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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

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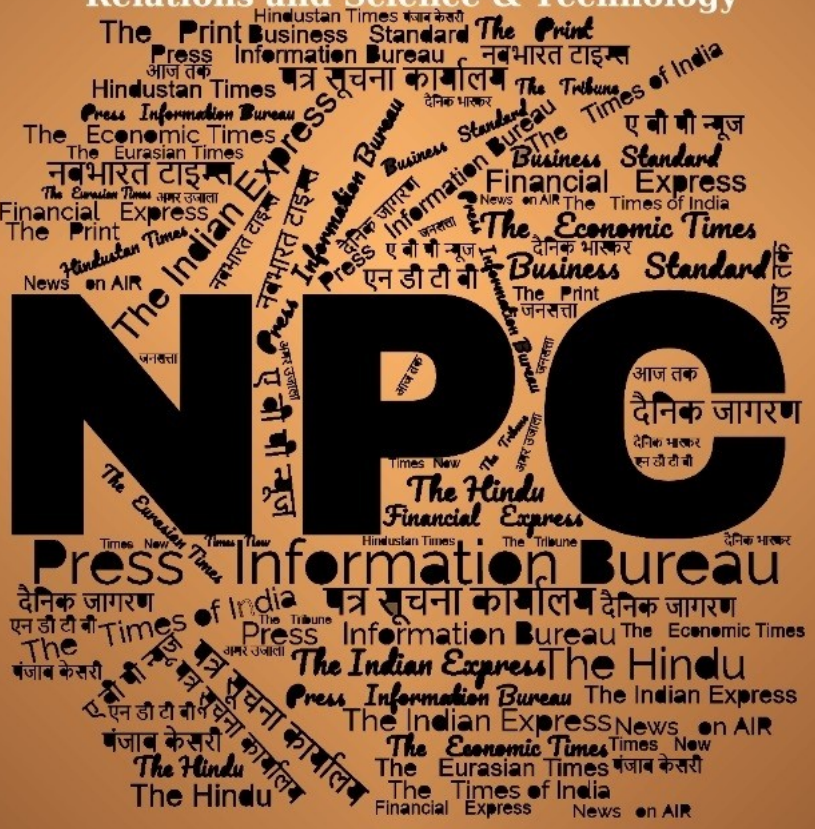

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CONTENTS

Defence News

Defence Strategic: National/International

Terrorism remains an evolving challenge, use of advanced tech necessitates collaborative & action-oriented approach, says Defence Secretary at 14th meeting of ADMM-Plus Experts Working Group on Counter-Terrorism

Source: Press Information Bureau, Dt. 19 Mar 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2112877

"India remains steadfast in its zero-tolerance policy towards terrorism and believes in an approach that combines robust domestic mechanisms, enhanced intelligence-sharing, and strong regional cooperation," said Defence Secretary Shri Rajesh Kumar Singh during the keynote address at the 14th meeting of ASEAN Defence Ministers' Meeting (ADMM) - Plus Experts Working Group (EWG) on Counter-Terrorism in New Delhi on March 19, 2025.

The Defence Secretary stated that terrorism remains a dynamic & evolving challenge, with threats increasingly transcending borders, and the use of advanced technology, cyber tools & unmanned systems by terrorist groups necessitates a cohesive, forward looking and action-oriented approach. He added that the Indo-Pacific region, given its geopolitical and economic significance, is particularly vulnerable to transitional terrorism and violent extremism, which calls for a comprehensive, adaptive, and deeply collaborative response.

Shri Rajesh Kumar Singh emphasised that, through the ADMM-Plus platform, India seeks to build synergy among the defence forces, security agencies, and policy frameworks to address emerging threat effectively. "In the complex, hyper-connected & fast-paced world, social and ecological systems are fragile. It is important to assess this risk to empower the Governments in priority setting and decision making. Terrorism can destabilise governments, undermine civil society, and threaten social & economic development. We have a collective obligation to provide the decision-makers guidance to understand uncertainty and better weigh the impact on decision making," he said.

The event witnessed the handing over of ADMM-Plus EWG on Counter-Terrorism chairmanship to India and Malaysia from Russia and Myanmar for a three-year cycle. The Defence Secretary voiced the commitment of the new co-chairs towards ensuring that the efforts over this cycle yield practical and meaningful results. "By leveraging our collective expertise, enhancing capacity-building, and fostering deeper trust and cooperation, we can significantly strengthen regional security and counter-terrorism preparedness," he said.

Shri Rajesh Kumar Singh stated that in the present cycle of EWG on Counter-Terrorism, the focus will be on strengthening regional cooperation and improving interoperability among the Armed Forces through structured joint initiatives. He added that the aim will be to counter the misuse of emerging technologies and addressing threats posed by terrorists through use of AI-driven propaganda, encrypted communications, drone technologies. Strengthening cyber resilience against online radicalisation and recruitment efforts will also be a focus area, he said.

Towards the latter half of the cycle, the Defence Secretary said, work will be carried out together towards capacity building through practical exercises wherein Malaysia will conduct a Table-Top Exercise in 2026, facilitating strategic-level decision making simulations to improve Counter-Terrorism planning and preparedness. In 2027, India will host a Field Training Exercise, aimed at stimulating real-world Counter-Terrorism scenarios, enhancing operational coordination, and testing rapid response mechanisms. He called for developing a whole of government and whole of society approach to counter radicalisation & violent extremism and enhancing legal & financial frameworks to disrupt terror financing networks.

Shri Rajesh Kumar Singh congratulated Malaysia for assuming the chairmanship of ASEAN for the year 2025, extending India's full support. He acknowledged Malaysia's effort in effectively steering ASEAN under the current geopolitical scenario with the theme 'Inclusivity and Sustainability'. He added that India is privileged to co-chair this crucial initiative alongside Malaysia, and appreciates the participation of representatives from the ASEAN member states, the Plus nations, the ASEAN Secretariat, and Timor-Leste. "Your presence reaffirms our shared commitment in combating terrorism in all its forms," he said.

The Defence Secretary termed India's relationship with ASEAN as a key pillar of its foreign policy, which is at the heart of Act East Policy. He reiterated India's strong support to a stable and unified ASEAN which serves as an institutional anchor of an important region.

Delegations from 10 ASEAN members (Brunei, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Vietnam, Singapore and Thailand) and eight dialogue partners (Australia, New Zealand, RoK, Japan, China, USA and Russia) along with Timor Leste and ASEAN Secretariat are participating in the meeting. India is co-chairing the EWG on Counter-Terrorism for the first time.

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Slow procurement process makes it tough to imbibe tech: CDS Chauhan

Source: The Economic Times, Dt. 19 Mar 2025,
URL: https://economictimes.indiatimes.com/news/defence/slow-procurement-process-makes-it-tough-to-imbibe-tech-cds-chauhan/articleshow/119223234.cms

Indian procurement processes for the armed forces are slow and make it difficult to imbibe technology at the required pace, Chief of Defence Staff General Anil Chauhan has said, making the point that the dynamic nature of modern conflicts requires greater adaptability, with training of troops being a major challenge.

Speaking at the Raisina Dialogue in a session titled 'Verses and Wars: Navigating Hybrid Theatres', Gen Chauhan said the global security environment is marked by uncertainty and a rapid amount of change. He made the point that it is essential to keep up with technological advancements in warfare.

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Disinformation could be major challenge: CDS Gen Chauhan

Source: The Economic Times, Dt. 19 Mar 2025,
URL: https://economictimes.indiatimes.com/news/defence/disinformation-could-be-major-challenge-cds-gen-chauhan/articleshow/119214135.cms

Imparting appropriate training to military personnel to deal with hybrid warfare and new age conflicts along with conventional war poses a big challenge for India, Chief of Defence Staff Gen Anil Chauhan said on Wednesday. In an address at the Raisina Dialogue, India's flagship conference on geopolitics, the top military officer described "disinformation" as a major challenge.

For a multicultural, multi-religious and multi ethnic country like India, disinformation and internal strife could be a major challenge, he observed.Disinformation is a battle of minds or cognitive warfare and it could be a major challenge, he argued.

Gen Chauhan was speaking at a session titled "Verses and Wars: Navigating Hybrid Theatres".

I think the global security environment is marked by two challenges -- one is uncertainty and other is rapid amount of change, he said.

The biggest challenge that we face is to train people for hybrid kinds of wars as well as conventional war.

Elaborating on it, cited the rapid pace of technological advancement and said to train people on technology absorption is a challenge.

Delving into various national security challenges, Gen Chauhan said India has been facing the "asymmetric threat".

Though Chauhan did not name any adversary, his comments were seen as a reference to Pakistan.

"We have always called it a sub conventional kind of a conflict. We invented this particular term much before the West invented terms like global war on terror or asymmetric warfare or fourth generation warfare or hyper conflicts," he said.

"We have called it conflict below the threshold of conventional conflict and the lesson is that there is no substitute for boots on the ground," he said.

Gen Chauhan said technology can only be an enabler but it cannot replace people.

"I think that is very important," he said.

The Chief of Defence Staff also talked about new-age combat zones.

"In conventional conflicts, you shape the battlefield with fire. Over here, we are looking at shaping the mindscape not the landscape."

