

Gaganyaan Mission

❖ Context

- For the Gaganyaan mission, four astronauts who have been selected have completed the first semester of crew training and are undergoing Gaganyaan Mission-specific training at the Astronaut Training Facility in Bengaluru.



❖ Key Highlights

- The first semester of the crew training and 39 weeks of training activities have so far been successfully completed.
- Between early 2020 and mid-2021, they underwent generic space flight training at Gagarin Cosmonaut Training Centre in Russia.

❖ Gaganyaan

- Gaganyaan is a **crewed orbital spacecraft** that is **expected to take three astronauts** to space for a **period of seven days**.
- The Gaganyaan schedule is as follows :
 - **3 flights** will be launched into orbit.
 - **2 unmanned flights** and **1 human spaceflight**.
- The first trial (uncrewed flight) for Gaganyaan is being planned by the end of 2023 or early 2024.
- This will be followed by sending Vyom Mitra, a humanoid.
- Humans will be sent to space in the third experiment only when the first two experiments assure that the programme is completely ready.

• Launch Vehicle :

- The **Launch Vehicle Mark-3 (LVM3)** is the launch vehicle for the Gaganyaan mission.
- All systems in the LVM3 launch vehicle are reconfigured to meet human rating requirements and named Human Rated LVM3 (HLVM3).

• Orbit Module :

- In the Gaganyaan mission, the Orbiter Module will orbit the Earth, and it **consists of Crew Module (CM) and Service Module (SM)**.
- It is designed to keep the crew safe during ascent, orbital phase, and re-entry.
- SM will be used to provide the necessary support to CM while in orbit.

- The spacecraft will be **placed in a low earth orbit of 300-400 km**.

- **Cost-** Rs.10,000 crore

- If India successfully sends four astronauts to space, it will be only the **fourth nation to do so after the United States, China and Russia**.

NISAR Satellite

❖ Context

- A forthcoming satellite, NISAR, will map the most earthquake-prone regions in the Himalayas with unprecedented regularity..

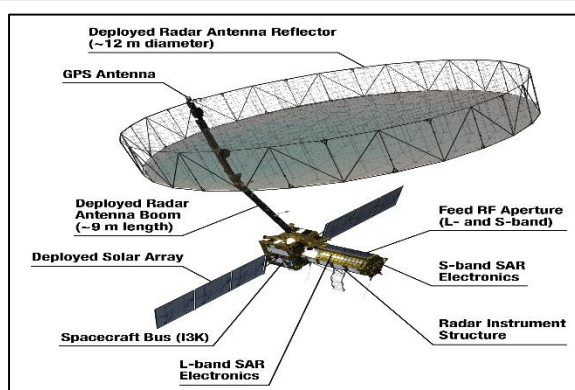


❖ Key Highlights

- The data which will generate can potentially give **advance warning** of land subsidence, as recently observed in Joshimath, Uttarakhand, as well point to places that are at greatest risk from earthquakes.
- It will use 2-frequency bands: the L-band and S-band to image the seismically active Himalayan region that will, every 12 days, create a "deformation map."

❖ About NISAR Satellite

- NISAR is an **Earth-observation satellite**.
- It is being **jointly developed** by the **National Aeronautics and Space Administration (NASA)** and the **Indian Space Research Organisation (ISRO)**.
- NISAR was envisioned by NASA and ISRO eight years ago in 2014 as a powerful demonstration of the capability of radar as a science tool and help us study Earth's dynamic land and ice surfaces in greater detail than ever before.
- It is expected to be **launched in January 2024** from Satish Dhawan Space Centre into a near-polar orbit.
- The satellite will **operate for a minimum of three years**.
- It is a **Low Earth Orbit (LEO) observatory**. NISAR will map the entire globe in 12 days.



- NISAR will be the first radar of its kind in space to systematically map Earth, using two different radar frequencies (L-band and S-band) to measure changes in our planet's surface less than a centimeter across.

• Significance :

- NISAR will provide a wealth of data and information about the Earth's surface changes, natural hazards, and ecosystem disturbances, helping to advance our understanding of Earth system processes and climate change.
- **NISAR** data will be used to **improve agriculture management** and **food security** by providing information about crop growth, soil moisture, and land-use changes.
- The mission will provide **data for infrastructure monitoring and management**, such as monitoring of oil spills, urbanization, and deforestation.
- NISAR will help to **monitor & understand the impacts of climate change** on the Earth's land surface, including melting glaciers, sea-level rise & changes in carbon storage.

