takes the improvements of 5G (like speed, capacity, and responsiveness) to voice calls.
- **Better call quality** – It uses advanced audio codecs that provides superior clarity and fidelity based on 5G's increased data capacity.
- **Faster call connection time** – It is due to 5G's *reduced network latency* and doing away with switching to VoLTE while calling.
- **Reliable and continuity of calls** – There is *lower packet loss*, potentially leading to fewer voice cut-outs and will ***end the call drop issues***.

> *VoLTE (Voice over Long-Term Evolution) 1st hit the scene in India back in 2016 that enabled crystal clear WhatsApp-quality voice on calls.*

References

The Indian Express| Voice over 5G

Kanakadasa

Kanakadasa Jayanthi is the birth anniversary of the famous philosopher Kanakadasa, celebrated on a large scale in Karnataka on the 18th day of the Karthika masa of the Hindu calendar every year.

- ***2023 marks the 529th birth anniversary*** of the saint.

> *According to Karnataka tourism official website, the Kanakadasa Jayanthi is*

mainly celebrated by the people of the Kuruba community.

- He was born as ***Thimmappa Nayaka*** on December 3, 1509.
- He was a warrior but he gave up after he was gravely injured in a battle but survived miraculously.
- **Proponent of the Bhakti movement** – He brought the Bhakti movement to Karnataka being the devotee of Lord Krishna and went on to become a ***Haridasa (servant of god).***
- **Music** – He was renowned for his Kirtans and ***Ugabhoga (Carnatic music compositions in the Kannada language)*** which reflect a deep sense of devotion and social consciousness.
- He, along with fellow Haridasa, ***Purandaradasa***, rejected norms by composing in the local language, Kannada as most songs were then composed in Sanskrit, inaccessible to the ordinary people.

Kanakadasa famous works include Nalacharithre, Haribhakthisara, Nrisimhastava, Ramadhanyacharithre and Mohanatarangini. He used the pen name ***'Kaaginele Adikeshava'*** *for all his songs.*

- **Social reformer** – He actively discarded rigid caste-based systems in places of worship and spread the messages of equity and uplifting the social community.

Bhakti Movement in Karnataka
• The **Shaiva bhakti cult** of the Kannada-speaking Virashaivas developed during the 12th and 13th centuries. • The Virshaiva Movement was initiated by **Basavanna** and his companions like **Allama Prabhu and Akkamahadevi**. • It argued for the equality and were also *against all forms of ritual and idol worship.* • Veerashaivism also came to be known as **Lingayatism.**

Reference

Hindustan Times| Kanakadasa Jayanthi

Osteoporosis

According to a new study, India has 6 crore osteoporosis patients, of which 80% are women.

- It is a ***progressive disease that weakens bones***, increasing the risk of fractures.
- **Causes** – Hormonal changes at ***menopause where oestrogen levels decline*** initiating bone loss as higher oestrogen protects bone strength in adulthood.

According to the World Health Organization (WHO), 30% of postmenopausal women suffer from osteoporosis. While the outcomes of disease are common in

both genders, women are more vulnerable.

- **Risk factors** – ***Gender***, advancing age after menopause, low body mass index (BMI), family history, poor diet, sedentary lifestyle, smoking and alcohol consumption.
- **Symptoms** – Usually, ***no symptoms in the early stages*** but once the bones weakens back pain, loss of height over time, a stooped posture, ***fracture and chronic pain*** develops.
- **Diagnosis** - People above 65 years and those people prone to fractures are suspected by measuring the bone mineral density.

Dual-energy x-ray absorptiometry (DXA) *is a quick, non-invasive test using low levels of X-rays to measures the bone mineral density of the skeleton and at various vulnerable sites like the hip and spine.*

- **Prevention** – Proper nutritional foods, a healthy lifestyle including exercises and avoiding smoking and alcohol.
- **Treatment** – There is ***no cure*** but proper treatment can help protect and strengthen the bones like
  - Using *bisphosphonates* , *Calcitonin* (a hormone of thyroid gland), Selective oestrogen receptor modulator (*SERM*), Tissue-selective oestrogen complex (*TSEC*) and *Parathyroid hormone* (PTH)
- **In India** – The peak incidence of osteoporosis in India occurs 10 to 20 years earlier than in western countries.

