

### INTERNATIONAL SPACE STATION (ISS)

- A space station is essentially a large spacecraft that remains in low-earth orbit (LEO) for extended periods of time. It is like a large laboratory in space.
- LEO is an orbit that is relatively close to Earth's surface. It is normally at an altitude of less than 1000 km but could be as low as 160 km above Earth.
- ISS is placed in an orbit at an altitude of about 400 km above Earth.
- It allows astronauts to come aboard and stay for weeks or months to carry out experiments in
- ISS has been known for the exemplary cooperation between the five participating space agencies that have been running it. These countries are:
  - NASA (United States), Roscosmos (Russia), JAXA (Japan), ESA (Europe), and CSA (Canada).
  - In July 2022, Russia announced to pull out of the International Space Station after 2024 and focus on building its own orbiting outpost.

### **Features**

- The ISS has been in space since 1998. It orbits the earth at an altitude of 430 km, with an inclination of 52 degree with an orbital velocity of 7.7 km/s.
  - It circles the Earth in roughly 93 minutes, completing 15.5 orbits per day.
  - So far, the floating laboratory has hosted more than 3,000 research and educational investigations, carrying out cutting edge research in various disciplines.
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### GAGANYAAN MISSION

- Gaganyaan project (expected to be launched in 2025) envisages **demonstration of human spaceflight capability** by launching a **crew of 3 members to an orbit of 400 km** for a 3 days mission and bring them back safely to earth.
- It is part of the **Indian Human Spaceflight Programme (IHSP)**, which was initiated (2007) by the ISRO to develop the technology needed to launch crewed orbital spacecraft into low earth orbit (LEO).
- **Launch Vehicle Mark-3 (LVM3/GSLV Mk3) rocket** - the well proven and reliable heavy lift launcher of ISRO, is identified as the launch vehicle for Gaganyaan mission.

- **India's heaviest rocket** consists of solid stage, liquid stage and cryogenic stage.
- All systems in the LVM3 launch vehicle are re-configured to meet human rating requirements and christened **Human Rated LVM3/HLVM3**.



## How is ISRO getting ready for the Gaganyaan Launch?

- Some of the recent efforts -
- HLVM3 launch vehicle,
- Upgrading the mission control complex,
- **Building an 'umbilical tower'** on the second launch pad (Sriharikota) for maintenance of the rocket while on the launch platform,
- **Agreement with Australia** for setting up a mobile unit for direct-to-ground communication at Cocos Island.
- **The selected astronauts** have completed the first semester of the mission-specific training in India, after completing a generic training for spacefaring in Russia.
- The four selected astronauts, whose identity has not been revealed, have been **training for the Gaganyaan flight since early 2020**.
- The space agency **will undertake two test vehicle missions** to demonstrate crew escape systems mid-flight and the retrieval of the crew module once it splashed down in the ocean.
- This will be **followed by the first unmanned Gaganyaan mission** that will carry an unpressurised crew module.
- Subsequently, there will be two more test vehicle missions to check all systems before the **second unmanned flight**.

### Current Status of Gaganyaan Mission

- Gaganyaan, originally meant to be launched in 2022, in the 75th year of India's Independence, has seen its schedule getting postponed because of the pandemic.
- Recently, ISRO chairman hinted that the mission could be pushed back further from its current 2024 schedule.

- There are eight major tests remaining to be carried out.
  - If all eight major tests happen successfully without any major glitch, then the launch could be happening in a 2024 timeframe.
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## PM KISAN APP

Recently, the PM-Kisan Mobile App with Face Authentication Feature was launched by Union Agriculture and Farmers' Welfare Minister.



### PM KISAN App:

- The newly launched application has the feature of face Authentication.
- From this app, farmers can complete e-KYC remotely, sitting at home easily by scanning their face without OTP or fingerprint.
- The app was designed and developed by the **National Informatics Centre** in collaboration with the **Ministry of Electronics and Information Technology**.

