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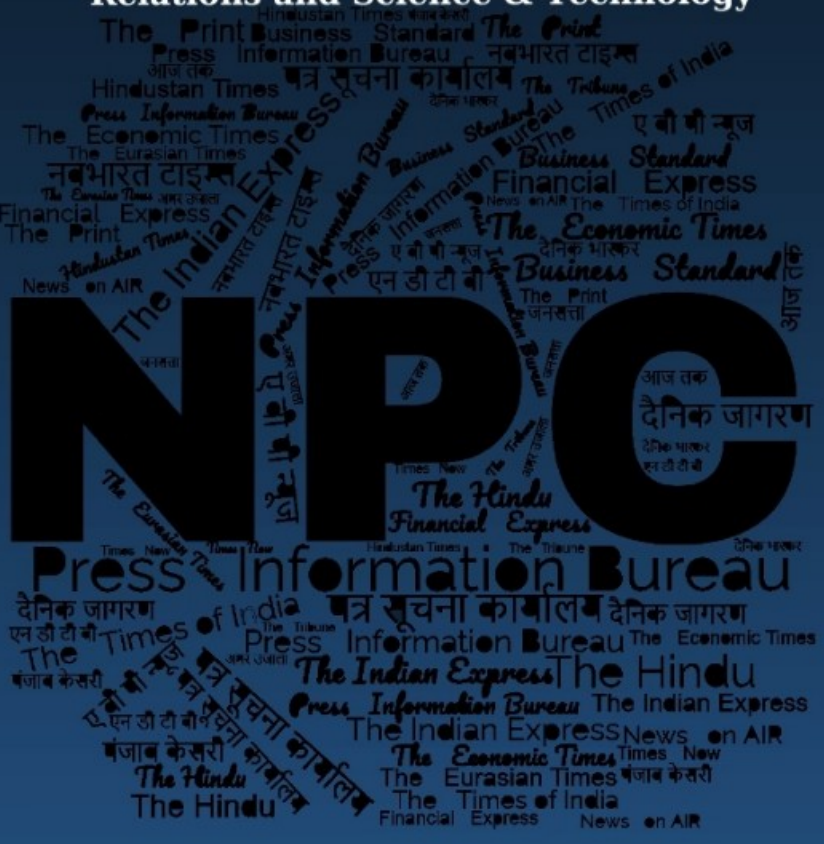
समाचार पत्रों से चयनित अंश

Newspapers Clippings

डीआरडीओ समुदाय को डीआरडीओ प्रौद्योगिकियों, रक्षा प्रौद्योगिकियों, रक्षा नीतियों, अंतर्राष्ट्रीय संबंधों और विज्ञान एवं प्रौद्योगिकी की नूतन जानकारी से अवगत कराने हेतु दैनिक सेवा

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology



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300 kW की शक्ति, 20 KM रेंज... भारत का 'Surya Weapon' दिखाएगा जलवा, 2027 तक हो जाएगा तैयार!

Source: Zee Bharat, Dt. 08 Apr 2025,
URL: https://zeenews.india.com/hindi/zee-hindustan/national/india-drdo-planning-to-develop-surya-directed-energy-weapon-for-know-its-power-and-features/2709746

भारत अपने रक्षा क्षेत्र में नए–नए कदम बढ़ा रहा है. आधुनिक तकनीक का इस्तेमाल कर ऐसे–ऐसे हथियार बनाए जा रहे हैं, जिन्हें दुनिया ने ना तो पहले देखा और ना ही इनके बारे में सुना होगा.

इसी कड़ी में आगे बढ़ते हुए अब भारत के रक्षा अनुसंधान और विकास संगठन (DRDO) एक डायरेक्टेड एनर्जी वेपन (DEW) विकसित कर रहा है. इस हथियार का नाम 'सूर्या' रखा गया है.

Surya Weapon क्या है?

सूर्या एक डायरेक्टेड एनर्जी वेपन (DEW) है. DEW ऐसी तकनीक है जो केंद्रित ऊर्जा, जैसे– लेजर, माइक्रोवेव या पार्टिकल बीम का उपयोग करके टारगेट का खात्मा करती है या उसे निष्क्रिय करती है.

सूर्या वेपन भी इसी तकनीक से बना होगा. ऐसा माना जा रहा है कि यह हथियार भारत का अब तक का सबसे ताकतवर DEW होने वाला है. DRDO ने दावा किया है कि 'सूर्या वेपन' पारंपरिक हथियारों के मुकाबले कई गुना अधिक फायदे देगा.

सूर्या हथियार में क्या खासियत?

सूर्या हथियार में 300 किलोवाट की शक्ति होगी, जो भारत के अब तक के किसी DEW में नहीं है. यह खास हथियार हवाई खतरों जैसे– ड्रोन, रॉकेट और मिसाइलों को टारगेट कर सकेगा.

इसकी प्रभावी रेंज 20 किलोमीटर के आसपास रहने वाली है. इस हथियार को ऑपरेट करने की कॉस्ट कम रहने वाली है. इसका Collateral Damage भी बेहद कम होता है.

2027 तक तैयार करने का लक्ष्य

सूर्या वेपन को बनाने के लिए DRDO की लेजर साइंस एंड टेक्नोलॉजी सेंटर (LASTEC) जैसी प्रयोगशालाएं अहम भूमिका निभा रही हैं. इसके अलावा, प्राइवेट सेक्टर की कंपनियों के साथ भी साझेदारी करने की योजना है.

DRDO ने 2027 तक इस डायरेक्टेड एनर्जी वेपन को बनाने का लक्ष्य रखा है. यह भारत को तकनीकी रूप से न केवल बाकी देशों के बराबर लाकर खड़ा करेगा, बल्कि कुछ देशों से आगे भी निकल सकता है.

दुनिया के बाकी देश भी बना रहे ऐसे वेपन

भारत से पहले ही कुछ देश DEW तकनीक की ओर कदम बढ़ा चुके हैं. अमेरिका 100 kW तक के लेजर हथियारों पर काम कर रहा है, जो ड्रोन और मिसाइलों को नष्ट करने में सक्षम होंगे.

चीन भी हाई एनर्जी लेजर और माइक्रोवेव हथियारों पर रिसर्च कर रहा है. इजरायल 'आयरन बीम' जैसे सिस्टम डेवलप कर रहा है, जो 100 kW की शक्ति के साथ छोटी रेंज के खतरों को रोक सकेगा.रूस भी 'पेरेस्वेट' लेजर सिस्टम बना रहा है, जो सैटेलाइट्स तक को टारगेट कर सकेगा.

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Defence News

Defence Strategic: National/International

Defence Secretary highlights role of integrated financial advisors in driving transparency; Lauds Defence Accounts Department's tech-driven reforms

Source: Press Information Bureau, Dt. 08 Apr 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2120203

Defence Secretary Shri Rajesh Kumar Singh lauded the role of Integrated Financial Advisors (IFA) as crucial enablers of transparency, accountability and responsiveness in defence financial system, while addressing a two day Integrated Financial Advisors Conference 2025, organised by Defence Accounts Department (DAD), Ministry of Defence (MoD), from April 03-04, 2025, in Hampi, Karnataka. He highlighted Raksha Mantri Shri Rajnath Singh's directive for DAD to become a Centre of Excellence in Defence Finance & Economics, calling for research-based policy inputs, cost-benefit analysis in procurement, and AI-driven financial analytics.