"The battle of the mind becomes important as far as hybrid warfare is concerned," he said.

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India, Kyrgyzstan joint exercise 'Khanjar-XII' symbolises deep-rooted camaraderie between two nations

Source: The Economic Times, Dt. 19 Mar 2025,
URL: https://economictimes.indiatimes.com/news/defence/india-kyrgyzstan-joint-exercise-khanjar-xii-symbolises-deep-rooted-camaraderie-between-two-nations/articleshow/119211610.cms

Amid the rugged mountainous landscapes of Tokmok, Kyrgyzstan, the 12th edition of Exercise KHANJAR-XII is in full swing, symbolising the deep-rooted camaraderie between India and Kyrgyzstan.

In this edition, elite troops from India's Parachute Regiment (Special Forces) and Kyrgyzstan's Scorpion Brigade are training side by side, focusing on advanced tactics in counter-terrorism and special operations. Their shared goal is to refine skills in high-altitude combat, sniping, building intervention, and mountain craft--techniques crucial for operating in complex urban and mountainous environments, a release said.

Beyond the intensive drills and field exercises, the participants are also engaging in rich cultural interactions. The celebration of Nowruz, a significant festival in Kyrgyz culture will provide a unique platform to strengthen bonds on a personal level and deepen mutual understanding.

The Exercise is being held from March 10 to 23.

"The Exercise is designed to enhance interoperability between the special forces of both countries, focusing on joint operations in urban warfare scenarios, counter-terrorism tactics and precision sniping, all conducted under the framework of a United Nations mandate," Indian Army had said in a post on X.

Exercise Khanjar-XII 2025 aims to enhance military cooperation and interoperability and share the best practices between the Special Forces of the Indian Army and the Kyrgyzstan Army.

The exercise Khanjar XII has evolved into an annual training event since its inception in 2011.

The alternating venues between India and Kyrgyzstan reflect the unique dimension of the thriving strategic relationship. The last edition of the same exercise was conducted in India in January 2024.

The exercise will provide an opportunity for both sides to fortify defence ties while addressing common concerns of international terrorism and extremism. The exercise reaffirms India and Kyrgyzstan's commitment to fostering peace, stability, and security in the region.

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India maintaining balance between hard power, soft power amid uncertainties in world: Rajnath Singh

Source: The Economic Times, Dt. 19 Mar 2025,
URL: https://economictimes.indiatimes.com/news/defence/india-maintaining-balance-between-hard-power-soft-power-amid-uncertainties-in-world-rajnath-singh/articleshow/119217744.cms

India is maintaining a balance between its hard power and soft power amid the prevailing uncertainties in a "multipolar world" today, Defence Minister Rajnath Singh said on Wednesday. And, it is a matter of great pride that India has strengthened its global position, he said at a memorial event here for Major Bob Khathing.

He termed Major Khathing a "great son of India" who left an indelible mark in the country's history through his bravery in the battlefield and skill in diplomacy. It is the responsibility of the people to adopt the ideals and principles of such great personalities, the Union minister said.

"Today, India is maintaining a balance between its hard power and soft power amidst the prevailing uncertainties in the multipolar world. It is a matter of great pride that India has strengthened its global position. A new, strong and organised India has emerged before the world. There was a time India was not taken seriously on international forums. But today, when we speak, the world listens. This is inspired by the ideals of Major Khathing," he said.

Singh also recalled he virtually inaugurated the Major Ralengnao 'Bob' Khathing Museum of Valour at Tawang in Arunachal Pradesh last year. The defence minister pointed out the government's foreign policy has been also shaped by the diplomatic skills of personalities such as Major Khathing.

Singh called upon people to always put the nation first, remain united, discharge their duties with honesty, and move fearlessly towards achieving their goals, which were the core principles of Major Khathing, an extraordinary figure who made invaluable contributions to the northeast region and the national security. Paying glowing tributes to him, the minister asserted India has been fortunate that it is home to such prominent personalities for whom security, integrity and sovereignty of the nation is paramount.

The fifth edition of Major Bob Khathing memorial event, jointly organised by the Indian Army, Assam Rifles and think-tank United Services Institution of India (USI) at Delhi Cantonment, honoured the life and legacy of the legendary figure.

Arunachal Pradesh Chief Minister Pema Khandu, Member of Parliament Alfred Kanngam Arthur, Army Chief General Upendra Dwivedi, IAF Chief Air Chief Marshal A P Singh, Director General Assam Rifles Lt Gen Vikas Lakhera and DG, USI Maj Gen B K Sharma (retd), were also present on the occasion. The defence minister commended Major Khathing's role in integrating, developing and rebuilding not only Tawang but the entire northeast region.

"Major Bob Khathing made a significant contribution in strengthening national unity. The work he carried out for the northeast is similar to what Sardar Vallabhbhai Patel did at the national level,"

he was quoting as saying in a statement by the defence ministry. Major Khathing efficiently carried out Tawang's integration into India without firing a single bullet, and the government led by Prime Minister Narendra Modi follows the principles of such revolutionaries, the defence minister said.

"We completely merged Jammu and Kashmir into India by removing the biggest hurdle -- Article 370 -- without firing a single bullet. The work was carried out peacefully with full security, keeping all the stakeholders in mind," he said. Singh, in his address, highlighted the administrative proficiency of Major Khathing, especially his contribution in the formation of Sashastra Seema Bal and Nagaland Armed Police and other such reforms.

He emphasised that on similar lines the government is focussing on administrative reforms. "Through 'Minimum Government, Maximum Governance' and 'Good Governance', we have reduced the gap between the people and the government. Through 'Digital India' and 'Jan Dhan, Aadhaar, Mobile (JAM) trinity', today administration has become more people-oriented," he said. Singh acknowledged the role of the northeast in India's development journey and voiced the government's commitment towards increasing the region's contribution and its progress. "We have always given priority to the development of the region," he said.

During the event, Singh visited a specially curated photo gallery showcasing Major Khathing's remarkable achievements and enduring legacy. He also attended the screening of a film depicting the pivotal moments of Major Khathing's life and service.

John Khathing, son of Major Khathing, shared reminiscences about his father's remarkable life and legacy, adding a personal dimension to the commemoration. The event also featured vibrant cultural performances by troupes showcasing the rich and diverse heritage of the northeast.

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Plans to procure more missile system, platforms from India: Top Philippines General

Source: The Economic Times, Dt. 19 Mar 2025,
URL: https://economictimes.indiatimes.com/news/defence/plans-to-procure-more-missile-system-platforms-from-india-top-philippines-general/articleshow/119210460.cms

The Philippines is looking at the possibility of procuring more missile systems and other military platforms from India, General Romeo Saturnino Brawner Jr., Chief of Staff of the armed forces of the Philippines, said on Wednesday, emphasising his country's commitment to deepening its defence partnership with New Delhi amid growing competition from China in the Indo-Pacific region. In an interview with PTI Videos, Gen Brawner expressed satisfaction with the Philippines' existing stock of BrahMos missile systems, acquired from India, and emphasised their strategic value.

"We're looking at the possibility of procuring more missile systems and other platforms from India," he said. "We already have the BrahMos systems. We're happy with them. We're still waiting

for the delivery of more components, but so far, they're creating a very good deterrent effect in the South China Sea."

The BrahMos, a supersonic cruise missile renowned for its speed and precision, has become a linchpin in the Philippines' efforts to bolster its maritime defences, particularly in the contested South China Sea.

Military cooperation between India and the Philippines has been steadily advancing, with years of student exchanges laying the groundwork for broader collaboration. "We have had this relationship for several years," Gen Brawner said.

"Now we're trying to establish better relations by perhaps doing more exchanges, intelligence exchanges," the General, who participated at the Raisina Dialogue, said.

He highlighted the geopolitical importance of both nations, stating that their strategic locations make cooperation vital for the Indo-Pacific region.

In addition to its focus on procuring more from India, the Philippines is exploring partnerships with Ukraine to modernise its forces.

Gen Brawner revealed interest in collaborating with Ukraine to develop the country's drone and counter-drone capabilities, citing Ukraine's robust industry forged amid its conflict with Russia.

"We're learning a lot from the conflict between Ukraine and Russia," he said, signalling a multi-pronged approach to enhancing national defence.

In April 2024, India supplied the Philippines with BrahMos supersonic cruise missiles as part of a USD375 million agreement inked in 2022, representing the inaugural export of the missile developed through a collaboration between India and Russia.

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Defence ministry paves way for faster weapon acquisition

Source: Hindustan Times, Dt. 20 Mar 2025,
URL: https://www.hindustantimes.com/india-news/defence-ministry-paves-way-for-faster-weapon-acquisition-101742439015754.html

The defence ministry today will seek approval from the Defence Acquisition Council (DAC) headed by Defence Minister Rajnath Singh to drastically compress timelines for the procurement of defence equipment in an effort to ensure that the country’s ability to defend itself doesn’t fall victim to bureaucratic procedures.

The ministry wants the average time taken for defence acquisition to be cut from the present 96 weeks (two years) to only 24 weeks (six months).

