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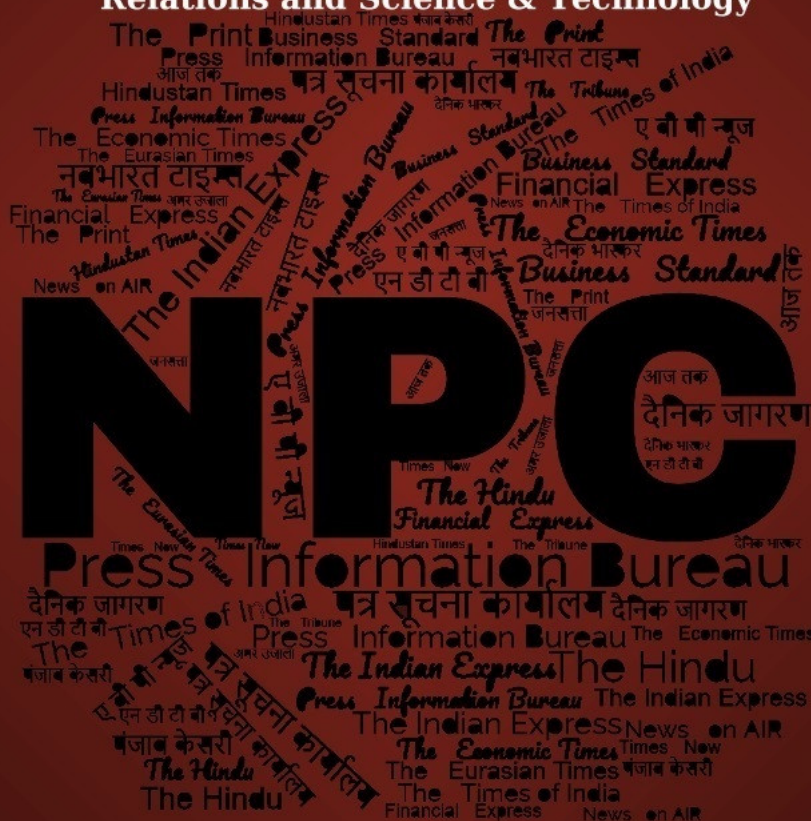
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# समाचार पत्रों से चयनित अंश Newspapers Clippings

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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# Defence News

## 'सुदर्शन चक्र' करेगा नागरिक और सुरक्षा प्रतिष्ठान की रक्षा

Source: Dainik Jagran, Dt. 16 Aug 2025

जागरण ब्यूरो, नई दिल्ली: आतंकवाद के साथ ही सीमाओं पर दोहरे मोर्चे की सुरक्षा चुनौतियों के मद्देनजर पीएम नरेन्द्र मोदी ने लाल किले की प्राचीर से मिशन 'सुदर्शन चक्र' शुरू करने की घोषणा की। इस स्वदेशी रक्षा कवच या प्रणाली का उद्देश्य दुश्मन की घुसपैठ को बेअसर करते हुए भारत की आक्रामक क्षमताओं को बढ़ाना होगा। इस मिशन को भगवान कृष्ण के सुदर्शन चक्र से जोड़ते हुए मोदी ने कहा कि भारत आधुनिक रक्षा नवाचारों में मार्गदर्शन के लिए अपनी समृद्ध सांस्कृतिक एवं पौराणिक विरासत से प्रेरणा लेता है। मोदी ने तेजस विमानों के लिए अमेरिका से जेट इंजन मिलने में हो रही देरी की ओर इशारा करते हुए देश में ही लड़ाकू जेट इंजन बनाने का आह्वान किया।

भारत को खतरों से बचाने के लिए 10 वर्षीय रक्षा परियोजना 'सुदर्शन चक्र' की घोषणा देश के महत्वपूर्ण सैन्य व नागरिक



- प्रधानमंत्री ने की स्वदेशी रक्षा प्रणाली के विकास की घोषणा
- स्वदेशी जेट इंजन बनाने के लिए भी मोदी ने किया आह्वान

प्रतिष्ठानों की सुरक्षा को मजबूती देने के लिए की गई है। इसमें दुश्मन को निर्णायक जवाब देने के लिए एक स्वदेशी रक्षा कवच विकसित करने की बात है। जाहिर तौर पर आपेरशन सिंदूर के दौरान पाक-चीन में दिखी सैन्य साझेदारी को देखते हुए यह कदम उठाया जा रहा है। माना जा रहा कि यह कवच इजरायल के आयरन डोम आल-वेदर एयर-डिफेंस सिस्टम की तर्ज पर हो सकता है जो हवाई खतरों से निपटने में सक्षम है।

सुरक्षाकवच का विस्तार जरूरी >> पेज 11

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## India's iron dome? PM Modi promises new Sudarshan Chakra defence system to thwart enemy attacks

Source: Hindustan Times, Dt. 15 Aug 2025

Prime Minister Narendra Modi on Thursday announced the launch of Mission Sudarshan Chakra, a state-of-the-art defence initiative aimed at bolstering India's security. The mission will aim at creating a shield to protect India's strategic, civilian, and religious sites from potential enemy attacks and also creating new weapons.



Speaking from the ramparts of the Red Fort during his Independence Day address, PM Modi said the system would integrate the latest technological tools to create a powerful, multi-layered shield around critical locations across the country.

"In the next ten years, by 2035, I want to expand, strengthen, and modernise this national security shield. Drawing inspiration from Lord Shri Krishna, we have chosen the path of the Sudarshan Chakra...The nation will be launching the Sudarshan Chakra Mission." The entire modern system should be researched, developed, and manufactured in India, harnessing the talent of our youth. This powerful system will not only counter terrorist attacks but also strike back at the terrorists," he said.

"India aims to develop its own Iron Dome-like defence system, named Mission Sudarshan Chakra, designed to safeguard critical sites, including civilian areas," he added.

The new system could give competition to Israel's famed Iron Dome, a multi-layered defence system known for stopping aerial attacks. Deployed in 2010s, the system has intercepted thousands of incoming rockets from Palestinian militant outfit Hamas and Lebanon's Hezbollah, with Israel claiming a success rate of over 90 per cent.

According to PM Modi, Mission Sudarshan Chakra will combine advanced surveillance, interception, and counter-attack capabilities, enabling swift neutralisation of threats in air, land, and sea domains.

### **India-Pak conflict**

PM Modi's remarks come amid the ongoing conflict between India and Pakistan. On May 7 2025, India launched Operation Sindoor to target terror infrastructure in Pakistan and Pakistan-occupied Kashmir following the Pahalgam attack that claimed 26 lives. Indian forces struck nine terror camps, killing over 100 terrorists, and hit 13 Pakistani military installations and airbases.

India on Thursday also acknowledged the heroism of its soldiers who took part in Operation Sindoor and played a pivotal role in hitting terror and military targets in Pakistan and Pakistan-occupied Kashmir three months ago, with President Droupadi Murmu approving scores of wartime honours for them.

Among the 127 gallantry medals and 40 distinguished service awards cleared by the President on the eve of the 79th Independence Day are four Kirti Chakras, 15 Vir Chakras, 16 Shaurya Chakras, two bar to Sena Medals (Gallantry), 58 Sena Medals (Gallantry), six Nao Sena Medals (Gallantry), 26 Vayu Sena Medals (Gallantry), seven Sarvottam Yudh Seva Medals, nine Uttam Yudh Seva Medals and 24 Yudh Seva Medals, the defence ministry said.

