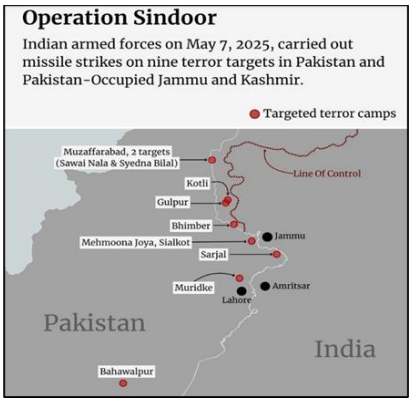
OPERATION SINDOOR

India successfully conducted Operation Sindoor, a joint military operation involving the Army, Navy, and Air Force, targeting terrorist camps at nine locations in Pakistan and Pakistan-occupied Kashmir (PoK).

The strikes were a response to the April 22 terrorist attack in Pahalgam, attributed to ISI-backed militant groups. Precision munitions were used to hit four targets in Pakistan (Bahawalpur, Muridke, Sialkot, Sarjal) and five in PoK, with the objective of dismantling terrorist infrastructure operating with impunity.



Purpose Behind Target Selection

- The targets were chosen to **dismantle anti-India terrorist infrastructure** linked to groups actively engaged in cross-border terrorism.
- **Involvement of Proscribed Terror Groups**
  - The sites were connected to banned outfits such as Lashkar-e-Taiba (LeT), Jaish-e-Mohammad (JeM), and Hizbul Mujahideen (HM), which are known to receive direct support from Pakistan's military and intelligence agencies.
- **Nature of Terrorist Facilities**
  - These groups operate from training camps (Markaz) and launch pads, often concealed within government-run buildings.
    - Launch pads: Used for infiltration staging and arms training.
    - Larger camps: Serve purposes like religious indoctrination, propaganda, logistics, and recruitment.

Key Signals from Operation Sindoor

- **Redefining the Causal Link Between Pakistan and Terrorism**
  - India framed Operation Sindoor as a response not just to the recent Pahalgam attack, but to a two-decade-long pattern of Pakistan-sponsored terrorism since the 2001 Parliament attack.
- **Targeting Terror, Not the Pakistani Military**
  - India continues its doctrine of hitting terrorist infrastructure without targeting Pakistan's conventional military.
- **Calibrated Action with Strategic Restraint**
  - India emphasized Sindoor was "focused, measured, and non-escalatory", showing **it does not seek full-scale war**.

What Makes Operation Sindoor Different

- **Unprecedented Scale and Reach**
  - Unlike Balakot (2019) and Uri (2016), which targeted one or few sites, Sindoor reflects a massive, coordinated offensive.
- **Wider Target Spectrum and Deep Strikes**
  - India signaled that no part of Pakistan is off-limits, targeting deep inside the Pakistani heartland.
- **Tri-Services Coordination and Advanced Weaponry**
  - Indian Army, Navy, and Air Force all took part, demonstrating joint operational strength.
- **Strategic Red Line Shift**
  - India refrained from hitting Pakistani military installations to avoid conventional escalation, but the depth and scale of the strikes clearly altered the red line.
- **Symbolic Naming, Human-Centric Messaging**
  - Named "Sindoor" to honour the victims of the Pahalgam attack, particularly widows of the 26 slain.

PRECISION GUIDED LONG RANGE WEAPONS IN INDIAN MILITARY'S ARSENAL

Precision Guided Munitions (PGMs)

- PGMs, also called smart weapons or smart bombs, are missiles or bombs designed to accurately strike specific targets while minimizing collateral damage.
- **Key Features of PGMs**
    - **Advanced Guidance Systems**: PGMs use GPS, laser guidance, infrared sensors, or radar to track and hit targets precisely.
    - **Mid-Flight Course Corrections**: They can adjust their trajectory mid-air to account for weather, wind, or targeting errors.
    - **Reduced Collateral Damage**: By targeting with precision, PGMs limit harm to civilians and nearby infrastructure.
    - **Increased Accuracy**: They offer greater accuracy than unguided munitions, with a much smaller margin of error.
    - **Versatile Deployment**: PGMs can be launched from aircraft, ships, ground platforms, or UAVs, enhancing their operational flexibility.