According to at least three top officials who spoke on condition of anonymity, the defence ministry wants the cumbersome capital acquisition procedure, governed by a voluminous Defence Acquisition Procedure (DAP) manual, running into 657 pages across two volumes, to be made more efficient so that acquisition of much-needed platforms is not delayed. The tedious DAP document was last amended in 2020. Over the years, there have been acquisition delays in the

procurement of Rafale fighters, Rafale-Maritime fighters (still to be cleared by CCS), additional three Scorpene class submarines, Project 75 I air-independent propulsion submarines and Predator Drones.

HT learns that the proposal before DAC lays down strict timelines for Request for Proposals (RFP), Field Evaluation Trials and Contract Negotiation Committee (CNC), so that the entire process is completed within six months.

According to the officials cited above, the Modi government wants armed forces to get the RFP ready even as they move (or ideally, before they move) the defence ministry for Acceptance of Necessity (AON) for a particular platform to be acquired. Until now, the whole process of RFP by the armed forces started after DAC gave an AON for a particular capital acquisition.

The next step is Field Evaluation Trial of a weapon system, which currently takes years as the armed forces want the system to be tested in polar conditions as well as the desert. Given that conditions can now be simulated, the defence ministry wants the trials to be completed parallelly by testing the capital equipment under simulated conditions

The final step, which involves CNC, driven by top defence ministry mandarins, must also be completed within six months rather than being negotiated with the supplier ad nauseam. It is only after the contract price has been negotiated and approved by the finance ministry, that the matter reaches the Cabinet Committee on Security headed by the Prime Minister.

By compressing the timelines of the capital acquisition process, the defence ministry wants faster decision-making when it comes to the procurement of high-end platforms. It wants to hold both the armed forces and itself accountable in case the price of the platform changes due to delays.

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Technology an enabler, but boots on ground can’t be replaced: CDS

Source: The Hindu, Dt. 19 Mar 2025,
URL: https://www.thehindu.com/news/national/technology-an-enabler-but-boots-on-ground-cant-be-replaced-cds/article69350170.ece

Boots on the ground cannot be replaced and technology will only be an enabler, Chief of Defence Staff (CDS) General Anil Chauhan said, in an address at the Raisina Dialogue, India’s flagship conference on geopolitics on Wednesday (March 19, 2025). At the same panel discussion, former U.S. Army General David Petraeus (retd) said his country’s military had a legacy procurement process and “yesterday’s equipment” was being procured for “fighting tomorrow’s wars”. General Chauhan acknowledged that Indian procurement cycles were also very long.

“India has been facing this asymmetric threat... We have always called it a sub-conventional kind of conflict. We invented this particular term much before the West invented terms like global war on terror or asymmetric warfare or fourth-generation warfare or now, ‘hyper conflicts’. So, we have called it conflict, which is below the threshold of a conventional kind of conflict. And as far as the lessons are concerned, I think the biggest lesson is that there is no substitute for boots on

ground. Technology can only be an enabler but it cannot replace people. I think that's very important," General Chauhan said, speaking at the panel discussion titled "Verses and Wars: Navigating Hybrid Theatres".

The second important lesson, the CDS said, was the shaping of the combat zone, with intelligence being the third lesson. Speaking on "the shaping of a battlefield", he said the battle of minds had become important as far as hybrid warfare was concerned. In hybrid warfare, close collaboration with the State government and the local police was important, General Chauhan stated.

"So it is a kind of a 'whole-of-government' approach which is able to look at such kind of warfare. This I think would be major lessons India learned in its... sub-conventional conflicts."He said the global security environment was marked by two aspects — uncertainty and rapid change."I think the global security environment is marked by two things... uncertainty and rapid amount of change. I joined the Army about almost 43 years back and the types of war they taught us about, the traditional wars, you know, declared conflicts, they are no longer there. Yet, conflicts exist. It is perennial and ubiquitous…"

India, U.S. agree to draft comprehensive framework on defence cooperation for 2025-2035Speaking at the session, Dr. Vivek Lall, chief executive of the General Atomics Global Corporation based in the U.S., said speed was critical in defence and energy security. In this regard, he identified six key areas: persistent surveillance, robust data-sharing, human resource training, electromagnetic spectrum dominance, real-time operational picture, ability to deliver mass in numbers, and logistical dominance.

General Patraeus (retd), also a former Director of the U.S. Central Intelligence Agency (CIA), said that the U.S. military envisions future combat capabilities but hasn't fully solidified them. Structures remain unchanged, leadership development lags, training needs an overhaul, and legacy defence procurement persists, he said, while delving in detail into the employment of technology in the Ukraine war and how it has changed the battlefield.

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Spy planes, radars, fighter jets, utility choppers: Indian Air Force lists key acquisitions for 2025-26

Source: ANI News, Dt. 20 Mar 2025,
URL: https://www.aninews.in/news/national/general-news/spy-planes-radars-fighter-jets-utility-choppers-indian-air-force-lists-key-acquisitions-for-2025-2620250320001403/

The Indian Air Force (IAF) is looking to acquire a range of advanced weapon systems and platforms, including fighter aircraft, spy planes, radars, and other critical technologies in the upcoming financial year, with a focus on improving its capabilities for operations along the borders with China and Pakistan.

According to the Standing Committee report on defence, tabled in Parliament, the IAF's key planned acquisitions in 2025-26 include low-level radars, Light Combat Aircraft (LCA), Light Utility Helicopters (LUH), multirole helicopters, and the leasing of mid-air refuelling aircraft.

Additionally, the IAF plans to focus on the indigenous upgrade of its Russian-origin Sukhoi-30 fighter jets, Signal Intelligence and Communication Jamming aircraft, and Airborne Early Warning and Control aircraft.

The Ministry of Defence (MoD) also provided details about the acquisitions made by the IAF from indigenous sources over the past five years, including the current fiscal year up to December 31, 2024. It revealed that the IAF had made acquisitions and upgrades in various platforms, such as Approach Radars, Missile Systems, Aircraft, Full Mission Simulators, Trainer Aircraft, Technology Missiles, Counter Drone Systems, Close-in-Weapon Systems, High Power Radars, Aero engines, Avionics upgrades, and Static Trans Receivers. These acquisitions were made for Rs 1,39,596.60 crore.

The MoD further underlined that the IAF is focusing on achieving self-reliance in defence manufacturing and supporting the growth of the domestic defence industry. As part of the Atmanirbhar Bharat initiative, the IAF is working on the indigenous production of fighters, transport aircraft, helicopters, trainer aircraft, air-to-air weapons, air-to-ground weapons, surface-to-air guided weapons, unmanned aerial vehicles, and radars."

IAF is pursuing indigenous production of fighters, transport, helicopters and trainer aircraft along with air to air weapons, air to ground weapons, surface to air guided weapons, unmanned aerial vehicles and radars," the Defence Ministry added in its report.

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Aware of ‘who is doing what and why’ in Indian Ocean: Navy chief

Source: Hindustan Times, Dt. 20 Mar 2025,
URL: https://www.hindustantimes.com/india-news/aware-of-who-is-doing-what-and-why-in-indian-ocean-navy-chief-101742412250555-amp.html

The Indian Navy is fully aware of the ongoing developments in the vast Indian Ocean Region (IOR) and keeping a close watch on dual-role vessels (military or spy ships passing off as something else) operating in the vast maritime expanse, navy chief Admiral Dinesh K Tripathi said on Wednesday, at a time when the Chinese navy is seeking to boost its presence in the region. “We are aware of what is happening in the IOR, and we know who is doing what, where, why and how,” he said, in response to a question during a session at the Raisina Dialogue-2025.

The challenges in the region include China’s carefully calculated power play for influence and defending the rules-based international order. Beijing’s approach to expand its maritime footprint in the IOR includes setting up military bases, pushing countries to advance its maritime claims and forcing strategic concessions from vulnerable states. These actions have fuelled global concerns about China’s intent.

"We feel it's our responsibility to ensure that the IOR remains peaceful, tranquil and it should facilitate unhindered movement of trade. For that, we are working with multiple partners within and outside the country. We are quite capable of maintaining maritime domain awareness in the region," Tripathi said. He said the navy was aware of dual role vessels operating in the IOR, which were not doing what they claimed to be doing.

"We are monitoring them. In many cases, we have acted decisively, called them out and told them 'this is not allowed, this is not done here," the navy chief said, sharing the stage with military leaders from the US, Japan, Australia and the Philippines. China is known to deploy research or survey vessels that collect data that can be used for civilian and military purposes. It has often deployed surveillance vessels in the region to track Indian missile launches. The Indian Navy keeps a close watch on extra-regional activity in the IOR, especially the movement and presence of Chinese vessels.

India has consistently called for a free, open and inclusive order in the IOR and the broader Indo-Pacific, pivoting on respect for sovereignty and territorial integrity of all nations, while stressing on peaceful resolution of disputes through dialogue and under the framework of international laws.

"One navy alone cannot say it has the capability to do everything. Individually, we have constraints but together we are not constrained. We are working with everybody, sharing information, intelligence...And as a country and as a navy, we want to work with others on convergence-based issues as that approach brings in results much faster rather than going into alliances," Tripathi said.