<https://www.hindustantimes.com/india-news/india-iron-dome-pm-modi-promises-new-sudarshan-chakra-defence-system-to-thwart-enemy-attacks-pakistan-independence-day-101755229550851.html>

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# **‘Sudarshan Chakra’ defence shield and indigenous jet engine push: What Modi’s I-Day speech has for defence establishment**

*Source: The Indian Express, Dt. 16 Aug 2025*

Weeks after Indian air defences successfully intercepted Pakistani missiles and drones during the hostilities that followed Operation Sindoor, Prime Minister Narendra Modi Friday announced the launch of Mission Sudarshan Chakra.

It is learnt to be an advanced, multi-tiered air defence system, aimed at creating a nationwide security shield to thwart enemy attacks across domains and strengthen the country’s deterrent and offensive capabilities.

In his Independence Day speech from the ramparts of the Red Fort, Modi drew an analogy between the initiative and the legendary Sudarshan Chakra of Lord Krishna, recalling how it was deployed during the Mahabharat to block the Sun’s rays and create darkness in the morning, enabling Arjun to fulfil his vow of killing Jayadratha.

“In the next 10 years, by 2035, I want to expand, strengthen and modernise this national security shield,” he said, adding that the country will launch the Sudarshan Chakra mission. “Taking inspiration from Shri Krishna, we have chosen the path of his Sudarshan Chakra,” he said.

The reference came a day ahead of Janmashtami, celebrated across India as the birthday of Lord Krishna.

A statement issued by the government after the Prime Minister’s speech said the initiative is designed to enable rapid, precise and powerful defence responses, reinforcing India’s strategic autonomy. It said all public places will be covered by the expanded nationwide security shield by 2035, ensuring comprehensive protection for the nation and demonstrating India’s commitment to self-reliance in defence.

While the exact contours of Mission Sudarshan Chakra are not yet known, it is learnt to be a comprehensive, multi-layered, networked system aimed at protecting India and its vital installations from a range of enemy attacks across domains.

The shield is expected to offer multiple layers of protection by combining surveillance, cybersecurity, and air defence systems to detect and destroy threats, including long-range missiles, aircraft and unmanned aerial vehicles, along the borders and at critical installations. Defence research organisations and the private sector are expected to collaborate on the project.

Modi also made a dramatic call to action, saying that just as India built its own vaccines during the Covid pandemic and created UPI for digital payments, it should now build its own jet engines for fighter aircraft. He urged the country’s scientists and youth to take up the challenge directly.

In his address, he called upon Indian innovators, young scientists, engineers, professionals and all government departments to work towards developing fighter jet engines indigenously, so that future defence technology is entirely home-grown and self-reliant.

“Should we not have our jet engines for our Made-in-India fighter jets? Just like how we made vaccines during Covid, and UPI for digital payments, we should build our own jet engines too. Our scientists and youth must take it up as a direct challenge,” he said.

India has manufactured the indigenous Light Combat Aircraft (LCA) Tejas, but efforts to make aero engines indigenously have so far not succeeded. The Defence Research and Development Organisation's Gas Turbine Research Establishment (GTRE) first worked on developing the GTX-37 engine for the LCA. This was followed by the ambitious Kaveri engine project, sanctioned in 1989.

Nine full prototype engines and four core engines were developed, with 3,217 hours of engine testing carried out, including altitude tests and Flying Test Bed (FTB) trials. However, the engines were not found suitable for fighter aircraft. A major shortfall was recorded in the wet thrust of the engine, which generated only 70.4 kN as against the targeted 81 kN.

At present, India is in discussions with global firms to jointly develop engines that could power its advanced fighter jets in the future. For instance, state-owned Hindustan Aeronautics Limited (HAL) is negotiating with GE Aerospace to jointly produce the F414 engines for the LCA Mk-2 programme. It has already been agreed that the deal, first announced in 2023, would include an 80 per cent transfer of technology from the US-based company.

Apart from GE, India has held talks with other global engine manufacturers such as France's Safran SA and the UK's Rolls-Royce for the Advanced Medium Combat Aircraft (AMCA) programme. The final decision on which engine will power the AMCA will be taken later, once the aircraft's key specifications are finalised. With only a handful of countries having mastered the complex technology and metallurgy required for combat jet engines, most have been reluctant to share it with others.

Modi also used his speech to hail Operation Sindoor, saying that strategic autonomy and indigenous capabilities are essential to decisively tackling threats, making self-reliance the bedrock of national strength, dignity and the journey to a developed India by 2047.

He said India no longer accepts nuclear blackmail or threats on foreign terms, and warned that enemies would get a "befitting reply" in the future. Indigenous capabilities, including Made-in-India weapons, he said, enable the country to act decisively and independently, showing that national security cannot rely on foreign dependence.

He said Operation Sindoor stemmed from the outrage India felt over the Pahalgam terror attack, in which 26 people were killed. The armed forces, he said, were given "a free hand to decide on strategy, objective and timing" and that Indian forces went hundreds of kilometres inside enemy territory to destroy their terrorist headquarters, something "which hasn't been done in many decades".

<https://indianexpress.com/article/india/sudarshan-chakra-defence-shield-indigenous-jet-engine-push-modi-i-day-speech-defence-10191305/>

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# एस-400 से गिराया था पाकिस्तानी जेट, वीर चक्र से हुए सम्मानित

Source: NavBharat Times, Dt. 16 Aug 2025



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300 किलोमीटर  
दूर से गिराया था  
पाकिस्तान का  
फाइटर जेट

कमांडिंग ऑफिसर  
ग्रुप कैप्टन अनिमेश  
पाटनी को मिला  
सम्मान

एयरफोर्स चीफ ने हाल ही में कहा  
था कि ये अब तक का सबसे बड़ा  
सर्फेस टू एयर किल था

## एस-400 ने दुश्मन को किया था नाकाम

■ नई दिल्ली: इस बार राष्ट्रपति अवॉर्ड की लिस्ट में ऑपरेशन सिंदूर में सेना के शौर्य की साफ झलक दिखती है। इंडियन एयरफोर्स के उन अधिकारियों को भी वीर चक्र से सम्मानित किया जा रहा है जिन्होंने ऑपरेशन सिंदूर के दौरान एयर डिफेंस सिस्टम S-400 से पाकिस्तान के एक फाइटर जेट को मार गिराया। 300 किलोमीटर दूरी पर पाकिस्तान के जेट को निशाना बनाया गया था। हाल ही में एयरफोर्स चीफ एयर चीफ मार्शल ए पी सिंह ने कहा था कि ये अब तक के रिकॉर्ड में सबसे बड़ा सर्फेस टू एयर किल था। एयरफोर्स की जिस रेजिमेंट ने S-400 से पाकिस्तान के फाइटर जेट को गिराया, उस रेजिमेंट के कमांडिंग ऑफिसर ग्रुप कैप्टन अनिमेश पाटनी को वॉर टाइम के तीसरे सबसे बड़े अवॉर्ड वीर चक्र से सम्मानित किया जाएगा। इसके साथ ही S-400 के दो और ऑफिसर विंग कमांडर मिलिंद लोंधे और विंग कमांडर केशव शर्मा का नाम मेशन इन डिस्पैच में शामिल है। मेशन इन डिस्पैच एक सम्मान है, ये उन्हें दिया जाता है जिन्होंने विशिष्ट वीरता या सराहनीय काम किया हो।

