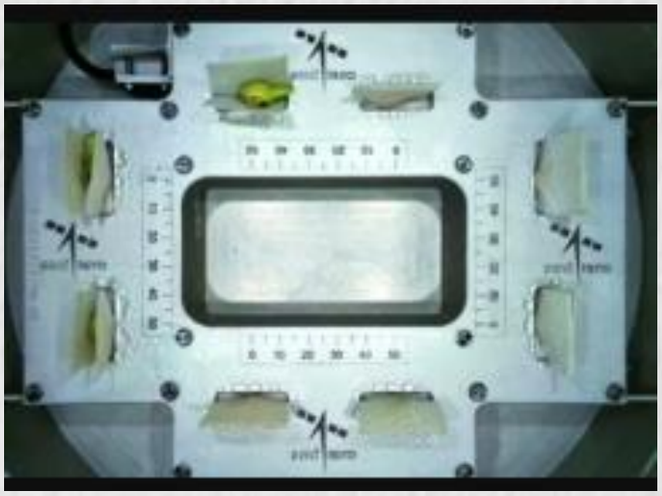
1. **Compact Research Module for Orbital Plant Studies (CROPS):** The lobia (black-eyed pea) seeds that the Indian Space Research Organisation (ISRO) sent to space on December 30 as a part of its Compact Research Module for Orbital Plant Studies (CROPS) germinated last week**.**



- **About:** Compact Research Module (CROPS) acts like a mini greenhouse, with a soil-like medium, lobia seeds, controlled water, sunlight-simulating LEDs, and Earth-like air, all in microgravity**.**
- **Soil Medium:** Highly porous clay pellets with water-activated slow-release fertilizer to nourish the plants.
- **Lighting:** LED lights, programmed to simulate day and night, help with photosynthesis, with 16 hours of light and 8 hours of darkness.
- **Temperature and Atmosphere**: The module maintains a controlled temperature range of 20-30°C and Earth-like atmospheric conditions.
- **Watering Mechanism:** Injected into the soil-like medium using an electric valve operated remotely from Earth.
- **Seed Germination:** Lobia seeds sprouted within four days of the experiment, with two leaves visible the following day.
- **Methods of Growing Plants in Space**: Hydroponics, Aeroponics, Soil-like Medium.
- **Challenges in Growing Plants in Space:** Microgravity Issues, Radiation Exposure, Temperature Fluctuations, Light Availability.

2. **US Entity List**: The U.S. removed restrictions on three Indian nuclear entities namely Bhabha Atomic Research Centre (BARC), Indira Gandhi Atomic Research Centre (IGCAR), and Indian Rare Earths (IRE) under the US Entity List.
   - **About:** Consists of foreign individuals, companies, and organizations that are subject to export restrictions and licensing requirements for certain goods and technologies.
   - **Compiled by**: Bureau of Industry and Security (BIS) under the U.S. Department of Commerce.

- **Purpose of the List:** Designed to prevent unauthorized trade that could potentially support:
  - Terrorism
  - Weapons of Mass Destruction (WMD) programs
  - Activities harmful to U.S. foreign policy or national security interests.
- **Reasons for removal of India**: Seen as part of efforts to implement the 2005 India-U.S. civil nuclear pact, finalized in 2008.
- **Aim:** To enhance cooperation in energy security, clean energy supply chains, and advanced technology with India.

3. **Poverty Estimates in India**: State Bank of India (SBI) survey claims that poverty has dropped to under 5% in urban and rural areas, however a research paper from **The Foundation for Agrarian Studies** counters this, estimating that **26.4% of India's population remains poor**.
   - **Determination**: In India, the poverty line is determined based on **consumption expenditure rather than income levels.**
   - **Poverty Line Issues and Discrepancies:** Poverty line hasn't been updated since 2011-12.
     - The government has not released official estimates based on the 2022-23 survey, leading to conflicting poverty estimates from NCAER (below 10%) and SBI (under 5%).
     - **Methodology to adjust poverty line**: Consumer Price Index (CPI).
   - **Issues with CPI:** Uses outdated weights and fails to reflect the consumption patterns of the poor.
   - **Associated committees:**
     - **Tendulkar Committee (2009)**: Tendulkar Committee's methodology set the poverty line at Rs 1,632 for rural areas and Rs 1,944 for urban areas and poverty ratio at 21.9%.
     - **Rangarajan Committee (2014)**: Rangarajan Committee, reviewed the Tendulkar method, proposed a different approach, estimating the poverty ratio at 29.5% for 2011-12
       ✓ Though this estimate was never officially approved by the government.
4. **Hydroclimate whiplash:** Los Angeles wildfire was intensified due to hydroclimate whiplash.
   - **About:** Hydroclimate whiplash refers to **rapid and extreme swings** between **wet and dry weather conditions**.

