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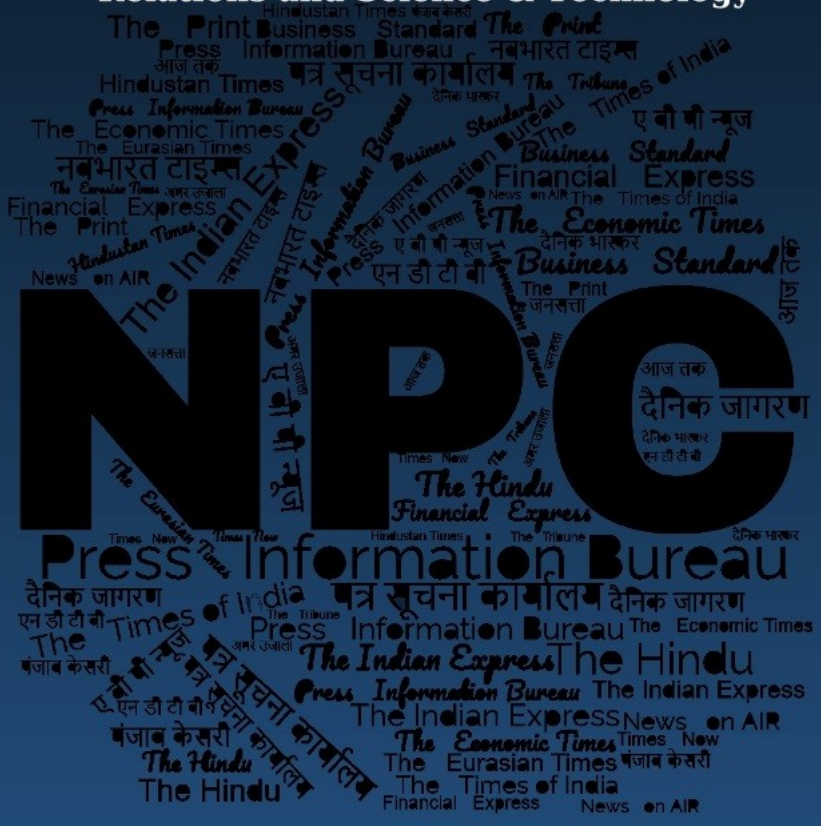
समाचार पत्रों से चयनित अंश
Newspapers Clippings

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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DRDO News

भारत स्पेस फोर्स के लिए बना रहा स्ट्रैटोस्फेरिक एयरशिप, ये कहलाएगा अंतरिक्ष का 'ब्योमकेश बक्शी'!

Source: Zee News, Dt. 20 April 2025,
URL: https://zeenews.india.com/hindi/zee-hindustan/national/iaf-and-drdo-planning-to-develop-stratospheric-airship-to-increase-power-of-indian-space-force/2724067

भारत अपनी सेना को मजबूत करने के लिए नए कदम उठा रहा है. ये काम जमीन तक ही सीमित नहीं है, बल्कि अंतरिक्ष में भी भारत अपना झंडा गाड़ रहा है. भारतीय वायु सेना (IAF) और रक्षा अनुसंधान और विकास संगठन (DRDO) एक लेटस्ट स्ट्रैटोस्फेरिक एयरशिप (Stratospheric Airship) बना रहे हैं. ये भारत की स्पेस फोर्स की ताकत को और अधिक बढ़ा देगा. इससे भारत दुश्मन के हर मूवमेंट पर नजर बनाए रखेगा.

स्ट्रैटोस्फेरिक एयरशिप क्या है?

स्ट्रैटोस्फेरिक एयरशिप हल्के गैस यानी हीलियम से भरा हुआ एक बड़ा गुब्बारा या जेट जैसा दिखने वाला एयरशिप है. यह पृथ्वी के Stratosphere में रहेगा. इसका मतलब है कि ये पृथ्वी से लगभग 20-50 किलोमीटर की ऊंचाई से काम करेगा. ये सौर ऊर्जा से एनर्जी पाता है इससे चलता है. ये लंबे टाइम तक स्पेस में रहने की क्षमता रखता है.

किस काम आएगा स्ट्रैटोस्फेरिक एयरशिप?

स्ट्रैटोस्फेरिक एयरशिप सैटेलाइट नहीं है, लेकिन यह सैटेलाइट की तरह नजर रखने के लिए इस्तेमाल किया जाता है. यह निगरानी, कम्युनिकेशन और डेटा कलेक्ट करने की क्षमता रखता है. इसका बड़ा फायदा ये है इसकी लागत सैटेलाइट जितनी भी नहीं है और ये उसके जितना काम भी देता है. उपग्रहों की तुलना में इसे लॉन्च करना और चालान कम खर्चीला है. इसे एक बार नहीं, बल्कि बार-बार उपयोग किया जा सकता है. इसकी मरम्मत करना और इसे अपडेट करना भी आसान है.

चीन-पाक पर होगी नजर

भारत जो एयरशिप बना रहा है, वह रिजॉल्यूशन कैमरों, रडार सिस्टम और सेंसर से लैस होगा. ये सीमाई क्षेत्रों, समुद्री क्षेत्रों और जरूरी स्थानों पर निगरानी करने में सक्षम होगा. यह भारत को अपने पड़ोसी देशों, खासकर चीन और पाकिस्तान की की सैन्य गतिविधियों पर नजर बनाए रखने में मदद करेगा. कुल मिलाकर ये भी कहा जा सकता है कि IAF और DRDO का स्ट्रैटोस्फेरिक एयरशिप ना सिर्फ भारत की रक्षा क्षमता मजबूत करेगा, बल्कि विज्ञान के क्षेत्र में भी नाम ऊंचा होगा.

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भारत की डीजल सबमरीन 2033 में मचाएगी तहलका! समुद्र में छिपे दुश्मनों का चुन-चुनकर करेगी खात्मा

Source: Zee News, Dt. 19 April 2025,
URL: https://zeenews.india.com/hindi/zee-hindustan/national/indian-navy-indigenous-diesel-submarine-by-drdo-in-2033-check-features/2723269

भारत की नौसैनिक महत्वाकांक्षाओं के लिए एक महत्वपूर्ण घटनाक्रम में देश की प्रमुख पनडुब्बी निर्माता कंपनी मझगांव डॉक शिपबिल्डर्स लिमिटेड (MDL) स्वतंत्र रूप से एक पारंपरिक डीजल-इलेक्ट्रिक पनडुब्बी डिजाइन कर रही है, जो रक्षा अनुसंधान एवं विकास संगठन (DRDO) के इसी तरह के प्रयास को टक्कर देगी.

MDL ने कहा कि वह DRDO के प्रोजेक्ट-76 के तहत प्रपोजल को टक्कर देने वाली पनडुब्बी बना रहा है. दरअसल, DRDO परियोजना-76 के अंतर्गत स्वदेशी पारंपरिक पनडुब्बी विकास कार्यक्रम के लिए सुरक्षा संबंधी कैबिनेट समिति (CCS) से अनुमोदन लेने की तैयारी कर रहा है.

बता दें कि घरेलू स्तर पर उन्नत पारंपरिक पनडुब्बियों का विकास और निर्माण करके पनडुब्बी प्रौद्योगिकी में भारत की आत्मनिर्भरता को बढ़ावा मिलेगा. भारतीय नौसेना के लिए स्वदेशी डीजल-इलेक्ट्रिक अटैक पनडुब्बियों की एक नई श्रेणी विकसित करने की पहल है. बताया जा रहा है कि CCS से जल्द मंजूरी मिल सकती है.

बात पहली पनडुब्बी की डिलीवरी की करें तो यह मंजूरी के बाद लगभग 8 वर्ष बाद मिल सकेगी. यानी 2033 में.

हालांकि, MDL और DRDO जो पनडुब्बी बना रही हैं, उसमें भारतीय नौसेना को फायदा मिल सकता है, जिससे वह अपने पास दो अलग-अलग स्वदेशी विकल्प रख सकती है. साथ ही बेहतर टेक्नोलॉजी के साथ आगे के खतरों से निपट सकती है और नई पीढ़ी के हथियारों को अपने बेड़े में शुमार कर सकती है.

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DRDO Unveils New 6.8mm Rifle, Eyes Replacement for INSAS Amid Ak-203 Programme Delays

Source: Republic World, Dt. 19 April 2025,
URL: https://www.republicworld.com/defence/indian-armed-forces/drdo-unveils-new-68mm-rifle-eyes-replacement-for-insas-amid-ak-203-programme-delays

In early 2025, India's premier defence research body DRDO quietly pulled the wraps off a new prototype assault rifle chambered in 6.8x43mm, signaling a major pushback against India’s longstanding reliance on imported small arms. Developed by the Armament Research and Development Establishment (ARDE) in Pune, the new rifle is aimed squarely at the void left by the imported SIG716 and the sluggish AK-203 programme.

This new prototype comes with a 30-round polymer magazine reinforced with metal and features a collapsible telescopic stock—design cues clearly intended for modularity and rugged use. While the platform hasn’t yet been publicised with flamboyance, its timing and calibre choice say plenty. Positioned between the 5.56mm INSAS and the 7.62mm SIG716, the 6.8mm weapon could offer Indian soldiers better-stopping power with reduced recoil and manageable weight.

Indian Army's Hunt for a Middleweight Rifle Now Has a Native Contender

This isn't DRDO's first tryst with the 6.8mm cartridge. Back in 2013-14, ARDE pitched a Multi Calibre Individual Weapon System (MCIWS) that could fire 5.56mm, 7.62mm, and 6.8mm rounds using a modular barrel-and-magazine swap system. The Army, unconvinced by the design, rejected the platform. But DRDO quietly kept the 6.8x43mm cartridge listed in its R&D ecosystem.

Then in 2019, DRDO officials were spotted holding exploratory talks with U.S.-based Textron Systems to explore 6.8mm cartridge co-development under the Indo-U.S. Defence Technology and Trade Initiative (DTTI). Around the same time, the U.S. Army began moving away from the 5.56mm round in favour of the 6.8mm under its Next Generation Squad Weapon (NGSW) programme. That timing wasn't lost on DRDO. Fast forward to 2025, and the Indian prototype is no longer a multi-calibre experiment—it's a focused, dedicated 6.8x43mm weapon.

Rifle Designed for Mountain, Urban, And Jungle Warfare

The Indian Army today fields three separate calibres across its inventory: 5.56mm INSAS, 7.62x51mm SIG716, and older 7.62x39mm AK variants. The SIG716 rifles, procured from SIG Sauer under an emergency route in 2019, were earmarked for frontline counterterror operations—especially in Kashmir. Meanwhile, the Indo-Russian AK-203 deal has stalled more times than a rusted bolt carrier.

Into this chaos steps the DRDO 6.8mm rifle, which may offer a Goldilocks solution. It's lighter than the 7.62x51mm SIG but hits harder than the 5.56mm INSAS. The design prioritises reliability, drawing from DRDO's INSAS and Ugram platforms, and is built for use in high-altitude, desert, and close-quarters combat environments.

Indigenous Push Gains Traction Amid Global Shift To Intermediate Calibres

Strategically, this rifle is more than a new piece of kit—it's an assertion of indigenous competence. With the AK-203 project entangled in delays linked to Russia-Ukraine disruptions, DRDO's offering is an all-Indian alternative that doesn't need foreign licenses, joint ventures, or imported spares. This weapon, if cleared for induction, could be produced entirely within India—offering the Army something the AK-203 cannot: autonomy.

The choice of calibre also isn't random. As militaries worldwide look to intermediate calibres that deliver high velocity, flatter trajectories, and better armour penetration, the 6.8mm round is becoming the new sweet spot. DRDO's decision to go down this path now places India in sync with evolving global standards—particularly the U.S. Army's next-gen rifle projects.

