जून
June
2025

खंड/Vol. : 50 अंक/Issue :110

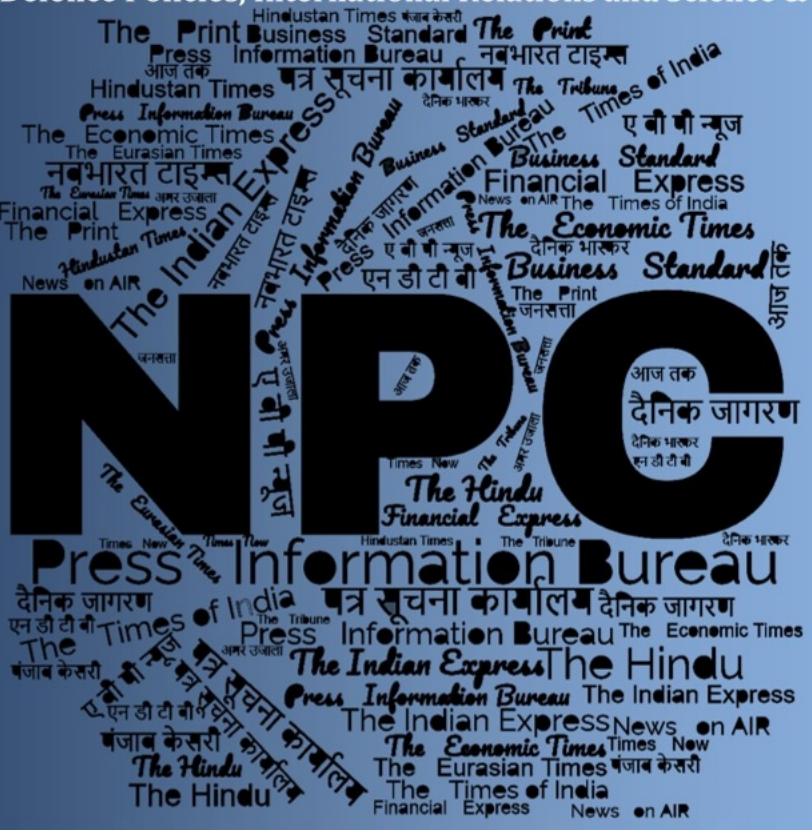
17 /06/2025

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



रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
Metcalfe House, Delhi - 110 054

CONTENTS

S. No.	Title	Source	Page No.
	DRDO News		**1-4**
1	डीआरडीओ ने किया फ्री-स्पेस क्वांटम सिक्योर कम्युनिकेशन का परीक्षण	*Dainik Jagran*	1
2	DRDO & IIT Delhi demonstrate experimental advancement in quantum communication	*Hindustan Times*	2
3	DRDO & IIT Delhi demonstrate Quantum Entanglement-Based Free-Space Quantum Secure Communication over more than 1 km distance	*Press Information Bureau*	3
	Defence News		**4-15**
4	तटरक्षक बल को मिला स्वदेश निर्मित तीव्र गश्ती पोत 'अचल'	*Dainik Jagran*	4
5	Fifth FPV 'Achal' built by Goa Shipyard Ltd Launched for ICG	*Press Information Bureau*	5
6	Defence Cyber Agency begins exercise to bolster cyber resilience at national level	*Press Information Bureau*	6
7	First Nashik-produced LCA Mk-1A set for maiden flight in July	*Hindustan Times*	6
8	Top military meet deferred in wake of 'Operation Sindoor'; Combined Commanders Conference may now happen in August–September	*The Indian Express*	8
9	A New Era of Armed Conflicts	*Hindustan Times*	9
10	हथियारो का दूसरा सबसे बड़ा आयातक देश है भारत	*Dainik Jagran*	10
11	दुनिया में परमाणु हथियारो की होड़, चीन सबसे आगे	*Jansatta*	11
12	India has more nuclear warheads than Pakistan but trails China: SIPRI	*Hindustan Times*	11
13	China adding 100 nuclear warheads annually: SIPRI	*The Times of India*	13
14	भारत समेत 24 देशों की सेनाएं कर रही हैं संघर्षग्रस्त क्षेत्रों के लिए शांति का अभ्यास	*Punjab Kesari*	15
	Science & Technology News		**16-17**
15	Indian scientist in Florida to help Shukla conduct experiments aboard space station	*The Tribune*	16
16	Axiom-4 mission: ISRO coordinating with Axiom Space to refresh time-sensitive experimental specimens	*The Hindu*	16

DRDO News

डीआरडीओ ने किया फ्री-स्पेस क्वांटम सिक्योर कम्युनिकेशन का परीक्षण

Source: Dainik Jagran, Dt. 17 Jun 2025

नई दिल्ली, प्रेट्र: भारत ने क्वांटम प्रौद्योगिकी के क्षेत्र में ऐतिहासिक उपलब्धि हासिल की है। रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) व आइआइटी दिल्ली ने मिलकर फ्री-स्पेस क्वांटम सिक्योर कम्युनिकेशन का सफल परीक्षण किया है। इस प्रयोग में क्वांटम तकनीक का उपयोग कर एक किमी से अधिक दूरी तक सुरक्षित संचार स्थापित किया गया, जो भारत को क्वांटम युग में एक निर्णायक छलांग की ओर ले जाता है। यह प्रयोग आइआइटी दिल्ली परिसर में स्थापित फ्री-स्पेस आप्टिकल लिंक के माध्यम से किया गया। परीक्षण के दौरान लगभग 240 बिट प्रति सेकेंड की दर से सुरक्षित कुंजी (की) का आदान-प्रदान हुआ, जबकि क्वांटम बिट एरर रेट सात प्रतिशत से भी कम रही। यह तकनीक आने वाले समय में क्वांटम साइबर सुरक्षा, लंबी दूरी की क्वांटम की डिस्ट्रीब्यूशन, क्वांटम नेटवर्क और भविष्य के क्वांटम इंटरनेट जैसे क्षेत्रों में क्रांति ला सकती है।

रक्षा मंत्री राजनाथ सिंह ने इस उपलब्धि के लिए डीआरडीओ व आइआइटी दिल्ली को बधाई दी। कहा, भारत सिक्योर कम्युनिकेशन करने के नए युग में प्रवेश कर चुका है, जो भविष्य के संभावित युद्ध के दौरान एक गेम चेंजर होगा। इससे पहले 2022 में विंध्याचल और प्रयागराज के बीच भारत का पहला इंटरसिटी क्वांटम कम्युनिकेशन लिंक प्रदर्शित किया गया था।

*

DRDO & IIT Delhi demonstrate experimental advancement in quantum communication

Source: Hindustan Times, Dt. 17 Jun 2025

Press Trust of India
letters@hindustantimes.com

NEW DELHI: India has successfully demonstrated an experimental advancement in quantum communication domain that paves the way for real-time applications in quantum cyber security, according to the defence ministry.