Illegal, unreported and unregulated (IUU) fishing is also among the challenges in the Indo-Pacific region, and China is under the scanner for such activities.

"One must keep one's ears and eyes open not only in the military domain but also in geopolitics, technology and tactics being employed by state, quasi-state and non-state actors. We have been doing this for some years. The aim is to be future-ready so that we are not caught unawares," he added. He said that the navy was working with its partners and imbibing the best practices from them across domains.

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Indian Navy committed to sustainability, says Admiral Tripathi

Source: The Tribune, Dt. 20 Mar 2025,
URL: https://www.tribuneindia.com/news/world/indian-navy-committed-to-sustainability-says-admiral-tripathi/

At the Raisina Dialogue 2025, Indian and Australian naval leaders reaffirmed their commitment to international regulations on maritime operations and environmental sustainability.

During a panel discussion on "Deepwater Perils: Securing Trade," Indian Navy Chief Admiral Dinesh K Tripathi and Australian Chief of Joint Operations Vice Admiral Justin Jones emphasised compliance with global maritime laws and the transition to cleaner technologies.

Vice Admiral Jones underscored Australia's adherence to legal frameworks governing naval operations, including international and domestic regulations related to fuel use. "There's various legal instruments and international law and domestic law in our case in Australia that would allow, defence forces, navies in particular, to the point about ships and warships, to distance themselves, if you like, seek waivers to that kind of requirements. We do not do that in Australia, we comply with international law and regulation about, fuels to which you've referred," he said.

Admiral Tripathi echoed this stance, affirming that the Indian Navy is equally committed to meeting global standards. "My friend from Australia has already brought out what we're doing. Indian Navy is no different. We want to comply with all the international regulations which are being done. We want to improve from where we were yesterday and where we want to go tomorrow."

"So all efforts in terms of the kind of propulsion, the kind of machinery, the equipment which is used, which could be in the past adding to the pollution, etc., those are being phased out and we want to get green and clean technology on board our ships, submarines and aircraft, so that is a constant process," he said. He further elaborated on the Indian Navy's transition towards sustainability, emphasising the continuous nature of the process. "It is not happening today, not happening tomorrow, as in the overall ambit the, Green emissions and, you know, COP 25 etc. So we in the navy and the government are committed to ensuring that we follow all the international regulations and minimise pollutions and pollutants both in harbours as also at sea and we are doing our bit towards that," he concluded.

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China presence in Indo-Pacific region is concerning, say Quad defence officers

Source: The Indian Express, Dt. 20 Mar 2025,
URL: https://indianexpress.com/article/india/china-presence-in-indo-pacific-region-is-concerning-say-quad-defence-officers-9895557/

Top defence officers from countries of Quad grouping on Wednesday expressed concern at the Chinese assertive behaviour in the Indo-Pacific, while Indian Navy chief Admiral Dinesh K Tripathi said that Delhi is closely watching the activities and has acted decisively. Talking about India’s priorities vis a vis China in the Indian Ocean Region, Admiral Tripathi said that the Indian Navy needs to ensure that it is ready to take on all the known challenges and be prepared for whatever is yet to come. “We feel that it’s our responsibility to ensure that the Indian Ocean Region remains peaceful, tranquil, and should facilitate unhindered movement of trade,” he said, adding that India is working with multiple partners and agencies internally and externally, and helping small island nations.

“We are aware that some of the vessels which are here have got a dual role; they are not doing exactly what they tell they are doing. We are keeping a close watch and have acted decisively in many cases to call them out,” he said.

During the discussion on 'Deepwater Perils: Securing Trade', Admiral Tripathi said, "One of the attributes (of the Navy) is that one has to of course keep your ears and eyes open, not only the military domain but also in the geopolitics, technology and the tactics as being employed by both state, quasi-state and non-state actors. So, the aim is that we are not caught unawares or surprised by the turn of events."

Besides Admiral Tripathi, the panel included Admiral Justin Jones, Chief of Joint Operations, Australia; Admiral Samuel Paparo, Commander, US Indo-Pacific Command; General Romeo S Brawner, Chief of Army Staff, the Philippines; and General Yoshihide Yoshida, Chief of Staff of the Joint Staff, Japan. Together, they examined the shifting nature of maritime threats, risks for global security and trade, and the evolving responses required to safeguard vital trade routes, including in the South China Sea.

On the 2027 timeline given by Chinese President Xi Jinping on taking over of Taiwan by the PLA, Admiral Paparo said that whether it's a blockade or a full-scale aggression in the Taiwan Strait, depending on the political condition, "the US shall maintain a capacity to resist any resort to force that jeopardises the social, political, economic system of Taiwan", adding that the US policy remains unchanged. When asked about Chinese military ships being spotted 190 nautical miles from Sydney about three weeks ago, Admiral Jones said that the closest they (Chinese) came to the Australian mainland is 140 nautical miles. "It was legal, however, it was a strategic messaging of China's capabilities, capacity, and perhaps intent," he said.

General Brawner spoke on the situation in the South China Sea, especially from the perspective of the Philippines. "China's building of artificial islands gives them effective control over the whole South China Sea, and more than 50% of world trade passes through the South China Sea. Once they take full control, it would be very harmful for the world economy," he said, labelling Chinese activities as "illegal, coercive, aggressive and destructive".

Admiral Tripathi said that the Indian Navy is working with partners and learning the best practices from them in all domains. "We have to ensure that we are ready to take on all the known challenges. We are reasonably prepared for something which is yet to come," he said.

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Ready for synergy with India on dual-use tech: Dutch minister

Source: The Times of India, Dt. 20 Mar 2025,
URL: https://timesofindia.indiatimes.com/india/ready-for-synergy-with-india-on-dual-use-tech-dutch-minister/articleshow/119232316.cms

One of the global leaders in the semiconductor industry, which is also looking to ramp up its presence in the Indo-Pacific, the Netherlands wants to integrate its defence industry with India with collaboration in dual use technologies like drones, AI and semiconductors. Dutch defence minister Ruben Brekelmans told TOI in an exclusive interview that the 2 countries are looking to upgrade their ties to the level of a strategic partnership and it's important to have a strong defence and security pillar to base it on.

Brekelmans said that the Netherlands, one of the principal backers of Kyiv in Europe, seeks robust security guarantees for Ukraine to blunt Russia's "imperial ambitions" and to prevent a return to the 19th century.

"Both have strong maritime sectors and there's more we could do on this. There are also some dual-use technologies, for example in drones, AI, semiconductors where there's a lot of innovation in the Netherlands, also in India. It'd be interesting to look for synergies. India very often doesn't just have knowledge but also the scale to produce in large numbers. That's what we need right now. We need to ramp up our defence industries and if there's also capacity from the Indian side, it can be important,'' said the minister, before his meeting with counterpart Rajnath Singh this week.

The Netherlands had imposed restrictions on the export of chip equipment in 2023, apparently under pressure from the Biden administration that wanted to curb supplies to China.Asked about the Indo-Pacific, where the Netherlands was one of the first European countries to have its own policy, Brekelmans said the Dutch intend to have maritime exercise every 2 years in the region.

"So, we often have one of our frigates visiting multiple countries, India being one of the important ones of course. We also do air exercises, with our F-35s, to show indeed that we share the same values and principles. We have more people to people contacts with India and others, more military attaches to strengthen cooperation,'' he said. On the threat to the transatlantic alliance from US President Donald Trump's policies, Brekelmans said he had heard from his counterpart Pete Hegseth that Nato is more relevant today than ever and backed Trump's call for Europe to spend more on defence. He, however, said the policy of reciprocal tariffs would hurt all.

"There can be some tactical moves by the US to push allies and friends to do certain things and that's fine. But it's important that we remain close friends at the strategic level. It's positive that the US has stressed multiple times that Nato is important. If there are some strategic decisions made by the US, for example to promote focus on Asia, it's always better to do that together than make any unilateral move,'' he said.

With the Netherlands having committed military aid worth 10 billion euros to Ukraine, Brekelmans said there must be enough military power to ensure any peace deal is durable. "A peace deal should not lay the ground for future Russian aggression. Not just in Ukraine, but also other parts of Europe. It's also important to have credible deterrence at other Nato borders. We have had 80 years of peace and we want another 80 years of the same,'' said the minister.

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Philippines calls for India to join 'squad' alliance to counter China in Indo-Pacific

Source: The Times of India, Dt. 20 Mar 2025,
URL: https://timesofindia.indiatimes.com/india/philippines-calls-for-india-to-join-squad-alliance-to-counter-china-in-indo-pacific/articleshow/119231037.cms

Bearing the brunt of China's aggressive expansionist tactics in the South China Sea, the Philippines now wants India to join the relatively new `Squad' strategic alliance it has forged with

the US, Australia and Japan to counter such threats in the crucial Indo-Pacific region.Pointing to China's "illegal, coercive and disruptive Grey Zone" tactics to claim territory and build militarised artificial islands in the South China Sea region, Philippines chief of staff of armed forces General Romeo S Brawner said countries like India and South Korea should also be `included' in the Squad.

China was clearly the big dragon in the room when top military officers of the `Quad' (India, US, Australia and Japan) and the Philippines got together to discuss maritime security challenges in the Indo-Pacific during the Raisina Dialogue here on Wednesday.