Trials Ahead, Logistical Hurdles Loom, But DRDO Remains Confident

The real test lies ahead. The 6.8mm prototype will now have to prove itself through rigorous evaluations in conditions ranging from sub-zero Ladakh to scorching Rajasthan. Reliability, recoil management, and barrel life will be scrutinised. If it clears those hurdles, a fresh challenge awaits—scaling up ammunition production. India currently doesn't have existing facilities producing 6.8x43mm cartridges at scale. Creating those would be costly and logistically intense.

Moreover, the rifle will need to overcome institutional inertia. The SIG716 is already in field use. Army personnel are familiar with its performance and its maintenance ecosystem. The AK-203, while troubled, remains a politically loaded project with significant investment and strategic expectations.

What happens next depends on field trials, political will, and logistical foresight. But one thing is certain—India now has a homegrown contender in the fight for the soldier's primary weapon. DRDO, after years in the shadow of imports, has stepped back into the small arms game—and this time, it's chambered in 6.8.

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Indian Army Acquires Nine More DRDO Anti-Drone Systems to Tackle Rising Drone Threats from Bangladesh

Source: Republic World, Dt. 19 April 2025,
URL: https://www.republicworld.com/defence/indian-armed-forces/indian-army-acquires-nine-more-drdo-anti-drone-systems-to-tackle-rising-drone-threats-from-bangladesh

The Indian Army is ramping up its efforts to tackle the rising drone threat from across the Pakistan border with the acquisition of nine more laser-based anti-drone systems. The Defence Ministry has fast-tracked the procurement under emergency powers, adding to the seven systems already in place. These Integrated Drone Detection and Interdiction Systems, developed by the Defence Research and Development Organisation (DRDO), are proving crucial in curbing the growing use of drones for surveillance, smuggling weapons, and narcotics across the Line of Control (LoC) and the International Border (IB).

Counter-Drone Efforts Intensify Amid Increasing Drone Infiltration

The new systems are being introduced as part of the Army's broader counter-terror and counter-infiltration strategy, especially aimed at Jammu and Kashmir. With drones, many of them of Chinese origin, increasingly being used to carry out surveillance and illegal activities, India's military is under pressure to find more efficient ways to deal with these small, but dangerous, aerial threats. The addition of nine more systems comes as part of a Defence Ministry-approved emergency procurement, which officials say is aimed at strengthening the Army's defences in the region.

These laser-based anti-drone systems are already showing results. Recently, one of the DRDO-developed systems successfully brought down a Pakistani drone in the 16 Corps area, which falls under the Army's responsibility in Jammu. The drone, which was spotted flying from Pakistan's side, was swiftly neutralised by Army Air Defence units deployed south of the Pir Panjal ranges in Jammu, officials said. The laser systems, armed with a 2-kilowatt laser beam, have proven effective at a range of up to 1,000 metres, ensuring drones are incapacitated before they can pose a serious threat.

India's Counter-Drone Arsenal Set to Expand Further

In addition to these 2-kilowatt laser-based systems, India is also working on a more advanced 30-kilowatt version. This next-generation system will be capable of taking down larger drones,

aircraft, and even cruise missiles, adding another layer to the country's already formidable air defence setup. Expected to be ready for deployment within two years, this advanced counter-drone tech is expected to raise India's anti-aircraft capabilities to a whole new level, reinforcing the nation's defence against aerial threats.

The development of such advanced technologies positions India among a select group of nations leading the way in laser-based air defence. With rising drone threats globally, India's expertise in this area is quickly becoming a benchmark for other countries, highlighting its growing role in global security innovation.

Laser Systems as Key to Modern Defence Operations

These systems not only represent a technological leap but also reflect India's growing ability to respond to modern security challenges. The evolving nature of warfare, with an increasing reliance on drones for surveillance and attacks, requires new tools. India's response, developing homegrown laser systems, is a testament to its commitment to staying ahead of emerging threats. While the 2-kilowatt systems are currently operational, the upcoming 30-kilowatt systems will likely become a game-changer, offering expanded operational ranges and a more powerful response to large-scale drone threats.

As drones increasingly become part of modern warfare, India's proactive approach to neutralizing these threats is clear. Whether used for smuggling or surveillance, drones present a growing security challenge, especially along the western border. However the Indian Army is fighting back with homegrown solutions that are proving highly effective in neutralizing these threats. With further advancements in counter-drone technology, India is positioning itself as a leader in this space.

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Defence News

Defence Strategic: National/International

Indian Air Force Participates In Multinational Exercise Desert Flag-10 In UAE

Source: Press Information Bureau, Dt. 20 April 2025,
URL: https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2123037

A contingent of the Indian Air Force reached Al Dhafra Air Base in the United Arab Emirates to participate in Exercise Desert Flag-10, a premier multinational air combat exercise. The IAF is fielding MiG-29 and Jaguar aircraft in the exercise.

Exercise Desert Flag is a multinational exercise being hosted by the UAE Air Force, with participating contingents from the Air Forces of Australia, Bahrain, France, Germany, Qatar Saudi Arabia, Republic of Korea, Turkey, UAE, United Kingdom, and the United States in addition to the Indian Air Force. The exercise is scheduled to take place between 21 April to 08 May 2025.

The aim of the exercise is to undertake complex and diverse fighter engagements, with exchange of operational knowledge and best practices with some of the most capable Air Forces in the world. Participation in such exercises enhances mutual understanding interoperability, and strengthens military cooperation among the participating nations.

The IAF's participation underscores India's commitment to strengthening defence ties and interoperability with friendly nations in the region and beyond.

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HQ IDS to conduct second edition of Tri-services Future Warfare Course in New Delhi

Source: Press Information Bureau, Dt. 19 April 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2122831

The second edition of the Tri-services Future Warfare Course will be held at Manekshaw Centre in New Delhi from April 21 to May 09, 2025. The course is being conducted under the aegis of Headquarters Integrated Defence Staff and coordinated by the Tri-services think-tank, Centre for Joint Warfare Studies (CENJOWS).

Building on the success of the first course held in September 2024, this expanded three-week program continues the vision of Chief of the Defence Staff General Anil Chauhan to prepare officers for the complex challenges of modern warfare. The course maintains its rank-agnostic approach, albeit with an enhanced and diverse participation.

This edition features an enhanced curriculum covering specialised subjects and domain-specific warfare developments in military operations. It focuses on developing an erudite understanding on how war fighting is being impacted by technology, necessitating a relook at the thinking, concepts, doctrines, strategies and Tactics, Techniques and Procedures. It will align operational priorities with the capabilities of the indigenous defence industry and enable a free-flowing discussion on the various facets of modern and futuristic war fighting.

The attendees in the course range from Major Generals to Majors and their equivalent officers from other Services, along with representatives from other Departments under the Ministry of Defence, including DRDO, as well as the defence industry incorporating start-ups, MSMEs, DPSUs and private industry.

This second edition continues the larger mission of making the Armed Forces 'future ready' fostering Jointness and Integration among the Services and developing strategic leaders equipped to navigate the increasingly complex landscape of modern warfare.

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Defence Secretary Concludes Two-Day UK Visit; Co-Chairs 24th India-UK Defence Consultative Group Meeting

Source: Press Information Bureau, Dt. 18 April 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2122599

Defence Secretary Shri Rajesh Kumar Singh concluded a two-day visit to London from April 16–17, 2025, leading a high-level Indian delegation for the annual bilateral defence dialogue with the United Kingdom. During the visit, he co-chaired the 24th India-UK Defence Consultative Group meeting with Mr. David Williams, Permanent Under Secretary of State for Defence.

Both sides reviewed the evolving regional and global geopolitical landscape and reaffirmed their shared commitment to deepening defence ties. The discussions were held in the context of the Comprehensive Strategic Partnership announced in 2021 and the Roadmap to 2030, which continues to steer cooperation between the two nations. The Defence Secretary also interacted with the UK's National Security Adviser, Mr. Jonathan Powell, with talks focused on expanding tri-service military engagements and strengthening collaboration between the two countries' defence industries.

Addressing participants at the India-UK Defence Industry Roundtable, organised by the UK India Business Council, Shri Rajesh Kumar Singh highlighted the growing capabilities of Indian start-ups across key defence domains such as naval systems, drones, surveillance, defence space and aviation. He encouraged UK companies to explore partnerships with these agile innovators, noting their potential to deliver cost-effective and cutting-edge solutions.

The Defence Secretary also said that India is working closely with the UK Ministry of Defence to develop an Industrial Cooperation Roadmap to guide future industry engagement. He invited UK firms to invest in India's dedicated Defence Corridors in Uttar Pradesh and Tamil Nadu, where they can take advantage of state-level incentives and a rapidly evolving defence manufacturing ecosystem.

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INS Sunayna (IOS SAGAR) Arrives In Mozambique Under Sagar Mission To Strengthen Maritime Ties

Source: Press Information Bureau, Dt. 18 April 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2122722

INS Sunayna, currently on deployment to Africa as Indian Ocean Ship IOS SAGAR arrived at Nacala Port, Mozambique on 17 Apr 25. The ship had earlier participated in the inaugural session of the India-Africa maritime partnership exercise AIKEYME 25, at Dar-es-Salaam, Tanzania.

IOS SAGAR is a unique mission based on the Government of India's regional initiative of maritime collaboration titled SAGAR, which stands for Security and Growth for All in the Region. The mission is aimed at fostering international cooperation between India and several African countries.

The ship was flagged off on her mission from Karwar on 05 Apr 25 by Hon'ble Raksha Mantri. She had embarked 44 naval personnel from nine friendly foreign nations, including Comoros, Kenya, Mozambique, Tanzania, Mauritius, Seychelles, Sri Lanka, Madagascar and Maldives, on her departure from India.

On her arrival at Nacala, the ship was welcomed by Commander Nelson H. Mabjaia, Chief of Commission, with the Mozambique Naval Band in attendance.

A range of collaborative activities and outreach programs are planned to be held during the port stay, aimed at promoting capacity building, operational synergy, and community engagements with the Mozambique Navy. These include joint training on Visit, Board, Search and Seizure (VBSS) drills as well as firefighting and damage control procedures. The ship will also host a deck reception on board for local officials and dignitaries in a celebration of maritime friendship.

Community interactions by the ship's crew will feature a yoga session to promote wellness and health, ship visits for Indian diaspora and local school children, an interschool quiz competition focused on maritime awareness and regional history as well as a guided tour for military cadets of the Nampula Military Academy, to offer firsthand insights into naval operations.

On completion of her port visit, the ship will embark personnel of Mozambique Navy as Sea Riders for a joint surveillance mission in the Mozambique Exclusive Economic Zone (EEZ), reaffirming the shared commitment to maritime security and countering non-traditional threats.

The port call marks a significant milestone enhancing maritime cooperation and interoperability between the Indian and Mozambique Navies. It also underscores India's enduring commitment to strengthening maritime partnerships in the Indian Ocean Region, enhancing mutual trust, and fostering collective regional security in consonance with the vision of the SAGAR initiative.

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India to emerge as a developed nation and number one military power in the world: Raksha Mantri

Source: Press Information Bureau, Dt. 17 April 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2122381

Raksha Mantri Shri Rajnath Singh laid out a compelling vision for a self-reliant and future-ready India at a Defence Conclave in New Delhi today on April 17, 2025. With a clear focus on indigenisation, innovation, and global leadership, he declared that India is not only securing its borders but also positioning itself as a key player in the international defence ecosystem. "The day is not far when India will not only emerge as a developed country, but our Military Power will also emerge as the number one in the world," he added.

Raksha Mantri reiterated that under the leadership of Prime Minister Shri Narendra Modi, the revival and strengthening of the defence sector is one of the biggest priorities for the government. He further stated that the government's first and foremost challenge was to change the mindset that India would simply import to meet its defence needs. "India will reduce its dependency on imports and create a defence industrial complex that will not only meet India's needs but will also strengthen the potential of defence exports," he emphasised.