"The free-space quantum secure communication using quantum entanglement over a distance of more than one km was achieved via a free-space optical link established on the IIT-Delhi campus," it said in a statement on Monday.

QUANTUM COMMUNICATION PROVIDES FUNDAMENTALLY UNBREAKABLE ENCRYPTION

With this, India has entered a "new quantum era", officials said. Defence Minister Rajnath Singh has congratulated the DRDO and IIT-Delhi for this landmark achievement, stating that India entered a new quantum era of secure communication which will be a "game-changer" in future warfare.

"This entanglement-assisted quantum secure communication paves the way for real-time applications in quantum cyber security, including long-distance Quantum Key Distribution (QKD), the development of quantum networks, and the future quantum internet," the statement said.

The experiment attained a secure key rate of nearly 240 bits per second with a quantum bit error rate of less than 7 per cent, the ministry said.

Under the project 'Design and development of photonic technologies for free space QKD', sanctioned by Directorate of Futuristic Technology Management (DFTM), DRDO, the demonstration was given by Prof Bhaskar Kanseri's research group in the presence of several senior officials of the DRDO, Dean (R&D) IIT-Delhi, Director (DIA-CoE) and DRDO laboratory scientists.

Quantum communication provides fundamentally unbreakable encryption, making it a dual-use technology with varied applications.

*

DRDO & IIT Delhi demonstrate Quantum Entanglement-Based Free-Space Quantum Secure Communication over more than 1 km distance

Source: Press Information Bureau, Dt. 16 Jun 2025

India has entered into a new quantum era by successfully demonstrating an experimental advancement through DRDO-Industry-Academia Centre of Excellence (DIA-CoE), IIT Delhi. The free-space quantum secure communication using quantum entanglement over a distance of more than one km was achieved via a free-space optical link established on the IIT Delhi campus. The experiment attained a secure key rate of nearly 240 bits per second with a quantum bit error rate of less than 7%. This entanglement-assisted quantum secure communication paves the way for real-time applications in quantum cyber security, including long-distance Quantum Key Distribution (QKD), the development of quantum networks, and the future quantum internet. These efforts align with India's broader objectives to advance quantum technologies for national development.

Test-Bed Configuration and Optical Line-of-Sight for Free-Space Quantum Key Distribution Experiment Conducted at IIT Delhi

Under the project 'Design and development of photonic technologies for free space QKD', sanctioned by Directorate of Futuristic Technology Management (DFTM), DRDO, the demonstration was given by Prof Bhaskar Kanseri's research group in the presence of several dignitaries, including the DRDO DG (MED, COS & CS), Director SAG, Director DFTM, Dean (R&D) IIT Delhi, Director (DIA-CoE) and DRDO laboratory scientists. Quantum entanglement-based QKD offers several significant advantages over the traditional prepare-and-measure method by enhancing both security and functionality. Even if devices are compromised or imperfect, the use of quantum entanglement ensures the security of key distribution. Any attempt to measure or intercept the entangled photons disturbs the quantum state, allowing authorised users to detect the presence of an eavesdropper.

Quantum communication provides fundamentally unbreakable encryption, making it a dual-use technology with applications in securing data in strategic sectors such as defence, finance, and telecommunications, as well as in protecting national security-related communications. Free-space QKD eliminates the need to lay optical fibers, which can be both disruptive and expensive,

especially in challenging terrains and dense urban environments. Earlier, India's first intercity quantum communication link between Vindhyachal and Prayagraj in 2022, using commercial-grade underground dark optical fiber was demonstrated by DRDO scientists along with Prof Bhaskar's team. More recently, in 2024, the team successfully distributed quantum keys using entanglement over a 100 km spool of telecom-grade optical fiber in another DRDO-supported project.

These technologies are being developed through DRDO-Industry-Academia – Centres of Excellence (DIA-CoEs) – an initiative of DRDO, where 15 Centres of Excellence have been established at premier academic institutes like IITs, IISc & Universities for development of cutting edge defence technologies. Raksha Mantri Shri Rajnath Singh has congratulated DRDO & IIT Delhi for this landmark achievement, stating that India entered into a new quantum era of secure communication which will be a game changer in future warfare. Secretary Department of Defence R&D and Chairman DRDO Dr Samir V Kamat and Director, IIT Delhi Prof Rangan Banerjee congratulated the team for these key achievements.

https://www.pib.gov.in/PressReleasePage.aspx?PRID=2136702

*

Defence News

तटरक्षक बल को मिला स्वदेश निर्मित तीव्र गश्ती पोत 'अचल'

Source: Dainik Jagran, Dt. 17 Jun 2025

पणजी, एएनआइ: भारतीय तटरक्षक बल को सोमवार को स्वदेशी तीव्र गश्ती पोत 'अचल' मिल गया। इस पोत को भारतीय तट रक्षक के लिए गोवा शिपयार्ड लिमिटेड में 60% स्वदेशी सामग्री के साथ तैयार किया गया है। यह रक्षा उत्पादन में 'आत्मनिर्भरता' की दिशा में बड़ी उपलब्धि है।

'अचल' भारतीय तट रक्षक के लिए निर्मित आठ फास्ट पेट्रोल वेसल्स (एफपीवी) में से पांचवां पोत है। पश्चिमी समुद्र तट के तटरक्षक कमांडर अनिल कुमार हरबोला की पत्नी कविता हरबोला ने 'अथर्ववेद' के मंत्रों के साथ जहाज का नामकरण किया। यह पोत 52

52 मीटर लंबा और आठ मीटर चौड़ा है यह पोत, तटरक्षक बल की जरूरतों को पूरा करने के लिए डिजाइन किया गया है पोत