The Defence Secretary emphasized strengthening outcome-oriented mechanisms, promoting emerging technologies, and foster collaboration across the departments to enhance operational efficiency. He noted that DAD achieved 100% capital budget utilization in 2024–25, which was a first in the last five years. He also highlighted the importance of Project SAMPURNA (System Automation for Procurement, Payment and Uniform Raksha Accounting), which integrates AI, Machine Learning, and Data Science into financial management ushering in a new era of automation and efficiency.

The conference featured six focused business sessions under which the role of financial advisors was highlighted to enhance capital acquisition outcomes, multifaceted challenges confronting the recently implemented IFA system in Military Engineer Services and the prospective pathways for their resolution, complexities associated with the Army Commander Special Financial Powers & merits and potential challenges of outsourcing in the defence sector.

Shri S.G. Dastidar, Financial Advisor (Defence Services), in his inaugural address highlighted the expansion of the IFA system amid growing defence capabilities and greater delegation of financial

powers to Service Headquarters and lower levels. Emphasizing Aatmanirbharta, he called for standardized procedures, better data systems, and stronger coordination between IFAs and CDAs to enhance financial efficiency. Dr. Mayank Sharma, CGDA, talked about the changing role of financial advisors and highlighted Project SAMPURNA.

Senior officials from the MoD and DAD, along with Principal Integrated Financial Advisors and Integrated Financial Advisors from across the country, participated in the conference.

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Raksha Mantri Shri Rajnath Singh holds meeting with Crown Prince of Dubai and UAE Deputy PM & Defence Minister Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum in New Delhi

Source: Press Information Bureau, Dt. 08 Apr 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2120093

Raksha Mantri Shri Rajnath Singh held a meeting with the Crown Prince of Dubai and Deputy Prime Minister & Minister of Defence of UAE Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum at South Block, New Delhi on April 08, 2025. The two leaders expressed happiness on the current defence cooperation through institutional mechanisms, military exercises, exchange of training programmes etc.

Both the Ministers acknowledged that defence cooperation needs to be scaled up to match the progress made in other areas such as trade and business, in line with the vision and determination of the two leaders - Prime Minister Shri Narendra Modi and President of UAE Sheikh Mohamed bin Zayed Al Nahyan. They identified training exchanges as one of the key areas of defence cooperation which would enable understanding of each other’s defence ecosystems and accelerate strengthening of bilateral defence ties.

The two leaders expressed satisfaction on the active Coast Guard-to-Coast Guard cooperation and committed to further deepen it by formalising the same through an MoU. They were convinced

that close collaboration between the defence industries should be an integral part of the bilateral cooperation. They emphasised on increasing defence industry collaboration and discussed opportunities for enhancing partnership in defence manufacturing.

Both the Ministers acknowledged active participation from the two sides in each other's exhibitions & defence expos, and welcomed India-UAE Defence Partnership Forum which has the potential to result in strategic Joint Ventures and co-production projects benefiting both countries. They also agreed to focus on complementarities for the two countries in the Make-in-India and Make-in-Emirates initiatives.

Through a post on X after the meeting, Raksha Mantri stated that the Comprehensive Strategic Partnership with the UAE is of immense priority for India. "In the coming years, we are eager to work closely in areas such as defence cooperation, co-production and co-development projects, innovation and technology. Both India and the UAE are committed to work towards peace and prosperity in the region," he added.

The Defence Cooperation MoU with the UAE was signed in 2003, and an MoU on Defence Industry Cooperation was signed in 2017. India and the UAE have strong bonds of friendship based on centuries-old cultural and economic ties.

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J-K: Army Chief Gen Upendra Dwivedi visits Srinagar to assess security situation, operational readiness

Source: The Economic Times, Dt. 08 Apr 2025,
URL: https://economictimes.indiatimes.com/news/defence/j-k-army-chief-gen-upendra-dwivedi-visits-srinagar-to-assess-security-situation-operational-readiness/articleshow/120081937.cms

Chief of Army Staff (COAS) General Upendra Dwivedi visited Srinagar to assess the prevailing security situation and operational readiness of the forces and held discussions on wide-ranging issues over the current security scenario, as per an official statement from the Indian Army.

During his visit, General Dwivedi was provided with a detailed briefing by the Chinar Corps Commander, who outlined the latest developments and operational updates from the region.

The Army Chief also held discussions with the formation commander, covering a range of topics related to the ongoing security challenges and the overall security landscape, the statement added.

The visit is part of the Army's ongoing efforts to maintain high operational standards and ensure that the forces are well-equipped to handle any security threats in the region.

The Indian Army continues to remain vigilant and responsive to evolving security dynamics in Jammu and Kashmir, with leadership regularly engaging with operational units to ensure coordination and effectiveness in maintaining peace and stability.

Earlier a week ago, COAS General Upendra Dwivedi underscored the need for jointness & integration among the Armed Forces amid the evolving nature of warfare.

The COAS highlighted the evolving nature of warfare, the strategic challenges facing India and the need for jointness and synergy among the armed forces while addressing the student officers from the Indian Armed Forces undergoing the 80th Staff Course and the permanent staff at Defence Services Staff College, Wellington.

The COAS underscored the significance of leadership, adaptability and technological integration in modern warfare and urged officers to remain proactive in their approach to emerging security threats and to embrace innovation in military planning and operations.

Gen Dwivedi was briefed by Commandant DSSC Lt Gen Virendra Vats on the adaptation of the Staff Course curriculum to align to the challenges of Future Wars, with special reference to the activities of the first Deep Purple Division, wherein 40 tri-services officers have undergone their training.

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Navy chief Admiral Dinesh K Tripathi directs commanders to focus on 7 specific areas

Source: The Economic Times, Dt. 08 Apr 2025,
URL: https://economictimes.indiatimes.com/news/defence/navy-chief-admiral-dinesh-k-tripathi-directs-commanders-to-focus-on-7-specific-areas/articleshow/120096426.cms

Navy Chief Admiral Dinesh K Tripathi has directed naval commanders to focus on seven key areas including war fighting and combat efficiency, fleet maintenance and operational logistics, integration of new technologies and synergy with other agencies. In his remarks at the Navy Commanders' Conference, Admiral Tripathi also asked them to ensure operational and organisational "agility" and a balanced workforce development programme.

The first phase of the conference took place at Karwar base in Karnataka on April 5 while the second and final phase is being held in the national capital from April 7 to 10.

The Navy commanders are learnt to have carried out a detailed review of the overall situation in the Indian Ocean, a region that has witnessed increasing Chinese activities.

In his address to the outstation operational and area commanders, and the staff of the command and naval headquarters, Admiral Tripathi commended the achievements of the Navy in maintaining a combat ready force through the conduct of successful operational exercises, higher operational availability of platforms and joint operations with the Indian Army and Indian Air Force, according to an official readout.

Highlighting the contribution to the domestic shipbuilding industry and increased culture of innovation and creativity, he laid emphasis on continued focus on adapting emerging technologies to build a "future ready" force.

"The Navy Chief reiterated the Indian Navy's obligation in the Indian Ocean Region in the emerging geopolitical scenario and importance of cohesive and credible approach by engaging in

multilateral and bilateral exercises and supporting littoral countries through activities such as 'Operation Brahma'," he said.

"The Chief of Naval Staff directed the staff to maintain focus on seven key areas -- war fighting and combat efficiency, force levels and capacity development, fleet maintenance and operational logistics, innovation and integration of new technologies, balanced workforce development, operational and organisational agility and synergy with other national agencies and stakeholders," the readout noted.