ऑपरेशन सिंदूर के दौरान एस-400 ने न सिर्फ दुश्मन के हमले नाकाम किए, बल्कि दुश्मन पर कड़ा प्रहार भी किया। तब पाकिस्तान ने ये झूठ फैलाने की कोशिश की कि पाकिस्तान ने भारत के एस-400 को आदमपुर में तबाह किया है। इसका जवाब सीधे प्रधानमंत्री नरेंद्र मोदी की तरफ से मिला। 13 मई की सुबह-सुबह पीएम एयरफोर्स के आदमपुर एयरबेस पहुंचे और वहां से जो तस्वीरें और वीडियो दुनिया को दिखाए गए, उसने पाक के दावों की हवा निकाल दी।

## पाकिस्तान को पहुंचाया था नुकसान

हाल में एयरफोर्स चीफ ने कहा था कि ऑपरेशन सिंदूर के दौरान इंडियन एयरफोर्स ने 5 पाकिस्तानी लड़ाकू विमानों को मार गिराया था। इसके अलावा और भी एयरक्राफ्ट को मार गिराया गया था। साथ ही पाकिस्तान के 2 कमांड एंड कंट्रोल सेंटर, 6 रडार, 2 SAGW सिस्टम, 2 रनवे, 3 हैंगर्स, 1 AEW&C और कुछ F-16 फाइटर जेट भी तबाह किए।

**कितना ताकतवर है S-400 :** एस-400 सिस्टम लॉन्ग रेंज में दुश्मन के हमले को फेल करने के लिए है। यह सिस्टम 500 किलोमीटर की दूरी से दुश्मन के हमले को ट्रैक करता है और रेंज में आते ही दुश्मन की मिसाइल को तबाह कर देता है। इसकी रेंज 380 किलोमीटर तक है। भारत के पास एस-400 की तीन यूनिट हैं।

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## ऑपरेशन सिन्दूर के रण-नीतिकारों को सर्वोत्तम युद्ध सेवा पदक

Source: Dainik Jagran, Dt. 15 Aug 2025

नई दिल्ली, प्रेटर : भारत ने गुरुवार को 79वें स्वतंत्रता दिवस की पूर्व संध्या में वार्षिक सैन्य सम्मानों की घोषणा की। इसके तहत पहलगाम आतंकी हमले के बाद उनके विरुद्ध चलाए गए आपरेशन सिंदूर के योजनाकार व उसे क्रियान्वित करने में शामिल वरिष्ठ सात सैन्य अधिकारियों को सर्वोत्तम युद्ध सेवा पदक दिए जाने की घोषणा की। इसके तहत भारतीय वायु सेना के पायलटों के साथ-साथ एस-400 वायु रक्षा प्रणालियों को संचालित करने वाले पायलटों को भी प्रतिष्ठित पुरस्कार प्रदान करने का एलान किया गया।

वायु सेना के उप प्रमुख एयर मार्शल नर्मदेश्वर तिवारी और एयर मार्शल अवधेश कुमार भारती, भारतीय सेना के डीजीएमओ लेफ्टिनेंट जनरल राजीव घई और उत्तरी सेना के कमांडर लेफ्टिनेंट जनरल प्रतीक शर्मा उन शीर्ष सैन्य अधिकारियों में शामिल हैं जिन्हें सर्वोत्तम युद्ध सेवा पदक से सम्मानित किया जाएगा। दक्षिण पश्चिमी वायु कमान और पश्चिमी



एयर मार्शल  
जितेंद्र मिश्रा



एयर मार्शल  
नर्मदेश्वर तिवारी



डीजीएमओ ले.  
जनरल राजीव घई



एयर मार्शल  
अवधेश भारती



कमांडर लेफ्टिनेंट  
जनरल प्रतीक शर्मा



वाइस एडमिरल  
संजय जसजीत सिंह

### चार कीर्ति चक्र, 15 वीर चक्र, 16 शौर्य चक्र दिए जाएंगे

राष्ट्रपति द्रौपदी मुर्मु ने सशस्त्र बलों और केंद्रीय सशस्त्र पुलिस बलों के कर्मियों के लिए 127 वीरता पुरस्कार और 40 विशिष्ट सेवा पुरस्कारों को मंजूरी दी। इनमें चार कीर्ति चक्र, 15 वीर चक्र, 16 शौर्य चक्र, दो 'बार टू सेना' पदक (वीरता), 58 सेना पदक (वीरता), छह नौसेना पदक (वीरता) और 26 वायु सेना पदक (वीरता) शामिल हैं। पुरस्कारों में नौ उत्तम युद्ध सेवा पदक और 24 युद्ध सेवा पदक भी शामिल हैं। राष्ट्रपति ने 290 'मेशन-इन-डिस्पैच' को भी मंजूरी दी है, जिनमें से 115 भारतीय सेना से, पांच भारतीय नौसेना से और 167 भारतीय वायु सेना से हैं। 'मेशन-इन-डिस्पैच' एक सम्मान है जो भारतीय सशस्त्र बलों के कर्मियों को दिया जाता है, विशेष रूप से उन लोगों को जिन्होंने विशिष्ट वीरता या सराहनीय सेवा का प्रदर्शन किया है।

वायु कमान का नेतृत्व कर रहे क्रमशः एयर मार्शल नागेश कपूर और एयर मार्शल जितेंद्र मिश्रा को भी सर्वोत्तम युद्ध सेवा पदक प्रदान किया जाएगा। इसके अलावा वाइस

एडमिरल संजय जसजीत सिंह को भी इस सर्वोत्तम युद्ध सेवा पदक के लिए नामित किया गया है।

नौसेना उप प्रमुख वाइस एडमिरल तरुण सोबती, जिन्होंने

### पहली बार दो अग्निवीरों को वीरता के लिए सेना पदक मिला

नई दिल्ली, प्रेटर : पहली बार भारतीय सेना के दो अग्निवीरों को वीरतापूर्ण कार्यों के लिए प्रतिष्ठित सैन्य सम्मान से सम्मानित किया गया है। 7 सिख लाइट इन्फैंट्री के अग्निवीर कुलवीर सिंह और 851 लाइट रेजिमेंट के अग्निवीर मूंद मुरलीनायक सेना पदक (वीरता) से सम्मानित किए गए। रक्षा मंत्रालय द्वारा जारी की जाने वाली सैन्य सम्मानों की वार्षिक सूची में सेना के इन दो अग्निवीरों का भी उल्लेख है।

पहलगाम हमले के बाद नौसेना की तैनाती रणनीति को अंतिम रूप देने में प्रमुख भूमिका निभाई थी, को उत्तम युद्ध सेवा पदक से नवाजा जाएगा।

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## Independence day: Gallantry awards honour heroes of Operation Sindoor

Source: The Times of India, Dt. 15 Aug 2025

Nine IAF fighter pilots, four soldiers and two BSF personnel have been awarded Vir Chakra, the nation's third-highest wartime gallantry medal, for their role in Operation Sindoor, under which India conducted deep cross-border precision strikes against terror hubs and military installations in Pakistan.

Operation Sindoor was the prominent theme of 127 gallantry medals & 40 distinguished service awards.