मीटर लंबा और आठ मीटर चौड़ा है। इसकी अधिकतम गति 27 नाट है। गोवा शिपयार्ड लिमिटेड ने भारतीय तटरक्षक बल की जरूरतों को पूरा करने के लिए जहाज को डिजाइन किया है। यह पोत तटीय निगरानी और राष्ट्रीय सुरक्षा को मजबूत करेगा। गोवा शिपयार्ड लिमिटेड में भारतीय तटरक्षक बल के लिए आठ एफपीवी का निर्माण किया जा रहा है।

*

Fifth FPV 'Achal' built by Goa Shipyard Ltd Launched for ICG

Source: Press Information Bureau, Dt. 16 Jun 2025

'Achal', the fifth Fast Patrol Vessel (FPV) in a series of eight being constructed by Goa Shipyard Ltd (GSL) for the Indian Coast Guard (ICG), was ceremoniously launched on June 16, 2025, in Goa by Smt. Kavita Harbola in the presence of Coast Guard Commander (Western Seaboard), Additional Director General Anil Kumar Harbola.

Designed and constructed under stringent dual-class certification from the American Bureau of Shipping and Indian Register of Shipping, the FPV features over 60% indigenous content. The vessel measures 52 meters in length and 8 meters in breadth, with a displacement of 320 tons. Powered by a CPP-based propulsion system, the vessel can reach a top speed of 27 knots.

With its primary roles of protection, monitoring, control, and surveillance, 'Achal' is equipped to safeguard offshore assets and island territories. Its launch marks another milestone in the long-standing partnership between the Indian Coast Guard and GSL, further reinforcing the collective march towards Aatmanirbharta in defence manufacturing.

Built at a total cost of Rs 473 crore, the project has also provided a significant boost to local industry by generating substantial employment and supporting MSMEs engaged in production activities at various factories and within GSL.

The ceremony was attended by Chairman & Managing Director, GSL, Shri Brajesh Kumar Upadhyay, along with senior officials from the Indian Navy, ICG, shipyard and others.

https://www.pib.gov.in/PressReleasePage.aspx?PRID=2136647

*

Defence Cyber Agency begins exercise to bolster cyber resilience at national level

Source: Press Information Bureau, Dt. 16 Jun 2025

'Cyber Suraksha', a comprehensive Cyber Security Exercise organised by Defence Cyber Agency under the aegis of Headquarters Integrated Defence Staff, commenced on June 16, 2025. This multi-phased exercise, which concludes on June 27, 2025, is a proactive step towards bolstering cyber resilience at national level, and encompasses the conduct of targeted training sessions, evaluation and an engaging capsule for leadership. Over 100 participants from national-level agencies and stakeholders from defence domains are taking part in the event.

The exercise is designed to simulate real-world cyber threats, reinforce secure practices, and test the analytical and defensive cyber skills of participants in a high-paced, gamified environment. Chief Information Security Officers (CISOs) conclave for leadership has also been dovetailed in 'Cyber Suraksha', thereby integrating the technical aspects with leadership roles. The CISOs conclave includes talks by eminent speakers and will culminate in an immersive Table-Top Exercise.

Combining structured learning with dynamic hands-on challenge environments will empower participants to act decisively in the face of cyber threats. Defence Cyber Agency plans to conduct such exercises on a regular basis to maintain a state of readiness and cultivate a security-first culture across all levels.

https://www.pib.gov.in/PressReleasePage.aspx?PRID=2136618

*

First Nashik-produced LCA Mk-1A set for maiden flight in July

Source: Hindustan Times, Dt. 17 Jun 2025

The first light combat aircraft (LCA Mk-1A) built at Hindustan Aeronautics Limited's new production line in Nashik is set to make its maiden flight in mid-July, and the state-owned plane maker is targeting delivery of the first LCA Mk-1A produced in Bengaluru to the Indian Air Force in July-August after a delay of almost 16 months, officials aware of the matter said on Monday. HAL can build 16 Mk-1As every year in Bengaluru, and the Nashik production line will help it boost production to a total of 24 jets. To be sure, the Bengaluru-produced LCA Mk-1A flew for the first time in March 2024.

"The Nashik production line will roll out four to five Mk-1A fighters this year, followed by eight annually next year onwards. It will help us make up for the delay in deliveries due to factors including US firm GE Aerospace's inability to supply F404- IN20 engines on time and some pending certifications," said one of the officials cited above, asking not to be named.

IAF is concerned about the current pace of the LCA Mk-1A programme because of the possible risks a delay in the induction of new fighters could pose to its combat effectiveness. The air force ordered 83 Mk-1A fighters for ₹48,000 crore in February 2021 and plans to buy 97 more Mk-1As at a cost of around ₹67,000 crore. The first of the 83 jets on order was to be delivered to the IAF by March 31, 2024. The last of the 83 jets are to be delivered by 2028-29.

“HAL has so far manufactured six LCA Mk-1As in Bengaluru to execute the 83-aircraft order. One of these, equipped with GE’s F404-IN20 engine, is expected to be delivered to the IAF in July-August. We have sufficient capacity to offset the delay once the engine supplies stabilise,” said a second official, who also asked not to be named. GE Aerospace delivered the first of 99 F404-IN20 engines to HAL in March. The second engine is expected to be delivered in July, followed by two every month until December, the officials said, adding that deliveries will be accelerated next year onwards.

The US firm had then explained why the engine supply was delayed and assured HAL that production was being ramped up to execute the Indian order. In 2004, the F404-IN20 engine was selected for the older LCA Mk-1, which has been inducted by the IAF. By 2016, GE Aerospace had delivered 65 F404-IN20 engines for the Mk-1 aircraft. With no additional engine orders, the production line for F404-IN20 in the US was shut down. However, when HAL ordered an additional 99 engines in 2021 for the LCA Mk-1A, the US firm began the complex task of restarting the production line, which had been dormant for five years, and re-engaging the engine’s global supply chain. In May, IAF voiced its frustration over the delays in key projects.

The chief of the air staff Air Chief Marshal AP Singh then put the spotlight on the armed forces’ agonising wait for new weapons and systems, saying he could not recall a single instance of a project being executed on time, in what was seen as a wake-up call for the country’s defence production sector. “Timelines are a big issue,” Singh said at the CII Annual Business Summit 2025. The air force is grappling with a shortage of fighter jets and operates around 30 fighter squadrons compared to an authorised 42. The armed forces have so far not called “the black sheep” out, but their “restraint” should not be stretched to a breaking point, Singh said, issuing a veiled warning to defence public sector units including HAL and the Defence Research and Development Organisation among others.