Foreign Secretary Vikram Misri also interacted with the naval commanders.

He spoke on the changing dynamics in the global order and its impact on wide ranging issues pertaining to international relations including the global security architecture.

The Navy chief released publications pertaining to the Indian Navy's operational data framework, space vision, naval aviation safety, and one-stop reference guide on retirement and life beyond the Navy, the readout by the Navy said.

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Tech adoption needed to be future-ready: Navy Chief

Source: The Tribune, Dt. 09 Apr 2025,
URL: https://www.tribuneindia.com/news/india/tech-adoption-needed-to-be-future-ready-navy-chief/

Indian Navy Chief Admiral DK Tripathi today laid out the direction of his force while focusing on adapting emerging technologies to build a ‘future-ready’ force.

Admiral Tripathi was addressing the ‘Naval commanders' conference’. This is the second phase of the conference; the first was held in Karwar on April 5 where Defence Minister Rajnath Singh addressed the conference.

The Indian Navy Chief also laid down seven focus areas, which included, among other aspects, ensuring combat efficiency, capacity development, maintenance, integration of new technologies and operational synergy with other national agencies and stakeholders.

Foreign Secretary Vikram Misri interacted with the Naval Commanders. He spoke on the changing dynamics in the global order and its impact on wide-ranging issues pertaining to international relations including the international security architecture.

The Navy Chief released publications pertaining to Indian Navy's operational data framework, space vision and naval aviation safety. The Navy ‘space vision 2025 – 40’ outlines the framework and roadmap over the next 15 years for utilisation of the full spectrum of the space-based capabilities in support of Naval Operations.

Another document outlines the vision of harnessing data as a strategic asset and leveraging it to generate operational insights.

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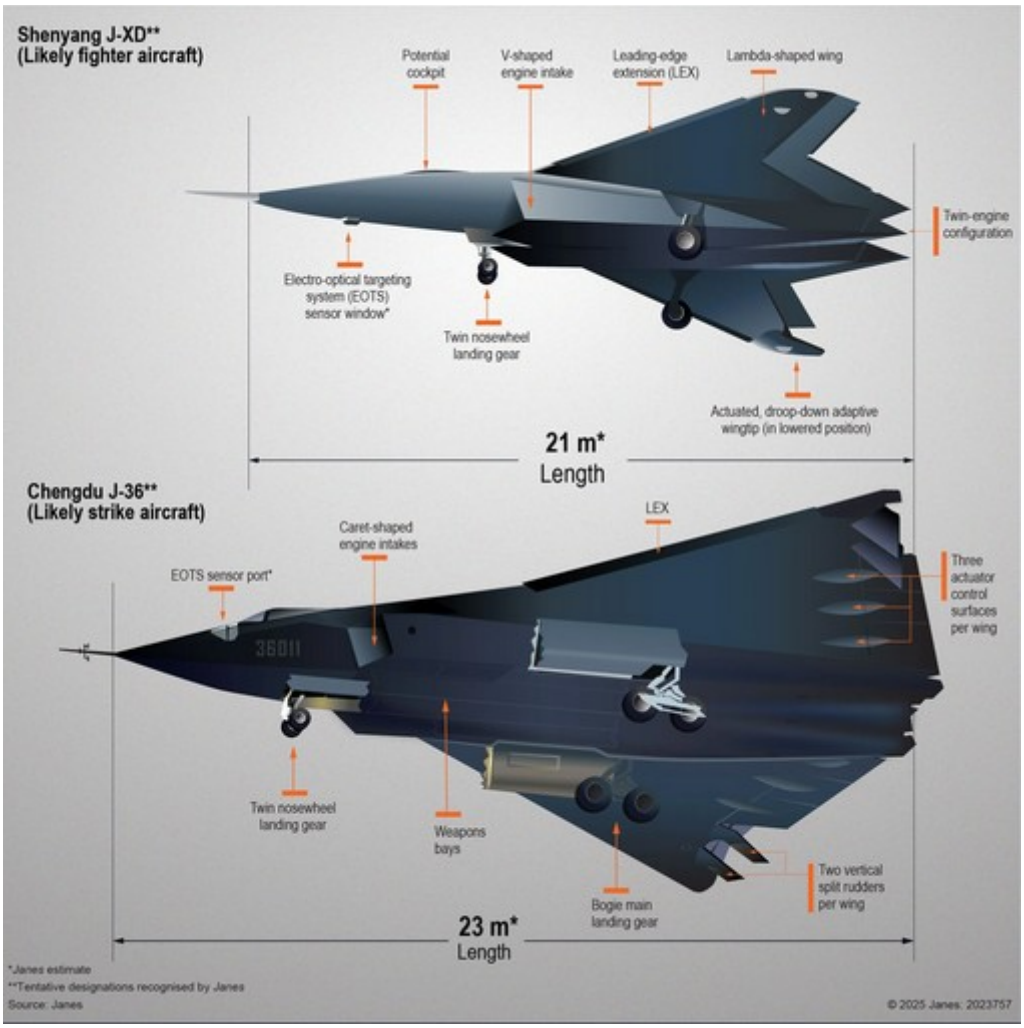
New imagery reveals additional details of China's tailless aircraft

Source: Janes, Dt. 08 Apr 2025,
URL: https://www.janes.com/osint-insights/defence-news/defence/new-imagery-reveals-additional-details-of-chinas-tailless-aircraft

New imagery of China's Shenyang J-XD and Chengdu J-36 tailless stealth aircraft have emerged, showing their design features in greater detail.



China's Shenyang J-XD and Chengdu J-36 tailless combat aircraft have been observed conducting flight tests since December 2024.

That the two aircraft were involved in flight-testing was first revealed in December 2024, following the emergence of video footage of the trials on Chinese social media. Since then the J-36 (a tentative designation) appears to have conducted additional flight tests. However, the J-XD was not publicly seen in the air again, until three new photographs of the aircraft and a video surfaced on Chinese social media in April.

One of the photographs shows the lower port side view of the aircraft, revealing the aircraft's landing gear and showing its engine intakes and lambda-shaped wing in greater detail as well. Also visible is the aircraft's control surfaces, including its actuated, droop-down adaptive wingtips.

This was the first known reappearance of the J-XD in the air since the type was spotted conducting a test flight over Shenyang city on 22 December 2024.

A second photograph of the aircraft shows that, unusually, only the adaptive wingtip on the starboard wing was lowered as the J-XD flew at low altitude along a glide path towards a runway. This indicates that the wingtips can be lowered independent of each other. The wingtips are likely an additional control surface to improve manoeuvrability at low speeds, Janes assesses.

The aircraft also appears to have lengthy differential leading-edge extensions (LEXs). The angle of the aircraft in the photographs, however, hinders Janes from assessing if the aircraft has upper surface spoilers or pitch, and yaw thrust vectoring controls.

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‘Talks underway to update Slovakia-India defence MoU’: Secy to Slovak Foreign Ministry

Source: The Indian Express, Dt. 09 Apr 2025,
URL: https://indianexpress.com/article/india/talks-underway-to-update-slovakia-india-defence-mou-secy-to-slovak-foreign-ministry-9933159/

Ahead of President Droupadi Murmu’s visit to the Slovak Republic on April 9 and 10, its Foreign Ministry’s State Secretary (equivalent to Minister of State) Rastislav Chovanec tells Shubhajit Roy that defence, trade and investments are areas in which the two countries can collaborate. During the visit, the first by a President of India to Slovakia in 29 years, Murmu will hold meetings with Slovak Republic’s President Peter Pellegrini and Prime Minister Robert Fico.