"The three artificial islands created by China give it effective control over the South China Sea. They have built a 2.7-km runway, with air defence and other missile systems, on Mischief Reef… Moving forward, it is our belief that they will take full control of the South China Sea," Gen Brawner said.

China has been strong-arming its neighbours in the South and East China Seas as well as the Taiwan Strait to push its territorial claims, flouting all international norms. Japan, on its part, is doubling its defence spending to improve its current war-fighting capabilities and prepare for the future, said Japanese chief of joint staff Gen Yoshihide Yoshida. US Indo-Pacific Command chief Admiral Samuel Paparo, who also dwelt upon the prospect of China forcibly intervening in Taiwan, in turn, said all countries that believe matters should not be "settled by force" should build and maintain a strong deterrence posture.

China, with the world's largest Navy of 370 warships and submarines, now of course also deploys seven to eight naval vessels on a permanent basis in the Indian Ocean Region (IOR), including dual-purpose research or spy ships to map oceanographic and other data useful for navigation and submarine operations.

Navy chief Admiral Dinesh K Tripathi said India believed it was its responsibility to ensure IOR remains peaceful and stable, with unhindered passage of trade. "A Navy that does not deploy does not deter. So, we have been deploying far and wide…We are quite capable of maintaining MDA (maritime domain awareness) in the IOR. We are aware of who is doing what, where and how," he said.

India is "keeping a close watch" on dual-purpose and other naval vessels operating in the IOR, sharing intelligence, building bilateral, trilateral and multilateral partnerships, and helping island nations build capacity, Admiral Tripathi added. Former Maldives President Mohamed Nasheed, sitting in the audience, asked whether the new Trump administration can be trusted to remain steadfast about its partners in the Indo-Pacific. The consensus, by and large, was that while the US may rollback from Europe, the Indo-Pacific would remain on the top of Trump's radar screen.

"We foresee an increase in support to the Indo-Pacific," Gen Brawner said. Admiral Paparo added that the Trump administration had reiterated its commitment to the Indo-Pacific and its partners there. One of the first meetings of the new administration was of the foreign ministers of the Quad, he added.

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CCS clears mega deal for big indigenous artillery guns

Source: The Times of India, Dt. 20 Mar 2025,
URL: https://timesofindia.indiatimes.com/india/ccs-clears-mega-deal-for-big-indigenous-artillery-guns/articleshow/119234281.cms

Big indigenous guns are finally booming. The PM-led cabinet committee on security on Wednesday cleared the around Rs 7,000 crore deal to acquire advanced towed artillery gun systems (ATAGS) for the Army, in a major boost for home-grown capability to manufacture such heavy-duty howitzers.

The deal is for 307 howitzers, which have a strike range up to 45-48-km, and 327 gun-towing vehicles to arm 15 artillery regiments of the Army, with the contract expected to be inked next week, top sources told TOI.

Designed and developed by DRDO, the 155mm/52-calibre ATAGS will be produced by Bharat Forge and Tata Advanced Systems. Bharat Forge will manufacture 60% of the guns after it emerged as the L-1 (lowest bidder), while Tata will produce the remaining 40%.

TOI was the first to report that the ATAGS deal would be inked within this fiscal after clearance from the CCS. The orders for ATAGS are likely to go up in the future because the Army plans to induct “more advanced versions” for a total requirement of 1,580 such guns.

India, incidentally, has also secured a couple of export orders for the ATAGs, which officers say have “excellent” accuracy, consistency, mobility, reliability and automation, and can fire five-round bursts as compared to three-round bursts by other contemporary foreign guns.

With ATAGS having an “all-electric drive technology” to ensure maintenance-free reliable operations over longer periods of time, India will be able to export the guns in large numbers in the years ahead, an officer said.

The ATAGS, whose development began in 2013, has undergone a series of protracted field trials over the years. Finally, in 2021-22, the winter trials were successfully completed at high-altitude areas in Sikkim, which were followed by summer user-firing tests at the Pokhran field firing ranges.

The ongoing Russia-Ukraine war has again driven home the operational utility of long-range, high-volume firepower. Consequently, the Army is progressively stepping up induction of howitzers, missiles, rocket systems and loiter munitions, as reported by TOI earlier.

In Dec, for instance, the defence ministry inked a Rs 7,629 crore contract with L&T in collaboration with South Korean Hanwha Defence for the procurement of another 100 K-9 Vajra-T self-propelled tracked gun systems, which have a strike range of 28-38 km and can be deployed in high-altitude areas along the frontier with China.

Then in Feb, the MoD inked contracts worth Rs 10,147 crore for high-explosive pre-fragmented extended rockets (45-km range) and area denial munitions (37-km) for the indigenous Pinaka multi-launch artillery rocket systems being inducted by the Army. Pinaka, too, is being exported to other countries.

India has grappled with recurring scandals in import of artillery guns, from the Swedish Bofors in the mid-1980s to the South African Denel in 2005 and Singapore Technology Kinetics in 2009, repeatedly derailing the Army's modernization drive.

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US, Indian firms join hands for autonomous surface vessels

Source: The Tribune, Dt. 20 Mar 2025,
URL: https://www.tribuneindia.com/news/india/us-indian-firms-join-hands-for-autonomous-surface-vessels/

Liquid Robotics, a Boeing-owned company, has signed a memorandum of understanding with Indian company Sagar Defence Engineering to co-develop and co-produce autonomous surface vessels (ASV) — small ships that would sail at sea without a crew.

The agreement builds on the joint US-India roadmap for defence industrial cooperation.

Liquid Robotics manufactures the 'Wave Glider' — a proven unmanned vessel that is powered by sea waves and solar energy. It can stay on a mission round the clock for several months at a time, providing real-time data and communications for a variety of applications.

This partnership aims to enhance undersea domain awareness through manufacturing, system interoperability, ocean testing and the establishment of a maintenance, repair and overhaul (MRO) capacity for the wave glider platform.

Salil Gupte, president, Boeing India and South Asia said, "The US-India relationship continues to strengthen, and we see immense potential in deepening our collaboration."

"This partnership with Sagar Defence Engineering underscores our commitment to co-developing and co-producing critical systems in India, fully aligning with the collaborative vision of both the US and Indian Governments outlined in the US-India Joint Leaders Statement last month," Gupte added.

The MoU is aimed at expanding industry partnerships and strengthening production capabilities across the Indo-Pacific region.

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Mid-level officers: The backbone of India's defence

Source: The Pioneer, Dt. 20 Mar 2025,
URL: https://www.dailypioneer.com/2025/columnists/mid-level-officers--the-backbone-of-india---s-defence.html

India's defence capability and strategic dominance in modern warfare are not solely dependent on high-ranking commanders or frontline soldiers. A critical yet often underappreciated element lies in the mid-level officers, tactical communication specialists, and engineering officers who serve as the vital link between strategic planning and operational execution. Their expertise ensures that India's military maintains technological superiority, robust battlefield communication, and

seamless multi-domain operations. This analysis delves into their indispensable contributions across the Army, Navy, and Air Force, emphasising their roles in engineering innovation, cyber and electronic warfare (EW), and actionable policy measures needed to strengthen and empower them.

Mid-level officers-including majors, colonels, wing commanders, group captains, commanders, and technical or engineering specialists-are the core leadership managing battlefield dynamics. They oversee unit command, tactical communications, and the integration of cutting-edge technologies into operations. Despite being pivotal in India's AI-driven, network-centric warfare structure, their contributions are often overshadowed by senior leadership. Recognising and institutionalising their roles is vital to ensuring success in modern combat.

Indian Army

The Corps of Signals, led by mid-level officers, enables real-time, encrypted communication, battlefield networking, and electronic warfare capabilities. Their responsibilities include securing tactical communication during high-intensity and joint operations, integrating EW and cybersecurity measures, and managing communication networks within Integrated Battle Groups (IBGs). The organisational structure

comprises signal companies led by majors and signal regiments commanded by Colonels, with specialised trades such as Operator Radio and Line (ORL) and Technician Electronics and Systems (TES).

Engineering officers play a crucial role in combat engineering, rapid construction of strategic infrastructure, and executing counter-mobility tactics. They deploy AI-based Battlefield Surveillance Systems (BSS) and robotics to enhance warfare efficiency. A notable example is the India-China standoff (2020-21), where Signals Officers maintained encrypted communications in high-altitude conflict zones while engineering officers constructed operational infrastructure like bridges and logistics hubs under extreme conditions.

Indian Air Force

The communication engineers of the Indian Air Force (IAF) are integral to maintaining a state-of-the-art, in-house communication network. These skilled professionals ensure seamless, secure, and resilient connectivity by leveraging advanced technologies such as Software-Defined Networking (SDN) and 5G. Their expertise supports real-time situational awareness, mission-critical data exchange, and robust cybersecurity, enabling uninterrupted operations in high-intensity scenarios. By continuously adapting to evolving technologies and threats, IAF communication engineers strengthen air defence operations, enhance operational readiness, and uphold national security while setting new standards in military-grade communication technology.