"Today, while India's defence sector is moving ahead on the path of self-reliance, it is also ready to play a very important role in making global supply chains resilient," Raksha Mantri emphasised. He added that the Make in India program is not only strengthening the country's defence

production but also has the capability to make the global defence supply chain resilient and flexible. He further stated that while India's defence manufacturing capabilities are aimed at national security and strategic autonomy, they are also insulating manufacturing from global supply shocks.

Shri Rajnath Singh underlined that India's growing defence capability is not meant to provoke conflict. "Our defence capabilities are like a credible deterrence, to maintain peace and tranquillity. Peace is possible only when we remain strong," he added.

On the evolving nature of warfare, Shri Rajnath Singh underscored that in the coming days, conflicts & wars will be more violent and unpredictable. The Cyber & Space Domains are rapidly emerging as new battlefields and along with this, a war of narrative & perception is also being fought all over the world. To address these challenges, he mentioned that the focus is on holistic capacity building and continuous reforms. Raksha Mantri also announced that the Ministry of Defence had declared 2025 as the 'Year of Reforms'.

Reflecting on reforms, Shri Rajnath Singh highlighted that corporatising the over 200-year-old Ordnance Factories was a bold but necessary step. "Today Ordnance Factories are performing very well in their new form and have become profit making units. I believe that changing a structure that is more than two hundred years old is a very big reform of this century" he added.

Raksha Mantri also outlined the government's indigenisation drive, noting the release of five positive indigenization lists by the Armed Forces and five by Defence Public Sector Undertakings (DPSUs). "The total number of defence equipment, weapon systems and platforms included in the list of the Services is 509. These will now be produced in India. Similarly, the total number of items included in the DPSU lists is 5,012 including strategically-important Line Replacement Units, sub-systems, spares and components," he said.

Shri Rajnath Singh also underlined the fact that the government has reserved 75 per cent of the defence budget for procurement from domestic companies. He pointed out that defence production in India has risen from Rs 40,000 crore in 2014 to over Rs 1.27 lakh crore today. "This year, defence production should cross Rs 1.60 lakh crore, while our target is to produce defence equipment worth Rs 3 lakh crore by the year 2029," he added.

On defence exports, Raksha Mantri underscored that the figures had surged from Rs 686 crore in 2013–14 to Rs 23,622 crore in 2024–25. "Defence products made in our country are being exported to about 100 countries. "our defence exports should reach Rs 30,000 crore this year and Rs 50,000 crore by the year 2029," he announced.

Shri Rajnath Singh underlined the government's commitment to fostering innovation, particularly among the youth and start-ups. He stated that to encourage cutting-edge technology in the defence sector, iDEX was launched, which offers financial support of up to Rs 1.5 crore to selected start-ups. Building on its success, iDEX Prime was introduced, enhancing this support to Rs 10 crore. Further, the newly launched ADITI scheme provides assistance of up to Rs 25 crore to help scale breakthrough innovations. "The target is to strengthen the hands of our start-ups and MSMEs and for this, the Ministry of Defence has approved purchases worth more than Rs 2,400 crore from

start-ups/MSMEs, and projects worth more than Rs 1,500 crore have been approved for development of new technology," he added.

Highlighting India's growing strategic capabilities, Raksha Mantri mentioned that the country now stands shoulder to shoulder with developed nations in critical areas such as missile technology (Agni, BrahMos), submarines (INS Arihant), aircraft carriers (INS Vikrant), artificial intelligence, drones, cyber defence and hypersonic systems. "Aero engine manufacturing remains a challenge," he said, while also pointing to significant progress under the Kaveri engine project and ongoing discussions with global players like Safran, GE and Rolls Royce to build domestic capabilities.

With emphasis on India's success in shipbuilding, Shri Rajnath Singh stated that more than 97% of the war ships of Indian Navy and Indian Coast Guard are now built in Indian shipyards. Ships built by India are also being exported to friendly countries like Mauritius, Sri Lanka, Vietnam and Maldives.

Senior officials, experts and dignitaries including former Chief of Army Staff General Manoj Pande, former Chief of Naval Staff Admiral Sunil Lanba, former Chief of the Air Staff Air Chief Marshal VR Chaudhari, Secretary (Defence Production) Shri Sanjeev Kumar, Secretary, Department of Defence R&D and Chairman DRDO Dr Samir V Kamat and former Defence Secretary Shri Sanjay Mitra also attended the conclave.

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EU Naval Force Operation Atalanta proposes joint exercise with Indian Navy

Source: The Economic Times, Dt. 17 April 2025,
URL: https://economictimes.indiatimes.com/news/defence/eu-naval-force-operation-atalanta-proposes-joint-exercise-with-indian-navy/articleshow/120376361.cms

Vice Admiral Ignacio Villanueva Serrano, Operation Commander of EUNAVFOR ATALANTA, on Thursday said he has proposed conducting a joint exercise with the Indian Navy later this year. European Union Naval Force Operation ATALANTA -- EUNAVFOR ATALANTA -- is the EU military operation to contribute to the maritime security in the Western Indian Ocean and in the Red Sea.

Interacting with a small group of reporters at the embassy of the European Union Delegation to India here, the top military officer said he recognises the Indian Navy as a "major actor" in the area in which it operates.

Vice Admiral Serrano emphasised that the Indian Ocean must be a "free, open, sustainable and inclusive area".

"We are one of the tools to keep the ocean safe..to work on the maritime security of the Indian Ocean. So, that is why I came, I came here to the co-ordination, to meet our counterparts, to do things effectively, for the good of the people," he said.

The Operation Commander of EUNAVFOR ATALANTA asserted that "we are ready to keep working together".

Indian Navy conducts joint all-domain operations including Amphibious Assault, Coordinated HADR Operations and MEDEVAC Operations.

"I made a proposal to the Indian Navy and Indian authorities, to do an exercise around end of May. If it is finally approved, I will be sending two ships to Mumbai, to this exercise, and to practice and enhance the coordination and cooperation with the Indian Navy," he said, adding that is the vision with which, he came to India.

Vice Admiral Serrano said he encounters Indian Navy ships in the area many times.

"The coordination has always been good and very professional. And, we want to keep it that way. I recognise the Indian Navy as a major actor in the area. We will complement and definitely will be efficient working together," he said.

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General Manoj Pande advocates leapfrogging reforms for India's defence modernisation

Source: The Economic Times, Dt. 18 April 2025,
URL: https://economictimes.indiatimes.com/news/defence/general-manoj-pande-advocates-leapfrogging-reforms-for-indias-defence-modernisation/articleshow/120400736.cms

Modernisation demands speed while indigenisation will take time and managing this contradiction is the key, former army chief General Manoj Pande (retd) said on Thursday and asserted it is time to move away from taking incremental steps to "leapfrog and perhaps pole-vault" in the quest for 'Atmanirbharta' in defence. In a special address at The Week Defence Conclave hosted at Manekshaw Centre here, he also said that a "path-breaking reform" in the human resource management has been implemented by the Services in the form of Agnipath scheme.

"Its evolution, planning and implementation required extensive inter-ministerial and inter-departmental consultations and coordination of a very complex nature. I believe this process must continue, for further consolidation and refinement to the scheme," General Pande said.

He also spelt out the core difference between reforms and transformation being sought in the sector.

In order to give impetus to the ongoing and future reforms, the government has declared 2025 as the 'Year of Reforms' in the Ministry of Defence, aiming at transforming the armed forces into a technologically-advanced combat-ready force capable of multi-domain integrated operations.

Reforms are about changes and making the system more efficient and it deals with finite issues, while transformation involves a fundamental change which has to do with attitude, mindset and is broader in scope, involves long-term actions, is organisation-wide and deals with more than one function of a department or an agency.

"Transformation, therefore, can achieve better results for a multi-agency or the multi-disciplinary organisation such as the Ministry of Defence. They say the whole is greater than the sum of its parts, so in this case, reforms are the part, the transformation is the whole," he added.

In his address, General Pande also touched upon the aspect of achieving self-reliance in defence sector while working towards modernisation.

"While modernisation will demand speed and is the need of the hour, indigenisation will take time. Managing this contradiction in my opinion is the key. And, I also believe it is time, we moved away from taking incremental steps to leapfrog and perhaps pole-vault in our quest for 'Atmanirbharta'," he said.

General Pande had superannuated in June 2024 after more than four decades of service to the nation as the 29th Chief of the Army Staff (COAS).

Under his leadership, year 2024 was declared 'Year of Technology Absorption' for the Indian Army.

"We need to recognise that the defence forces are form part of a larger defence and security environment or ecosystem in the country... So, if the aim of the reforms is to enhance defence capabilities, operational readiness levels, improve combat and functional efficiency, it is not just the reforms pertaining to individual service or department that is going to be important.

"And, unless cross-functional linkages, inter-department linkages, besides the aspects of jointness, integration, and the tri-Service synergy are addressed, I feel the overall outcomes will always remain sub-optimal," he said.

The former army chief underlined that any reform must go through "five distinct phases", from identifying the need for change to sustaining the change, and each of the phases are equally important and must have clearly-defined objectives, deliverables, timelines and must focus on actionable points and allocate specific responsibilities for execution.

Also for a reform to succeed, its evolution should be participative and collaborative, with due consultations from within the organisation, and if required, even outside it, he said.

Leaders at all levels must take ownership and communicate effectively the purpose of the reform to the rank and file. Shedding of entrenched beliefs, methods and processes entails a focus shift in the cognitive domain, the former COAS said.

The Indian Army has spelt out its transformation roadmap based on five pillars. "Defence reforms must not be seen in isolation, as incremental in nature, as individual steps that each service is taking, they must form part of the overall transformation efforts. We should look beyond the 'Year of Defence Reforms' and convert the process into a drive or movement for transformation towards achieving our identified visions, goals and objectives," he said.

Forme IAF chief Air Chief Marshal V R Chaudhari (Retd.) also addressed the gathering during the conclave. He also spoke about the Russia-Ukraine conflict and the use of drones in it. "The future of any conflict as I see it, will focus less on firepower and more on the power of information," he said.

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Indian armed forces face major setback as more than 300 ALHs continue to remain grounded, disrupting critical operations

Source: The Economic Times, Dt. 19 April 2025,
URL: https://economictimes.indiatimes.com/news/defence/indian-armed-forces-face-major-setback-as-more-than-300-alhs-continue-to-remain-grounded-disrupting-critical-operations/articleshow/120425752.cms

While the Indian armed forces are already struggling with the high crash rate and poor serviceability of their 350 obsolete single-engine Cheetah and Chetak helicopters, the military is now facing a serious setback due to the grounding of nearly 330 twin-engine `Dhruv' advanced light helicopters (ALHs). These helicopters have been out of service for over three months, severely affecting military operations and readiness, as reported by TOI's Rajat Pandit.

The multi-role ALHs are crucial for many military tasks, from carrying supplies to remote forward areas near the borders with China and Pakistan, to rescue missions and patrolling. A senior officer told TOI, "All have suffered major disruptions for over three months now. ALH pilots are also losing flying currency, and forced to make do with simulators."

The Army, which operates the largest number of ALHs (over 180, including 60 weaponised Rudra versions), has been hit the hardest. The Indian Air Force has 75, the Navy 24, and the Coast Guard 19. These helicopters, made by Hindustan Aeronautics Ltd (HAL), have been in service since 2002 and are considered workhorses of the military. Last year alone, the Army's ALHs flew nearly 40,000 hours.

The grounding began after a tragic crash on 5 January in Porbandar, where two Coast Guard pilots and an aircrew diver lost their lives. Since then, no ALHs have flown, adding to the already existing shortage of helicopters in the armed forces. As TOI's Rajat Pandit reported, the lack of serviceable choppers has become a serious concern. The armed forces have said they need over

1,000 new helicopters in the next 10 to 15 years. This includes 484 Light Utility Helicopters (LUH) and 419 Indian Multi-Role Helicopters (IMRH). But there have been long delays in these HAL-led projects.