Edited excerpts:

What are the areas of cooperation that Slovakia is looking at in India?

Slovakia is committed to strengthening its partnership with India, with economic cooperation at the forefront of this relationship. Several Slovak companies have established a solid presence in India… .their notable contributions include environmental monitoring systems and upgrading meteorological infrastructure for the Indian Air Force, as well as developing biofuel plants and railway wagon manufacturing facilities.

Trade and investment efforts remain concentrated on core sectors like automotive manufacturing and machinery.

In defence, Slovakia offers reliable solutions in artillery systems, armoured vehicles, virtual reality simulators, cybersecurity and specialised training programmes. The modernisation of the existing defence cooperation and the establishment of a joint working group are expected to enhance strategic ties further.

In defence sector, what can the two countries do together?

Key areas of partnership include joint ventures, technology transfer and the co-development of advanced defence products. Slovakia is strengthening ties with India through specialised training programmes, such as pilot training with advanced simulators at Slovak Air Force bases and chemical, biological, radiological and nuclear (CBRN) preparedness at its Defence Training and Testing Centre. The existing MoU on defence serves as a solid framework for expanding strategic projects that align with shared security interests. Discussions are underway to update the MoU to address evolving priorities.

Slovakia's expertise in areas like defence electronics, precision engineering, and cybersecurity aligns well with India's modernisation goals under the "Make in India" initiative.

Slovakia came to India's attention during the evacuation of Indian students at the beginning of the Russia-Ukraine war. Did Slovakia's response lead to the positive momentum in the relations?

After the outbreak of war in Ukraine, Slovakia swiftly stepped up to assist Indian students seeking refuge. We opened our borders, ensured their safe passage and facilitated humanitarian support. Additionally, we organised and supported eight evacuation flights from Košice, successfully evacuating 1,414 Indian citizens to safety. This humanitarian effort was recognised at the highest level, with Indian Prime Minister Narendra Modi personally expressing his gratitude to Slovakia.

With the talks to end the war in Ukraine taking place in recent weeks, how does Slovakia view the road ahead?

Slovakia firmly believes that the war in Ukraine has no military solution. We strongly support ongoing talks aimed at achieving peace. At the same time, this conflict has been a stark reminder that Europe must enhance its defence capabilities.

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China's Expanding Radar Capabilities Pose Serious Threat To India's Missile Program; How Can New Delhi Respond?

Source: The EurAsian Times, Dt. 08 Apr 2025,
URL: https://www.eurasiantimes.com/indias-missile-program-espond/

China is making bold moves to dominate the radar and missile defense space, signaling a serious challenge to India's strategic edge in the region. In early April, the Gobi Desert echoed with the roar of 16 ballistic missiles launched by the People's Liberation Army (PLA) in a dramatic demonstration of China's missile defense capabilities.

The target? A Single, High-Value Point

The goal? To test a radar system capable of identifying and prioritizing real threats amid a swarm of decoys—a capability central to countering hypersonic glide vehicles and Multiple Independently-targetable Reentry Vehicles (MIRVs).

According to PLA engineer Zhang Zhenbiao, the system can distinguish real warheads from decoys, even amid complex mid-flight countermeasures such as jamming or submunition dispersal. In the test, it tracked 31 decoys and simultaneously prioritized seven high-value targets—a clear leap in China's anti-missile tech.

The sheer scale and cost of the exercise highlight China's willingness to invest heavily in advanced military technology. But this isn't an isolated move by China—it's part of a larger, accelerating radar expansion effort.

Yunnan's Eye In The Sky: A 5,000-Km Watchtower

Just weeks before the Gobi test, satellite imagery and defense reports confirmed the deployment of a massive Large Phased Array Radar (LPAR) in Yunnan province, barely 2,200 km from India's eastern coastline. The radar's reach extends over 5,000 km, well within range to track missile activity from India's most sensitive site: Dr. APJ Abdul Kalam Island.

This isn't just about early detection; it's about real-time intelligence gathering, trajectory tracking, and telemetry interception. Operated by the PLA Aerospace Force, this LPAR gives Beijing unprecedented visibility into Indian missile activities. This radar can potentially monitor missile launches from India's Dr. APJ Abdul Kalam Island and track movements deep into the Indian Ocean.

More importantly, it signals a strategic shift in China's regional military doctrine—one focused on constant watchfulness and layered deterrence. It's clear: China is knitting together a surveillance net that spans not only its borders but reaches deep into the Indian Ocean.

India's Island Launchpad

Located off the Odisha coast in the Bay of Bengal, Dr. APJ Abdul Kalam Island (formerly Wheeler Island) is one of India's most vital strategic assets. Since its first test launch in 1989, the island has been the launchpad for missiles that define India's deterrence posture—Agni-V, K-4, BrahMos, and even the nation's anti-satellite (ASAT) weapons.

Chosen for its isolated location and over-sea testing range, the island hosts the Integrated Test Range (ITR), radar tracking stations, and advanced meteorological support systems. Launch Complex-IV (LC-IV) is based here, while LC-III sits in Chandipur, 70 km away. Together, they form the core of India's missile testing infrastructure. In 2015, the island was renamed to honor Dr. Kalam, the architect of India's missile program, who saw it as his "Theatre of Action." Today, that very theatre is under close observation from China's expanding high-tech radar web.

LPAR: China's Radar Revolution

What makes the Yunnan LPAR formidable is its design. Unlike older radar systems that rotate mechanically, LPARs use electronically steered antennas. This allows for near-instant scanning of large areas, making them capable of tracking multiple fast-moving objects, including ballistic missiles and satellites, with remarkable precision.

The Yunnan-based system is reportedly under the command of Base 37, a specialized PLA Aerospace Force unit focused on space situational awareness (SSA). From tracking orbital debris

to monitoring foreign launches, Base 37 acts as China's celestial sentry, observing not just the skies but also strategic shifts on Earth.

What's more, this isn't China's first radar aimed at India. The Yunnan installation now complements existing LPAR systems in Korla and Xinjiang, which already keep a close eye on northern and northeastern India. In short, China is quietly building a 360-degree surveillance ring around India, turning its high-tech radar systems into invisible sentinels that monitor not just the skies but also the balance of power in the region.

Surveillance Or Signal?

This isn't just a technological advancement—it's a strategic posture. With its latest LPAR system active in Yunnan, China has significantly raised the stakes in the regional power equation. It now has the capability to not only detect and track India's missile launches but potentially interfere with them via electronic warfare (EW) capabilities embedded in these radars.

Experts warn that LPARs can disrupt GPS signals, radio communications, and aviation navigation systems, making them not just eyes, but potential saboteurs in the event of conflict.

India's Radar Game: Time To Upgrade

India is not taking these developments lightly. The Ministry of Defense has recently signed a Rs 2,906 crore deal with Bharat Electronics Ltd (BEL) to acquire 18 indigenous 'Ashwini' Low-Level Transportable Radars (LLTRs), equipped with Active Electronically Scanned Array (AESA) technology. These systems are designed to detect everything from fast jets to drones and helicopters, significantly boosting the Indian Air Force's tactical radar coverage.

India's long-range Swordfish radar, part of its Ballistic Missile Defense (BMD) program, is also due for upgrades to keep up with China's evolving capabilities. Additionally, the IAF is exploring the deployment of specialized mountain radars to keep watch over the heavily militarized Line of Actual Control (LAC), where China has ramped up its air defense infrastructure since the 2020 Ladakh standoff.