### Key facts about PM Kisan Samman Nidhi (PM-KISAN)

- It is a **Central Sector scheme with 100% funding** from the Government of India.
  - **Objective:** The scheme aims to **supplement the financial needs of the farmers** in procuring various inputs to ensure proper crop health and appropriate yields commensurate with the anticipated farm income.
  - **Benefits and Eligibility Conditions:**
    - Under the scheme, an income **support of 6,000/- per year** in three equal instalments will be provided to all land-holding farmer families.
    - The definition of family for the scheme is husband, wife and minor children.
  - **State Government and UT administration** will **identify the farmer** families which are eligible for support as per scheme guidelines.
  - The fund will be directly **transferred to the bank accounts of the beneficiaries**.
  - The following categories of beneficiaries shall not be eligible for benefits under the scheme:
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- All Institutional Landholders.
- Farmer families which belong to one or more of the following categories:
- Former and present holders **of constitutional posts.**
- Former and present Ministers/ State Ministers and former/present Members of Lok Sabha/ Rajya Sabha/ State Legislative Assemblies/ State Legislative Councils, former and present Mayors of Municipal Corporations, former and present Chairpersons of District Panchayats.
- All superannuated/retired pensioners whose monthly pension is Rs.10,000/-or more (Excluding Multi-Tasking Staff / Class IV/Group D employees) of the above category
- All Persons who paid **Income Tax in the last assessment year**
- Professionals like Doctors, Engineers, Lawyers, Chartered Accountants, and Architects are registered with Professional bodies and carry out their profession by undertaking practices.

## GLOBAL LIVEABILITY INDEX 2023

Recently, the Economist Intelligence Unit (EIU) unveiled its highly anticipated Global Liveability Index 2023.



### About Global Liveability Index 2023:

- The index **quantifies the challenges presented** to an individual's lifestyle in 173 cities worldwide.
- It was given considering five metrics: **healthcare, culture, environment, education, and stability.**
- This ranking offers insights into the cities that excel in providing an exceptional quality of life.

### Key highlights of the report

- **Top cities to live:** Vienna (Austria), Copenhagen (Denmark), Melbourne and Sydney (Australia)
- **Bottom 3 Liveable cities:** Algiers (Algeria), Tripoli (Libya) and Damascus (Syria)
- From Asia, Japan's Osaka was ranked number 10 in the rankings.
- The index rose last year to reach a 15-year high as the world recovered from the pandemic.
- The average index score is now 76.2 out of 100, up from 73.2 a year ago.

- Despite overall growth in the index score, **stability saw a marginal decline.**
- Those in **Western Europe**, in particular, have slipped in rankings **due to increased instances of workers' strikes failing to “match gains”** made by cities in Asia and the Middle East.
- The cities which are plagued by ongoing civil unrest and military conflicts, amongst other issues, remained at the bottom of the list.

## WHAT IS MEANT BY TERRITORIAL WATERS?

The Sri Lankan Navy recently arrested 22 Indian fishermen on board four trawlers for allegedly poaching in the country's territorial waters northwest of Delft Island, Jaffna.



### About Territorial waters:

- **What is it?** Territorial waters, under the United Nations Convention on the Law of the Sea (UNCLOS), is that **area of the sea immediately adjacent to the shores of a country and subject to the territorial jurisdiction of that country.**
- **Extend:** The territorial sea extends to a limit of 12 nautical miles from the baseline of a country's coast.
- **Importance of Territorial waters:**
  - Within its territorial waters, a **country exercises full sovereignty over the air space above the sea and over the seabed and subsoil.**
  - The **government can legislate on matters** concerning the safety of navigation, the preservation of the environment, and the prevention, reduction, and control of pollution within its territorial waters.
  - **Resource use within the territorial sea is strictly reserved for the coastal nation.**
  - **All countries have the right of innocent passage** (a passage that is not prejudicial to the security of the coastal country) through the territorial sea of another country. However, there is no right to innocent air space passage.
  - The right of innocent passage **does not apply to submerged submarines, nor does it include a right to fish.**



## United Nations Convention on the Law of the Sea (UNCLOS):

- The UNCLOS, also known as the Law of the Sea, was adopted in 1982.
- It lays down a **comprehensive regime of law and order in the world's oceans and seas, establishing rules governing all uses of the oceans and their resources.**
- There are many provisions under UNCLOS which **regulate and control the functioning and claims of nations on the world's oceans and seas.**
- The convention was **ratified by 168 parties**, which included **167 states and the European Union.**
- **India is a state party to the UNCLOS.**
- UNCLOS, as the currently prevailing law of the sea, **is ultimately binding.**

## What is an Exclusive Economic Zone?

- Exclusive economic zone (EEZ), as defined under the UNCLOS, **is an area of the ocean extending up to 200 nautical miles (370 km) immediately offshore from a country's land coast in which that country retains exclusive rights to the exploration and exploitation of natural resources.**

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## WHAT IS NANO UREA?