Mid-level IAF communication officers ensure uninterrupted and secure communication for air defence and combat operations. They manage Air Defence Control Units (including S-400, Akash, and SPYDER systems), UAV and satellite networks, and cyber defences for air assets.

IAF engineers specialising in Aeronautical, Electronics, and Mechanical fields oversee aircraft readiness, system maintenance, and the integration of missile systems, radars, and EW platforms. Their expertise has been crucial in indigenous system development, such as the LCA Tejas and

AMCA. During the Balakot Airstrike (2019), Communication Officers ensured real-time, encrypted communication for operational secrecy, while engineers guaranteed the operational readiness of Mirage-2000 aircraft, including EW systems and radar evasion measures.

IAF vs Chinese PLAAF mid-level officers

A comparison between India's IAF and China's PLAAF reveals key operational differences. Indian mid-level officers, including Squadron Leaders and Wing Commanders, are empowered for independent decision-making and multi-platform management. In contrast, Chinese officers operate under a centralised command model, limiting battlefield initiative. Reports from RAND Corporation and the Pentagon (2020-22) highlight that PLAAF officers face systemic challenges in joint operations and adaptive warfare. In contrast, Indian officers, seasoned through real combat experiences, lead the integration of advanced indigenous and Western technologies, whereas PLAAF officers primarily operate evolving domestic platforms with less proven combat capability.

Indian Navy

Naval communication officers manage secure ship-to-ship and ship-to-shore communication, Blue Water Communication Systems (BWCS) for long-range coordination, and encrypted submarine and stealth platform communications.

Naval engineers oversee the maintenance and readiness of warships, submarines, and aircraft carriers. They also integrate sophisticated weapons such as BrahMos missiles and torpedoes while managing stealth and radar-evading systems. A case in point is the anti-piracy operations in the Gulf of Aden, where communication officers coordinated multi-national, encrypted communication while engineers maintained operational readiness of naval platforms throughout extended deployments.

Mid-level officers play a pivotal role in coordinating tri-service communication and operational integration, ensuring seamless joint missions across land, air, and sea. Mid-level officers are at the frontline of cyber and EW defence.

Communication officers ensure robust cybersecurity frameworks, while engineers lead the design and operation of AI-based EW platforms and cyber-resilient technologies. These officers spearhead the induction and field application of indigenous defence systems like BrahMos, Akash, and AI-driven surveillance. They work closely with DRDO, BEL, and private defence innovators to enhance technological self-reliance.

Empowering India's defence backbone

To strengthen mid-level officers, the government should implement AI, Cyber, EW, and space warfare training, conduct integrated tactical communication-engineering exercises, and facilitate global exposure through collaborations with allies like the US, France, and Israel.

National awards should be introduced to recognise excellence in tactical communications and engineering. Defence technology fellowships should be launched for innovation leaders in these domains. Mid-level officers should have representation in defence technology boards and policy-making bodies to ensure that operational insights shape defence strategies. Promotions should be fast-tracked for excellence in emerging tech domains like EW, AI, and Cyber.

Additionally, foreign exchange programs and specialised leadership incentives should be introduced. Collaboration with DRDO, clean startups, and established industries should be strengthened. Mid-level officers should play an active role in innovation ecosystems like iDEX to foster indigenous technological advancements.

Conclusion

India's evolving security landscape demands proactive empowerment of mid-level Tactical Communication and Engineering Officers. These officers are the operational backbone and technological brain of India's modern military, translating national defence strategies into battlefield readiness.

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Science & Technology News

India Plans Chandrayaan-4 Mission with Advanced Docking, Lunar Sample Collection: Dr. Jitendra Singh in Lok Sabha

Source: Press Information Bureau, Dt. 19 Mar 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2112835

Of the four astronauts undergoing rigorous training for the upcoming human mission, "Gaganyaan" one of them, Group Captain Shukla, has been selected to join the mission to the International Space Station, while others remain in an intensive preparatory phase to ensure mission success.

This was stated in the Lok Sabha today by Union Minister Dr Jitendra Singh. He asserted that India's space ambitions are set to reach new heights in reply to a question , while revealing crucial details about the upcoming Chandrayaan-4 mission. The mission, which will feature multiple advanced docking technology and lunar sample collection, is poised to be a major step toward India's goal of establishing its own space station by 2040.

Beginning his reply in the Lok Sabha to a discussion on Chandrayaan 4 and India's Space missions, Union Minister Dr Jitendra Singh shared with the House that Sunita Williams had landed back on the surface of Earth this morning at 3.27 AM after spending more than 300 days in the Space and our message of congratulations was put out by the social media soon thereafter around 4 AM defining this "as a moment of glory, pride and relief".

The Minister referred to PM Narendra Modi's letter to Sunita Williams in which he had conveyed his good wishes and extended her invitation to visit India. He also recalled that when Sunita came to India last time in 2007, he had met Shri Modi who was then the Chief Minister of Gujarat.

Dr. Jitendra Singh highlighted the importance of Chandrayaan-4 in strengthening India's space capabilities. "This mission will not just be about landing on the Moon but also about mastering

docking and undocking procedures, a key requirement for future interplanetary missions and space station operations," he said. The Minister further noted that India's long-term objective includes sending an Indian astronaut to the Moon, with Chandrayaan-4 serving as a precursor to that historic feat.

The mission will involve two launch vehicles carrying five components in total. These modules will execute complex manoeuvres, including docking in Earth's orbit before proceeding to the Moon. Upon reaching lunar orbit, the modules will separate, with the descender collecting samples while the ascender returns to dock with the remaining modules. The return module will then make its way back to Earth, simulating key aspects of crewed lunar missions.

Dr. Jitendra Singh also touched upon the broader applications of space technology in governance and development. He emphasized that space-based innovations are now integrated into urban planning, disaster management, healthcare, and agriculture, demonstrating how India's advancements in space science are benefiting the general public.

Additionally, he addressed queries about India's first human spaceflight mission, Gaganyaan, confirming that the selected four astronauts are undergoing rigorous training. While one astronaut, Group Captain Shukla, was selected to participate in a mission to the International Space Station, the others remained in an intensive preparatory phase to ensure mission success.

India's space program has gained global recognition, and with Chandrayaan-4, the country aims to take another significant leap. As the mission takes shape, it is expected to further cement India's standing in the global space race and pave the way for future deep-space exploration.

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Redefining energy storage with photo-assisted, self-charging energy storage devices

Source: Press Information Bureau, Dt. 19 Mar 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2112812

Researchers have unveiled a novel air-chargeable battery for a sustainable power solution. This technology traps the oxygen from the environment to drive the charging process for energy storage and is a step towards a carbon-neutral future.

In a world racing toward renewable energy solutions, a photo-assisted battery offers great promise as they combine the best of two worlds-- the light-capturing capability of solar cells and the robust energy storage of conventional batteries. Generally, solar panels convert sunlight into electricity, but they rely on separate battery systems to store the energy for later use. In contrast, photo-assisted batteries merge these functions into a single device, creating a seamless synergy between solar energy conversion and storage.

Photo-assisted batteries enhance the capacity of the batteries in the presence of light. However, it needs an external power supply to charge the battery. To overcome this limitation, there is an urgent requirement to develop energy storage devices with self-rechargeability.

Recent research has explored the “air-assisted self-charging” concept of aqueous ZIBs, aiming to utilize oxygen from the air to replenish the charge of the battery.

Researchers from the Centre for Nano and Soft Matter Sciences (CeNS), an autonomous institution under the Department of Science and Technology (DST) in Bengaluru, India, have developed a photo-assisted self-chargeable energy storage device that enhances the charge storage capacity in the presence of light. It can charge by its own in the presence of oxygen from the atmosphere.

A team led by Dr. Ashutosh Kumar Singh presented their study on these smart energy storage devices, titled "Photo-assisted self-chargeable aqueous Zn-ion energy storage device." This work published in the Chemical Engineering Journal explores the integration of photo-assisted and self-chargeable features into zinc-ion batteries (ZIBs), utilizing vanadium oxide (VO2) and tungsten trioxide (WO3) as the primary cathode material.

This work introduces a novel approach utilizing VO2 as an active material, blended with WO3 as a charge-separating layer, to design a photoelectrode for air-photo-assisted self-charged zinc ion energy storage. In addition, this work reports the utilization of WO3 as a charge-separating layer in photo-assisted self-chargeable energy storage device for the first-time. The device shows a significant increment in the charge storage capacity (170%) at a constant current density of 0.02 mA/cm2. Additionally, the VO2 layer works as an air cathode electrode that can help air-assisted self-charging. It demonstrates an open circuit potential (OCP) of 1 V. This shows the superiority of photo-assisted self-charged energy storage performance.

The findings pave the way for integrating these devices into self-reliable electronics, potentially powered by renewable energy sources. This marks a major step forward in the pursuit of sustainable energy solutions and demonstrates the practical utility of energy storage devices in modern technology.