The Skies Are The New Battlefield

As China weaves a high-tech web of radar coverage around India, it's clear that the nature of warfare is evolving. The frontlines are no longer just on land or sea—they're in the skies and across electromagnetic spectrums.

For India, maintaining a credible deterrent means more than developing advanced missiles—it means ensuring those missiles can be tested, launched, and deployed without being constantly watched or electronically disrupted.

The "Theatre of Action" that Dr. Kalam once envisioned must now be protected with stronger curtains—ones woven from next-generation stealth, mobility, and electronic resilience. Because in this new age of surveillance supremacy, it's not just about who can strike but who can strike unseen.

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U.S.-China 6th-Gen Aircraft Battle Heats Up As Beijing Increases J-36, J-50 Testing Amid US Push For F-47

Source: The EurAsian Times, Dt. 09 Apr 2025,
URL: https://www.eurasiantimes.com/china-has-increased-6th-gen-fighter-testing/

US President Donald Trump announced the decision to move forward with a next-generation fighter jet dubbed F-47 last month, emphasizing that it would be the "first sixth-generation combat aircraft" in the world. However, the Chinese sixth-generation aircraft program is now rapidly gathering pace.

Awarding the contract for the development of the F-47 to aerospace giant Boeing in March, Donald Trump said, "At my direction, the United States Air Force is moving forward with the world's first sixth-generation fighter jet, number six, sixth generation, nothing in the world comes even close to it, and it'll be known as the F-47."

The world's first sixth-generation fighter jet was the keyword in the President's gleeful announcement, although he did not elaborate on how the Pentagon planned to achieve that. The United States flew a full-scale prototype of a sixth-generation fighter jet in 2020, developed as part of the Next Generation Air Dominance (NGAD) program, as reported by the EurAsian Times at the time. This was also reiterated by Trump, who emphasized that an experimental version of the aircraft has been flying for about five years.

In fact, reports have noted that three prototypes, one from each company that participated in the Next Generation Air Dominance program, including Boeing, Lockheed Martin, and Northrop Grumman, have likely all flown. However, that could not be officially verified due to the program's classified nature.

The United States' primary rival, China, has been working on next-generation combat aircraft for several years and has already conducted several test flights of its sixth-generation aircraft prototypes. In December 2024, China flew two sixth-generation fighter prototypes, the J-36 and J-50, taking the world by surprise. The J-36 is reportedly being developed by the Chengdu Aircraft Corporation (CAC), whereas the J-50 is being developed by the Shenyang Aircraft Corporation (SAC).

Some military observers quipped that Trump's award of a contract for the next-generation air dominance aircraft, which was paused last year, may have been prompted by the appearance of the Chinese J-36 and J-50. In fact, since Trump's assertion that the US would be the first country to fly a sixth-generation aircraft, there has been a noticeable increase in test flights of China's sixth-generation fighters, even though the development and testing of major military systems in China is typically a heavily guarded secret.

Chinese J-36 & J-50 Make Frequent Flights

On April 8, for instance, new footage of the Shenyang sixth-generation demonstrator in flight was published on social media. Military watchers on the Internet have nicknamed the aircraft J-50, but its designation remains a secret. It first appeared on December 26, 2024, shortly after the Chengdu

J-36 was spotted. The footage published on April 8 is the first ever clear video of the aircraft. A PLA watcher who goes by the name 'Hurin' on social media site X wrote: "Focus is not on payload or too much range given CCAs are around the corner.. mostly next-generation avionics (huge nose) + ACE engines which should give it J20 equivalent CR + 2D the nozzles."

This is the third appearance of the J-50. Earlier this week, a set of new images of Shenyang's tailless J-50 stealth fighter were obtained from Chinese social media, offering a closer look at its unique design. According to reports, this aircraft is visibly smaller than the CAC's J-36 and features a tailless design on a lambda wing. The latest images show enhanced details such as two engines, a tricycle landing gear system with a dual nose wheel, 2D thrust vectoring nozzles, Diverterless Supersonic Intakes (DSI), and movable wingtips. Moreover, observers also pointed to a bulge under the cockpit that may contain an electro-optical sensor similar to that of the J-35A stealth aircraft that was unveiled in November.

The aircraft features distinctive stealth design features, such as smooth surfaces and sharp angles. Moreover, radar visibility is reduced by the form of the fuselage. The new photos give a glimpse into the side weapons bay, which closely resembles those on the stealthy J-20 fighter of the People's Liberation Army Air Force (PLAAF). While the images did not give a proper look into the cockpit, observers agree it is unlikely to be unmanned. Although the J-50's definitive role cannot be ascertained at this point, its architecture implies that it intends to accomplish network-centric operations, air superiority domination, and survivability in highly protected airspace.

The new footage of the aircraft indicates that China is working on its sixth-generation fighter program on a war footing. In addition to the J-50, another sixth-gen prototype—the J-36—was also spotted recently. While the J-36 has been spotted flying near the CAC facility in Sichuan multiple times in recent weeks, the latest video published online was its most impressive one yet, as the aircraft was seen swooping over traffic on a freeway.

In the undated video published earlier this week, a mammoth three-engine J-36 is seen on its final approach, flying over a busy highway near the CAC facility. The video, which was recorded from inside a car on the road, shows the J-36 from a very close perspective and offers the clearest view of the aircraft to date.

As previously reported by the EurAsian Times, the J-36 looks to have a streamlined canopy that aligns with the forward fuselage and a dorsal air intake that appears to use a diverterless supersonic inlet (DSI) design. In addition, the aircraft has three engines and rare twin split ruddervators on each wing, which is rare for tactical fighter aircraft. These aerodynamic features suggest a focus on stealth, range, and speed, critical attributes in contemporary air combat.

The latest updated video of J-36 shows the moments before the aircraft would have landed at the airfield inside the CAC, seen with its heavy-duty landing gear deployed. With a closer view of the cockpit now recorded on camera, several observers noted that the aircraft likely has side-by-side seating, unlike the two-seat configuration that was previously predicted. Additionally, the J-36 wears a camouflage scheme similar to a splinter, with distinctly lighter panels aft and surrounding the dorsal intake, as highlighted by The War Zone.

As the video went viral on social media, some observers noted that with the J-36 now making multiple flights, it is likely that China deliberately wants the world to see the progress it is making with sixth-generation combat aircraft. However, some dedicated PLA watchers have argued that China has been working on its sixth-generation fighters for several years. However, these flights being caught on camera is the power of social media, meaning that Chinese military programs can barely stay hidden now. One user also highlighted that, unlike the USA, which has the hidden Area 51, the Chinese fighters fly over public spaces, which means they will get photographed.

Nonetheless, it is safe to say that the frequent appearance of these prototypes has given the impression that the US might not be the first country to field an operational sixth-generation aircraft. In fact, some reports have even suggested that China is assessing sixth-generation technology and improving designs while the US F-47 remains on the drawing board.

While this may be quite a stretch because the US sixth-generation combat aircraft program remains classified, there is enough evidence to believe that China's program is maturing. The two countries are now in a neck-to-neck competition to field the world's first sixth-generation aircraft.

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India's Mountain Strike Corps vs China's Western Theatre Command: Who Holds the Advantage in the Himalayas?

