

7. Short News

1. Emerging Science, Technology and Innovation Conclave (ESTIC) 2025

What it is – A national meeting in New Delhi connecting scientists, industries, and policymakers to boost innovation.

6G Research Initiatives –

100 5G Labs – Established across India to serve as testbeds for developing 6G prototypes.

Bharat 6G Alliance – Signed 10 international partnerships to boost global R&D.

Vision 2030 – India aims to hold 10% of all global 6G patents by 2030.

5G vs. 6G –

5G – Offers speeds up to **10 Gbps** (supports IoT and smart cities).

6G – Aims for speeds up to **1 Tbps** (will enable things like holographic communication by integrating AI and quantum communication).

2. Syro-Malabar Church

Context – PM Modi met the Church's head, Major Archbishop Mar Raphael Thattil, in New Delhi.

Origin – Traces its history to St. Thomas the Apostle, who is believed to have come to India between 42 and 72 AD.

Present Status – It is one of India's three Eastern Catholic Churches, mainly based in Kerala, and is in allegiance with the Pope in Rome.

Significance – The meeting recognized the Church's contribution to education, social welfare, and interfaith harmony.

3. 'Atomic Stencils' for Designer Nanoparticles

Context – Scientists from the U.S. and South Korea developed a new method called "atomic stencilling."

What it is – It uses iodide atoms as a microscopic "mask" (like an artist's stencil) on gold nanoparticles.

How it works –

1. The iodide atoms stick to specific parts of the nanoparticle.
2. Polymers (long molecules) are added and only attach to the *unmasked* regions.

Result – This creates precisely patterned "patchy nanoparticles" (over 20 types) that can self-assemble into ordered 3D structures.

Applications – Designing "metamaterials" (to manipulate light/sound), targeted drug delivery, and smart materials.

4. Quantum-Safe Communication Network

Context – QNu Labs (a Bengaluru startup) successfully demonstrated India's first large-scale Quantum Key Distribution (QKD) network.

What is QKD – A technology that uses quantum particles to exchange encryption keys, making data security "unbreakable."

The Project – A 500 km quantum-safe network was set up using existing optical fiber. It was tested in partnership with the Indian Army's Southern Command. The project was funded under the National Mission on Interdisciplinary Cyber-Physical Systems (NMICPS).

Significance – This strengthens India's cybersecurity against future quantum computing attacks.

5. World Inequality Database

Context – A new report, commissioned by the G20 (led by Nobel laureate Joseph Stiglitz), was released.

Key Finding (India) – India's richest 1% now own 62% of the nation's total wealth (up from 2000–2023).

Key Finding (Global) – The world's top 1% control 41% of total wealth.

Concern – The report warns that inequality has reached "emergency levels," threatening democracy and economic stability.

Recommendation – It proposes creating an International Panel on Inequality (IPI) to monitor trends and guide policy.

6. Luxembourg

Context - India and Luxembourg agreed to increase cooperation in space and technology.

Goal - To help Indian space start-ups enter European markets.

About Luxembourg - A small, landlocked country in northwestern Europe. It is bordered by Belgium, France, and Germany. The northern region (Oesling) is part of the Ardennes Mountains.

7. "Operation White Cauldron"

Context - The Directorate of Revenue Intelligence (DRI) busted a multi-state drug network and a hidden factory in Valsad, Gujarat.

What it Targeted - The illegal manufacturing of Alprazolam.

About Alprazolam - A psychotropic drug (benzodiazepine) regulated under the NDPS Act, 1985.

Legal Use - Prescribed to treat anxiety and panic disorders.

Illegal Use - Misused for its euphoric and calming effects.

Health Impact - Misuse can lead to dependence, addiction, respiratory depression, and overdose.

8. Khangchendzonga National Park

Context - The IUCN rated the park as "good" in its global review of natural World Heritage Sites.

Significance - It is the only Indian park to receive this positive rating (sites like the Western Ghats and Sundarbans face "serious concerns").

Why it was rated "good" - Effective conservation, strong community participation, minimal human disturbance, and good disaster preparedness.

About the Park - Located in Sikkim. India's first "mixed" (natural and cultural) UNESCO World Heritage Site (2016).

Features - Home to Mount Khangchendzonga (8,586 m), glaciers, lakes, snow leopards, and red pandas.

Cultural - It is a sacred landscape for Lepcha and Tibetan Buddhist communities.

9. Project Suncatcher

Google has launched Project Suncatcher to test the feasibility of running AI data centers in space. The project plans to use a constellation of satellites equipped with Google's custom Tensor Processing Unit (TPU) chips (processors designed for AI). These satellites will be solar-powered and will use free-space optical communication (lasers) to relay data between themselves and back to Earth. The initial phase involves launching two prototype satellites by early 2027 to test how the TPUs operate in orbit.

10. GW250114 & Hawking's Law

The LIGO-Virgo-KAGRA network (detectors in the U.S., Italy, and Japan) detected GW250114. This signal is the clearest gravitational wave signal ever recorded from a black hole merger, which occurred 1.3 billion light-years away. Gravitational waves are ripples in spacetime caused by massive events, like colliding black holes, and were first predicted by Einstein and first detected in 2015. The GW250114 detection provided the first strong, direct evidence supporting Stephen Hawking's black-hole area theorem (from 1971). Hawking's theorem states that the total surface area of black holes' event horizons can never decrease over time. This observation confirmed that the surface area of the new, merged black hole was greater than the sum of the two original black holes. The signal also helped confirm Roy Kerr's 1963 solution for how rotating black holes behave.