- This phenomenon is becoming more **frequent and intense** due to climate change.
- **Causes:** It is driven by a combination of changing **atmospheric circulation patterns** and warming temperatures, which intensify weather extremes.
- **Global Trend:** Hydroclimate whiplash events have increased by 31% to 66% worldwide since the mid-20th century, with projections of a further rise as global temperatures increase.
- **California Context**: In California, wet periods promote dense vegetation growth, followed by prolonged droughts that dry out the vegetation, turning it into fuel for wildfires.
- **Wildfire Link**: The dry phases, combined with conditions like low humidity, lack of precipitation, and high temperatures, exacerbate the risk of intense wildfires.
- **Role of Santa Ana Winds:** These dry, warm winds descending from the mountains amplify wildfire intensity, especially during drought conditions.

5. **Blood Money**: Recently, nurse Nimisha Priya's Yemen death sentence sparked debates on acquittal, repatriation, and blood money.
   - **About:** Blood money, or **diyah**, is compensation paid by a perpetrator to the victim or their family in cases of murder or unintentional homicide under Islamic law.
   - **Objective:** The aim is to alleviate the suffering of the victim's family and provide financial support, rather than to assign a monetary value to human life.
   - **Legal Framework:** Rooted in Sharia law, diyah allows victims' families to choose compensation over retributive justice (qisas).
   - **Compensation Factors**: The amount varies based on the victim's gender, age, and social status, with traditional disparities existing (e.g., a woman's diyah is often half that of a man's).
   - **Judicial Role**: Sharia courts typically oversee the determination of diyah amounts, ensuring fairness through negotiation and assessment of circumstances.
   - **Contemporary Practice**: Countries like Saudi Arabia and Iran have specific regulations for diyah.
   - **India's stand on blood money:** India **does not formally recognize diya (blood money)** in its legal system.

- Instead, it has provisions for plea bargaining, allowing negotiated concessions between the accused and prosecution.

6. **Semi-Dirac fermions**: Recently, scientists discovered semi-Dirac fermions, a unique **quasiparticle** in the topological metal ZrSiS in a groundbreaking study.
   - **About:** It is a type of quasiparticle that exhibits mass when moving in **one direction but not in a perpendicular direction**.
     - Similar to a train—free in one direction but constrained in another when changing tracks.
   - **Discovery**: Recently observed in **ZrSiS crystals,** a topological semimetal, under **low temperatures** and strong magnetic fields.
   - **Mass Behavior**: Exhibit directional mass properties—massless horizontally and massive vertically.
   - **Energy Dispersion**: Energy changes from **quadratic to linear** based on motion direction, distinguishing them from regular fermions.
   - **Potential Applications**: Could enhance **electronics, quantum computing**, and **sensors** due to their unique characteristics.
   - **Research Implications**: Opens new avenues for **studying quantum phenomena and material science**.
   - **Quasiparticle**:
     - It is a **weakly interacting entity** that emerges from the **strong interactions between particles** in a system, such as in a solid, where it behaves like a particle with a finite lifetime due to its approximate nature.
     - These are **not actual particles** like **electrons or protons**, but rather **collective excitations** that behave like particles within a material.
7. **INS Surat, INS Nilgiri & INS Vaghsheer:** Recently, the Prime Minister commissioned three frontline naval combatants—INS Surat, INS Nilgiri, and INS Vaghsheer, dedicating them to the nation at the Naval Dockyard in Mumbai.
   - **About:** These are advanced **Indian Navy warships** that enhance maritime capabilities with modern technology.

- **INS Surat**: It is the fourth and final ship of the **P15B Guided Missile Destroyer Project**, ranks among the largest and most sophisticated destroyers in the world.
  - It has an **indigenous content of 75%** and is equipped with state-of-the-art weapon-sensor packages and advanced network-centric capabilities.
- **INS Nilgiri:** It is the first ship of the **P17A Stealth Frigate Project.**
  - It has been designed by the Indian **Navy's Warship Design Bureau** and incorporates advanced features for enhanced survivability, seakeeping, and stealth, reflecting the next generation of indigenous frigates.
- **INS Vaghsheer**: It is the **sixth and final submarine** of the **P75 Scorpene Project.**
  - It represents India's growing expertise in submarine construction and has been constructed in collaboration with the **Naval Group of France.**
- **Significance:** The commissioning of three major naval combatants marks a significant leap forward in realizing India's vision of becoming a **global leader in defence manufacturing** and maritime security.

8. **Ladakh Land Policy Proposals**: The Ministry of Home Affairs (MHA) is considering a proposal to regularize government-owned wasteland in Ladakh in the names of local residents who have been cultivating or using these lands.
   - **About:** The practice of cultivating wasteland, **known as 'Nautor'**, dates back to a 1932 rule by the then King of Jammu and Kashmir, Hari Singh.
   - **Reservation of seats**: Ladakh leaders have agreed to a domicile policy where 95% of government jobs will be reserved for permanent residents
   - **Extension of domicile cut-off:** Ladakh leaders have requested an extension of the domicile cut-off from 15 to 20 years.
   - **Inclusion in 6th schedule**: Discussions on major demands including Ladakh's inclusion under the Sixth Schedule and Restoration of statehood with a Legislative Assembly.
     - **6th schedule**: The Sixth Schedule of the Indian Constitution aims to protect tribal areas in northeastern states (Assam, Meghalaya, Tripura, and Mizoram), safeguard tribal land and resources, and preserve the cultural and social identities of tribal communities.