Apart from that, the forces are also waiting for the delivery of 156 Prachand Light Combat Helicopters (90 for the Army, 66 for the IAF), which are part of a Rs 62,700 crore deal signed last month. These are scheduled to be delivered between 2028 and 2033. Amidst all this, there is one small relief, the Army has hired private helicopters to help deliver supplies and transport troops in high-altitude border areas.

“The use of civil choppers was started by the Army’s Northern and Central Commands last Nov due to the huge shortage of helicopters. If that had not been done, it would have become extremely tough to supply troops deployed in forward locations after the grounding of ALHs,” an officer said.

This is the first time such outsourcing has been done. The Army signed contracts worth over Rs 70 crore with companies like Pawan Hans, Himalayan Heli Services, Global Vectra, and Thumby Aviation. Since mid-November, these choppers have flown over 1,500 hours, carrying nearly 900 tonnes of supplies to remote areas like Kargil, Gurez, Kishtwar, Garhwal and parts of Himachal Pradesh.

“They proved a boon for soldiers deployed in over 30 remote posts in high-altitude areas of the Himalayas in J&K, Himachal Pradesh and Uttarakhand, especially after the ALH fleet was grounded. The Army plans to begin this soon in the eastern sector as well,” the officer added.

Using private helicopters for supply duties also helps preserve military helicopters for more critical roles during war or emergency situations.

But the ALHs need to be back in action soon. HAL is still trying to determine exactly what caused the “swashplate fracture” that led to the Porbandar crash. So far, similar material issues have been found in other ALHs too. “ALHs have been grounded three-four times for safety checks after crashes in recent years. This time, the entire process should be thorough and transparent without any patchwork solutions. Precious lives and operational preparedness, after all, cannot be put at risk,” said an experienced military pilot.

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India, France to sign their largest ever deal for Rafale-Marine fighter jets on April 28

Source: The Economic Times, Dt. 19 April 2025,
URL: https://economictimes.indiatimes.com/news/defence/india-france-to-sign-their-largest-ever-deal-for-rafale-marine-fighter-jets-on-april-28/articleshow/120437284.cms

India and France are expected to sign their largest-ever defence deal for the sale of 26 Rafale Marine aircraft for the Indian Navy on April 28 in the presence of French Defence Minister Sebastien Lecornu. Defence sources told that senior officials will represent the two sides at the signing of the over Rs 63,000 crore contract.

The sources said that the event is also planned to be held outside the Defence Ministry headquarters in South Block.

The French Minister is expected to reach India on Sunday evening and return on Monday late evening, the sources said. India had cleared its largest-ever defence deal for 26 Rafale-Marine combat aircraft with France earlier this month on April 9 at a meeting of the Cabinet Committee on Security led by Prime Minister Narendra Modi under a government-to-government deal.

This government-to-government contract will include 22 single-seater and four twin-seater jets, along with a comprehensive package for fleet maintenance, logistical support, personnel training, and indigenous component manufacturing. These fighters will be operational from INS Vikrant and will support the existing Mig-29 K fleet.

The Indian Air Force already has a fleet of 36 aircraft acquired under a separate deal inked in 2016. The IAF Rafale jets operate from their two bases in Ambala and Hashinara. The deal for 26 Rafale-Ms will increase the number of Rafale jets to 62 and increase the number of 4.5-plus-generation aircraft in the Indian arsenal.

A new tender from the Indian Air Force for competition for multirole fighter aircraft is expected to be issued soon. However, the Indian Air Force has shown keenness to acquire a particular aircraft to meet its immediate requirements.

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Army facilitates mobile connectivity across Ladakh region including Galwan, Siachen Glacier

Source: The Economic Times, Dt. 19 April 2025,
URL: https://economictimes.indiatimes.com/news/defence/army-facilitates-mobile-connectivity-across-ladakh-region-including-galwan-siachen-glacier/articleshow/120431291.cms

Troops deployed in some of the world's most inhospitable terrains including Galwan and Siachen Glacier can now stay connected with their loved ones as the Army has facilitated reliable high-speed mobile connectivity across the Ladakh region, officials said on Saturday. In a transformative stride towards bridging the digital divide and empowering remote communities, the Indian Army has facilitated unprecedented mobile connectivity across the remote and high-altitude areas of Ladakh, including forward locations in eastern Ladakh, western Ladakh and the Siachen Glacier, Army officials said.

They said for the first time ever, troops deployed in some of the world's most inhospitable terrains -- such as DBO, Galwan, Demchok, Chumar, Batalik, Dras and the Siachen Glacier -- now have access to reliable 4G and 5G mobile connectivity.

This initiative has proved to be a major morale-booster for soldiers serving in isolated winter cut-off posts at altitudes above 18,000 feet, allowing them to stay connected with their families and loved ones, the officials said.

The pioneering effort has been made possible through a collaborative approach under the Whole-of-Government framework, wherein the Indian Army -- leveraging its robust optical fibre cable infrastructure -- has partnered with Telecom Service Providers (TSPs) and the UT administration of Ladakh, they added.

The Fire and Fury Corps has played a leading role in enabling this synergy, resulting in the installation of multiple mobile towers on Army infrastructure, including four key towers in Ladakh and Kargil districts alone, the Army officials said.

The impact of this initiative extends far beyond troop welfare. It is a significant nation-building endeavour that is transforming the socio-economic fabric of remote border villages. By integrating 'First Villages' into the national digital network, this effort is bridging the digital divide, boosting local economies, promoting border tourism, enhancing medical aid and emergency services, and enabling educational access.

A particularly historic milestone was the successful installation of a 5G mobile tower on the Siachen Glacier -- the highest battlefield in the world -- showcasing India's technological prowess and resolve, they said.

The officials said local populations have welcomed this initiative with overwhelming gratitude. Mobile connectivity is not just a communication tool, it is now a lifeline for remote communities, fostering inclusion, opportunity and dignity.

This visionary initiative by the Indian Army stands as a testament to its enduring commitment to national integration and development, echoing the spirit of 'Viksit Bharat' - India@2047, the officials added.

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Defence Secretary calls on U.K. industry to explore partnerships with Indian defence start ups

Source: The Hindu, Dt. 18 April 2025,
URL: https://www.thehindu.com/news/national/defence-secretary-calls-on-uk-industry-to-explore-partnerships-with-indian-defence-start-ups/article69464552.ece

Defence Secretary Rajesh Kumar Singh urged U.K. companies to explore partnerships with Indian defence start-ups and invited investment in India’s dedicated defence corridors during a two-day visit to London. The visit followed discussions in Rome aimed at enhancing defence cooperation with Italy, particularly in technology and armament production.

Mr. Singh was in London from April 16-17, 2025, where he co-chaired the 24th India-U.K. Defence Consultative Group (DCG) meeting with David Williams, Permanent Under Secretary of State for Defence, the Defence Ministry said in a statement on Friday.

“Both sides reviewed the evolving regional and global geopolitical landscape and reaffirmed their shared commitment to deepening defence ties,” the Ministry stated. The discussions were held

within the framework of the India-U.K. comprehensive strategic partnership announced in 2021 and the Roadmap 2030.

During the visit, Mr. Singh also met the U.K.'s National Security Adviser, Jonathan Powell. Their talks focused on expanding tri-service military engagements and strengthening collaboration between the defence industries of the two nations, according to the statement.

Addressing the participants at the India-U.K. Defence Industry Roundtable organised by the UK India Business Council, Mr. Singh highlighted the potential of Indian start-ups to deliver cost-effective solutions in areas such as naval systems, drones, surveillance, space defence sector, and aviation.

"He invited U.K. firms to invest in India's dedicated Defence Corridors in Uttar Pradesh and Tamil Nadu, where they can take advantage of state-level incentives and a rapidly evolving defence manufacturing ecosystem," the Ministry added.

Mr. Singh noted that India is collaborating with the U.K. Ministry of Defence to develop an industrial cooperation roadmap in this regard.Prior to his U.K. visit, Mr. Singh was in Rome from April 14-15, where he co-chaired the 11th India-Italy Joint Defence Committee (JDC) meeting. He also held talks with Italian Defence Minister Guido Crosetto.

"During the meeting, the two sides held productive discussions aimed at further enhancing defence cooperation as a key pillar of India-Italy strategic partnership," the Ministry said.

The JDC meeting covered defence, security, and industrial cooperation, including maritime cooperation and information sharing, with an emphasis on the Trans Regional Maritime Network. The security situation in the Red Sea and the Western Indian Ocean Region was also discussed.

On the sidelines of the JDC, a Memorandum of Understanding (MoU) was signed between the Society of Indian Defence Manufacturers (SIDM) and the Italian Companies for Aerospace, Defence and Security (AIAD) to foster closer cooperation between the nations' defence industries.

A delegation from SIDM accompanied the Defence Secretary to promote business-to-business connections. India's defence sector ready to play important role in global supply chain resilience, says Rajnath.

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Pakistan Navy's plan to hold naval exercise off Trincomalee scrapped following India's concerns

Source: The Hindu, Dt. 19 April 2025,
URL: https://www.thehindu.com/news/international/pakistan-navys-plan-to-hold-naval-exercise-off-trincomalee-scrapped-following-indias-concerns/article69467170.ece

A plan to hold a military exercise between the navies of Pakistan and Sri Lanka in the strategic waters of Trincomalee was shelved a few weeks back, after New Delhi conveyed its concerns to Colombo over the proposed drills, multiple sources have said.

Trincomalee is situated on Sri Lanka's northeastern coast and is considered a significant hub in the Indian Ocean region, especially for India's maritime security interests. The sources said the Navies of the two countries had planned to carry out the exercise off Trincomalee, in line with their regular engagements.

The plan did not go through after India apprised its apprehensions over the exercise to the Sri Lankan side, they told PTI. The joint exercise was planned weeks ahead of Prime Minister Narendra Modi's visit to Colombo, the sources said.

The Navies of Pakistan and Sri Lanka are known to have cordial relations and warships from both countries visit each other's ports regularly, besides carrying out wargames. There was no official word on the plan either from Sri Lanka or Pakistan.

Military experts, explaining Trincomalee's strategic importance for India, said it has the potential to dominate the Bay of Bengal and much of the northeast Indian Ocean, and New Delhi was right in expressing concerns over the proposed exercise.

The Pakistani Navy operates in close cooperation with China's PLA Navy and New Delhi has reasons to have concerns over any visit by Pakistani warships to Trincomalee, said one of the experts.

The docking of Chinese missile and satellite tracking ship "Yuan Wang" at the Hambantota port in August 2022 had triggered a diplomatic row between India and Sri Lanka.

Another Chinese warship docked at the Colombo port in August 2023 had also triggered some concerns in New Delhi.In the last few years, India has been focusing on extending assistance to Sri Lanka in developing Trincomalee's energy infrastructure.

India is especially looking at revitalising the oil tank farms in Trincomalee that has one of the finest natural harbours in the world.

During Mr. Modi's visit to Colombo this month, India, Sri Lanka and the United Arab Emirates (UAE) firmed up an ambitious agreement to develop Trincomalee as an "energy hub", with a broader aim to help the island nation achieve energy security and fuel its economic growth.

Significantly, India and Sri Lanka also signed a defence pact to institutionalise military cooperation following talks between Mr. Modi and Sri Lankan President Anura Kumara Dissanayake.

The agreement on defence cooperation signals a major attempt to boost the India-Sri Lanka defence ties, nearly four decades after the Indian Peace Keeping Force's intervention in the island nation strained the relations.

India has been expanding its overall strategic ties with Sri Lanka amid concerns over China's attempts to increase influence over the island nation.

Three years back, India handed over a Dornier maritime surveillance aircraft to Sri Lanka.The aircraft was given to Sri Lanka from the inventory of the Indian Navy to help the country meet its immediate security requirement.

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India to deepen defence and trade partnership with Saudi Arabia during PM Modi's upcoming visit

Source: ANI News, Dt. 19 April 2025,
URL: https://www.aninews.in/news/world/asia/india-to-deepen-defence-and-trade-partnership-with-saudi-arabia-during-pm-modis-upcoming-visit20250419202433/

India and Saudi Arabia are expected to strengthen their defence cooperation and expand their economic partnership, currently valued at nearly USD 43 billion during Prime Minister Narendra Modi's visit to the Kingdom on April 22 and 23, Foreign Secretary Vikram Misri said on Saturday.