Singh has often publicly flagged concerns about a worrying erosion of IAF’s capabilities and called for urgent measures to fix it. In February, he questioned the ability of HAL to meet the air force’s critical requirements in the backdrop of the lingering delay in the supply of new Mk-1A fighter jets, saying he had “no confidence” in the plane maker. HAL chief DK Sunil then responded by saying that his company’s focus is on delivering the LCA Mk-1A to the IAF at the earliest rather than spending time on countering criticism of the indigenous programme.

The LCA is set to emerge as the cornerstone of IAF’s combat power as the world’s fourth largest air force is expected to operate around 350 LCAs (Mk-1, Mk-1A and Mk-2 variants) in the coming decades. The Mk-1A, a 4.5 generation fighter, will come with digital radar warning receivers, external self-protection jammer pods, superior radar, advanced beyond-visual-range (BVR) air-to-air missiles, and significantly improved maintainability. On June 11, a top IAF officer said precision weapons, such as the ones used by IAF against Pakistan during Operation Sindoor rendered geographical barriers almost meaningless and altered the relationship between distance and vulnerability.

“Today, precision-guided munitions like Scalp and BrahMos (missiles) have rendered geographical barriers almost meaningless as strikes with beyond visual range air-to-air missiles and supersonic air-to-ground missiles have become commonplace,” said Air Marshal Ashutosh Dixit, chief of integrated defence staff. Modern warfare -- thanks to technology -- has fundamentally altered the relationship between distance and vulnerability, he added. In March, a top government committee recommended a raft of short and long-term measures to boost the capabilities of IAF and pointed out that it was critical to enhance self-reliance in the aerospace sector through increased

participation of the private sector to fill critical gaps. Steps are being taken to boost private participation in the aerospace sector.

Last month, India unveiled its long-awaited plan to fast-track the development of an indigenous fifth-generation stealth fighter, or the advanced medium combat aircraft (AMCA), announcing that the execution model will be competitive and provide equal opportunities to public and private sector firms to participate in one of the country's most significant military projects.

The approval of the industry partnership model by defence minister Rajnath Singh came at a critical moment as HAL --- the sole manufacturer of fighter jets in the country --- was till then believed to be the frontrunner for the project. While the model unlocks new possibilities for the local aerospace industry, including firms like Tata Advanced Systems Limited, Larsen & Toubro, Adani Defence and Aerospace and the Mahindra Group; HAL is still a strong contender for the project, as earlier reported by HT.

https://www.hindustantimes.com/india-news/first-nashik-produced-lca-mk-1a-set-for-maiden-flight-in-july-101750099444643.html

*

Top military meet deferred in wake of 'Operation Sindoor'; Combined Commanders Conference may now happen in August–September

Source: The Indian Express, Dt. 17 Jun 2025

The Combined Commanders Conference (CCC) — a biennial event that brings together the country's top military brass to discuss military matters and national security — has been postponed in the backdrop of Operation Sindoor conducted last month, The Indian Express has learnt. The conference was scheduled to be held in Kolkata at the end of May or early June. While no concrete date has been finalised yet, it could now take place in August or September this year, defence sources said. They added that the timing will depend on the security situation at that time. Prime Minister Narendra Modi usually attends the conference, which is held every alternate year.

While Operation Sindoor is currently on pause, alertness levels remain high and are likely to stay elevated over the next several months. The final date for this year's CCC will be decided after assessing the security situation over the next two to three months. With Operation Sindoor conducted in May by the Indian military, its joint execution by the services and the lessons that emerged from it are likely to be key points of discussion when the conference is eventually held.

Motivation and combat leadership, the absorption of technology in the Armed Forces amid the increasing use of new-age technologies in global conflicts, the Agnipath scheme and its future, as well as the current security situation and preparedness—particularly along the northern and western borders and in the northeast—are expected to feature in the agenda. The last CCC was held in March 2023 in Bhopal, where the top military leadership deliberated on a range of topics, including digitisation of data, challenges and opportunities posed by social media, defence exports, and the implementation of the Agnipath scheme.

That conference also featured discussions on reforms in the Defence Research and Development Organisation (DRDO) to enhance the capability development of the Armed Forces, and a review of Defence PSU reforms. The CCC prior to that was held at Kevadia in Gujarat in March 2021.

