

## 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 1<sup>st</sup> 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 **observe 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](#)

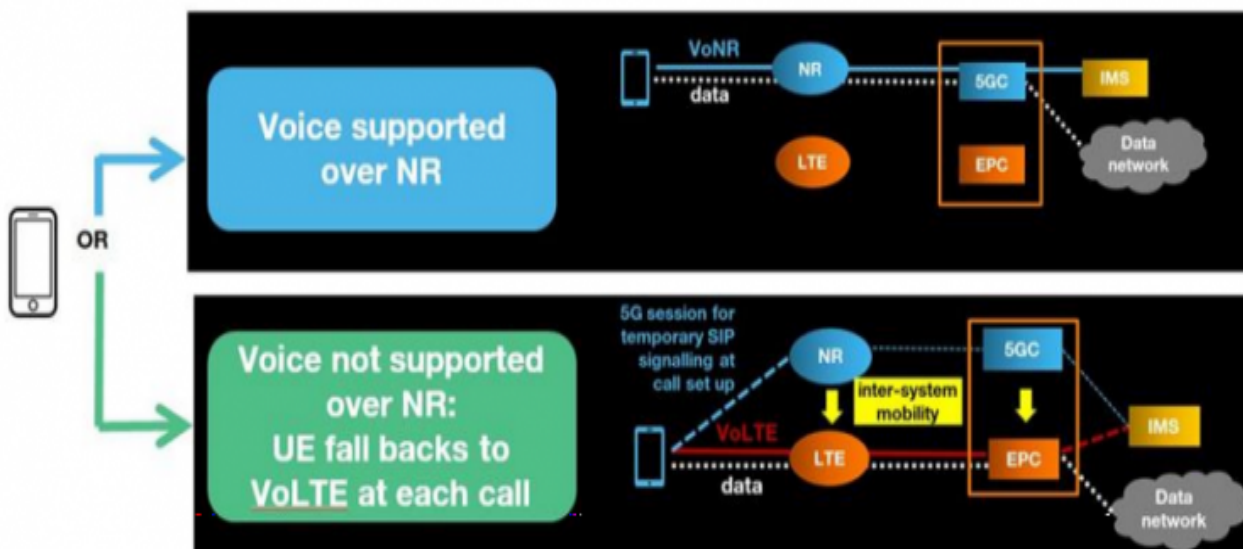
## Voice over 5G (Vo5G/ VoNR)

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) 1<sup>st</sup> hit the scene in India back in 2016 that enabled crystal clear WhatsApp-quality voice on calls.

## References

## 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 529<sup>th</sup> 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 ***Ugabhogga (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](#)

### 5<sup>th</sup> 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 4<sup>th</sup> 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.

### 1<sup>st</sup> spy satellite of South Korea

- South Korea has recently launched its 1<sup>st</sup> 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 ***1<sup>st</sup> 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 **Phosphorene, Cystine, 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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