IAF, Army & BSF personnel honoured for Sindoor valour

Operation Sindoor was the prominent theme of 127 gallantry medals and 40 distinguished service awards approved by the President in the awards list for the 79th Independence Day.

They included four Kirti Chakras, which is the country's second-highest peacetime gallantry medal, 15 Vir Chakras, 16 Shaurya Chakras, 58 Sena Medals, six Nao Sena Medals, seven Sarvottam Yudh Seva Medals (SYSMs), nine Uttam Yudh Seva Medals, 24 Yudh Seva Medals, two Bar to Sena Medals, and 290 Mention-in-Despatches.

Vir Chakras were awarded to IAF officers, Group Captains Ranjeet Singh Sidhu, Manish Arora, Animesh Patni and Kunal Kalra, Wing Commander Joy Chandra, Squadron Leaders Sarthak Kumar, Siddhant Singh and Rizwan Malik, and Flight Lieutenant Aarshveer Singh Thakur.

While the Army awardees were Colonel Koshank Lamba, Lt Colonel Sushil Bisht, Naib Subedar Satish Kumar and Rifleman Sunil Kumar, the ones from BSF were sub-inspector Mohd Imteyaj and constable Deepak Chingakham who were killed defending the highly-sensitive Kharkola outpost in Jammu against intense shelling and drone attacks during the cross-border hostilities.

SYSMs, highest wartime distinguished service decoration that has been awarded only a few times in the past, was awarded to seven top military officers who planned and executed Operation Sindoor.

They are Lt-Gen Pratik Sharma (Northern Army Command chief), Lt-Gen Rajiv Ghai (DGMO), Vice Admiral Sanjay Jasjit Singh (then Western Naval Command chief), Air Marshal Narmdeshwar Tiwari (IAF vice chief), Air Marshal Nagesh Kapoor (Southern Air Command chief), Air Marshal Jeetendra Mishra (Western Air Command chief), and Air Marshal A K Bharti (DG Air Operations).

Twenty-six IAF officers and air warriors were awarded Vayu Sena Medal, most of them for their role in the operation for managing and operating S-400 surface-to-air missile and other air defence systems to intercept missiles and waves of drones launched from across the border.

Sixteen BSF personnel, who fought shoulder-to-shoulder with the armed forces during Operation Sindoor, successfully defending their posts in J&K and destroying enemy posts and their surveillance equipment in retaliatory fire, were, in turn, honoured with police medals for gallantry.

<https://timesofindia.indiatimes.com/india/independence-day-gallantry-awards-honour-heroes-of-operation-sindoor-iaf-army-and-bsf-personnel-recognised-for-valour/articleshow/123313288.cms>

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## 'ऑपरेशन सिन्दूर' संतुलित सैन्य जवाबी कार्यवाही के रूप में उभारा

Source: Dainik Jagran, Dt. 15 Aug 2025

नई दिल्ली, प्रेटर : रक्षामंत्री राजनाथ सिंह ने कहा कि पाकिस्तान के खिलाफ 'ऑपरेशन सिन्दूर' दुनिया में चल रहे युद्ध के माहौल में संतुलित सैन्य जवाबी कार्यवाही के रूप में उभरा। उन्होंने कहा कि भारत ने ड्रोन, इलेक्ट्रॉनिक युद्ध और अत्याधुनिक उपकरणों का इस्तेमाल कर साबित कर दिया है कि अब वह विदेशी तकनीक पर निर्भर नहीं है।

स्वतंत्रता दिवस से एक दिन पहले सशस्त्र बलों के कर्मियों को दिए संदेश में रक्षामंत्री ने कहा, ऑपरेशन सिन्दूर युद्ध की 'नई कला', तकनीकी प्रगति के साथ ही रक्षा क्षेत्र में भारत की आत्मनिर्भरता का प्रतीक है। यह आधुनिक तकनीक, सटीक खुफिया जानकारी और स्मार्ट रणनीतियों का उपयोग करता है। आतंकवाद की जड़ें चाहे कितनी भी गहरी क्यों न हों, उसका विनाश निश्चित तौर पर किया जाएगा।

राजनाथ ने कहा कि ऑपरेशन सिन्दूर की संतुलित रणनीति का

- कहा- आतंकवाद की जड़ें कितनी भी गहरी हों, इसका विनाश सुनिश्चित करेंगे
- बंदिशों से नहीं बंधा है भारत, यह ऑपरेशन रक्षा क्षेत्र में आत्मनिर्भरता का प्रतीक

अंदाजा इस बात से लगाया जा सकता है कि कुछ ही मिनटों में सटीक मिसाइल हमलों से लश्कर-ए-तैयबा और जैश-ए-मोहम्मद के मुख्यालयों सहित नौ आतंकी प्रशिक्षण शिविरों को ध्वस्त कर दिया गया। सशस्त्र बलों ने न तो नियंत्रण रेखा पार की और न ही अंतरराष्ट्रीय सीमा का उल्लंघन किया, फिर भी वे 'दुश्मन' के क्षेत्र में छिपे आतंकी ढांचे को तबाह करने में कामयाब रहे। इस बीच आइएनएस के अनुसार अंडमान और निकोबार द्वीप समूह के आदिवासी छात्रों ने रक्षा मंत्री राजनाथ सिंह से साउथ ब्लाक स्थित कार्यालय में बातचीत की।

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## Rajnath hails India's action against Pak as model of self-reliance

Source: The Tribune, Dt. 15 Aug 2025

Defence Minister Rajnath Singh, in an address to soldiers on the eve of Independence Day, said India's actions during Operation Sindoor were a shining example of precise and successful military strategy.

The operation provided a glimpse of a new vision, technological advancements and self-reliance, the minister said in his message that was broadcast on All India Radio.

He said India's response was balanced, and that cutting-edge apparatus such as drone war, layered air defence, electronic warfare and network-centric operation proved that the country was no longer dependent on foreign technology.



Rajnath recollected the start of Operation Sindoor (on May 7), saying within a few minutes, nine terror training camps, including the headquarters of Lashkar-e-Toiba and Jaish-e-Mohammed, were destroyed by precise missile attacks, and no civilian areas and Pakistani military establishments were targeted.

“The armed forces neither crossed the Line of Control nor violated the international border, yet managed to give a crushing blow to the terror infrastructure hidden within the enemy’s territory,” the minister said.

This, he said, was a new art of warfare; India was no longer bound by traditional boundaries, but was using modern technology, accurate intelligence and smart military strategies. “It was a clear message from India that we are tolerant, but when it comes to the safety of our people and the dignity of our country, we unite and face every challenge boldly.”

<https://www.tribuneindia.com/news/india/rajnath-hails-indias-action-against-pak-as-model-of-self-reliance/>

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## India’s Navy latest stealth frigate INS Tamal visits ITALY

Source: *The Pioneer*, Dt. 18 Aug 2025

### PIONEER NEWS SERVICE

■ New Delhi

Underscoring the strong bilateral relations between the two nations, INS Tamal, the latest stealth frigate of the Indian Navy, called at Naples, Italy, from August 13-16 during its return passage to India. The ties between the two countries were formally elevated to a Strategic Partnership in 2023, defence ministry said here on Sunday.

Giving details, it said the Indian warship participated in a Passage Exercise (PASSEX) with ITS Trieste, the recently commissioned Landing Helicopter Dock (LHD) of the Italian Navy, prior entering harbour at Naples.