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URL: https://www.republicworld.com/defence/indian-armed-forces/indias-mountain-strike-corps-vs-chinas-western-theatre-command-who-holds-the-advantage-in-the-himalayas

Along the jagged ridgelines and thin air of the Himalayas, a silent contest for dominance simmers beneath the surface. It is not merely about holding ground but about preparing for a possible clash that would test the limits of man and machine. On one side stands India's Mountain Strike Corps (MSC)—a purpose-built offensive formation designed to pierce through enemy lines in rugged terrain. On the other, China's Western Theatre Command (WTC)—a massive, integrated force tasked with controlling all of Beijing's operations along the India-China border. In a region where snow is a constant companion and altitude a ruthless adversary, these two formations represent divergent doctrines and distinct battlefield strategies.

India's mountain warfare legacy is steeped in operational experience—Kargil, Siachen, and multiple stand-offs along the LAC. In contrast, China's PLA has embraced technological supremacy and theatre-level integration, though it lacks real-world high-altitude combat exposure. This report assesses the comparative combat capability of India's MSC and China's WTC by analyzing their structure, terrain adaptability, deployment strategy, and doctrinal philosophy—culminating in the question that commands strategic planners: who really holds the upper hand in the Himalayas?

India's Mountain Strike Corps: A Force Forged for High-Altitude Punishment

The Mountain Strike Corps, headquartered at Panagarh in West Bengal, was formally raised in 2013 with the explicit mission to enable counter-offensive operations in the eastern and northern sectors. The idea was to shift India's doctrine from one of pure defence to limited strategic offensives—capable of capturing key terrain inside enemy territory to gain leverage in post-conflict scenarios.

Structured around two key divisions—59 Mountain Division (Panagarh) and 72 Mountain Division (Ranchi)—the MSC draws on high-mobility infantry units, light artillery, combat engineers, and integral logistical formations that are optimized for mountainous terrain. Though budgetary constraints delayed the full-scale raising of the corps, the operational momentum received renewed impetus following the 2020 Galwan Valley clash. The Indian Army began integrating M777 Ultra-Light Howitzers, CH-47 Chinook helicopters, Apache gunships, and ALH Rudra assets into the formation's operational envelope.

What makes the MSC unique is its proactive orientation. Unlike static formations tasked with holding ground, the MSC is designed to strike across the LAC, seize tactical heights, and deny the PLA critical ingress routes. It banks on long-range surveillance, acclimatised troops, and terrain-specific warfighting experience to conduct "deep-strike raids"—a concept Indian strategists believe is crucial to offset China's numerical superiority.

China's Western Theatre Command: The Monolith of the PLA's Border Power

The PLA's Western Theatre Command is the largest of China's five theatre commands, covering Tibet, Xinjiang, and parts of Sichuan—essentially all regions bordering India. It was created in 2016 as part of President Xi Jinping's sweeping military reforms that restructured the PLA from a region-based to a mission-oriented command model. WTC integrates Ground Forces (PLAGF), Air Force (PLAAF), Rocket Force (PLARF), and electronic/cyber warfare units into a unified command chain.

Unlike India's MSC, the WTC is not a specialized mountain warfare formation per se, but rather a multi-domain, combined-arms theatre with flexible deployment capabilities. Its group armies, especially the 76th and 77th, are often rotated through high-altitude postings in Tibet, where the PLA has developed heavy-lift logistics infrastructure, forward airbases like Ngari Gunsa, and hardened bunkers connected through an extensive road-rail network. However, a major operational drawback for the WTC remains the need for rotational acclimatisation—as most Chinese troops are not native to high-altitude zones and must be cycled in and out of forward positions.

Nevertheless, China has made notable advances in indigenous mountain combat platforms. The PLA now fields the Type 15 light tank, designed specifically for operations in mountainous and plateau regions. Artillery systems like the PCL-181 and long-range rocket launchers, combined with UAV-based surveillance and electronic warfare, form the backbone of China's mountain warfare arsenal. In sum, WTC is an infrastructure-backed war machine, designed to dominate through synergy, not battlefield intimacy.

Terrain, Doctrine, and Deployment: A Matter of Philosophy

The difference between MSC and WTC isn't just structural—it's philosophical. India's Mountain Strike Corps thrives on human adaptability, intimate terrain knowledge, and high-altitude infantry

discipline. It relies on troops permanently posted in difficult areas like Sikkim, Tawang, and Ladakh, where knowledge of the terrain often proves decisive in tactical engagements. The doctrinal approach is decentralized; junior commanders are trained to take decisions under fire, which is vital in the chaotic, often communication-denied battlefield of the Himalayas. The WTC, on the other hand, is centralized and technology-driven. The PLA's reliance on networked warfare, real-time battlefield management, and precision strikes suggests a preference for short, decisive engagements rather than prolonged attritional battles. However, the system's effectiveness in high-altitude warfare—where harsh weather and terrain routinely disrupt electronic and mechanical systems—remains largely untested.

India has also steadily upgraded its forward connectivity—with projects like the Atal Tunnel, Sela Tunnel, Darbuk-Shyok-DBO Road, and the Brahmaputra bridges enhancing inter-sectoral troop mobility. Meanwhile, China's G219 and G318 highways, along with its high-altitude rail networks, give it faster reaction capabilities over long distances. The difference is that India's routes are tactically dispersed and survivable, while China's logistics are centralised but exposed—a vulnerability that Indian planners aim to exploit.

Who Holds the Advantage in a Himalayan Conflict?

If a conflict were to break out in the Himalayas, the outcome would hinge on terrain familiarity, troop endurance, mobility, and escalation dynamics. In limited skirmishes or tactical standoffs, India's MSC, with its acclimatised units and decentralised strike strategy, holds the upper hand. The ability to launch quick, deep raids and occupy dominating features is something the Indian Army has perfected since Kargil and repeated in Kalapani, Galwan, and Yangtse.

However, in a long-duration or escalated theatre-level war, the WTC could leverage its mass, firepower, and logistics to push forward—especially if supported by air and cyber dominance. But it would still face serious challenges in maintaining troop morale, high-altitude endurance, and operational flexibility—areas where Indian soldiers have time and again proven their superiority. Ultimately, the MSC is a specialist's scalpel—trained for precise, terrain-specific missions in unforgiving conditions. The WTC is a sledgehammer—capable of overwhelming force projection, but not necessarily suited for protracted mountain warfare.

Between The Summit and The Sword

The Himalayas do not forgive weakness. And between India's Mountain Strike Corps and China's Western Theatre Command, lies a contest of doctrine, determination, and endurance. While China's WTC brings integrated might and rapid projection to the table, India's MSC brings hardened soldiers, honed tactics, and the sheer will to hold ground in one of the harshest battlefields on Earth.

As the Line of Actual Control bristles with infrastructure upgrades and forward deployments on both sides, the Himalayas may soon witness a test of these rival visions. One is a force built for strike and surprise; the other is a command configured for dominance by design. In war, both may bleed—but in the high passes of the Himalayas, the edge may still lie with the one who knows the mountain best.

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U.S., Iran in direct talks over nuclear program: Trump

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URL: https://www.thehindu.com/news/international/trump-us-iran-direct-talks-nuclear-program/article69424731.ece

President Donald Trump said on Monday (April 7, 2025) that the United States and Iran were beginning direct talks on Tehran's nuclear program, a surprise announcement after Iranian officials had appeared to rebuff U.S. calls for such negotiations.

Iran had pushed back against Trump's demands that it directly negotiate over its nuclear program or be bombed, though it had initially left the door open to indirect discussions.