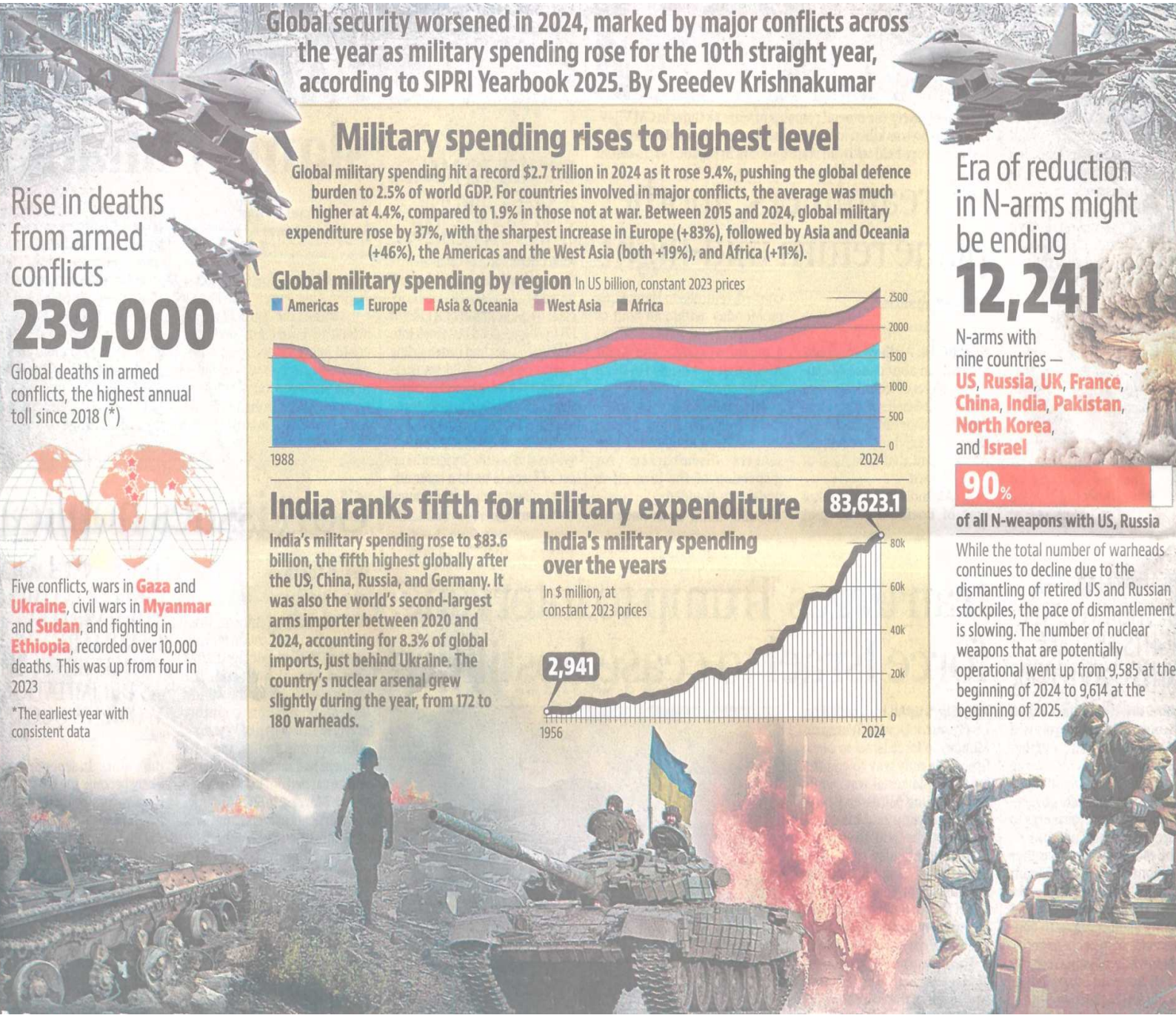
Each of the three services also holds its own service-specific commanders' conference annually. In September last year, a two-day Joint Commanders' Conference was held for the first time in Lucknow. It was organised as a forum for the exchange of ideas, strategies, and best practices among India's top Armed Forces leadership and officials from the Ministry of Defence. Defence Minister Rajnath Singh had presided over the conference.

https://indianexpress.com/article/india/military-meet-operation-sindoor-combined-commanders-conference-10070180/

*

A New Era of Armed Conflicts

Source: Hindustan Times, Dt. 17 Jun 2025



*

हथियारो का दूसरा सबसे बड़ा आयातक देश है भारत

Source: Dainik Jagran, Dt. 17 Jun 2025

जेएनएन, नई दिल्ली: बुद्ध का देश भारत हमेशा शांति में यकीन रखता है, लेकिन अपनी सामरिक सुरक्षा के लिए वह 'भय बिनु होय न प्रीत' का भी पालन करता है। अपनी सीमाओं को सुरक्षित रखने के लिए रक्षा क्षेत्र में मेक इन इंडिया अभियान के तहत आत्मनिर्भरता के साथ जरूरी रक्षा हथियारों की वह बेहिचक खरीद भी कर रहा है। यही वजह है कि पिछले कई साल से रक्षा आयात के मामले में वह शीर्ष देशों में शुमार है। सीपरी की हालिया रिपोर्ट बताती है कि भारत विश्व का दूसरा सबसे बड़ा हथियार आयातक देश है। भारत के इन्हीं प्रयासों का रौद्र रूप आपरेशन सिंदूर के दौरान दुनिया में देखा।

इंटरनेशनल सिक्यूरिटी थिंक टैंक 'स्टाकहोम इंटरनेशनल पीस रिसर्च इंस्टीट्यूट' (सीपरी) की रिपोर्ट के अनुसार 2020-24 में यूक्रेन ने सबसे अधिक हथियारों का आयात किया। यूक्रेन ने 2015-19 की तुलना में लगभग 100 गुना अधिक हथियारों का आयात किया। यूक्रेन 2022 से रूस के खिलाफ युद्ध लड़ रहा है। पश्चिम के लगभग 35 देशों ने उसे सहायता के रूप में हथियार दिए हैं। हथियार आयात में यूक्रेन की हिस्सेदारी 8.8 प्रतिशत रही। कुल हथियार आयात में भार की हिस्सेदारी 8.3 प्रतिशत रही हथियारों का आयात करने वाले 16 देशों में से केवल पांच देशों की कु

हथियार आयात करने वाले शीर्ष 10 देश (2020–24)

देश	वैश्विक हथियार आयात में हिस्सेदारी
यूक्रेन	8.8 प्रतिशत
भारत	8.3 प्रतिशत
कतर	6.8 प्रतिशत
सऊदी अरब	6.8 प्रतिशत
पाकिस्तान	4.6 प्रतिशत
जापान	3.9 प्रतिशत
आस्ट्रेलिया	3.5 प्रतिशत
मिस्र	3.3 प्रतिशत
अमेरिका	3.1 प्रतिशत
कुवैत	2.9 प्रतिशत

देश	वैश्विक हथियार निर्यात में हिस्सेदारी
अमेरिका	43 प्रतिशत
फ्रांस	9.6 प्रतिशत
रूस	7.8 प्रतिशत
चीन	5.9 प्रतिशत
जापान	3.9 प्रतिशत
आस्ट्रेलिया	3.5 प्रतिशत
मिस्र	3.3 प्रतिशत
अमेरिका	3.1 प्रतिशत
कुवैत	2.9 प्रतिशत
जर्मनी	5.6 प्रतिशत
इटली	4.8 प्रतिशत
ब्रिटेन	3.6 प्रतिशत
इजरायल	3.1 प्रतिशत
स्पेन	3.0 प्रतिशत
दक्षिण कोरिया	2.2 प्रतिशत

हथियार आयात में 35% हिस्सेदारी थी। 2015-19 की तुलना में 2020-24 में चीन के हथियारों के आयात में गिरावट देखी गई। चीन दशकों से शीर्ष हथियार आयातकों में शामिल रहा था। चीन अपनी घरेलू हथियार उत्पादन क्षमताओं का विस्तार कर रहा है।