Foreign Secretary Vikram Misri said that defence cooperation has grown rapidly in recent years, with joint exercises, training, and defence trade gaining momentum.

"The Defence Partnership has witnessed several firsts in the past few years. We had the first ever joint land forces exercise between the two countries in 2024. I think it's called the 'Sada Tanseeq'. Two editions have been held of joint naval exercises. We've had regular exchanges on training and capacity building and staff talks are taking place across all the three services," he said.

According to the MEA, India is also emerging as a key defence supplier to Saudi Arabia. "Our cooperation has also expanded on the defence industry front. And India is gaining space as an important supplier of defence stores to Saudi Arabia. And a special agreement on the export of munitions to the Kingdom worth about USD 225 million was signed last year," he added.

The two countries will also discuss deepening economic engagement during the visit. The value of bilateral trade in FY 2023-24 was close to USD 43 billion.

"The value of total trade between the two countries in FY 23-24 was nearly USD 43 billion. Saudi Arabia is India's fifth-largest trading partner overall, and India is the Kingdom's second-largest trading partner overall," Misri said.

India's imports from Saudi Arabia stood at USD 31.42 billion, while exports were valued at USD 11.56 billion. "Apart from trade, investment also continues to do well. And there are investments across different sectors such as energy, steel, chemicals, food sector, telecommunications and startups," he added.

Energy will also be a key topic during the talks. "The value of the energy trade in FY 23- 24 was USD 25.7 billion. The Kingdom remains India's third largest crude and petroleum sourcing destination... and also the third largest source of LPG for India, accounting for almost 18 per cent of the total LPG imports of India," Misri said.

The visit will include the second summit-level meeting of the Strategic Partnership Council, which was established during Crown Prince Mohammed bin Salman's visit to India in 2019. The council has two subcommittees, one focused on security and cultural relations, and the other on trade and investment.

"This is a visit at the invitation of His Royal Highness Prince Mohammed Bin Salman, Crown Prince and Prime Minister of the Kingdom of Saudi Arabia," Misri said, adding that the two leaders share "a very close personal relationship with a lot of warmth and respect for each other.

"This will be PM Modi's third visit to Saudi Arabia. He was earlier conferred with the Kingdom's highest civilian honour, the "King Abdulaziz Sash", during his 2016 visit.

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Indians prefer tech tie-ups to atmanirbharta, US & Israel as partners—Takshashila Institution survey

Source: The Print, Dt. 18 April 2025,
URL: https://theprint.in/defence/indians-prefer-tech-tie-ups-to-atmanirbharta-us-israel-as-partners-takshashila-institution-survey/2594433/

Amid the debate over the Indian Air Force's fighter jet acquisition strategy, a survey by The Takshashila Institution indicates higher public support in India for international collaboration in critical technologies than for indigenous development.

Findings were published last month by the Bangalore-based centre for research and education in public policy. The survey was conducted in November-December last year. It examined India's approach to high-tech geopolitics and sought responses a varied array of stakeholders, including private sector representatives, defence and security personnel, government officials, students, academics and think tank members.

The private sector comprised the majority of the 502 respondents at 40.2 percent, followed by defence and security personnel at 21.5 percent. A total of 10 questions were asked, ranging from broad-based themes such as technology and partners to specific ones on technology domains such as semiconductor and AI.

To the query 'what should be India's highest priority for technology development in the next decade', the majority leaned towards international collaboration rather than self-reliance, challenging the dominant 'Atmanirbhar Bharat' narrative in strategic circles.

As many as 43.8 percent of respondents advocated for India's collaboration with nations such as the US, the UK and France to expedite technological advancement, while 36.1 percent preferred development of indigenous technology, regardless of global competitiveness.

Findings come in the wake of a debate over projects including the Advanced Medium Combat Aircraft (AMCA), a 5.5-generation stealth fighter presently under development by Aeronautical Development Agency under Defence Research and Development Organisation (DRDO) in collaboration with Hindustan Aeronautics Limited (HAL) and private industry partners.

The survey considers AMCA programme as a case study on whether India should persist with ambitious indigenous initiatives, select established platforms such as the F-35 or Su-57, or engage in co-development and joint manufacture with reliable international partners.

"In the case of stealth fighters, the Indian government should choose between indigenous AMCA and co-development/co-production of next-gen aircraft," the survey report states. Given the IAF's fighter squadron shortfall (just 31 against the approved 42.5), this argument becomes more urgent and emphasises the requirement of quick combat capability upgrades.

A modest yet relevant 16.9 percent of respondents asserted that the Indian government should refrain from undertaking a direct role in establishing technological development projects, advocating alternatively for the private sector to lead in such decisions. Meanwhile, merely 3.2 percent supported the direct acquisition of technologies from foreign nations without joint production or technological collaboration.

The survey additionally analysed public preferences for international partners in the domain of critical technologies, including defence. Up to 45.4 percent of respondents picked the US as India's principal partner in this area, followed by Israel at 20.5 percent, France at 18.1 percent and Russia at 12.9 percent, with China receiving a mere 3 percent of picks.

Choices differed markedly among stakeholder groups. Among the surveyed defence and security personnel, Israel emerged as the preferred partner at 35.2 percent, followed by the US at 31.5 percent and Russia at 19.4 percent. France scored barely 12 percent in this category, indicating a pronounced inclination within India's defence sector towards Israeli technologies, alongside a persistent dependence on Russian equipment. The survey also sought to comprehend how Indians view the components that construct the nation's overall power in the forthcoming decade.

Only 14.1 percent of respondents prioritised military power as the most significant among military, technological, economic, soft and talent-based power. Within the "government" stakeholder category, only 10 percent prioritised military strength as their primary priority.

Meanwhile, soft power received the lowest ranking at 13.5 percent. On the contrary, 35.6 percent of those surveyed recognised economic power as India's primary source of national power, succeeded by talent power at 21.7 percent and technological power at 14.9 percent.

The comparatively elevated importance of talent over technology indicates an increasing acknowledgement that human capital and trained labour would be crucial in determining India's competitiveness in burgeoning high-tech sectors.

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IIT-Hyderabad builds world's highest on-site 3D-printed military bunker at 11,000ft in Leh

Source: The Times of India, Dt. 18 April 2025,
URL: https://timesofindia.indiatimes.com/city/hyderabad/simpliforge-iit-h-indian-army-3d-print-worlds-highest-on-site-military-bunker-in-leh/articleshow/120389924.cms

It took just five days and a total printing time of 14 hours to build what is being touted as the world's highest ever on-site 3D-printed military bunker in Leh. This feat was executed by the

Indian Institute of Technology, Hyderabad (IIT-H), along with Hyderabad-based Simpliforge Creations and the Indian Army.

This marks the world's highest-ever in-situ 3D construction printing feat to be accomplished under extreme high altitude and low oxygen (HALO) conditions.

The bunker, 3D printed at an extremely high altitude of 11,000 ft above sea level amid low oxygen conditions (HALO), is also India's first on-site 3D printed protective military structure.

It was built using locally sourced materials as part of Project Prabal, which showcases homegrown technology and academia-industry collaboration. This was done under the guidance of IIT-H's Prof KVL Subramaniam, with the Indian Army being represented by Arun Krishnan, who is doing his PhD at IIT-H.

According to Prof Subramaniam, the most critical aspect was the development of specially engineered materials that could perform under extreme environmental conditions. "Operating at high altitudes with low oxygen levels, low humidity, and significant thermal variations required not just structural innovation, but also innovation in material science. Our team, along with Simpliforge Creations, designed a concrete mix that could be 3D printed on-site while offering superior mechanical performance, durability, and resilience," he said.

However, before deploying the material in Leh, it underwent rigorous testing at IIT-H. "Understanding the material's behaviour under simulated environmental stresses allowed us to optimise the mix design for on-site usage," Prof Subramaniam added.

Pointing out that executing the project was a huge operational challenge for both the men and machines involved in the exercise, Simpliforge Creations CEO Dhruv Gandhi said: "The reduced oxygen levels affected everything from the performance of the power systems, which were delivering lower energy output than they would on the plains, to human efficiency. The low humidity and high UV also posed challenges to the integrity of the built material. The robotic printer system was set up and commissioned in under 24 hours."

The deployment of this first-of-its-kind 3D printed bunker paves the way for the rapid deployment of on-site infrastructure in challenging terrains in a short period of time, beefing up India's defence preparedness, IIT-H said.

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China Develops Powerful Non-Nuclear Hydrogen Explosive With Military Potential For Precision Thermal Strikes

Source: Swarajya, Dt. 20 April 2025,
URL: https://swarajyamag.com/news-brief/china-develops-powerful-non-nuclear-hydrogen-explosive-with-military-potential-for-precision-thermal-strikes

Chinese scientists have tested a hydrogen-powered bomb that unleashes massive chain reactions without nuclear materials, marking a significant advancement in non-nuclear explosive technology, South China Morning Post reported citing a study published last month. The 2kg bomb created a

fireball over 1,000 degree celsius that burned for more than two seconds—15 times longer than TNT— without using any nuclear materials.

Developed by the China State Shipbuilding Corporation's 705 Institute—known for naval weapons —the device uses a magnesium-based solid-state hydrogen storage material. The silvery powder, known as magnesium hydride, stores considerably more hydrogen than a pressurised tank.

It was originally developed for bringing hydrogen gas to generate clean energy in remote areas, where it could power fuel cells for clean electricity and heat.

But its dense hydrogen storage will now power a new wave of high-energy explosives.

Triggered by a conventional explosive, magnesium hydride decomposes thermally, releasing hydrogen that ignites into a long-lasting inferno, the researchers said in a peer-reviewed paper published in the Chinese-language Journal of Projectiles, Rockets, Missiles and Guidance.

"Hydrogen gas explosions ignite with minimal ignition energy, have a broad explosion range, and unleash flames that race outward rapidly while spreading widely," said the team, led by CSSC research scientist Wang Xuefeng.

"This combination allows precise control over blast intensity, easily achieving uniform destruction of targets across vast areas," it added.

According to the paper, the hydrogen bomb can cause extended thermal damage because the white-hot fireball it produces is sufficient to melt aluminium alloys and lasts much longer than TNT's fleeting 0.12-second flash. The research team reportedly conducted a series of experiments that showed the weapon's directed energy potential.

The researchers found that under constrained detonation, peak overpressure reached 428.43 kilopascals at two metres from the bomb – about 40 per cent of TNT's blast force, but with a far greater heat projection range. Further, they also looked at the weapon's other potential military applications, such as using it to cover a large area with intense heat and focusing its power on high-value targets to destroy them.

Detonation fractures the magnesium hydride into micron-scale particles, exposing new surfaces and setting off a chain reaction. Thermal decomposition rapidly releases hydrogen gas, which mixes with ambient air. Upon reaching the lower explosive limit, the mixture ignites, triggering exothermic combustion.

This released heat further propagates magnesium hydride decomposition, creating a self-sustaining loop until fuel exhaustion – a synergistic cascading of mechanical fracturing, hydrogen release, and thermal feedback, according to the paper. The study stayed silent on the source of the large amount of magnesium hydride. It also remains unclear under what conditions the Chinese Army might deploy the weapon.

According to the SCMP report, until recently, magnesium hydride could only be produced in laboratories at the pace of a few grams per day. This is because binding hydrogen with magnesium requires high temperatures and pressure. Accidental exposure to the air during the manufacturing process can lead to deadly explosions.

Earlier this year, China launched a plant in northwestern province of Shaanxi that can produce 150 tonnes per year of magnesium hydride using a cost-effective "one-pot synthesis" method. Beyond bombs, the tech is being also developed for other use case including in drones and submarines—hinting at dual-use potential in China's military-energy push.