"We're having direct talks with Iran, and they've started. It'll go on Saturday. We have a very big meeting, and we'll see what can happen," Trump told reporters in the Oval Office during talks with visiting Israeli Prime Minister Benjamin Netanyahu.

"And I think everybody agrees that doing a deal would be preferable," Mr. Trump said. He did not elaborate.

Warnings by Mr. Trump of military action against Iran had jangled already tense nerves across the Middle East after open warfare in Gaza and Lebanon, military strikes on Yemen, a change of leadership in Syria and Israeli-Iranian exchanges of fire.

Mr. Trump has said he would prefer a deal over Iran's nuclear program to a military confrontation and he said on March 7 he had written to Supreme Leader Ayatollah Ali Khamenei to suggest talks. Iranian officials said at the time that Tehran would not be bullied into negotiations.

During his 2017-2021 term, Mr. Trump withdrew the U.S. from a 2015 deal between Iran and world powers that placed strict limits on Tehran's disputed nuclear activities in exchange for sanctions relief. Trump also reimposed sweeping U.S. sanctions.

Since then, Iran has far surpassed that deal's limits on uranium enrichment.Western powers accuse Iran of having a clandestine agenda to develop nuclear weapons capability by enriching uranium to a high level of fissile purity, above what they say is justifiable for a civilian atomic energy program.

Tehran says its nuclear program is wholly for civilian energy purposes.

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Science & Technology News

Scientists demonstrate clear quantum advantage using simple game

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URL: https://www.thehindu.com/sci-tech/science/quantum-advantage-odd-cycle-graph-two-qubits/article69407720.ece

For a long time, researchers have been looking for the sort of task that a quantum computer will be better at doing than a classical computer. Because if a quantum computer shows that it can be superior, it will achieve a milestone called quantum supremacy.

Researchers from the University of Oxford and Universidad de Sevilla recently demonstrated quantum supremacy using a simple game.

Their finding, published in Physical Review Letters in February, borrowed a concept from the odd-cycle graph. The aim here is simple: to colour a circle containing an odd number of points with two colours, such that no two adjacent points have the same colour. This is mathematically impossible.

The researchers adapted this game to use as a test of quantum supremacy.

Previous attempts at showing quantum supremacy have used complicated problems. For example, Google used a problem called random circuit sampling to demonstrate the supremacy of its Sycamore processor in 2019.

Researchers in China went with the Gaussian boson sampling problem for the Jiuzhang quantum computer. Both these problems require complex mathematics and specialised equipment to perform, which make it hard to verify the results.

The colouring problem

The setup for the odd-cycle problem is simple. Consider a circle with an odd number of points inside it, say three. The challenge is to use two colours, blue and red, to colour the points such that no two adjacent points have the same colour.Once one of the points is coloured red and the other blue, the third point has to be red or blue, breaking the rule.

In the researchers' experiment, there are two players named Alice and Bob who can't communicate with each other. A referee asks them questions about the colour of the points in an odd-numbered circle. The game ends in victory if two conditions are met: when asked about the same points, the players must answer with the same colour (e.g. both must say "blue") and when asked about adjacent points, they must answer with different colours (i.e. Alice says "blue" and Bob says "red").

In the classical scenario, the players agree on a colouring pattern for the points before the game begins, yielding a success rate of 83.3% for a three-point circle. In other words, the game can be

won 83.3% of the time.Playing the quantum gameTo implement the quantum version of the experiment, the researchers trapped two strontium atoms in separate locations 2 m apart.

Using lasers, the researchers entangled the two atoms. When two particles are entangled, they are correlated in a way that classical physics can't explain. Measuring one particle — i.e. checking its present condition — will instantaneously affect the other.

A single computer acted as the referee, sending the questions to two separate control systems controlled by Alice and Bob. After receiving the questions, each player performs specific quantum operations on the atom using laser pulses.

These operations involved rotating their particles through specific angles that were mathematically related to which point on the circle a question was about. The first question meant rotating some angle, say, and the second question meant rotating through a different angle.

After performing the operations, the players measured their atoms to determine the answer, which could be 0 or 1. Each number was mapped to a colour, blue or red, and its value was reported to the referee.

The researchers played this game for circles containing 3 to 27 points 101,000 times, which took about a minute.They also performed additional tests to verify the strength of the correlations and ensure they are quantum in nature.

The quantum advantage

For the 3-point circle, the quantum scenario had a win rate much greater than the classical scenario (i.e. 83.3%). It clearly demonstrated quantum supremacy, which the team showed for circles with up to 19 points.

Across all the 101,000 games, their implementation achieved a win rate of 97.8%. The remaining 2.2% gap was attributed to noise while creating the entanglement between the atoms.

Their test to make sure the atoms were properly entangled was also found to be the strongest such correlation ever observed between two separated quantum systems.

Why this matters

As demonstrated in the study, the odd-cycle game approach is much simpler to implement in order to establish quantum supremacy.

In order to prove the Sycamore processor had achieved quantum supremacy, Google fit it with 53 superconducting qubits, an enormous computational resource. On the other hand, the researchers used only two entangled qubits, which is much simpler and less computationally demanding than Google's setup.

Majorana 1: A quantum phenomenon

According to the researchers, their approach could be used in practical scenarios where collaborating agents can't communicate, such as the rendezvous task. A type of coordination problem, the rendezvous task is about two or more people meeting at a particular location without communicating with each other.

A classical computer may try to determine where they will meet by systematically exploring potential meeting points and the routes the two people may take to get there. A quantum computer will leverage quantum entanglement to create correlations that classical physics can't reproduce, speeding up its search for the most likely meeting point.

If there are 1 million meeting points, for example, the worst-case number of steps for a classical computer to find the meeting point is 1 million whereas for a quantum computer using Grover's algorithm would be 1,000 steps.

For now, the odd-cycle game is an example of the kind of power quantum computers have, and without requiring complicated mathematics to make sense of.

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As China & US flex their satellite power, India plays catch-up in a cosmic game of thrones

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URL: https://theprint.in/science/as-china-us-flex-their-satellite-power-india-plays-catch-up-in-a-cosmic-game-of-thrones/2581124/

A full-fledged space war is on like never before. Sophisticated, high-tech satellites circling in space are the weapons, and uninterrupted surveillance of everything from military movements to disaster risks are the spoils of war. The more you have, the better you are placed. India is breathlessly trying to catch up too. But India's tryst to conquer space is somewhat challenging.

Even as it has established its presence in the global space industry as a serious competitor in recent years—with big-ticket missions like Chandrayaan-3 and now the upcoming Gaganyaan—it is still considerably behind its counterparts, such as the United States, China, and the European Union, when it comes to launching satellites.

The difference is nowhere close.

While the US averages over 50 satellite launches per year, India only has a little over 50 active satellites in space. This means the Indian Space Research Organisation (ISRO) is averaging only about four to six launches every year.

This is worrying because, lately, everything from a country's disaster preparedness to infrastructure development and military surveillance has become dependent on how well it monitors its regions from space. Knowledge, after all, is power in the new age. And ISRO agrees. The newly sworn-in chairperson, V. Narayanan, has acknowledged that India needs to enhance its presence in space. "We are aiming for a scenario where the number of Indian satellites in space will go up to more than 100 in the next three to four years," he said.