Joint operations during the PASSEX included communication exercises, manoeuvres



INS Tamal, the latest stealth frigate of the Indian Navy, called at Naples, Italy, from 13-16 Aug 2025 during her return passage to India

PTI

and flying operations and exchange of sea riders, finally culminating in a steam past. During the port call at Naples, the ship engaged in a range of activities focused on furthering defence cooperation and collaboration between India and Italy. Bilateral discussions with senior military and local officials,

as well as professional exchanges, were the highlights of the visit.

The Commanding Officer called on Vice Admiral Pierpaolo Budri, Chief of Staff of the Logistics Command of the Italian Navy and Ms Laura Lieto, Deputy Mayor of Naples. Both sides discussed various initiatives under the

India-Italy Strategic Action Plan 2025-2029.

INS Tamal and the Embassy of India in Rome, hosted a cultural program onboard for officials from the local Government, the Italian Navy, and the Diplomatic Corps based at Rome, and representatives of UN agencies based in Italy and Italian defence industry leaders.

Ambassador of India to Italy, Vani Rao, also interacted with the ship’s crew and senior officers from the Italian Navy onboard the Indian ship.

A ceremonial parade was conducted onboard on August 15 on the occasion of 79th Independence Day of India. The ship’s crew also participated in the Independence Day celebrations at the Embassy of India in Rome.

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## साउथ कोरिया संग कई मुद्दों पर बात

Source: NavBharat Times, Dt. 17 Aug 2025

### ■ NBT रिपोर्ट

दक्षिण कोरिया के विदेश मंत्री चो ह्यून अपने पहले भारत दौरे पर पहुंचे और शनिवार को विदेश मंत्री डॉ. एस. जयशंकर से मुलाकात की। दोनों नेताओं ने बैठक में AI, क्लीन

**पहलगाम आतंकी हमले की निंदा के लिए आभार**

एनर्जी, रक्षा और व्यापार जैसे क्षेत्रों में सहयोग को आगे बढ़ाने पर सहमति जताई। साथ ही, साझा महत्व के मुद्दों

पर मिलकर काम करने की प्रतिबद्धता भी दोहराई।

इससे पहले, जयशंकर ने ह्यून को पुराना मित्र बताते हुए उनका स्वागत किया और कोरिया के राष्ट्रीय लिबरेशन डे पर बधाई दी। उन्होंने पहलगाम आतंकी हमले की निंदा करने के लिए दक्षिण कोरिया का



भारतीय विदेश मंत्री जयशंकर ने चो ह्यून को पुराना मित्र बताया।

आभार जताया।

जयशंकर ने बताया कि ऑपरेशन सिंदूर के बाद भारत का संसदीय प्रतिनिधिमंडल सोल गया था, जहां बेहद सकारात्मक बैठकें हुई थीं। उन्होंने कहा कि भारत इस सहयोग की सराहना करता है। चो ह्यून का यह दौरा खास इसलिए भी है क्योंकि भारत और दक्षिण कोरिया के बीच

विशेष रणनीतिक साझेदारी के 10 साल पूरे हो रहे हैं। जयशंकर ने याद किया कि पीएम मोदी और राष्ट्रपति यून की मुलाकात कनाडा के कनानास्किस में हुई थी, जहां उन्होंने भी शिरकत की थी। दक्षिण कोरिया के विदेश मंत्री ने किश्तवाड़ में बादल फटने से जान गंवाने वालों के प्रति संवेदना जताई।

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## जीआरएसआई ने नौसेना को सौंपा किया एक और सर्वेक्षक युधपोत

Source: Dainik Jagran, Dt. 15 Aug 2025

राज्य ब्यूरो, जागरण • कोलकाता : गार्डन रीच शिपबिल्डर्स एंड इंजीनियर्स लिमिटेड (जीआरएसआई) ने स्वतंत्रता दिवस से पहले एक और उपलब्धि अपने नाम दर्ज करते हुए 113वां सर्वेक्षण युधपोत 'ईक्षक' नौसेना को सौंपा है। यह जीआरएसआई द्वारा निर्मित चार सर्वेक्षण युधपोत (बड़े) की श्रृंखला का तीसरा है। इस श्रेणी का दूसरा पोत आइएनएस 'निर्देशक' 8 अक्टूबर, 2024 जबकि पहला पोत आइएनएस 'संध्याक' 4 दिसंबर, 2023 को नौसेना को सौंपा गया था। ईक्षक जीआरएसआई द्वारा निर्मित 802वां जहाज है।

**ईक्षक की विशेषताएं :** 110 मीटर लंबा ईक्षक नौसेना को परिचालन उद्देश्यों के लिए महत्वपूर्ण सर्वेक्षण डाटा प्रदान करेगा। इस डाटा के आधार पर तैयार किए गए मानचित्रों और चाटों का उपयोग वाणिज्यिक



कोलकाता में गुरुवार को भारतीय नौसेना को सर्वेक्षण युधपोत 'ईक्षक' सौंपने के दौरान जीआरएसआई के अधिकारी • प्रेड

नौवहन (शिपिंग) द्वारा भी किया जाता है। उन्नत उपकरणों से युक्त ईक्षक तटीय और गहरे पानी का सर्वेक्षण करने के साथ-साथ नौवहन चैनलों और मार्गों का निर्धारण करने में भी सक्षम है।

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## Navy gets new warship this independence day

Source: The Asian Age, Dt. 15 Aug 2025

**RAJIB CHOWDHURI**  
KOLKATA, AUG. 14

On the eve of Independence Day, the Indian Navy got a new advanced warship: *INS Ikshak*. Defence PSU, Garden Reach Shipbuilders & Engineers (GRSE), delivered the survey vessel (large), which is also the 113th warship built by the shipyard, to the Navy on Thursday.

Cmde Arvind Chari, CSO (Tech) (South) of the Navy, accepted the warship from GRSE chairman and managing director Cmde P.R. Hari

(retired) at a ceremony. The name, *Ikshak*, stands for "Guide". The warship is the third in a series of four survey vessels (large) being built by GRSE.

It is 110-metre-long and will join *INS Sandhayak* and *INS Nirdeshak*, the previous two warships of the series, after getting commissioned. *INS Ikshak* will provide the Navy vital survey data which is important for operations.

The maps and charts prepared on the basis of this survey data are also used by commercial shipping.

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## US Defence Team in India soon, jt drills ahead

Source: The Asian Age, Dt. 15 Aug 2025

**SRIDHAR KUMARASWAMI**  
NEW DELHI, AUG. 14

A defence policy team from the United States will visit India shortly and scheduled joint military exercises between the two nations will also take place in Alaska, New Delhi said on Thursday, as it hoped ties can move forward based on "mutual

respect and shared interests". India also warned Pakistan not to continue with its "hateful" rhetoric against New Delhi, saying any misadventure will have "painful consequences".

At his weekly briefing, ministry of external affairs spokesperson Randhir Jaiswal said India's defence procurement process to acquire

certain American defence platforms "is on as per established procedure". New Delhi also noted that the bilateral defence ties "underpinned by defence agreements" already in place have given these ties a "strong form" and added that it remains focused on the bilateral, "substantive agenda" between the two nations.

■ Turn to Page 5



■ **Continued from Page 1**  
Responding to queries on whether Prime Minister Narendra Modi will travel next month to the US for the UN General Assembly (UNGA) session, New Delhi said that "no decision has been taken" yet.