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BrahMos export: Second battery of missile shipped out for Philippines

Source: The New Indian Express, Dt. 20 April 2025,
URL: https://www.newindianexpress.com/thesundaystandard/2025/Apr/20/brahmos-export-second-battery-of-missile-shipped-out-for-philippines

The second battery of the BrahMos cruise missile has been moved out for the Philippines, marking a milestone in Indian defence exports. "The second battery of the missile has been sent in a ship this time," a defence source said, confirming the development.

"The first battery was sent in April 2024 in an IAF aircraft, with support coming from civil aircraft agencies. The long-haul flight carrying the heavy load was a non-stop six-hour journey before the equipment reached the western parts of the Philippines," the source said.

The deal with the Philippines was announced in January 2022 for the supply of the BrahMos supersonic cruise missile, making it the country's first major defence export order.

As reported by this newspaper, the Philippines Department of National Defence issued the 'Notice of Award' to India's BrahMos Aerospace Private Limited, approving a $374.96 million (`2,700 crore) contract for the purchase of a shore-based anti-ship missile system (SBASMS) from India.

As per the initial deal, the Philippines will get three batteries for the missile system, which has a range of 290 kilometres and a speed of 2.8 Mach (around 3,400 kms, thrice the speed of sound).

The deal also encompassed training for operators and the necessary integrated logistics support package. The operator training for the missile system was conducted in February 2023 for 21 personnel of the Philippine Navy.

The training focused on the operations and maintenance of some of the most important logistics packages of SBASMS to be delivered to the Philippines.

Also, as reported first by this newspaper, in January this year Indonesia's defence ministry sent a letter regarding a $450 million BrahMos deal to the Indian embassy in Jakarta. India has been in talks with Indonesia, Thailand, and a few other nations that have shown interest in the system.

The BrahMos missile can be launched from submarines, ships, aircraft or land. According to sources, the missile —a collaboration between India and Russia—is undergoing a process where 83% of its components are being indigenised.

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Science & Technology News

Department of Biotechnology along with BIRAC Hosts the 12th Webinar in its Webinar Series on Biomanufacturing and Biofoundry Initiative on the Theme "Cell and Gene Therapy"

Source: Press Information Bureau, Dt. 18 April 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2122720

The Department of Biotechnology (DBT), Government of India, along with BIRAC conducted the 12th Webinar in its Biofoundry and Biomanufacturing Initiative series on 17th April, 2025. The session focused on "Cell and Gene Therapy", a critical domain under the Precision Biotherapeutics thematic area of BioE3 (Biotechnology for Economy, Environment & Employment) Policy for fostering high-performance biomanufacturing. Approved by the Union Cabinet in August 2024, the BioE3 Policy aims to position India as a global leader in bio-based innovations. The rapidly evolving field of "Cell and Gene Therapy" with transformative potential for treatment of a range of complex and previously untreatable diseases is a priority segment under the Precision Biotherapeutics vertical of the BioE3 Policy. The Webinar provided a platform for academia, industry leaders, start-ups, and researchers to discuss advancements, as well as, opportunities in Cell and Gene Therapy.

Dr. Alka Sharma, Senior Adviser/Sc 'H', DBT, highlighted the BioE3 Policy's vision to foster high-performance biomanufacturing by supporting sustainable green growth. She summarized that BioE3 Policy has been approved by the Hon'ble Prime Minister for fostering high-performance biomanufacturing. She said today's Webinar will deliberate upon current landscape, emerging opportunities, challenges, and the strategic interventions which are essential for strengthening this sector in the country.

Dr. Kamakshi Chaithri, Scientist 'D', DBT, provided an overview of the thematic sector. She highlighted the need for prioritizing this sector at a critical time, emphasizing the importance of these therapies in offering a potential curative outcome for several life threatening diseases including cancers and rare diseases. She touched upon how the sector is positioned globally and nationally, and stressed on the need for a focused and holistic approach for addressing the challenges in the cell and gene therapy product development chain. She further highlighted the steps taken by DBT under the BioE3 Policy, to foster innovation and facilitate a conducive ecosystem for development of indigenous cell and gene therapies.

Dr. Debojyoti Chakraborty, Principal Scientist at CSIR-Institute of Genomics and Integrative Biology, New Delhi discussed the gene editing technologies under development for various diseases such as sickle cell disease, ocular diseases etc. He highlighted the need to address the manufacturing and regulatory hurdles in the pathway from discovery to commercialization of these therapies and the issues to be considered in bringing about development of affordable and accessible therapies.

Dr. Anil Kamat, Head, Clinical Development, Immuneel Therapeutics, touched upon the local and global landscape of cell and gene therapies and elaborated on the commercial approval of the BIRAC supported CAR-T Cell therapy by Immuneel Therapeutics. He discussed various challenges in scale up and manufacturing of cell & gene therapies. He further suggested way forward for improved access, availability and affordability of these therapies.

The session concluded with a vibrant Q&A segment moderated by DBT and BIRAC officials. Participants actively engaged with the experts, discussing challenges and opportunities in biomanufacturing for cell and gene therapy and addressing the regulatory requirements.

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Anusandhan National Research Foundation announces the selection of PAIR Networks—comprising 18 Hub institutions and 106 partnering Spokes—under its flagship initiative, the Partnerships for Accelerated Innovation and Research (PAIR) Program

Source: Press Information Bureau, Dt. 18 April 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2122728

ANRF Supports 18 Hub Institutions and 106 Partnering Spokes Under PAIR Program Strengthening India's Research Ecosystem Through Strategic Mentorship and Collaboration.

Anusandhan National Research Foundation (ANRF) has announced the selection of PAIR Networks—comprising 18 Hub institutions and 106 partnering Spokes—under its flagship initiative, the Partnerships for Accelerated Innovation and Research (PAIR) Program.

The network connects universities and colleges with leading research institutions through structured mentorship and collaboration. The PAIR program aims to strengthen India's higher education and research ecosystem by nurturing innovation, building research capacity and promoting excellence across regions.

The academic community responded enthusiastically to the call, with 30 proposals received from top academic institutions for Hub selection and 166 institutions as potential Spokes. After rigorous evaluation, 18 institutions have been selected as Hubs to lead collaborative research and capacity-building efforts in partnership with 106 Spokes across the country.

The selected institutions have been categorized into two strategic modes to foster deeper research engagement and inclusive growth:

- Category A: 7 Hub institutions with 45 Spokes
- Category B: 11 Hub institutions with 61 Spokes

Rooted in the vision of the National Education Policy (NEP) 2020, the PAIR Program is a pivotal step in ANRF's mission to unlock the untapped research potential of India's academic landscape.

By fostering strategic partnerships and mentorship, the initiative is set to transform institutions into centres of innovation, leadership and global relevance.

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Technology Development Board-Department of Science and Technology (TDB-DST) supports M/s dvipa Defence India Pvt. Ltd. in Strengthening India's Small Arms Manufacturing Ecosystem"

Source: Press Information Bureau, Dt. 17 April 2025,
URL: https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2122388

The Ministry of Science and Technology, through the Technology Development Board (TDB), has taken a pivotal step toward indigenizing India's small arms manufacturing capability by extending financial assistance to M/s dvipa Defence India Pvt. Ltd., Hyderabad (erstwhile M/s dvipa Armour Pvt. Ltd.). The project, titled "Development and Commercialization of 7.62 mm x 51 mm Assault Rifles," aims to produce high-performance, indigenous assault rifles in alignment with the Indian Army's General Staff Qualitative Requirements (GSQR).

TDB's assistance will play a crucial role in enabling the development, testing, and commercialization of the UGRAM rifle, including the creation of a state-of-the-art in-house manufacturing unit with integrated quality assurance and testing infrastructure.

For decades, India has depended heavily on imported small arms, resulting in substantial foreign exchange outflows and interoperability challenges across armed forces, thereby complicating training and logistics. The ageing INSAS rifles, once developed through earlier collaborations, are increasingly viewed as inadequate for modern combat needs. In 2017, the Government initiated a policy shift to replace these with advanced, reliable rifles chambered in 7.62 mm x 51 mm NATO-grade ammunition.

In response to this national need, dvipa Defence, incorporated in October 2018, emerged as a strong domestic player in the defence manufacturing sector. As one of the early license holders for small arms and ammunition production, the company partnered with DRDO's Armament Research

& Development Establishment (ARDE), Pune, to develop a fully indigenous assault rifle, UGRAM – Sanskrit for "ferocious." Demonstrating exceptional execution, five prototypes were developed within 100 days and successfully passed initial testing at ARDE.

UGRAM: A Modern, Indigenous Combat-Ready Assault Rifle

UGRAM is a modular, ergonomically designed 7.62 mm x 51 mm assault rifle, tailored for counter-insurgency (CI) and counter-terror (CT) operations by armed forces, paramilitary units, and special forces. It incorporates several advanced features:

Indigenous Development:

- 100% design, material selection, manufacturing, and testing conducted domestically and approved by ARDE, DRDO.

Key Features:

- Long-stroke piston mechanism for enhanced reliability.
- High-strength steel used in all pressure-bearing parts.
- High-grade nylon-based handguard, pistol grip, and buttstock.
- Ambidextrous magazine release and ergonomic, side-mounted cocking handle.

Speaking on the occasion, Sh. Rajesh Kumar Pathak, Secretary, TDB, said,"TDB's support to dvipa Defence underscores our commitment to indigenizing critical defence technologies under 'Make in India' and 'Atmanirbhar Bharat'. This project not only strengthens self-reliance but also paves the way for import substitution and future exports through trusted strategic partnerships."

Commenting on TDB's support, Founders of M/s dvipa Defence India Pvt. Ltd. said,"We are proud to contribute to India's strategic autonomy by building world-class defence products from Indian soil. The support from TDB strengthens our resolve to manufacture for the forces, by the forces, in India."

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Indian telescope sheds light on the elusive 'middleweight' black holes

Source: Press Information Bureau, Dt. 17 April 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2122433

Tracing an intermedia black hole (IMBH) located in a faint galaxy about 4.3 million light-years away using India's largest optical telescope, astronomers have found that gas clouds orbit the black hole at a distance of 125 light-minutes (around 2.25 billion kilometre) with a velocity dispersion of 545 km per second.

The discovery refines our understanding about how black holes, specially those that weight between 100 and 100,000 Suns, grow and interact with their surroundings.

For decades, astronomers have searched for a missing link in the cosmic black hole family: the elusive Intermediate-Mass Black Holes (IMBHs). Bridging the gap between smaller stellar black holes (having a few dozen times the Sun's mass) and massive supermassive black holes (having millions to billions of solar masses), IMBHs have remained elusive.

IMBHs, are thought to be the seeds that grow into supermassive black holes. However, their faint nature and location in small galaxies make them extremely difficult to observe. Unlike their larger counterparts, they don't generate bright emissions unless they're actively pulling in matter, making advanced observational techniques essential.

Using the 3.6m Devasthal Optical Telescope (DOT) a team led by scientists from Aryabhatta Research Institute of Observational Sciences (ARIES), an autonomous institute of the Department of Science and Technology (DST), have successfully detected and measured the properties of an IMBH in a faint galaxy called NGC 4395.

The team of astrophysicists, led by Shivangi Pandey studied NGC 4395—a low-luminosity active galaxy hosting one of the faintest actively feeding black holes ever observed.