- दुनिया के कुल हथियार आयात में भारत की हिस्सेदारी 8.3%
- 2020-24 के दौरान चीन के हथियार आयात में दो तिहाई की गिरावट

फाइटर विमान राफेल • फाइल फोटो

हथियार निर्यातकों में शीर्ष पर अमेरिका

सीपरी के अनुसार 2020-24 में हथियारों के सबसे बड़े आपूर्तिकर्ता 25 देशों की हिस्सेदारी हथियारों के कुल वैश्विक निर्यात में 98 प्रतिशत रही। अमेरिका हथियारों का सबसे बड़ा निर्यातक रहा। वैश्विक हथियार निर्यात में इसकी हिस्सेदारी 43 प्रतिशत रही। 9.6 हिस्सेदारी के साथ फ्रांस दूसरा सबसे बड़ा हथियार निर्यातक देश रहा। हथियार निर्यात के मामले में रूस तीसरे स्थान पर रहा।

*

दुनिया में परमाणु हथियारो की होड़, चीन सबसे आगे

Source: Jansatta, Dt. 17 Jun 2025

जनसत्ता ब्यूरो
नई दिल्ली, 16 जून।

दुनिया के परमाणु-सशस्त्र राष्ट्र अपने परमाणु शस्त्रागार को मजबूत कर रहे हैं और हथियार नियंत्रण समझौतों से बाहर निकल रहे हैं, जिससे खतरे का एक नया युग शुरू हो गया है। इसने शीत युद्ध के बाद से परमाणु हथियार के भंडार में दशकों से हो रही कटौती को समाप्त कर दिया है।

'स्टाकहोम इंटरनेशनल पीस रिसर्च इंस्टीट्यूट' (सिपरी) ने अपनी वार्षिक पुस्तक में कहा कि जनवरी 2025 में अनुमानित 12,241 परमाणु हथियारों की कुल वैश्विक सूची में से लगभग 9,614 संभावित उपयोग के लिए सैन्य भंडार में मौजूद हैं। तैनात किए गए लगभग 2,100 परमाणु हथियारों को बैलिस्टिक मिसाइलों पर उच्च परिचालन अलर्ट की स्थिति में रखा गया था, जिनमें से लगभग सभी अमेरिका या रूस के

फाइल फोटो।

हैं लेकिन चीन ने शांति काल के दौरान मिसाइलों पर कुछ परमाणु हथियार रखे हैं। दुनिया में नौ देशों के पास परमाणु हथियार हैं जिनमें संयुक्त राज्य अमेरिका, रूस, ब्रिटेन, फ्रांस, चीन, भारत, पाकिस्तान, उत्तर कोरिया व इजराइल शामिल है।

सिपरी ने कहा कि रूस और अमेरिका, जिनके पास कुल परमाणु हथियारों का लगभग 90 फीसद हिस्सा है, ने 2024 में अपने-अपने उपयोग योग्य परमाणु हथियारों के आकार को अपेक्षाकृत स्थिर रखा है। लेकिन दोनों ही व्यापक आधुनिकीकरण कार्यक्रमों को लागू कर रहे हैं जो भविष्य में उनके शस्त्रागार के आकार को बढ़ा सकते हैं। सबसे तेजी से बढ़ने वाला शस्त्रागार चीन का है, जिसमें बेजिंग 2023 से प्रति वर्ष लगभग 100 नए हथियार जोड़ रहा है।

दशक के अंत तक चीन के पास संभावित रूप से रूस या अमेरिका जितनी कम से कम उतनी अंतरमहाद्वीपीय बैलिस्टिक मिसाइलें हो सकती हैं। अनुमानों के अनुसार रूस और अमेरिका के पास क्रमशः लगभग 5,459 और 5,177 परमाणु हथियार हैं, जबकि चीन के पास लगभग 600 हैं। सिपरी के मुताबिक, ऐसी आशंका है कि चीन में यह संख्या 'आने वाले दशक में बढ़ती रहेगी'। रपट में कहा गया है, 'चीन के पास दुनिया में सबसे तेजी से बढ़ता परमाणु शस्त्रागार है' जहां अधिकांश चीनी परमाणु आयुध को उनके 'लांचर' से अलग रखा गया है, वहीं माना जा रहा है कि चीन अब सीमित संख्या में मिसाइलों पर परमाणु हथियार तैनात करना शुरू कर रहा है, ठीक उसी तरह जैसे अमेरिका बड़े पैमाने पर करता है।

सिपरी के अनुमान के मुताबिक, 132 परमाणु आयुध उन लांचर पर रखे गए हैं, जिन पर फिलहाल लोडिंग की प्रक्रिया जारी है। पर्यवेक्षकों के अनुसार, चीन के बढ़ते परमाणु हथियार भंडार का भारत पर भी प्रभाव पड़ेगा, क्योंकि बेजिंग का करीबी सहयोगी पाकिस्तान भी अपने परमाणु हथियार कार्यक्रम में तेजी ला रहा है।

रपट में बताया गया है कि भारत के पास पाकिस्तान के मुकाबले अधिक परमाणु हथियार हैं। भारत के पास वर्ष 2025 में करीब 180 परमाणु हथियार हैं। बीते साल भारत के पास 172 परमाणु हथियार थे। वहीं, पाकिस्तान के पास वर्ष 2025 में 170 परमाणु हथियार मौजूद हैं जबकि उसके पास पिछले साल भी इतने ही हथियार थे।

*

India has more nuclear warheads than Pakistan but trails China: SIPRI

Source: Hindustan Times, Dt. 17 Jun 2025

India has more nuclear weapons than Pakistan, but Beijing's strategic arsenal is bigger than New Delhi's, said the Stockholm International Peace Research Institute (SIPRI) in a new yearbook released on Monday.

SIPRI pegged the number of nuclear warheads in the Indian arsenal at 180 as of January 2025, compared to 172 a year earlier, while Pakistan is estimated to have 170 nuclear weapons, the

same as last year. China's arsenal consisted of 600 nuclear warheads in January 2025, up from 500 last year.

SIPRI revises its world nuclear forces data every year based on new information. Its latest report comes after India launched Operation Sindoor in the early hours of May 7 and struck terror and military installations in Pakistan and Pakistan-occupied Kashmir (PoK) following the Pahalgam terror strike in which 26 people were shot dead. The strikes triggered a four-day military confrontation with Pakistan involving fighter jets, missiles, drones, long-range weapons, and heavy artillery.