Face to Face Centres



Dabba Trading

❖ Context

- The **National Stock Exchange (NSE)** recently issued notices warning retail investors about dabba trading.



❖ What is 'Dabba Trading'?

- Dabba (box) trading refers to informal trading that takes place outside the purview of the stock exchanges.
- Traders bet on **stock price movements** without incurring a real transaction to take physical ownership of a particular stock as is done in exchange.
- In simple words, it is **gambling centred around** stock price movements.
- For example, an investor places a bet on a stock at a price point, say ₹1,000. If the price point rose to ₹1,500, he/she would make a **gain of ₹500**.
- However, if the price point falls to ₹900, the investor would have to pay the difference to the dabba broker.
- Thus, it could be concluded that the broker's profit equates the investor's loss and vice-versa.

Why people book dabba trades?

TO SAVE on statutory levies, taxes exchange charges & higher broking commission	NO KYC needed; refer-ences will do
LOWER MARGIN requirements	UNREGULATED MARKETS, cash dealings allowed

JEWELLERS, SPOT commodity traders use the dabba market to hedge inventories cheaply

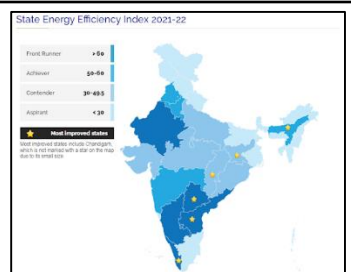
❖ Key Issues with it:

- Since there are no proper records of income or gain, it helps **dabba traders escape taxation**.
- They would not have to pay the **Commodity Transaction Tax (CTT)** or the Securities Transaction Tax (STT) on their transactions.
- The use of cash also means that they are outside the purview of the formal banking system.
- All of it combined results in a loss to the **government exchequer**.
- In 'dabba trading', the primary risk entails the possibility that the broker defaults in paying the **investor or the entity becomes insolvent** or bankrupt.
- Being outside the regulatory purview implies that investors are without formal **provisions for investor protection**, dispute resolution mechanisms and grievance redressal mechanisms that are available within an exchange.
- Since all activities are facilitated using cash, and without any auditable records, it could potentially **encourage the growth of 'black money'** alongside perpetuating a parallel economy.
- This could potentially translate to **risks entailing money laundering** and criminal activities.
- **Note:** 'Dabba trading' is recognised as an offence **under Section 23(1)** of the Securities Contracts (Regulation) Act (SCRA), 1956 and upon conviction, can invite imprisonment for a term extending up to **10 years or a fine up to ₹25 crore, or both**.

The State Energy Efficiency Index (SEEI) 2021-22 Report

❖ Context

- The State Energy Efficiency Index (SEEI) 2021-22 report, developed by the **Bureau of Energy Efficiency (BEE)** and the **Alliance for an Energy-Efficient Economy (AEEE)**, was released recently.



❖ Key Highlights:

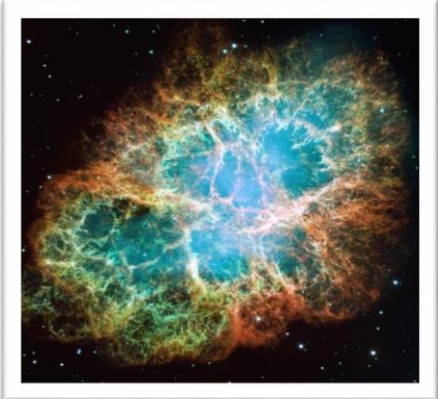
- The SEEI index assesses the annual progress of states and union territories in energy efficiency implementation for **FY 2020-21 and 2021-22**.
- The updated framework of SEEI 2021-22 has 50 indicators aligned with national priorities.
- The states were categorized into two groups, **Front Runner and Achiever**.
- The Front Runner category includes states with a score greater than **60 points**, while the Achiever category comprises states with scores between **50-60 points**.
- **Andhra Pradesh, Karnataka, Kerala, Rajasthan, and Telangana** are in the Front Runner category, while Assam, Haryana, Maharashtra, and Punjab are in the Achiever category.
- **Karnataka, Andhra Pradesh, Assam, and Chandigarh** are the top-performing states in their respective state groups.