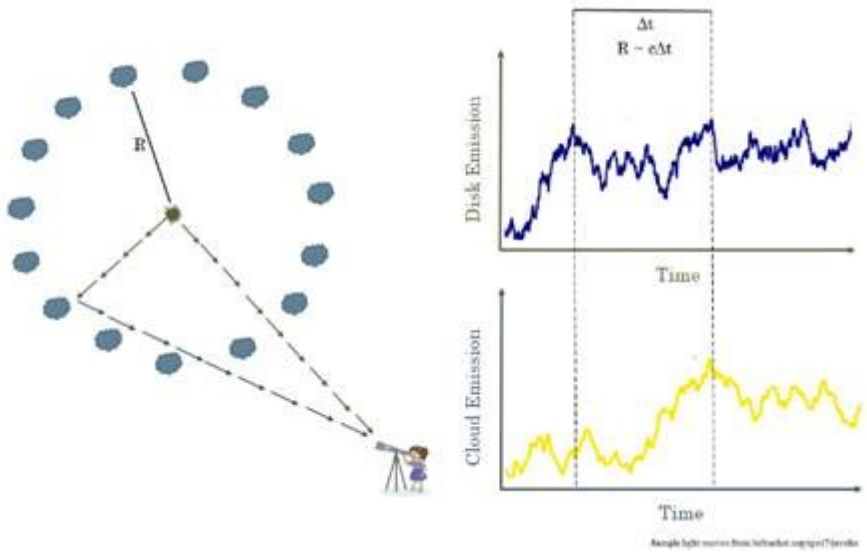
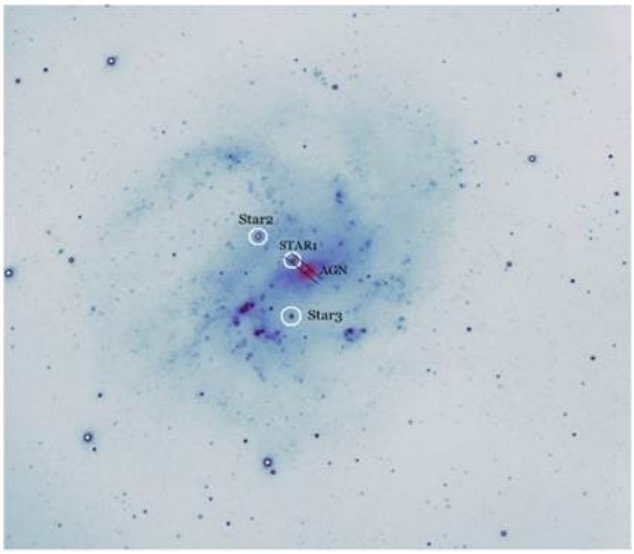


Illustration of Reverberation mapping technique. The central region of an active galaxy sends out light in all directions. Some light reaches us directly, while some bounces off nearby gas clouds before reaching us, creating a slight delay. This delay helps us map the region around the centre.

They used the largest optical telescope in India, the 3.6m DOT, and its indigenously developed spectrograph and camera ADFOSC, along with the smaller 1.3m Devasthal Fast Optical Telescope (DFOT) located at the Devasthal Observatory of ARIES.

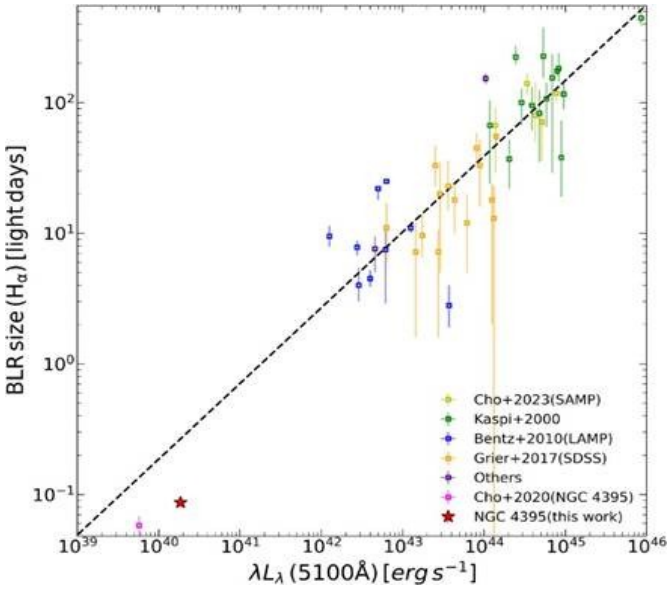
Since the size of the region surrounding the black hole is very difficult to resolve even with a sophisticated telescope, the team monitored the object continuously for two nights using both the telescopes and applied a special technique called spectrophotometric reverberation mapping.

This technique measures the delay between light emitted by the black hole's accretion disk and the surrounding gas clouds (broad-line region). This delay, or time lag, revealed the region's size and helped calculate the black hole’s mass.



A V-band image of NGC 4395 taken on March 10, 2022, using the 1.3m DFOT, shows the active galactic nucleus (AGN) marked with a red circle, with three comparison stars highlighted in white. The field of view measures 18′ × 18′ arcmin.

Apart from racing the gas clouds, they also found that theIMBH weighs about 22,000 times the Sun's mass, making it one of the most precisely measured intermediate-mass black holes. The black hole consumes matter at just 6% of its maximum theoretical rate.



The size of the Hα BLR, compared to the monochromatic continuum luminosity at 5100 Å, aligns with the relationship across previous studies. The current lag of 125 minutes contrasts with earlier estimates, underscoring the precision of this study.

The study published in the Astrophysical Journal validates the size-luminosity relationship for black holes in low-luminosity active galaxies, provides a more accurate black hole mass estimate than previous studies and offers a more precise benchmark for future research.

Dr Suvendu Rakshit, a scientist at ARIES involved in this study, notes: "The hunt for more IMBHs is far from over. Larger telescopes and advanced instruments will be key to uncovering these cosmic middleweights."

As technology advances, future observations with larger telescopes and higher-resolution instruments will deepen our understanding of IMBHs and their role in shaping the universe.

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Bose Institute scientists receive Breakthrough Prize in Fundamental Physics as part of ALICE collaboration at CERN

Source: Press Information Bureau, Dt. 17 April 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2122435

The Experimental High Energy Physics (HEP) group of Bose Institute (BI), currently consisting of Faculty members- Prof. Supriya Das, Dr. Sidharth Kumar Prasad and Dr. Saikat Biswas, Post Doctoral Fellow- Dr. Sanchari Thakur and Senior Research Fellow- Mr. Mintu Haldar, has been awarded the Breakthrough Prize 2025 in Fundamental Physics as a part of ALICE at CERN.

The $3 million Breakthrough Prize in Fundamental Physics for 2025 is awarded to thousands of researchers from more than 70 countries representing four experimental collaborations at CERN's Large Hadron Collider (LHC) – ATLAS, CMS, ALICE and LHCb.

Bose Institute, Kolkata is the only Autonomous Institute under Department of Science and Technology, Government of India, working in A Large Ion Collider Experiment (ALICE) at CERN along with many other collaborators in India. ALICE studies the Quark-Gluon Plasma (QGP), a state of extremely hot and dense matter that existed in the first microseconds after the Big Bang.

The institute joined ALICE Collaboration under the leadership of Prof. Sibaji Raha, former Director of Bose Institute as Principal Investigator.

Prof. Kaustuv Sanyal, Director, Bose Institute conveyed his warm congratulations to the team members of Experimental High Energy Physics group and said, "This is a great achievement not only for the Bose Institute team but also for the entire community of Indian high energy physicists working in mega science projects such as ALICE at CERN. Such awards will encourage young minds to join this kind of complex and large experimental programs for exploration of new physics."

The HEP Group of Bose Institute has made significant contributions in several areas of the ALICE experimental program such as detector hardware development, simulation, physics analysis, data-taking and operations of the experiment.

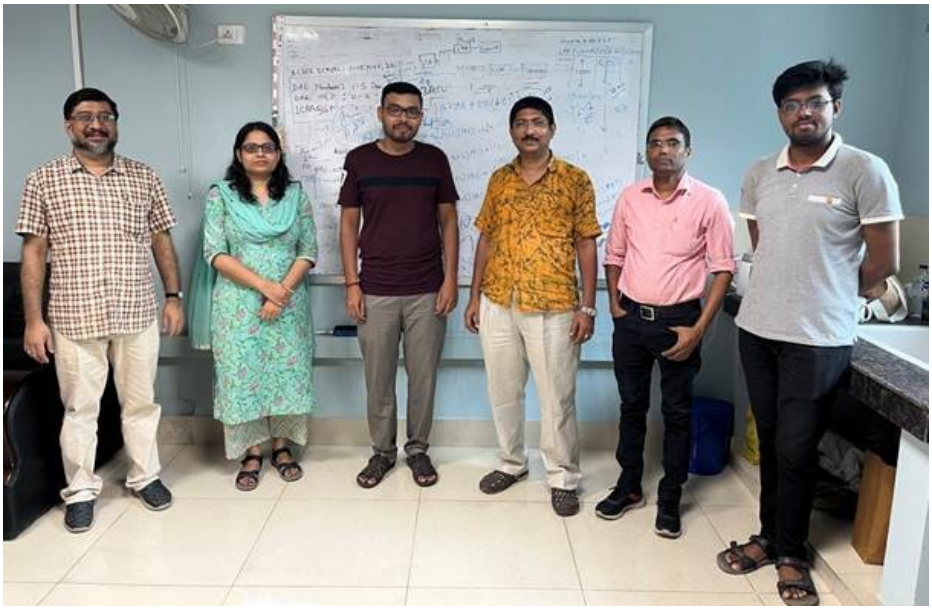
An indigenously built proportional counter based highly granular Photon Multiplicity Detector (PMD) was deployed in the ALICE experiment for detection of inclusive photons at forward rapidity. The PMD was commissioned in ALICE in the year 2008 and participated in the data taking program till 2018. Bose Institute played a leading role in the operations of PMD at CERN since 2014 till its decommissioning. Post data collection, the efforts of data clean up, calibration and quality assurance of the entire PMD data set to optimize it for physics analysis was also led by the faculty from Bose Institute in collaboration with students from various Indian institutes/universities participating in ALICE.

A new type of Time Projection Chamber (TPC) is being used after the upgrade of the ALICE so as to cater to the high luminosity environment expected at the LHC facility. This device relies on the intrinsic ion back flow (IBF) suppression of Micro-Pattern Gas Detectors (MPGD) based technology in particular the Gas Electron Multiplier (GEM).

The new read-out chambers in TPC consist of stacks of 4 GEM foils combining different hole pitches. In addition to the low ion back flow, other advantages of GEM technology are good energy resolution and long-term stability in operation. Researchers from Bose Institute were involved in ALICE-TPC upgradation project.

Faculties and trainees from Bose Institute have made significant contributions to the Physics program of the ALICE by leading about six publications in addition to contributing to several other ALICE papers. Bose Institute members have contributed to several areas of Physics studies.

Congratulating all the collaborators, the ALICE Spokesperson Prof. Marco Van Leeuwen wrote “I would like to congratulate the entire collaboration and the LHC community for this well-deserved recognition of the scientific advancements achieved through our collective efforts. All authors of publications based on Run 2 data up to 15 July 2024 will be listed as laureates.”



Prof. Sanjay Kumar Ghosh, Dr. Rathijit Biswas, Dr. Abhi Modak, Dr. Debjani Banerjee, Dr. Prottoy Das and Dr. Md. Asif Bhatt were also part of this group.

The Break Through prize money is allocated to ATLAS ($1 million); CMS ($1 million), ALICE ($500,000) and LHCb ($500,000), in recognition of 13,508 co-authors of publications based on LHC Run-2 data released between 2015 and July 15, 2024. [ATLAS – 5,345 researchers; CMS – 4,550; ALICE – 1,869; LHCb – 1,744].

The prize money will be used to fund a Breakthrough prize studentship to allow selected PhD students to spend up to two years at CERN while working on their PhD research.

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SpaDex Mission: ISRO successfully completes second docking of satellites, says Union Minister Jitendra Singh

Source: The Economic Times, Dt. 21 April 2025,
URL: https://economictimes.indiatimes.com/news/science/spadex-mission-isro-successfully-completes-second-docking-of-satellites-says-union-minister-jitendra-singh/articleshow/120472714.cms

Union Minister Jitendra Singh on Monday announced that the second docking of satellites, adding that more experiments are planned in the next two weeks.