The reference to "mutual respect" in New Delhi's comments is significant, given the vitriolic outbursts by the US President against India in recent weeks, particularly on the trade front. When asked about the recent announcement by Mr Trump on the imposition of tariffs by the US amounting to a total of 50 per cent, which New Delhi had earlier criticised, the foreign ministry spokesperson pointed out that an official reaction had earlier been issued already.

New Delhi also clarified that "de-dollarisation" was never on India's financial agenda. Mr Jaiswal reiterated that India-US ties have faced "transition and challenges" earlier as well. He said both sides are working to hold the 2+2 (foreign policy and defence) inter-sessional treaty by the end of this month.

In the wake of threats hurled at India by Pakistan's Army chief

Asim Munir, PM Shehbaz Sharif and former foreign minister Bilawal Bhutto Zardari, India warned Pakistan that "any misadventure" would have "painful consequences" for Islamabad, as was seen during Operation Sindoor in May.

At the weekly briefing, Mr Jaiswal said India had noted the "war-mongering and hateful comments" of the Pakistani leadership, which has been trying to hide its failures by whipping up anti-India sentiments. New Delhi also sternly advised Islamabad to "restrain its comments".

The warning by New Delhi came on the occasion of Pakistan's Independence Day celebrated on Thursday, including at the Pakistan high commission in New Delhi.

Till a few years ago, the Indian government sent the customary greetings to Islamabad on the occasion, but the developments of the past few years, culminating in the horrific Pahalgam massacre in April this year, have seen bilateral ties plummet to a new low.

Pakistani politicians, including Mr Sharif and Mr Bhutto Zardari, have

been issuing threats to India over the sharing of the Indus waters. New Delhi, meanwhile, reiterated its "sovereign" decision taken in April this year to keep the 1960 Indus Waters Treaty (IWT) with Pakistan in "abeyance". New Delhi said the IWT is in abeyance due to continued cross-border terrorism by Pakistan.

The foreign ministry spokesperson reiterated that India had never accepted the rulings of the World Bank-appointed Court of Arbitration pertaining to the Indus waters as these were "without jurisdiction and devoid of legal standing". India also rejected Pakistan's references to the rulings of the Court of Arbitration.

Even as India warned Pakistan, the Pakistani chargé d'affaires Saad Ahmad Warraich said in his Independence Day speech at the Pakistan high commission in New Delhi that "as recent developments affirm, Pakistan is fully capable of defending its sovereignty and territorial integrity against any external threat or aggression". He also mentioned the quest for "peaceful settlement of all disputes, including Jammu and Kashmir".

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## Op Sindoor warriors dominate honours; Pilots, S-400 operators among awardees

*Source: The Economic Times, Dt. 15 Aug 2025*

President Droupadi Murmu approved 127 gallantry awards and 40 distinguished service awards on the eve of the 79th Independence Day, with most of the honours going to the personnel who took

part in Operation Sindoor. The President approved four Kirti Chakras, 15 Vir Chakras and 16 Shaurya Chakras on the occasion.

Among the awardees are pilots who carried out deep strikes against terror targets and Pakistani military establishment, air defence operators who used systems like the S-400 to thwart Pakistani attacks and senior commanders who directed the operations during the May 7-10 operation.

A total of 1,090 personnel of police, fire services, Civil Defence & Home Guards and Correctional Services have also been awarded gallantry and service medals. Out of these, 233 personnel have been awarded the Medal for Gallantry while 99 have been awarded the President's Medal for Distinguished Service.

In the honours lists are nine Air Force pilots from Operation Sindoor who have been given the Vir Chakra, India's third highest wartime gallantry award. Besides, 26 have been awarded the Vayu Sena Medal for gallantry while one has been given the Shaurya Chakra. These include a group captain and a squadron leader, who are sons of former Air Force chiefs.

In all, seven senior commanders, including the Northern Army commander Lt Gen Pratik Sharma have been conferred the Sarvottam Yudh Seva Medal - all for their contributions to Operation Sindoor. Others who have been given the honour are the director general military operations, the Central and Southern Air Force commanders, the director general air operations, the vice chief of air staff and the Western Navy commander.

The Air Force has also accorded mention in despatches to 167 personnel, out of which 162 are for Operation Sindoor. These include at least five women officers who took part in the operation. For now, the air force has not shared citations that detail actions taken by personnel who have been accorded the gallantry medals.

However, the Border Security Force shared citations of two personnel who have been given the Vir Chakra posthumously. These include sub inspector (late) Mohd Imteyaj, who was the post commander of border outpost Kharkola, on the international border in Jammu area. According to the citation, his post came under intense firing on May 9 and he directed a strong response. It added that Pakistani drones then targeted his post and he got grievously wounded but continued to direct troops under his command.

Constable Deepak Chingakham, who was in the same post, refused to be evacuated and stayed with his post commander and continued to put up a fight. He, too, has been posthumously awarded the Vir Chakra.

<https://economictimes.indiatimes.com/news/defence/op-sindoor-warriors-dominate-honours-pilots-s-400-operators-among-awardees/articleshow/123311596.cms?from=mdr>

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## **Operation Sindoor: A defining moment in India's strategic history**

**-by Ravi K Chaudhary (Rtd Maj Gen, VSM Former Scientist H, GOI)**

**Source: The Pioneer, Dt. 18 Aug 2025**

7th and 10th May strikes by our forces on our persistently irritating neighbour really hurt, not just the target of our strikes, but beyond too. The narrative spin, sought through bringing the



discussions down to a tactical level about loss of combat assets, is ingeniously crafted to deny the significance of the strategic Statement made through Operation(Op) SINDOOR. It is intriguing that the PM's Statement of 12th May, setting the "new normal" has not been discussed enough in the strategic community, with commentators on geo-politics and international relations giving it a complete miss.

A strategic communication has three components - matter, medium and message. The fact that the Statement came from a duly elected Prime Minister of the largest democracy, representing 1.4 billion people, makes it as authentic and credible as can be. So it is the matter and message that ought to be analysed for its magnitude and implications.

PM mentioned that Pahalgam attack was a "disgusting attempt to break the harmony and unity of the country." Asif Munir's Statement, regurgitating the false premise of the country's partition only a few days prior to the Pahalgam attack, lends credence to this fact.

That every citizen and every community in India came together to defeat this attempt is a testimony to Indian civilisational strength. This should also put paid to every bid to create scare and insecurity on religious lines, whether internally or externally. A nation used to naming their weapons as Ghorri, Ghazni and Babur and exercises as Zarb-e-Momin would have been amused at the name "SINDOOR" if it was not for the impact it made, both in physical and cognitive dimensions.

Indian names, though far less provocative, had also followed a pattern of power signalling that geo-politics is mostly about. SINDOOR represents empathy, faith, resilience and tenacity. And it conveys a lot about where we stand on security of our freedom to pursue national interests. The continuum of power swings from freedom to influence to control.

When control interferes with someone's freedom, conflict arises. India is happy to maintain its freedom and sees no need to enhance its control to secure this freedom. That is the crux of strategic autonomy. The third point made was to differentiate war from fight against terror. PM has repeatedly emphasised that it is not the age of war, implying that there is nothing that nations need to go to war for that cannot be resolved by civilised means of dialogue.

Conversely, a State that indulges in terrorist violence to force an outcome is not worth engaging with. Once the civilised world settled with concept of States, violent methods of redressing individual or community grievances, mostly perceived than real, is against humanity. Further, "rules based order" can be negotiated only among States.