References

The New Indian Express| Osteoporosis disease burden in India

Other Important News
5th Global Ayurveda Festival, 2023 • Global Ayurveda Festival is a platform to celebrate India's healing wisdom organized at Greenfield International Stadium, Kariavattom Thiruvananthapuram, Kerala. • **Focal theme**: *Emerging Challenges in Healthcare & a Resurgent Ayurveda*
UNITAMS • The United Nations Security Council (UNSC) has voted to end its political mission dedicated to ending the civil war in Sudan. • The liquidation of UNITAMS will begin on March 1, 2024. • The ***United Nations Integrated Transition Assistance Mission in Sudan (UNITAMS)*** was established in June 2020. • The mission's mandate was extended in 2021 and 2022. • UNITAMS supports the promotion and protection of human rights.

Damascus

• Damascus, one of the ***world's oldest*** continuously inhabited cities, is the ***capital and the largest city of Syria***.
• It is located in South-western Syria at the foothills of the ***Anti-Lebanon mountain range.***
• It is the 4th holiest city in Islam, and was known as the ***Pearl of the East***
• It recently secures the top spot as the ***cheapest city*** to live in.

1st spy satellite of South Korea

• South Korea has recently launched its 1st spy satellite after North Korea's recent launch.
• The satellite is launched using the SpaceX's Falcon 9 rocket.
• It was the first of 5 spy satellites South Korea plans to send into space by 2025 using SpaceX.
• South Korea had no military reconnaissance satellites of its own in space and has partially resorted to the United States' spy satellites to monitor moves by North Korea.

Thitu Islands & Subi Reef

• The Philippines opened a coast guard base on the contested island of Thitu, South China Sea recently.
• **Thitu Island -** Thitu Island is a rock located in the Spratly Islands. The Philippines first took possession of the feature in 1974.
• **Subi Reef** – It is a low-tide elevation in the Spratly Islands.
• It is located in the South China Sea and it was possessed by China in 1988.

Sparsh Bharati

• After introducing the Bharati script V. Srinivasa Chakravarthy, a professor in IIT Madras has developed a script for persons with visual impairment named as Sparsh Bharati.
• This 'Indian Braille' can be used across Indian languages.
• Bharati is a simple and unified script which can be used to write most major Indian languages.
• It is designed using simplest shapes, often borrowing simple characters from various Indian languages/scripts and English.

Same-sex marriage in Nepal

• Nepal makes history as the ***1st Southeast Asian Nation*** to formally register same-sex marriage after it was legalized by the Supreme Court of Nepal.

Severe Tropical Cyclones, 2023

• **Mawar and Bolaven -** Western Pacific Ocean
• **Hurricanes Jova and Otis -** Eastern Pacific Ocean.
• **Hurricane Lee -** Atlantic Ocean.
• **Cyclone Mocha -** North Indian Ocean.
• **Cyclone Freddy -** Southern Indian Ocean.

Operation Al-Aqsa Flood

• Operation Al-Aqsa Flood was the name given to the 2023 ***Hamas attack on Israel.***
• The operation was motivated by Israeli aggression and occupation, and the treatment of Palestinians.
• The attack was also a response to recent violence at the Al-Aqsa Mosque in Jerusalem.

Phosphorene, Cystine, and Gold (Ph-Cys-Au)

• Scientists of Institute of Advanced Study in Science and Technology (IASST) have developed a highly fluorescent material using **Ph**osphorene, **Cys**tine, and Gold-**Au** (Ph-Cys-Au).

• It can be used for detecting over dosage of ***anti-cancer drug Methotrexate (MTX)*** which will has toxic effect on lungs, stomach, and heart.

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