Cutting-Edge Precision Weapons in India's Military Arsenal

- The Indian Air Force (IAF) deployed Rafale jets, which used SCALP missiles for deep strikes and HAMMER missiles for medium-range precision targets.
- **HAMMER**
    - The **HAMMER (Highly Agile and Manoeuvrable Munition Extended Range)** is an air-to-ground precision-guided weapon system developed by Safran, a French aerospace and defence company.
- **SCALP**
    - SCALP-EG (Système de Croisière Autonome à Longue Portée — Emploi Général), also known as Storm Shadow in the UK, is an air-launched cruise missile designed for long-range deep strike missions with stealth features.
- **METEOR: Next-Gen Air-to-Air Superiority**

- The Meteor is a Beyond Visual Range Air-to-Air Missile (BVRAAM) developed by MBDA, effective even in dense electronic warfare environments.
- It uses a solid-fuel 'ramjet' motor, providing continuous thrust and enabling the largest 'No Escape Zone' among air-to-air missile systems.

- **BRAHMOS: India's Supersonic Cruise Power**
  - The BrahMos is a supersonic cruise missile jointly developed by India's DRDO and Russia's NPO Mashinostroyeniya, and is operational in all three Indian defence services.
  - It operates at speeds close to Mach 3, ensuring faster target engagement, low dispersion, and minimal interception risk.

IMDEX ASIA 2025

INS Kiltan, an Indian Naval Ship, arrived in Singapore to participate in IMDEX Asia 2025, held at the Changi Exhibition Centre.

- **IMDEX Asia** is a **premier maritime and defence exhibition** in the Asia-Pacific region, held biennially in Singapore since its inception in 1997.
- It serves as a global platform for navies, coast guards, and maritime defence industries to:
  - Showcase naval platforms and systems
  - Debut cutting-edge maritime technologies
  - Engage in high-level policy and strategic dialogue
- The **International Maritime Security Conference (IMSC)** is a key part of IMDEX.
  - It was **established in 2009**.
  - **Jointly organised** by the **Republic of Singapore Navy (RSN)** and the **Rajaratnam School of International Studies (RSIS)**.
  - It brings together navy chiefs, coast guard heads, policymakers, strategic analysts, and maritime stakeholders.
  - The conference focuses on enhancing mutual security.

INDIA'S EXPANDING SPACE VISION: FROM EMPOWERMENT TO INTERPLANETARY EXPLORATION

- PM Modi has outlined an ambitious future for India's space programme, reaffirming the country's rising role in both global scientific exploration and domestic empowerment.
- In his address to the **Global Space Exploration Conference** (GLEX) 2025, PM Modi emphasized that India's space efforts are not about competition, but about "reaching higher together", driven by the spirit of collective growth, technological advancement, and service to humanity.

Space as a Catalyst for Empowerment

- PM Modi asserted that **space exploration in India has a dual purpose, scientific progress and citizen empowerment**.
- From providing alerts to fishermen to enabling the Gati Shakti logistics platform and enhancing railway safety and weather forecasting, Indian satellites have been actively improving governance and the everyday lives of citizens.
- He added that India's space infrastructure supports socio-economic transformation, showcasing space not merely as a frontier of science, but as a driver of inclusive development.
- Highlighting this, PM Modi said India's rockets don't just carry payloads but "the dreams of 1.4 billion Indians."

A Legacy of Achievements

- **India's space journey began modestly with a small rocket launch in 1963**. Since then, the country has reached several significant milestones:
    - India became the first country to land near the lunar South Pole with Chandrayaan-3 in 2023.
    - Chandrayaan-1 helped discover water on the Moon.
    - Chandrayaan-2 produced the highest resolution images of the Moon.

- In 2014, India became the first country to reach Mars in its maiden attempt with the Mangalyaan mission.

- India has also demonstrated engineering excellence by:
  - Building cryogenic engines in record time.
  - Launching 100 satellites in a single mission.
  - Sending more than 400 satellites for 34 countries.
  - Achieving satellite docking in space, a step forward for human spaceflight capability.

The Road Ahead: Moon, Mars, Venus

- Looking toward the future, PM Modi announced a clear and ambitious roadmap:
  - **By 2025**: India will send astronaut Shubhanshu Shukla on a 14-day joint ISRO-NASA mission to the International Space Station under the Axiom-4 mission.
  - **By 2035**: India will establish the **Bharatiya Antariksha Station**, opening new frontiers in research and international collaboration.
  - **By 2040**: Indian astronauts will set foot on the Moon. Mars and Venus are also part of ISRO's future planetary exploration agenda.
- These goals reaffirm India's commitment to bold, long-term space ambitions, rooted in both national pride and global cooperation.