Low launch numbers

The Sriharikota spaceport, also known as the Satish Dhawan Space Centre (SDSC), and situated on India's eastern coast, has been abuzz with unusual activity lately. There was a time when the only movement that this quiet island witnessed was that of trucks carrying parts of launch vehicles

right before a launch. And that, too, only once or twice a year. Now, every few months, the empty roads leading to the launch pads of the SDSC start brimming with a cheerful crowd of families and media vans, which cover each aspect of a launch. Things have changed for the better, but don't be fooled by the numbers, experts say.

Government data shows that in 2024, ISRO carried out a total of 15 missions, but of these, only nine were launch missions. And of the nine launch missions, only five were tasked with placing Indian satellites in orbit. Similarly, in 2023, the Indian space agency conducted seven satellite launches. Of these, only three were Indian satellite launches. In the global satellite race, these numbers are significantly low.

Last year, the US accomplished a record 154 orbital launches. In 2023, their orbital launch numbers stood at a solid 110. China is also not far behind. In 2024, China conducted 68 orbital launches. Srimathy Kesan, founder and CEO of Space Kidz, an Indian aerospace startup pioneering in design, fabrication and launch of small satellites, spacecraft and ground systems, told ThePrint that India needs to up its marketing game and ease procedures if it aspires to compete with spacefaring nations like the US and China.

"Elon Musk's SpaceX is practically ruling the space industry currently. Even China has realised the importance of having a marked presence in space and has upped its game," Kesan said. She said that most of India's own space companies are also trusting SpaceX to launch their satellites for ease and reliability.

"To book a launch with SpaceX, all one needs to do is fill a form, which is extremely straightforward, and they will give you a launch slot," Kesan said. Because of frequent launches, Musk's SpaceX is also able to provide the lowest launch costs to its passengers, she said. In India, on the other hand, the process of booking a launch is a little more complicated.

The booking process is overseen by IN-SPACe (Indian National Space Promotion and Authorization Centre), the commercial arm of ISRO, which is the primary agency facilitating private sector involvement in India's space programme. If an Indian company wants to book a slot for a satellite launch, they need to submit a detailed proposal, undergo evaluation, and finalise a contract with IN-SPACe for the launch.

Foreign companies must undergo additional regulatory approvals and security clearances before they can book a launch with ISRO. Industry insiders ThePrint spoke to said that once a company completes all the formalities with IN-SPACe, it would take anywhere between 12 and 24 months for the final launch to happen. With the US's SpaceX, however, the wait time is only about six to 12 months.

A senior ISRO official, who wished not to be named, told ThePrint that India is also trying to follow the US way in the coming years. By promoting more private players in the domain, ISRO aims to transition into the role of a governmental research and exploration organisation—similar to NASA—while complementing private companies that can take over the task of providing launch services.

"We have just started opening up our space sector for private players. Once these companies expand their capabilities, we will also be able to increase our commercial and strategic launches," the official said.

Colonising space

Space wars are no longer fiction. David Ignatius, a columnist with The Washington Post and a novelist, says that the first space war is already happening between Ukraine and Russia. Military movements are being monitored through satellite surveillance, strikes are being thwarted due to unprecedented battlefield awareness, and strategies are being devised to disrupt navigation systems.

India gained this knowledge the hard way back in 1999. During the Kargil War, India had requested the US to provide access to the Global Position System (GPS) to identify enemy locations, but was denied. This exchange prompted the Indian space agency to begin strategically designing its own answer to the GPS—Navigation with Indian Constellation, or, NavIC.

A standalone navigation satellite system, it is currently used on a regional scale, but will be developed in the coming years as a 'Made-in-India' global satellite navigation system. This is expected to be comparable to the US's GPS, Europe's Galileo, or China's BeiDou.

While India's NavIC currently has seven satellites in orbit, its second instalment of satellites—launched in January this year—faced a setback after the thrusters failed to ignite, hindering the planned orbit adjustment. Data shows that as of 2024, the US has around 4,500-5,000 active satellites in space. This accounts for over 60 percent of all operational satellites globally. China has nearly 450 operational satellites, while Russia has around 200.

According to data provided by the Department of Space, as of 2024, India has 54 operational satellites. Earth observation satellites, including the Cartosat, RISAT, OCEANSAT and the GSAT series, perform functions such as weather, disaster and military surveillance. But for places where India's satellites don't reach, agencies rely on foreign satellite data.

Many space enthusiasts have argued that India's space ambitions might be "misguided".

In March, ISRO completed a 1000-hour test on the 300 milliNewton Stationary Plasma Thruster, which was developed for induction into the electric propulsion system of satellites. This electric propulsion system is set to replace the chemical propulsion system in future ISRO satellites, paving the way for communication satellites that use only electric propulsion systems for orbit raising and station-keeping.

But experts say that such advancements are getting overshadowed by larger missions like Gaganyaan—India's first human spaceflight mission which is due to be launched around 2026.

"I have been waiting for this for the past 15 years. Increases the effective payload by 40-50% for all launches. This and much better launchers (aka NGLV). Instead, we jumped on to Gaganyaan. Speak about misplaced priorities," science communicator and space enthusiast Indranil Roy said in a post on X.

But many also argue that this is a harsh and unfair judgment of India's rapidly developing space programme. An aerospace engineer, who recently quit ISRO to join a private space company, said a primary reason behind India's low launch count is its limited launch capabilities. India still relies on small and medium-sized launch vehicles, which have limited payload capacity.

"What India lacks in resources, it makes up for in skill. We do have some limitations, but that has not stopped us from making some significant advancements in the field," the 30-year-old engineer said. So, progress might be slow but steady.

Retired Lieutenant General A.K. Bhatt, the current director general of the Indian Space Association (ISpA), told ThePrint that India has recognised the necessity of deploying its own surveillance satellites rather than relying on foreign inputs for satellite coverage of its own region. "It would be unfair to compare satellite numbers between countries. A better marker of comparison would be how these satellites are fulfilling a country's requirements," Bhatt said.

He said that the government's Space Based Surveillance (SBS) project will be a big push for Intelligence Surveillance and Reconnaissance (ISR) satellites in the coming years. Last year, the government sanctioned Rs 27,000 crores to launch 52 ISR satellites in the next five years under the SBS-3 project. These new satellites will complement the existing satellite systems, enhancing India's capabilities for better surveillance over its land and sea borders.

Changing focus

In 2014, when ISRO successfully put its Mangalyaan robotic probe mission (orbiter) around Mars, The New York Times published a cartoon. It portrayed a stereotypical depiction of India featuring a farmer—dressed in a kurta and dhoti—with a cow knocking on the doors of the "elite space club". Inside were some tea-sipping westerners, reading about India's Mars Orbiter Mission (MOM) in the papers. The cartoon might have been distasteful, and the NYT was forced to apologise and recall it, but ISRO chose to respond to this through its work.

With the success of Chandrayaan-3 in 2023, India became the first country in the world to land near the lunar south pole. In the same year, it launched a first-of-its-kind satellite, Aditya-L1, to study the Sun. It is now preparing to build its own space station—Bharatiya Antariksh Station (BSS)—similar to the International Space Station (ISS).

NASA has also partnered with India for launching the NASA-ISRO Synthetic Aperture Radar (NISAR), designed to provide detailed measurements of the Earth's surface and monitor various environmental changes using advanced radar technology.

"The next decade is very exciting for India's space programme. Of course, there are areas we need to improve, but that is the case with every agency. Even NASA did not reach where it is today overnight," former ISRO chief S. Somanath told ThePrint. But one thing is clear. While ISRO has miles to go, it has undoubtedly joined the "elite space club".

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