- **Telangana and Andhra Pradesh** showed the most improvement since the last index.
- **The SEEI report recommendations:**
 - enabling fiscal assistance for energy efficiency in focus sectors,
 - developing institutional **capacity in states and UTs** to address emerging needs and challenges in energy efficiency implementation,
 - enhancing **cross-functional collaborations across financial institutions**, energy service companies,
 - energy professionals in large-scale energy efficiency implementation in states,
 - and mainstreaming energy data reporting and monitoring across sectors.
- The **BEE** is a **statutory body** under the **Ministry of Power**, with the core aim of minimizing the energy intensity of the Indian economy.



News in Between the Lines

Crab Nebula



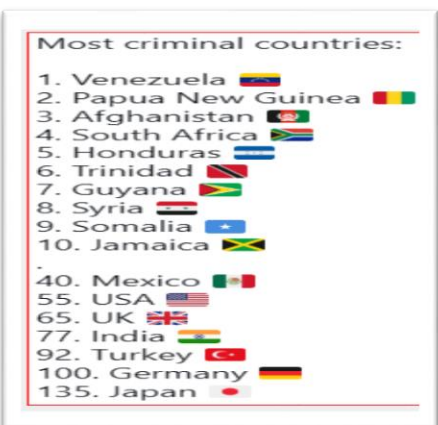
❖ Context

➤ NASA's **Imaging X-ray Polarimetry Explorer (IXPE)** spacecraft has captured stunning images of the Crab Nebula, a celestial object that has intrigued astronomers for centuries.

❖ Key Highlights:

- The Crab Nebula is the remnant of a supernova explosion that occurred in 1054 AD, and it is located approximately 6,500 light-years away in the **Taurus constellation**.
- The explosion created a dense object called the **Crab Pulsar**, which has a diameter equivalent to the length of Manhattan and a mass equivalent to two Suns.
- Scientists are particularly interested in studying the **pulsar wind nebula** of the Crab Nebula as it provides insight into the magnetic field.
- The polarization of X-rays emitted from different parts of the Crab Nebula gives scientists clues **about the direction and orderliness** of the magnetic field, which plays a critical role in the behaviour of cosmic objects.

World's 'Most Criminal Countries' Ranking



❖ Context

➤ Recently World of Statistics has shared the ranking of the world's "most criminal countries".

❖ Key Highlights:

- On the list, Venezuela has been ranked top, followed by Papua New Guinea (2), Afghanistan (3), South Africa (4), Honduras (5), Trinidad (6), Guyana (7), Syria (8), Somalia (9) and Jamaica (10), respectively.
- India stood **at 77 spots while the US and UK** were ahead of India in the criminal ranking country, the USA was at **55th number and the UK at 65th rank**, according to the World of Statistics.
- Turkey, Germany, and Japan were among the least criminal countries, ranking at **92nd, 100th, and 135th ranks**.
- The crimes have various forms including **corruption, drug trafficking, kidnapping, and assassination**. Other forms of crimes could be robbery and assault due to the high unemployment rate in the country.
- The total number of crimes of any kind reported is divided by the total population, then multiplied by 100,000, which yields the overall crime rate (**because the crime rate is typically reported as X number of crimes per 100,000 people**).

Kibithoo Village



❖ Context

➤ Recently, Union Home Minister urged people to visit Kibithoo - "**India's first village**" - in Arunachal Pradesh to enjoy its natural beauty and take inspiration from its history.

❖ Key Highlights

- Kibithoo is India's **eastern most forward post**, along the border with China.
- It is uniquely located on the **trijunction, with China to the north and Myanmar to the east**. It is a small village in the Arunachal Pradesh's Anjaw district.
- It is located on the last road head of extreme northeast of north eastern India and the very place that the Lohit river enters India.
 - Lohit river is a tributary to the Brahmaputra River which rises in Tibet Autonomous Region, in the Kangri Garpo range, where it is known as the Zayü River.
- The village is nestled roughly around 4000 ft above sea level and **lies in Mishmi hills**.
- Kibithoo lies on the east of Dong Valley, where the first sun rays in India is received.
- The area also has a military history as Kibithoo and **neighbouring Walong had witnessed a fierce battle during the Chinese aggression in 1962**.