"Glad to inform that the second docking of satellites has been accomplished successfully. As informed earlier, the PSLV-C60 / SPADEX mission was successfully launched on 30 December 2024. Thereafter the satellites were successfully docked for the first time on 16 January 2025 at 06:20 AM and successfully undocked on 13 March 2025 at 09:20 AM. Further experiments are planned in the next two weeks,"

ISRO's SpaDex Mission

On January 16, ISRO successfully completed the docking of satellites as part of its Space Docking Experiment (SpaDeX).

This made India only the fourth country in the world to have achieved the feat.

The achievement followed an earlier trial on January 12, where ISRO brought the two spacecraft to within three meters of each other before moving them back to a safe distance in preparation for the docking maneuver.

The mission was launched on December 30, 2024, with the PSLV C60 rocket carrying two small satellites—SDX01 (Chaser) and SDX02 (Target)—along with 24 other payloads. Approximately 15 minutes after liftoff from the Satish Dhawan Space Centre in Sriharikota, the spacecraft, each weighing around 220 kg, were placed into a 475-kilometer circular orbit as planned.

ISRO describes the SpaDeX project as a cost-effective technology demonstrator aimed at showcasing in-space docking using small spacecraft.

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Indian scientists submit detailed project report to develop new semiconductor material

Source: The Economic Times, Dt. 20 April 2025,
URL: https://economictimes.indiatimes.com/news/science/indian-scientists-submit-detailed-project-report-to-develop-new-semiconductor-material/articleshow/120451811.cms

A team of 30 scientists from India's premier institute, the Indian Institute of Science (IISc), has submitted a proposal to the government to develop 'angstrom-scale' chips, far smaller than the smallest chips currently in production. The team has submitted the proposal to the government for developing technologies using a new class of semiconductor materials, called 2D Materials, that could enable chip sizes as small as one-tenth of the smallest chips currently in global production and develop India's leadership in semiconductors.

Currently, semiconductor manufacturing is dominated by silicon-based technologies, led by advanced nations such as the US, Japan, South Korea, and Taiwan.

"A team of scientists at IISc submitted a detailed project report (DPR) to the Principal Scientific Adviser (PSA) in April 2022, which was revised and submitted again in October 2024. The report was later shared with the Ministry of Electronics and IT. The project promises to develop angstrom-scale chips, far smaller than the smallest chips in production today," a source in the government familiar with the proposal told PTI.

The DPR proposes the development of 2D semiconductors using ultra-thin materials like graphene and transition metal dichalcogenides (TMDs). These materials can enable chip fabrication at the angstrom scale, significantly smaller than current nanometer-scale technologies.

The smallest chip currently in production is the 3-nanometer node, manufactured by companies like Samsung and MediaTek.

A brief summary of the 2D materials project -- which aims to replace silicon, is available on the website of the PSA's office.

Sources in the Ministry of Electronics and IT (MeitY) confirmed that the proposal has been under discussion.

"MeitY is positive about the project. The Principal Scientific Adviser and Secretary, MeitY, have held meetings on it. MeitY is exploring the electronics applications where such technology can be deployed. This is a collaborative effort that requires due diligence at every step," an official aware of the matter said.

India currently relies heavily on foreign players for semiconductor manufacturing -- a technology that is strategic from both an economic and national security standpoint.

The country's largest semiconductor project, being set up by Tata Electronics in partnership with Taiwan's PSMC, involves an investment of Rs 91,000 crore. This project has been approved under the India Semiconductor Mission and is eligible for 50 per cent capital support from the government.

In comparison, the IISc-led proposal requests a relatively modest Rs 500 crore over five years to build indigenous technology for next- generation semiconductors. The project also includes a roadmap for self-sustainability after the initial funding phase.

Globally, 2D materials have drawn significant interest. Europe has invested over USD 1 billion (around Rs 8,300 crore), South Korea over USD 300 million, and countries like China and Japan have made serious but undisclosed investments in 2D material-based semiconductor research.

"2D materials will be key enablers for future heterogeneous systems. While global momentum is building, India's efforts remain limited and need urgent scaling. This is a domain where India can take leadership, but time is running out," said an officer familiar with the efforts and global developments, speaking on condition of anonymity.

According to the PSA office website, communications regarding the project have been ongoing since 2021, with outreach to key ministries including MeitY, DRDO, and the Department of Space. NITI Aayog also recommended the project in September 2022 based on the IISc report.

The officer privy to the research ecosystem noted that several countries are already preparing for a post-silicon world as traditional chip scaling nears its limits.

"Global technology players have turned their attention to 2D semiconductors. India now needs to move from deliberation to execution. The proposal seeks Rs 500 crore over five years, but there is still no formal assurance. This window may not stay open for long," the person added.

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Indian astronaut Shubhanshu Shukla set for space travel in May

Source: The Hindu, Dt. 18 April 2025,
URL: https://www.thehindu.com/sci-tech/science/indian-astronaut-shubhanshu-shukla-set-for-space-travel-in-may/article69465247.ece

Indian astronaut Shubhanshu Shukla is set to travel to the International Space Station next month as part of an Axiom-4 mission, four decades after Rakesh Sharma's iconic spaceflight onboard Russia's Soyuz spacecraft, Union Minister Jitendra Singh said on Friday (April 18, 2025). Mr. Singh made the remarks after reviewing the work of the Department of Space and the Indian Space Research Organisation (ISRO) in New Delhi.

"Group Captain Shukla's journey is more than just a flight – it's a signal that India is stepping boldly into a new era of space exploration," Mr. Singh said. My journey to space will be the journey of 1.4 billion fellow Indians: Axiom Mission 4 pilot Group Captain Shubhanshu ShuklaISRO Chairman V. Narayanan made a presentation on various upcoming space missions.

ISRO is set to launch the NISAR satellite – developed jointly with NASA – in June on board the GSLV-Mark 2 rocket, Mr. Singh said, adding that in July the space agency will put in orbit BlueBird Block-2 satellites of US-based AST SpaceMobile Inc. using the heavy-lift LVM-3 rocket.

Mr. Singh said Group Captain Shukla's mission, scheduled for May, marks a milestone in India's expanding international space collaborations.A decorated test pilot with the Indian Air Force, Group Captain Shukla was shortlisted under ISRO's Human Spaceflight Program and is among the top contenders for the Gaganyaan mission.

Four IAF pilots named as possible Gaganyaan crewHis journey aboard the Axiom-4 mission is expected to provide critical hands-on experience in spaceflight operations, launch protocols, microgravity adaptation, and emergency preparedness – all essential for India's crewed space ambitions, an official statement said.

"What sets Shukla's mission apart is its strategic importance. Unlike the symbolic undertones of India's first human spaceflight, this time the focus is on operational readiness and global integration," it said.

The statement said Group Captain Shukla's participation underscores India's growing engagement with public-private international partnerships in space and its resolve to emerge as a serious contender in human space exploration. Mr. Singh said the collaboration with international partners and the strategic momentum of projects like Gaganyaan reflect India's commitment to becoming a global leader in space technology.

The minister said these efforts were not only scientific in nature but also aligned with the vision of a developed and self- reliant India. ISRO also plans to launch the PSLV-C61 mission carrying the EOS-09 satellite, which is equipped with a C-band synthetic aperture radar, capable of capturing high-resolution images of Earth's surface under all weather conditions, day or night.

Another significant milestone will be the Test Vehicle-D2 (TV-D2) mission, designed to simulate an abort scenario and demonstrate the Gaganyaan Crew Escape System. The mission includes sea recovery operations for the Crew Module, mimicking procedures planned for India's first human spaceflight, he said.

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भारतवंशी वैज्ञानिक दावा- सौरमंडल से बाहर जीवन के संकेत मिले, दूर के ग्रहों को करीब से देखा

Source: Amar Ujala, Dt. 18 April 2025,
URL: https://www.amarujala.com/world/indian-origin-astronomer-dr-nikku-madhusudan-claims-life-signs-found-on-giant-planet-outside-solar-system-2025-04-18

भारतीय मूल के खगोल वैज्ञानिक डॉ. निक्कू मधुसूदन के नेतृत्व में शोधकर्ताओं की एक टीम ने बृहस्पतिवार को दावा किया कि उन्हें हमारे सौरमंडल से बाहर एक विशाल ग्रह पर जीवन के संकेत मिले हैं। ये अब तक के सबसे मजबूत संकेत हैं। यह ग्रह पृथ्वी से 120 प्रकाश वर्ष दूर एक तारे की परिक्रमा करता है। वैज्ञानिकों ने इसे 'के2-18 बी' नाम दिया है। उन्होंने कहा, हमारी टीम की सबसे अच्छी व्याख्या यह है कि यह ग्रह एक गर्म महासागर से ढका हुआ है और यहां सक्रिय रूप से जीवन है।

इस बाहरी ग्रह के वायुमंडल का विश्लेषण बताता है कि पृथ्वी पर एक अणु की प्रचुरता है, जिसका केवल एक ही ज्ञात स्रोत (समुद्री शैवाल) है। कैम्ब्रिज विवि के खगोलशास्त्री व नए अध्ययन के लेखक निक्कू मधुसूदन ने कहा,

समय पूर्व यह दावा किसी के हित में नहीं है कि हमने जीवन का पता लगा लिया है, लेकिन हम इसके संकेतों के काफी नजदीक पहुंच चुके हैं, 'यह एक क्रांतिकारी क्षण' है। पहली बार मानवता ने रहने योग्य ग्रह पर जैविक लक्षण देखे हैं। यह शोध 'एस्ट्रोफिजिकल' जर्नल लेटर्स में छपा है। वैज्ञानिकों ने पाया कि 'के2-18 बी' ग्रह में कई अणु हैं। उन्होंने एक अणु के फीके संकेत भी पाए व एक बहुत ही अहम अणु डाइमिथाइल सल्फाइड पाया है, जो सल्फर, कार्बन और हाइड्रोजन से बना है।

दूर के ग्रहों को करीब से देखा

2021 में मधुसूदन व उनके सहयोगियों ने प्रस्तावित किया कि उप-नेप्च्यून गर्म पानी के महासागरों से ढके हुए थे और हाइड्रोजन, मीथेन और अन्य कार्बन यौगिकों वाले वायुमंडल में लिपटे हुए थे। इन अजीब ग्रहों का वर्णन करने के लिए उन्होंने 'हाइड्रोजन' और 'महासागर' शब्दों के संयोजन से एक नया शब्द 'हाइसीन' गढ़ा। दिसंबर 2021 में जेम्स वेब स्पेस टेलीस्कोप के लॉन्च ने खगोलविदों को उप-नेप्च्यून व अन्य दूर के ग्रहों को करीब से देखने का मौका दिया।

वैज्ञानिक इस तरह लगाते हैं अनुमान

जब कोई एक्सोप्लैनेट (सौर मंडल से बाहर का ग्रह) अपने मेजबान तारे के सामने से गुजरता है, तो उसका वायुमंडल प्रकाशित होता है। इसकी गैसें वेब टेलीस्कोप तक आने वाले तारों के प्रकाश का रंग बदल देती हैं। इन बदलती तरंगदैर्घ्यों का विश्लेषण करके, वैज्ञानिक वायुमंडल की रासायनिक संरचना का अनुमान लगा सकते हैं। बता दें, पृथ्वी पर डाइमिथाइल सल्फाइड का एकमात्र जीवन का ज्ञात स्रोत समुद्री शैवाल हैं।

ठोस सबूत नहीं: अन्य वैज्ञानिक

जॉन्स हॉपकिंस यूनिवर्सिटी के ग्रह वैज्ञानिक स्टीफन श्मिट ने कहा, यह कुछ भी नहीं, सिर्फ एक संकेत है। सैन एंटोनियो में साउथवेस्ट रिसर्च इंस्टीट्यूट के ग्रह वैज्ञानिक क्रिस्टोफर ग्लेन ने कहा, जब तक हम बाहरी ग्रह को अपनी ओर लहराते हुए नहीं देखते, तब तक यह कोई ठोस सबूत नहीं होगा।

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