The SIPRI report said Russia and the US have the biggest arsenals among the nine nuclear-armed states (5,459 and 5,177). It added that although Pakistan remains the focus of India's nuclear deterrent, India appears to be placing growing emphasis on longer-range weapons capable of reaching targets throughout China.

India last year commissioned its second indigenous nuclear-powered ballistic missile submarine, INS Arighaat, at Visakhapatnam in a step towards strengthening the country's nuclear triad (ability to launch strategic weapons from land, sea, and air).

India's nuclear weapons, the SIPRI report said, were assigned to a maturing nuclear triad of aircraft, land-based missiles, and SSBNs (ship submersible ballistic nuclear or nuclear-powered ballistic missile submarines).

"It has long been assumed that India stores its nuclear warheads separate from its deployed launchers during peacetime; however, the country's recent moves towards placing missiles in canisters and conducting sea-based deterrence patrols suggest that India could be shifting in the direction of mating some of its warheads with their launchers in peacetime," the report said. India is building a fleet of four to six SSBNs as it continues to develop the naval component of its nascent nuclear triad, it said.

The country's third nuclear-powered ballistic missile submarine, Aridaman or S-4, is set to be commissioned later this year, followed by a fourth SSBN codenamed S-4*. Arighaat or S-3 is the second Arihant-class submarine and more advanced than INS Arihant (S-2).

The US, Russia, the United Kingdom, France, and China are the only other countries that can deliver nuclear warheads from a submarine.

China is in the middle of a significant modernisation and expansion of its nuclear arsenal, SIPRI said. "Depending on how it decides to structure its forces, China could potentially have at least as many ICBMs (inter-continental ballistic missiles) as either Russia or the US by the turn of the decade, although its stockpile of nuclear warheads is still expected to remain much smaller than the stockpiles of either of those two countries."

The rise in the number of states with multiple-warhead programmes could potentially lead to a rapid increase in deployed warheads and allow nuclear-armed states to threaten the destruction of significantly more targets, especially in the case of China, which has the fastest-growing nuclear arsenal in the world, the report said.

India has developed the Agni-5 missile with multiple independently targetable reentry vehicle (MIRV) technology. The MIRV capability allows the weapon system to deliver multiple nuclear warheads against different targets spread across hundreds of kilometres. MIRVs can cause more destruction than traditional missiles that carry a single warhead.

India's nuclear doctrine, promulgated in 2003, commits the country to a "no first use" posture, with weapons to be used only in retaliation against a nuclear attack on Indian territory or Indian forces. It states that nuclear retaliation to a first strike will be massive and designed to inflict unacceptable damage.

Under India's doctrine, retaliatory attacks can only be authorised by the civilian political leadership through the Nuclear Command Authority, consisting of a political council and executive council. The prime minister chairs the political council, while the national security advisor chairs the executive council.

https://www.hindustantimes.com/india-news/india-has-more-nuclear-warheads-than-pakistan-but-trails-china-sipri-101750072431263.html

*

China adding 100 nuclear warheads annually: SIPRI

Source: The Times of India, Dt. 17 Jun 2025

China is now adding 100 warheads to its nuclear arsenal every year, which is already more than three times India's stockpile. While India continues to maintain a slight edge over Pakistan, the recent cross-border military conflict between them risked escalating into a nuclear crisis, says a global arms watchdog.

China has 600 warheads, up from 500 in Jan 2024, while India has 180 and Pakistan 170, as per the latest assessment by the Stockholm International Peace Institute (SIPRI) released on Monday. Russia and the US, of course, are way ahead of others, together accounting for 90% of all nuclear weapons.

Taking note of Operation Sindoor launched by India against Pakistan on May 7, a senior SIPRI researcher said, "The combination of strikes on nuclear-related military infrastructure and third-party disinformation risked turning a conventional conflict into a nuclear crisis."

Indian officials, including Chief of Defence Staff General Anil Chauhan, however, have stressed that the May 7-10 hostilities came nowhere close to either side contemplating the use of nuclear weapons.

India, however, did strike the Sargodha and Nur Khan air-bases, among others, in clear strategic messaging. The first is located near Pakistan's underground nuclear infrastructure and storage facilities at Kirana Hills, while the second is close to the headquarters of the Strategic Plans Division that oversees the country's nuclear arsenal.

The SIPRI researcher, on his part, said, "As the recent flare-up of hostilities in India and Pakistan amply demonstrated, nuclear weapons do not prevent conflict. They also come with immense risks of escalation and catastrophic miscalculation - particularly when disinformation is rife - and may end up making a country's population less safe, not more."

Overall, the SIPRI report said China's nuclear arsenal is growing faster than any other country and is likely to touch 1,500 warheads by 2035. Both India and Pakistan continued to develop new types of nuclear weapon delivery systems in 2024, and are also pursuing the capability to deploy multiple warheads on ballistic missiles.

India has "slightly expanded" its nuclear arsenal from 172 warheads last year to 180 now, with its new "canisterised" missiles making it possible for them to carry mated nuclear warheads even during "peacetime", it added.

As reported by TOI earlier, the China-specific Agni-5 (strike range over 5,000 km) and the new-generation Agni-Prime (1,000-2,000 km) ballistic missiles, which are being inducted into the Strategic Forces Command (SFC), come in hermetically-sealed canisters. The Agni-Prime will gradually replace the Agni-1 (700 km) and Agni-2 (2,000 km) missiles already in the SFC's arsenal.

With missiles with mated warheads in ready-to-fire configurations, the SFC gets the requisite operational flexibility to store them for long periods, swiftly transport them through rail or road when required, and fire from wherever they want. The Agni-5 was also tested with multiple warheads (MIRVs or multiple independently targetable reentry vehicles) for the first time in March last year.

The SIPRI report said Pakistan is developing its "nascent" nuclear triad of aircraft, ground-launched ballistic and cruise missiles, and sea-launched cruise missiles like the Babur-3 being fitted on Agosta-90B diesel-electric submarines.