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Paliament Question: Research And Innovation In S &T

Source: Press Information Bureau, Dt. 19 Mar 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2112780

The Research and Development (R&D) measures increased the exposure of the students in academic institutions to real-world problems and created opportunities for working on the state-of-the-art R&D infrastructure created in the Country. These measures cultivated critical thinking and innovation skills, bridged the gap between theoretical knowledge and practical applications and helped in building a very strong academia-industry ecosystem wherein research lead to technology transfer. R&D in academic institutions thus increased the exposure of students beyond the confines of traditional education and propelled them to the forefront of global competitiveness, positioning them for cutting-edge research, interdisciplinary collaboration, intellectual contributions and preparing them for the demands of a knowledge-driven society.

The impact of R&D measures taken by the Government in increasing exposure of students in academic institutions is given below:

The total Ph.D. enrolment in India has increased to 81.2% in 2021-2022 (2.13 lakh) from 2015-2016 (1.17 lakh). In 2021-22, female enrolment in PhD programs in India doubled to 99,000 (0.99 lakh) from 48,000 (0.48 lakh) in 2014-15, representing a significant increase in women's participation in higher education, especially at the PhD level. In the year 2021-22, Gross Enrolment Ratio (GER) in higher education for the age group 18-23 years is estimated as 28.4, as compared to 23.7 in 2014-15. Female GER has increased to 28.5 in 2021-22 from 22.9 in 2014-15. Of the total enrolment in 2021-22, the number of Student enrolment in STEM for UG, PG, Ph.D. and M.Phil. levels is 98,49,488 (25.6%).

The details of various measures taken by the Government to collaborate with academic institutions to foster research and innovation in science and technology, thereby increasing exposure of students in academic institutions to Research and Development is given in Annexure – I.

ANNEXURE – I

1. Department of Biotechnology (DBT)

(a) Fellowship Programmes: DBT has taken significant steps to collaborate with academic institutions to foster research and innovation in science and technology. The Department has established several fellowship programs and initiatives that enhance collaboration between researchers and academic institutions. The DBT - Junior Research Fellowship Programme, DBT-RA Program in Biotechnology and Life Sciences, Ramalingaswami Re-entry Fellowship, Biotechnology Career Advancement and Re-orientation (BioCARe) Fellowship, and M K Bhan Fellowship programs represent significant initiatives by the Department to foster collaboration with academic institutions. These programs enhance exposure to research environments by creating pathways for researchers to engage with academic institutions, establish research groups, mentor students, and contribute to India's scientific advancement.

(b) R&D Infrastructure: DBT has been supporting the development of research infrastructure at universities and research institutes across the country under Research Resource, Service Facility and Platform (abbreviated as RRSFP) Programme through the following components

DBT- Boost to University Interdisciplinary Life Science Departments for Education and Research Programme (DBT-BUILDER) which focuses on upgrading the post-graduate teaching and training laboratories by enabling interdisciplinary advanced research and teaching capacity emphasizing discovery and innovation in proposed research areas, addressing emerging technologies with inter-disciplinary cross talk. In the DBT-BUILDER programme a total of 45 Universities and Institutes were supported, comprising 9 Central University, 14 State University, and 22 Private Universities or Postgraduate Colleges. Across these institutions, 177 departments received support, with 34 in central universities, 56 in state universities, and 87 in private institutions.

DBT - Scientific Infrastructure Access for Harnessing Academia University Research Joint Collaboration (DBT-SAHAJ) aims at creating “national” service facility/research resource/platform to provide access to resources that could not be provided by any single researcher's laboratory or scientific department. The Unified Online Booking Portal under the DBT-SAHAJ lists available equipment, user charges, and availability, allowing users to book facilities in advance.

(c) Star College Programme: The Star College Programme was initiated by DBT in 2008 to support colleges and universities offering undergraduate education to improve science teaching across the country. This Programme was launched for improving critical thinking and encouraging 'hands on' experimental science at undergraduate level in basic science subjects. On a larger perspective, the programme was initiated envisioning that it shall encourage more students to take up higher education in science. Through this programme the Department identifies colleges with potential for excellence and provides support for developing infrastructure for academics and laboratory activities. This support is in turn expected to invigorate teaching and provide unique exposure of students to experimental science.

(d) DBT-BIRAC Amrit Team Grant: is a new program of Department of Biotechnology (DBT) to support new and innovative collaborative research programs involving academia, the clinic and start-ups.

2. Department of Scientific & Industrial Research (DSIR)

Postdoctoral fellowships: The Council of Scientific and Industrial Research (CSIR) under the Department of Scientific & Industrial Research (DSIR), Ministry of Science and Technology through its "Capacity Building and Human Resource Development Scheme" carried out by National S&T Human Resource Development Group (HRDG) has been providing doctoral and postdoctoral fellowships to young budding researchers through its various fellowship programmes. These young researchers are basically involved in science and technology development. The main objective of the programme is to nurture the budding scientific talent and to nourish the objective of pursuit of scientific research. The CSIR supported research fellows are working in more than 650 academic and R&D institutions. Apart from doctoral and postdoctoral fellowships, CSIR provides financial assistance to academic and R&D institution to carry out basic and applied research in the frontier and emerging areas of science and technology. These research projects of CSIR awarded to academic and R&D institutions are also a source of S&T human resource development as the principal investigators of these research projects are a guiding force and train young researchers in recent trends of science and technology research. These researchers contribute in the scientific publications, patents, technology, processes and overall development of S&T in the country. It is an established fact that the number of research articles published from an academic institute are proportional to the number of research scholars. This is the pool of young researchers being utilised by universities and R&D institutions for their research and development work/activities and is a precious S&T asset of the country. The research activities such as doctoral and postdoctoral fellowships and research grants are contributing in the scientific development of the country as India has attained 3rd position in terms of publishing the Science and Engineering research articles, contributed in increase in researchers per million populations from India which has now reached to 260 in 2020 compared to 215 in 2015.

3. Department of Science and Technology (DST)

DST is making several efforts through its various schemes and programmes to collaborate with academic institutions to foster research and innovation in science and technology, thereby increasing exposure of students in academic institutions to Research and Development. Details of significant initiatives are given below.

(a) Innovation in Science Pursuit for Inspired Research (INSPIRE): The Scheme aims at attracting young talent toward pursuing research as a career by leveraging the existing educational structure for talent identification, without conducting any competitive exams. Covering meritorious youth from school to university levels, the scheme supports those interested in studying science and choosing scientific research as a career. It facilitates human capacity building through scholarships, fellowships, and research exposure, enabling students to develop their skills and pursue opportunities in scientific research. The Scheme has the following components to create a robust ecosystem for cultivating future leaders in scientific research:

- INSPIRE Internship: Provides exposure to the top 1% of students at the Class X Board level by organizing Science Camps during summer or winter. These camps allow students to interact with renowned scientists, including Nobel Laureates, fostering curiosity and inspiring them to pursue science at an early age (16-17 years).
- Scholarship for Higher Education (SHE): Offers 12,000 scholarships annually to meritorious students aged 17-22 years, encouraging them to study basic and natural sciences at the undergraduate level with additional scholarship and mentorship support.
- INSPIRE Fellowship: Awards 1,000 fellowships annually to students aged 22-27 years for pursuing Ph.D. in basic and applied sciences, including engineering, medicine, agriculture, and veterinary sciences.
- INSPIRE Faculty Fellowship: Provides 100 fellowships annually to young researchers aged 27-32 years with a Ph.D. qualification, offering them the opportunity to carry out research in both basic and applied science areas for a duration of 5 years, helping them establish themselves as independent researchers.

(b) Fund for Improvement of S&T Infrastructure (FIST): The Schemes supports basic infrastructure and enabling facilities for promoting R&D activities in new and emerging areas and attracting fresh talents in universities & other educational institutions. It is considered as complimentary support for enabling Departments/ Centres/ Schools/ Colleges to pursue research activities more effectively and efficiently It was launched in 2000 under the Department of Science & Technology (DST). The duration of support for each FIST Project will be 5 years and will have 4 levels – Level-0, Level-1, Level-2, and Level-3. The programme has played a crucial role in fostering academic and research growth by providing financial support to a vast network of 3072 departments and PG colleges with an allocated budget of approximately Rs 3130.82 crores. This consistent support has significantly contributed to the advancement of scientific and technological endeavours across various universities and colleges, fuelling innovation and progress in India's educational landscape.

(c) Sophisticated Analytical and Technical Help Institutes (SATHI) Centres: These Centres organizes training program for researchers, MSME and start-ups for sensitization and utilization of high-end equipment and provides appropriate level platform for networking and to explore possibilities for collaborative research and sharing of data, among the participants.

(d) Promotion of University Research and Scientific Excellence" (PURSE): The Scheme aims to bolster the Research and Development (R&D) foundation of universities nationwide. The primary

objective is to enhance the research capabilities of Indian universities, fostering a robust research ecosystem and strengthening their R&D bases.

(e) Women in Science and Engineering-KIRAN (WISE-KIRAN): ensures the participation of women in the field of Science and Technology (S&T) through various gender-enabling programmes. The various components of the Scheme for improving the exposure of women to Research and Development are given below.