Ad Hoc Judges

❖ Context

➤ In a rare instance, the Supreme Court collegium has recommended the appointment of a retired district judge as a judge of the Madhya Pradesh HC, citing legitimate expectation and delay in the selection process,.

Face to Face Centres



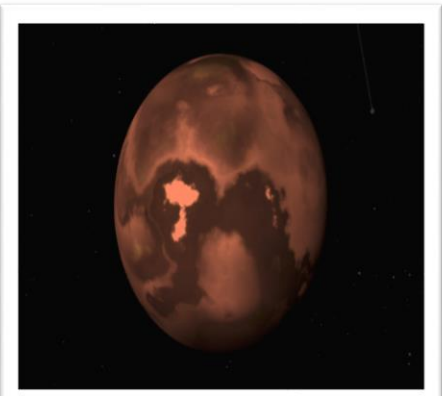
News in Between the Lines



❖ Key Highlights

- This move would allow him to serve two years as a constitutional court judge.
- In the past, only two persons were appointed as Supreme Court judges months after their retirement as HC judges.
- **Ad Hoc Judges : Article 224A of the Constitution** allows the Chief Justice of a High Court to appoint a person who has been a judge earlier to sit as a judge of the court with the previous consent of the **President**.
 - This has only been invoked thrice in the past and has more or less stayed dormant for years.
 - Such a judge is entitled to allowances as determined by the President.
 - He will also enjoy all the jurisdiction, powers & privileges of a judge of that HC.
 - Previously, the government had said that high courts must not invoke this till they filled up all regular vacancies.
- The top court said that the Article would be invoked by a High Court Chief Justice only under certain conditions. **These would include -**
 - Vacancies of a court exceeding 20% of the sanctioned strength.
 - 10% of pending cases must be over five years old.
 - The disposal rate must be lower than the filing rate of new cases.

YZ Ceti b



❖ Context

- Astronomers have discovered a **repeating radio signal from YZ Ceti b**.

❖ Key Highlights

- YZ Ceti b is a **rocky, Earth-sized exoplanet** rotating around a small red dwarf star only 12 light-years away from Earth. Astronomers are excited because they have detected a repeating radio signal from this exoplanet that suggests the presence of a magnetic field – one of the prerequisites for a habitable planet – around it.
- This is important because the survival of a **planet's atmosphere may well depend on its having, or not having, a strong magnetic field**, since the field protects its atmosphere from being eroded by the charged particles blowing in from its star.
- **Radio Signals** : Radio signals from planets are electromagnetic waves that are emitted naturally by planets in the radio frequency range. The intensity and frequency of the radio signals vary depending on the planet, its magnetic field, its atmosphere, and other factors.
 - Such signals can only be produced if the exoplanet orbits very close to its parent star and has its own magnetic field to influence the stellar wind and generate the signals.

Uttaramerur



❖ Context

- Recently, Prime Minister Narendra of India referred to the **Uttaramerur inscription in Kanchipuram, Tamil Nadu**, while discussing India's democratic history.

❖ Key Highlights

- Uttaramerur lies in present-day Kanchipuram district, approximately 90 km southeast of Chennai. Today, it is a small town and had a population of roughly 25,000 in the census of 2011. It is known for its historic temples built during Pallava and Chola rule.
- While Uttaramerur has multiple inscriptions spanning centuries, the most famous one – being referred to by the PM – is from the reign of Parantaka I (907-953 AD).
- These provide a detailed description about the village's self-governance and have been cited by historians and political leaders alike as evidence of India's history of democratic functioning.
- The famous inscription from Parantaka I's reign is found on the walls of the Vaikunda Perumal Temple, the inscription gives details of the functioning of the local sabha, i.e. the village assembly. A sabha was an assembly exclusively of brahmins and had specialised committees tasked with different things.
- The Uttaramerur inscription details how members were selected, the required qualifications, their roles and responsibilities, and even the circumstances in which they could be removed.

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