Although Francis Fukuyama's dream of "The End of History" has since crumbled, world peace has largely held, despite the proliferation of nuclear weapons and other advancements in warfare since the end of the cold war in 1990s.

Terrorism, however, has been on the rise since 1980s, growing into cult terrorist organisations like Al Qaeda and ISIS. India has suffered terrorism more than any other country. While the internal security situation has vastly improved, Pak sponsored terrorism has not abated. PM's clear enunciation of the new normal is an emphatic Statement of intent to Pakistan and its supporters.

### **Parsing the New Normal**

The PM defined the new normal in three bullets—a terrorist attack on India will be responded to befittingly; nuclear blackmail will not be tolerated; and a Government sponsoring terrorism will be held as guilty as masterminds of a terrorist incident.

He has thus given the security agencies, comprising armed forces, intelligence agencies and scientists working in related technologies, very clear directions on capability development.

Pakistan will keep making efforts at launching terrorist strikes to sustain the logic of its existence.

And though most such attempts are detected and neutralised before fructification, it is likely that one of them may succeed again. The response would have to be progressively more impactful, which is a challenge the security forces would have to continuously contend with.

Planning is credible when one knows what exactly is one planning for. That is the strategic direction that forces need to work with focus and energy.

Air Chief Marshall AP Singh, while delivering the ACM LM Katre memorial lecture at Bengaluru, made it clear that the strikes on 10th May were meant to send a message and not decimate the assets at a particular airfield.

Apparently, the message went rather deep and wide. China had clearly picked sides and was actively backing Pakistan. Even the USA, which till then considered the operations as a bilateral engagement and kept aloof, has since taken sides explicitly, encouraging Pakistan's Army Chief enough to deliver a nuclear threat to India from its soil. The Statement has not received the condemnation it deserves.

The US administration has been unabashed in its engagement with the Pak Army Chief over the elected civilian Government. In view of these dynamics, the fusion of State and terror leaders as a single target would entail diplomatic challenges.

Strategic circles are still wondering what made Indian PM declare that nuclear blackmail will not be tolerated. Is it the confidence in our own early warning and protection systems, our second strike capabilities, or some intelligence on Pak's nuclear capabilities post 10th May strikes that he is privy to? Some analysts have suggested that AI advances could undermine nuclear deterrence, whether by "splendid first strike" or through strengthened missile defences. For a long time the world had considered nuclear weapons as political, not military weapons, until a couple of rogue nuclear States appeared.

Pakistan knows that India would no more be constrained fearing an irrational response. Asif Munir's reiteration of nuclear threat, rationalising its employment as self-preservation, must be examined in this context.

Although it is amusing that a Chief claiming victory in the last engagement should talk about being threatened out of existence by an Indian attack, the Pak-USA tango is yet to unravel fully.

### **"Ekla Chalo"**

Op SINDOOR saw active collusion of China with Pakistan. With Chinese equipment, training and support staff, besides intelligence fed by Chinese resources on ground, air and space, it was almost a two front operation. India has to contend with this collusion and find ways of beating it. Neither China, nor India, and not even Pakistan, would want to engage in a full blown war, territorial disputes notwithstanding. Short of that, it would be contest of technologies and ingenuity.

Unlike Pakistan, which is completely dependent on Chinese systems, there is no need for India to depend on any one source for weapons or technologies. PM mentioned our superiority in new age warfare with indigenous weapon systems. Admittedly, there is long way to go, but we are accelerating in the right direction.

There has been much debate around a recent Ashley Tellis' article titled "India's great-power delusions" in "Foreign Affairs" issue of July/August 2025. Tellis decries Indian grand strategy, premised on delusions of being a great power, despite its lack of economic heft, military strength and reluctance for alliances.

Tellis confuses strategic autonomy with pursuit of multi polarity, interpreted as opposition to a unipolar world with US dominance. Indian refusal to align with US national interests, whether resisting military aspects of QUAD against China or picking sides in Russia-Ukraine War, despite enthusiastic courting by successive US regimes this century, baffles Western thinkers.

India seeks strategic autonomy to pursue its own national interests with complete freedom, uninhibited by alliance commitments.

It recognises its threats and their implications but refuses to be drawn into someone else's geo-political calculations. It does seek economic and military power. But that power is to ensure peace while India practices its freedom of action towards prosperity.

To some, this strategy may seem to be losing friends and discouraging collaboration, but earns the quiet admiration of many non-vocal players in the strategic arena who appreciate unencumbered freedom.

### **The Information Dimension of War**

Information plays a very critical role in combat and an important role in shaping perceptions. The two are absolutely independent of each other with combat being far more important than narrative, because the latter requires substance that the former provides.

Precision of Indian strikes, their impact and protection of own assets showed dominance in information dimension of combat. Narratives in international media have their own drivers and there is no need to lose sleep over them. Information is an element of national power and it is better leveraged in diplomacy than on international media.

It is, however, important to keep our own people well informed through our national media. Enemy's attempts to create distrust in Government is a familiar mode of information operation, which must be guarded against. Government briefings, followed by PM Statement were good, authentic information dissemination. There was no need to be drawn into aircraft counting despite the internal and external pressure.

Lessons are learnt by concerned agencies. The band of strategic experts on national or international media should avoid getting intrusive about details. As the Air Chief rightly pointed out to veterans that it was they who had selected present incumbents to their posts and they ought to have faith in them.

### **Strategic Inflection Point**

Not only was our independence marred by loss of a major part of our territory, people and resources, we lost significant territory in two wars since. India has been a status quoist power, not seeking territorial gains or revenge but pursuing economic development in a peaceful environment.

Revisionist neighbours have been a constant irritant and a hindrance to our peaceful pursuits. Punitive military operations other than war (MOOTW) were constrained by nuclear overhang.

Although military retaliation to terrorist strike were undertaken in 2016 and 2019, 2025 saw a far greater escalation with a firm dominance of the escalation ladder. Indian response to Pahalgam

attacks were highly anticipated and Pakistan, adequately supported by China, had been preparing for it. The strikes on 7th and 10th May ticked all the right boxes for a punitive, impactful strike despite enemy's readiness for it. The boldness and effectiveness of the attacks have left most military observers surprised beyond measure. There were no talks of any deficiencies in equipment or lack of preparation time, as happened earlier. This is a transformed posture of our armed forces.

China, which had played Pakistan against us for years was constrained to bare its fangs in 2020 when the previous strategy was rendered ineffective by 2019. Its support to Pakistan against India in this operation is explicit and unapologetic. India's refusal to sign the declaration at SCO Defence Ministers' Conference was a demonstration of our resolve. India is now displaying a new confidence to take on China, whether from the West or North.

### **Future Course**

Indian assertiveness, with clear enunciation of intent and strategy, is the new normal. Gen Sundarji once wrote that something deep down bothered him that in India we found it virtuous to be weak and meek and sinful to be strong. That India has since grown out of diffidence. Peace is only feasible through power.

Economy, military and technology have to be developed in tandem, building on each other, to provide India the economic heft and military strength that translates into power to help and harm. India's enunciation of strategic autonomy stems from its civilisational ethos of "Vasudhevkutumbakam" (the world is one family).

As Gurudev Ravindranath Tagore elucidates in his book "Nationalism", Indian History is the History of saints and sages and not of kings and rulers.