Strategic Diplomacy Through Space

- India's commitment to using space for diplomacy and regional cooperation was also emphasized.
- After launching satellites for South Asian countries, the upcoming **G20 Satellite Mission**, announced during India's G20 presidency, will be a symbolic and practical gift to the Global South.
- This aligns with India's broader vision of sharing scientific progress to address shared global challenges and strengthen multilateralism.

KOSMOS 482

- **Kosmos 482** is a **Soviet-era Venus lander**, launched on **March 31, 1972** as part of the **Venera space programme**.
- It was meant to land on **Venus**, but a rocket's upper stage malfunction left it stranded in Earth orbit.
- After more than **50 years in space**, a **500-kg lander module** is expected to make an **uncontrolled re-entry** into Earth's atmosphere around **May 10, 2025**.

What went wrong with Kosmos 482?

- The **upper stage of the launch vehicle** shut down prematurely due to a **timer malfunction**.
- This prevented the spacecraft from **escaping Earth's gravity** and sent it into a **low Earth orbit**
- The **main spacecraft** eventually **burned up** in the atmosphere, but the **lander module** continued orbiting.

About the Venera Programme

- The **Venera programme** (1961–1984) was a Soviet interplanetary mission series aimed at exploring Venus.
- It launched 28 probes, of which 13 entered Venus's atmosphere and 10 landed on the surface.
- **Venera 8**, the **twin of Kosmos 482**, successfully landed on Venus in 1972 and transmitted data for 50 minutes.
- Venus conditions: Surface temperature ~462°C and pressure ~92 times Earth's.

KEY FACTS ABOUT SNOW LEOPARD

- It is a **medium-sized big** cat that resides in the rugged terrains of **Central and South Asia.** Scientific Name: Panthera uncia
- Despite a **range of over 2 million sq.km.**, scientists estimate that there may only be between 3,920 and 6,390 snow leopards left in the wild.
- As they are **rarely spotted,** they are generally known as the **'ghost of the mountains'.**

Distribution:

- The snow leopard inhabits the **mountains of central Asia and the Indian subcontinent,** ranging from an elevation of about 1,800 metres (about 6,000 feet) in the winter to about 5,500 metres (18,000 feet) in the summer.
- They are found in **12 countries,** including **China, Bhutan, Nepal, India, Pakistan, Russia**, and Mongolia.
- **In India**, they can be largely found in the high-altitude cold, arid, and rugged terrains of **Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim** and **Arunachal Pradesh.**

- **Features:**
  - The snow leopard's **pale grey fur** is marked with dark rosettes, serving as camouflage against rocky terrains.
  - The **undercoat is dense and insulating**, which protects it from the harsh temperatures.
  - It reaches a length of about 7 feet (2.1 meters). The adult snow leopard stands about 2 feet (0.6 meter) high at the shoulder and weighs 60–120 pounds (27–54 kilograms). Males are typically larger than females.
  - The snow leopard is **generally solitary and lives alone.**
- **Conservation status:**
  - **IUCN Red List: Vulnerable**
  - Wildlife (Protection) Act 1972: Schedule I

WHAT ARE THE PIPRAHWA GEMS?

Buddhist scholars and monks from around the world expressed concerns over the auction of ancient Piprahwa Gems which they say were widely considered to be imbued with the presence of the Buddha.

- The Piprahwa Gems denote the cache of **jewels discovered** interred **in a stupa, or burial monument, in Piprahwa,** located in **present-day Uttar Pradesh.**
- According to an inscription carved into one of the reliquaries, the stupa contained the remains of the Buddha himself.
- The gems were believed to have been **combined with some of the cremated remains of the Buddha,** who died around **480 BC.**
- They were **excavated by William Claxton Peppe**, a British colonial engineer, after excavating part of his estate in 1898. The site was the **first credible find of the Buddha's relics in modern times**.
- The **British crown claimed Peppé's** discovery under the 1878 Indian Treasure Trove Act, and the **bone and ash fragments** were **gifted by the British to King Chulalongkorn of Siam, now Thailand.**
- The Piprahwa gems include amethysts, coral, garnets, pearls, rock crystals, shells, and gold, either worked into pendants, beads, and other ornaments, or in their natural form.
- Most of the 1,800 gems went to what is now the Indian Museum in Kolkata.
- But **Peppe was permitted to retain about a fifth** of them, some of which were described as "duplicates" by British colonial administrators at the time.