Indian Farmers Fertiliser Cooperative Ltd (IFFCO) recently said it had signed an agreement with California-based Kapoor Enterprises Inc to export liquid nano urea to the US.



### About Nano Urea:

- It is a **nanotechnology-based revolutionary Agri-input that provides nitrogen to plants.**
- It is **developed and patented by the Indian Farmers Fertiliser Cooperative Limited (IFFCO).**
- IFFCO Nano Urea is the **only nano fertiliser approved by the Government of India and included in the Fertilizer Control Order (FCO).**
- **Features:**

- Compared to conventional urea prill, Nano Urea has a **desirable particle size of about 20-50 nm and more surface area (10,000 times over 1 mm urea prill) and the number of particles (55,000 nitrogen particles over 1 mm urea prill).**
- It contains **4.0 % total nitrogen (w/v).**
- **Benefits:**
  - It is produced by an **energy-efficient, environment-friendly production process with less carbon footprints.**
  - **Increased availability to crop by more than 80%,** resulting in higher nutrient use efficiency.
  - It is expected to **improve crop productivity, soil health, and nutritional quality** of produce and address the "imbalanced and excessive use" of conventional fertiliser.

### **Indian Farmers Fertiliser Cooperative Limited (IFFCO):**

- It is **India's largest multi-state cooperative society that is entirely owned by Indian cooperatives.**
- IFFCO is primarily **engaged in the production and distribution of fertilisers.**
- **Headquarters: New Delhi, India.**

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## **INDIA SET TO JOIN ARTEMIS ACCORDS**

### **Why in news?**

- As per White House announcement, India has decided to join the Artemis Accords, which brings like-minded countries together on civil space exploration.
- Also, NASA and ISRO have agreed to a joint mission to the International Space Station in 2024.

### **Artemis Accords**

- **About**
  - The Artemis Accords are a set of guidelines and principles for international cooperation in **space exploration** to the **Moon and Mars.**
  - They were established in 2020 by the United States in coordination with other nations and international partners.

- The Accords aim to create a framework for peaceful and transparent space exploration, with a specific focus on lunar activities related to NASA's Artemis program.
  - Artemis program is NASA's initiative to return humans to the Moon.
  - In this program, NASA aims to land the first woman and the first person of colour on the Earth's natural satellite.
- The Artemis Accords are rooted in the **Outer Space Treaty of 1967** (OST).
- **Legal nature**
  - The Artemis Accords are **not a legally binding treaty**.
  - They serve as a framework for cooperative efforts among nations involved in lunar exploration.
- **Signatories of the accords**
  - As of May 2023, the number of signatories to Artemis Accords stands at 25.
  - They include:
    - United States, United Kingdom, Japan, Italy, Canada, Brazil, Australia, Bahrain, Colombia, Czech Republic,
    - France, Israel, Luxembourg, Mexico, New Zealand, Spain, Nigeria, Poland, Republic of Korea, Romania,
    - Rwanda, Saudi Arabia, Singapore, Ukraine, and United Arab Emirates (UAE).

## Principles of Artemis Accords

- **Peaceful purposes:** All participating countries commit to conducting space activities exclusively for peaceful purposes, adhering to relevant international laws.
- **Transparency:** Signatories are expected to be transparent about their national space policies and exploration plans.
- **Interoperability:** The development of common exploration infrastructure and standards is emphasized.
  - This includes areas such as fuel storage, landing structures, communications systems, and power systems.
- **Emergency assistance:** Countries agree to provide assistance to astronauts and personnel in distress in outer space.





# CROSS & CLIMB ROHTAK



- **Registration of Space Objects:** The Accords recognize the importance of registering relevant space objects according to the Registration Convention, allowing for better coordination and information sharing.
  - **Preserving Heritage:** Nations are encouraged to preserve historically significant landing sites, artifacts, etc.
  - **Space Resources:** The Accords affirm the extraction and utilization of space resources, such as those from the Moon, Mars, comets, or asteroids, in accordance with the Outer Space Treaty.
    - Ownership claims over extracted objects are not allowed.
  - **Deconfliction of Activities:** Countries conducting Moon exploration are urged to establish safety zones to prevent harmful interference with the activities of other nations.
  - **Orbital Debris:** Signatories commit to the safe and timely disposal of spacecraft at the end of their missions, as well as reducing the generation of long-lived or harmful debris.
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