India, in turn, has a "maturing" nuclear triad, with two operational SSBNs (nuclear-powered submarines armed with nuclear ballistic missiles) in INS Arihant and INS Arighaat, strengthening the naval leg of its nuclear triad. The third slightly larger SSBN will be commissioned as INS Aridhaman this year, as reported by TOI earlier.

https://timesofindia.indiatimes.com/india/china-adding-100-nuclear-warheads-annually-sipri/articleshow/121893995.cms

*

भारत समेत 24 देशों की सेनाएं कर रही हैं संघर्षग्रस्त क्षेत्रों के लिए शांति का अभ्यास

Source: Punjab Kesari, Dt. 17 Jun 2025

नई दिल्ली, (पंजाब केसरी): भारत और अमेरिका समेत 24 देशों की सेनाएं एक महत्वपूर्ण बहुराष्ट्रीय शांति स्थापना का सैन्य अभ्यास 'ख़ान क्वेस्ट' कर रही हैं। यह अभ्यास मंगोलिया के फाइव हिल्स ट्रेनिंग एरिया में चल रहा है। अमेरिकी इंडो-पैसिफिक कमांड के साथ साझेदारी में यह अभ्यास शांति स्थापना में सैन्य कौशल को निखारने के लिए 24 देशों की सैन्य टुकड़ियों को एक साथ लाया है।

सोमवार को भी इस मल्टीनेशनल संयुक्त सैन्य अभ्यास में भारत व अन्य देशों की सेनाएं महत्वपूर्ण अभ्यास कर रही हैं। रक्षा मंत्रालय के मुताबिक 'खान क्वेस्ट' सैन्य अभ्यास 28 जून 2025 तक चलेगा। इसका उद्देश्य विभिन्न देशों के बीच सैन्य सहयोग को बढ़ावा देना है। इसके अलावा यह अभ्यास इन 24 देशों को आपस में सीखने की प्रक्रिया के बारे में प्रोत्साहित करता है और बहुराष्ट्रीय समन्वय को मजबूती दे रहा है।

इस अभ्यास के दौरान संघर्षग्रस्त क्षेत्रों में कार्य संचालन और मानवीय राहत अभियानों का अभ्यास किया जा रहा है। संघर्षग्रस्त क्षेत्रों में सिविल-मिलिट्री समन्वय जैसे महत्वपूर्ण विषयों पर प्रशिक्षण दिया जा रहा है। ये सभी प्रशिक्षण गतिविधियां संयुक्त राष्ट्र शांति मिशनों के नियमों के तहत की जा रही हैं। सेना का मानना है कि इस अभियान में भारत की सहभागिता उसके यूएन शांति रक्षा के समृद्ध अनुभव को दर्शाती है।

*

Science & Technology News

Indian scientist in Florida to help Shukla conduct experiments aboard space station

Source: The Tribune, Dt. 17 Jun 2025

Eyeing a successful Axiom-4 mission, the government is extending all help to Group Captain Shubanshu Shukla to ensure that all seven scientific experiments by India on the International Space Station (ISS) are a success.

A scientist from the Department of Biotechnology (DBT) is already in Florida for its three experiments. “Our person is there to assist Shukla in carrying out the experiments smoothly. Of the seven experiments which he will conduct, three are from the department,” a DBT official said. The first experiment aims to study the impact of microgravity conditions in ISS on the growth of edible microalgae.

The study will help identify the most robust and suitable microalgal species to be grown in space for future in developing strategies to incorporate self-sustainable systems for extended space missions, a scientist said.

The second experiment involves studying the effect of growth and responses of cyanobacteria growing on urea in microgravity. For longer space programme, it is essential to have a source for generating oxygen. Due to its fast growth, cyanobacteria are the best biological agents for carbon recycling. Cyanobacteria can also utilise urea — a major component of human urine, as a nitrogen source.

The third experiment is about studying the effect of metabolic supplement on muscle regeneration under microgravity. One of the primary effects of microgravity on astronauts is the loss of muscle mass and a decline in the ability of muscle cells to regenerate. As part of this effort, the investigators are implementing muscle repair experiments.

https://www.tribuneindia.com/news/india/indian-scientist-in-florida-to-help-shukla-conduct-experiments-aboard-space-station#google_vignette

*

Axiom-4 mission: ISRO coordinating with Axiom Space to refresh time-sensitive experimental specimens

Source: The Hindu, Dt. 17 Jun 2025

With the launch of Indian astronaut Group Captain Shubhanshu Shukla’s mission to the International Space Station (ISS) scheduled for June 19, the Indian Space Research Organisation (ISRO) is coordinating with Axiom Space to refresh time-sensitive experimental specimens. ISRO announced on Monday that it, along with the Indian Principal Investigators (PIs), is coordinating with Axiom Space ahead of the Axiom-4 mission’s (AX-4) scheduled launch.

ISRO has shortlisted seven microgravity research experiments proposed by Indian (PIs) from various national R&D laboratories and academic institutions which Group Captain Shukla would be conducting during his 14-day stay at the ISS.

The seven experiments include impact of microgravity radiation in ISS on Edible Microalgae, sprouting salad seeds in space, survival, revival, reproduction and transcriptome of Tardigrades in space, effect of metabolic supplements on muscle regeneration under microgravity, analysing human interaction with electronic displays in microgravity, comparative growth and proteomics responses of cyanobacteria on urea and nitrate in microgravity and impact of microgravity on growth and yield parameters in food crop seeds.

“The experience gained through this effort in implementation of these experiments will nurture a microgravity research ecosystem in the country resulting in the induction of advanced microgravity experiments in various disciplines in the Indian space programme,” ISRO had said earlier while announcing the experiments.

5 more experiments

In addition to these seven experiments, ISRO and NASA will be conducting five more experiments which will mainly be on human research programmes which Group Captain Shukla will be participating in.

The mission has been rescheduled four times due to various issues ranging from observation in electrical harness in Crew Dragon Module, delay in preparedness of the Falcon 9 vehicle, unfavourable weather, liquid oxygen leak on Falcon 9 and a snag in the Zvezda service module aboard the ISS.

https://www.thehindu.com/sci-tech/science/axiom-4-mission-isro-coordinating-with-axiom-space-to-refresh-time-sensitive-experimental-specimens/article69701001.ece

*

The Tribune
The Statesman
पंजाब केसरी जनसत्ता
The Hindu
The Economic Times
Press Information Bureau
The Indian Express
The Times of India
Hindustan Times
नवभारत टाइम्स
दैनिक जागरण
The Asian Age
The Pioneer