- The WISE Fellowship Programme aims to provide support to women who want to pursue a Ph.D and Post Doctorate
- Women's Instinct for Developing and Ushering in Scientific Heights & Innovations (WIDUSHI): WIDUSHI Programme aims to encourage and support senior women scientists to conduct research in interdisciplinary areas of Science & Technology
- WISE Internship in Intellectual Property Rights (WISE-IPR) – WISE-IPR programme provides one-year training to women in the area of Intellectual Property Rights in order to develop a core professional skill in this domain
- Women International Grant Support (WINGS): WINGS Programme provides opportunities to Indian Women scientists to undertake research in the International research labs and academic institutions
- Consolidation of University Research for Innovation and Excellence (CURIE): CURIE Programme provides support to women institutions for establishing State-of-the art research infrastructure to enhance research facilities and improving R&D activities in order to create excellence in Science & Technology (S&T) domain
- VigyanJyoti programme aims to encourage girls to pursue higher education and career in STEM (Science, Technology, Engineering and Mathematics) especially in the areas where women participation is low in order to balance gender ratio across the streams

(f) The Anusandhan National Research Foundation (ANRF), erstwhile Science and Engineering Research Board (SERB) provides a wide range of fellowship which had increased the exposure of students to foster research and innovation in science and technology.

4. Department of Higher Education:

(a) The Prime Minister's Research Fellowship (PMRF) Scheme: PMRF was introduced in 2018, with the objective to attract top talent to doctoral research in India, particularly in Science and Technology, by offering attractive fellowships at institutions like IITs, IISc, and IISERs. The PMRF scheme aims to improve the quality of research in higher educational institutions and foster innovation. The scheme is offered at all IITs, IISERs, Indian Institute of Science (IISc) Bangalore, and some top Central Universities/NITs that offer science and/or technology degrees. The fellowship covers a research grant of Rs. 2 lakhs per year (up to Rs. 10 lakhs for five years). A new version of the PMRF scheme, PMRF 2.0, was announced in the current budget with the introduction of 10,000 fellowships over the next 5 years to boost R&D and provide enhanced PhD fellowships. Industry participation in the PMRF program is explored through CSR funding or otherwise to enable industry to sponsor Fellows.

(b) University Grants Commission (UGC): The UGC supports research and innovation in educational institutions through schemes like "Teaching and Research in Interdisciplinary and Emerging Areas," encouraging innovative proposals and specialized courses, and promoting Research Development Cells (RDCs) to foster a strong research ecosystem.

(c) All India Council for Technical Education (AICTE): AICTE supports research and innovation in technical education through various schemes, including the AICTE-Research Promotion Scheme (RPS), AICTE AURA, and by promoting infrastructure development, faculty development, and industry-institute interaction.

This information was given by Union Minister of State (Independent Charge) for Science and Technology, Earth Sciences, MoS PMO, Department of Atomic Ene

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Paliament Question: Indian Biological Data Centre (IBDC)

Source: Press Information Bureau, Dt. 19 Mar 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2112778

Department of Biotechnology has created the national resource data of whole genome sequencing of 10,074 healthy individuals from 83 heterogeneous populations from 99 different sites, under the "Genome India" project, to create a library of genetic variations. This data aims to serving both scientific and medical community, fostering genomic research. Hence, the data has been archived at the Indian Biological Data Center (IBDC), a National Repository set up by this Department.

The data can be used for developing indigenous chips, diagnostics and therapeutics, benefiting healthcare system of the country and thus will contribute to the bioeconomy of the country. The Department has planned to fund translational research in which this dataset will serve as a template, thus maximizing the benefits of the data generated under ‘Genome India’ project. This data will be disseminated to the researchers under the provisions of the Biotech-PRIDE (Promotion of Research and Innovation through Data Exchange) Guidelines and ‘Framework for Exchange of Data (FeED) Protocols.

Under the ‘Genome India’ project, the study has been carried out throughout the length and breadth of the country and ensured equitable sampling across linguistic, social, and regional groups in India. Approximately, 36.7% of the samples were collected from rural, 32.2 % from urban and 31.1 % from the tribal populations. It is imperative that maximum benefit should be accrued from the large data base already created. Hence the Department initially focuses on translational research using the already available dataset, for which proposals are being sought throughout the country and the process is still on; hence state wise data in this regard is not available.

This information was given by Union Minister of State (Independent Charge) for Science and Technology, Earth Sciences, MoS PMO, Department of Atomic Energy, Department of Space, Dr. Jitendra Singh in a written reply in the Lok Sabha today.

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New research suggests dark energy is fading. Could the the universe reverse course?

Source: The Times of India, Dt. 20 Mar 2025,
URL: https://timesofindia.indiatimes.com/science/new-research-suggests-dark-energy-is-fading-could-the-universe-reverse-course/articleshow/119235143.cms

Dark energy, which drives the universe's expansion, is showing signs of weakening, according to research that could fundamentally alter our understanding of the cosmos's destiny.

The findings from the dark energy spectroscopic instrument (Desi) team at Kitt Peak National Observatory in Arizona could significantly impact theories about universal evolution, suggesting the possibility of a reversal in expansion leading to a "big crunch".

This indication that dark energy peaked billions of years ago represents the first significant modification to the accepted universal model in decades, Guardian reported.

"What we are seeing is deeply intriguing. It is exciting to think that we may be on the cusp of a major discovery about dark energy and the fundamental nature of our universe," said Prof Alexie Leauthaud-Harnett, Desi co-spokesperson and cosmologist at the University of California, Santa Cruz.

Scientists discovered dark energy in the late 1990s whilst studying distant supernova explosions to understand cosmic expansion rates. Rather than gravity slowing the post-big bang expansion, they found acceleration driven by an unknown force, subsequently termed dark energy.

The findings, presented at the American Physical Society's Global Physics Summit in Anaheim, California, challenge the notion of dark energy as a constant force, which previously suggested a "big freeze" end to the universe.

Desi's 5,000 fibreoptic sensors have created the most detailed three-dimensional universal map yet, observing 15m galaxies across 11bn years of history.

Analysis indicates dark energy peaked when the universe was approximately 70% of its current age and has since decreased by about 10%. This suggests continued acceleration, albeit at a diminishing rate.

Prof Carlos Frenk from the University of Durham and Desi collaborator stated: "What we're finding is that, yes, there is something pushing galaxies away from each other, but it is not constant. It is declining." While not meeting physics' five-sigma threshold for definitive discovery, many researchers now support these findings with increasing confidence. Prof John Peacock from the University of Edinburgh, initially sceptical, now strongly supports the results, stating: "Extreme claims require extreme evidence. There's almost nothing in science that I would bet my house on. But I would put £1,000 on this result."

Should dark energy continue decreasing to negative values, the universe could end in a big crunch scenario. Scientists remain uncertain about why dark energy, comprising approximately 70% of the universe alongside dark and ordinary matter, might be diminishing, or whether this indicates incomplete or changing physical laws.

Prof Ofer Lahav from University College London noted: "It's fair to say we have no idea what dark matter or dark energy is. The constant dark energy [theory] is already sufficiently challenging. I feel like: 'As if things were not complicated enough.' But you can also look at it more positively. For 20 years we've been stuck with dark energy. Now physicists have new questions."

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ISRO chief inaugurates space technology incubation centre at NIT Rourkela

Source: The New Indian Express, Dt. 20 Mar 2025,
URL: https://www.newindianexpress.com/states/odisha/2025/Mar/20/isro-chief-inaugurates-space-technology-incubation-centre-at-nit-rourkela

ISRO chairman Dr V Narayanan on Wednesday inaugurated the new Space Technology Incubation Centre (STIC) at the National Institute of Technology-Rourkela on Wednesday.

Addressing the event virtually as the chief guest, Dr Narayanan said, “This is a momentous occasion as we are inaugurating the STIC facility at NIT-Rourkela and also celebrating the return of Sunita Williams and her fellow astronauts after their remarkable mission aboard the International Space Station.”

He highlighted ISRO’s Venus Orbiter, Chandrayaan-4, Chandrayaan-5 and the ambitious Gaganyaan missions to send Indian astronauts into space. “The success of India’s space programme is a collective effort, involving ISRO team, industrial partners and academia including institutes like IITs and NITs. With 20 departments, outstanding faculty and excellent infrastructure, NIT-Rourkela is an ideal place for a centre focused on space research. I urge students to embrace the opportunities at STIC and play a key role in shaping India’s future in space exploration.”

Director of the Capacity Building Programme Office (CPBO) at ISRO G Harikrishnan said STIC is designed to strengthen the academic foundation, develop high-quality human resources and build infrastructure at academic institutions to support the Indian space programme.

“To facilitate this, an MoU between ISRO and NIT-Rourkela was signed four years ago. Since then, eight projects with a total value of approximately Rs 1.7 crore, have been underway. I firmly believe that the new STIC facility will further expand the institute’s horizons, enabling the launch of more space technology projects,” he added.

Scientific secretary to ISRO M Ganesh Pillai emphasised the importance of nurturing young talents and collaboration between academia and industry to advance space technology research.NIT-R director Prof K Umamaheshwar Rao also spoke on the occasion.

The STIC at NIT-Rourkela acts as the hub for the eastern region covering Odisha, West Bengal, Jharkhand, Bihar and the Andaman & Nicobar Islands. The STIC initiative is coordinated by ISRO’s CBPO, which oversees activities related to incubation centres across the country.

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