Our "gotra" are after Rishis and not kings. There were many philosophies that co-existed. Kings winning and exchanging territory did not affect the common man, who was free to pursue his livelihood and interests. India does not seek multi polarity. It just does not acknowledge poles around which power is concentrated.

As an inclusive civilisation, we need to be free to pursue peace and prosperity and wish the same for everyone else. The need to develop power is to live in peace with our civilisational ethos. The clear strategic direction, post Op SINDOOR, is a harbinger of this New India.

<https://www.dailypioneer.com/2025/india/operation-sindoor--a-defining--moment-in--india---s-strategic-history.html>

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# China hands over third Hangor-Class submarine to Pakistan

Source: The Pioneer, Dt. 17 Aug 2025

China has delivered the third of the eight new "advanced" Hangor-class submarines to Pakistan as part of Beijing's efforts to upgrade Islamabad's naval strength to support its growing presence in the Indian Ocean, India's backyard. The launching ceremony of the third Hangor-class submarine was held in Wuhan, Central China's Hubei province, on Thursday, the State-run Global Times reported on Saturday.

The second of the eight submarines China is building for Pakistan was handed over in March this year.

This is in addition to four modern naval frigates that China supplied to Pakistan in the last few years as part of its efforts to boost Pakistan's naval strength amid the Chinese navy's steady expansion in the Arabian Sea, where it is developing the Gwadar port in Balochistan, as well as in the Indian Ocean.

Speaking at the launch of the third submarine, Pakistan's Deputy Chief of Naval Staff Project-2 Vice Admiral Abdul Samad said the Hangor-class submarine's cutting-edge weaponry and advanced sensors would be instrumental in sustaining regional power equilibrium and ensuring maritime stability, the daily quoted a Pakistan defence statement as saying. According to a



FILE PHOTO

recent report by the Stockholm International Peace Research Institute (SIPRI), China supplied over 81 per cent of Pakistan's military hardware. Some of Pakistan's key orders in the past five years include the country's first spy ship, the Rizwan; more than 600 VT-4 battle tanks, and 36 J-10CE 4.5-gen-

eration fighters, according to the SIPRI database.

China supplied the first delivery of multi-role J-10CE fighter jets to the Pakistan Air Force in 2022, adding to its JF-17 fighters jointly manufactured by both countries.

Pakistan used these fighter jets in the recent conflict with India. Zhang

Junshe, a Chinese military affairs expert, told the Global Times that the Hangor-class submarine is characterised by its strong underwater combat capabilities, including comprehensive sensor systems, excellent stealth characteristics, high mobility, long endurance and formidable firepower.

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## चीन ने पाकिस्तान को सौपी तीसरी हेंगर श्रेणी की पनडुब्बी

Source: Dainik Jagran, Dt. 17 Aug 2025

बीजिंग, ग्रेट : चीन ने पाकिस्तान को तीसरी आधुनिक हेंगर क्लास पनडुब्बी सौंप दी है। यह चीन द्वारा पाकिस्तान को दी जाने वाली आठ हेंगर क्लास पनडुब्बियों में तीसरी है। माना जा रहा है कि ये पनडुब्बियां देकर चीन हिंद महासागर में पाकिस्तान की नौसेना को मजबूत कर रहा है जिससे उसे भारतीय नौसेना की ताकत और ध्यान को बांटने में मदद मिले।

पाकिस्तान को हेंगर क्लास पनडुब्बी देने का समारोह मध्य चीन के शहर वुहान में गुरुवार को संपन्न हुआ। समारोह में पाकिस्तान नौसेना के उप प्रमुख वाइस एडमिरल अब्दुल समद ने कहा, हेंगर क्लास पनडुब्बी से पाकिस्तान की समुद्री

- पाक नौसेना को हिंद महासागर में मजबूत करने का उद्देश्य
- चीन से 81% सैन्य सामान की खरीद कर रहा पाकिस्तान

सुरक्षा मजबूत करने में मदद मिलेगी। स्टॉकहोम इंटरनेशनल पीस रिसर्च इंस्टीट्यूट (सीपरी) की ताजा रिपोर्ट के अनुसार चीन पाकिस्तान को जरूरत के 81 प्रतिशत से ज्यादा सैन्य साजोसामान की आपूर्ति कर रहा है।



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## Pakistan announces Army Rocket Force Command

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

Pakistan turned its Independence Day celebrations on Thursday into a carefully choreographed display of military muscle and political messaging headlined by the announcement of a new Army Rocket Force Command. The event at Islamabad's Jinnah Stadium, branded Marka-e-Haq ("Battle of Truth"), saw Prime Minister Shehbaz Sharif share the stage with army chief Field Marshal Asim Munir, ISI chief Lt Gen Asim Malik, and Asifa Bhutto Zardari. Military representatives from Turkey and Azerbaijan added a touch of foreign endorsement.

In his address, Shehbaz also unveiled "Misaq-e-Istehkam-e-Pakistan (Charter for Stability)", pitched as a call for unity beyond partisan divides. The newly announced rocket force marks a first in Pakistan's military structure, signalling ambitions for precision-strike capability. But with the economy still under strain, the decision is likely to spark debate over balancing strategic aspirations with fiscal realities.

On foreign policy, Shehbaz expressed gratitude to China, Turkey, Saudi Arabia, Azerbaijan, UAE, Iran, and, pointedly, US President Donald Trump, for support during tensions with India. He reiterated Pakistan's firm positions on Kashmir and Palestine, indicating no softening of regional stances. The Independence Day spectacle underscored an image of civil-military unity in a country where political turbulence often overlaps with military dominance. Whether Marka-e-Haq becomes more than pageantry will depend on Islamabad's ability to deliver on promises of reform, stability, and economic recovery long after the parades are over.

<https://timesofindia.indiatimes.com/world/pakistan/pakistan-announces-army-rocket-force-command/articleshow/123311070.cms>

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# Science & Technology News

## India gets its first privately funded institute for maths research

*Source: The Times of India, Dt. 18 Aug 2025*

India, said Fields medallist Manjul Bhargava, must fall in love with mathematics again. Not as a "drudgery of formulae" but as an act of "exploration".

Bhargava, Canadian by nationality but of Indian origin, believes classrooms need an overhaul-"experimental, playful," he said, with teachers "trained" to spark curiosity. Speaking to TOI on the sidelines of the launch of the Lodha Mathematical Sciences Institute (LMSI), he added: "I'm happy with the new textbooks and the changes brought in them. But they will only show impact in a few years."

On the scientific advisory council of LMSI, Bhargava will lead sessions on arithmetic statistics, its new developments, and future directions. State cabinet minister Mangal Prabhat Lodha called it a school "not for an individual, not for a business, but for the nation that always prioritised knowledge over all and for India that gave so much math to the world."

Entirely devoted to post-doctoral research, LMSI is India's first privately funded mathematics institute, backed by Lodha Foundation with a Rs 20,000 crore endowment. "We realised that for any nation to become strong, we ought to have original thinking and promote innovation," said Abhishek Lodha, CEO and MD of Lodha Developers. The privately funded mathematics research institute in the country is completely free, he added.

Founding director V Kumar Murthy-who earlier led Toronto's Fields Institute-described math as the hidden scaffolding of modern life: the foundation for finance, engineering, and technology. Economist Nachiket Mor, also on the advisory panel, noted that models built in the West often collapse in India because they rarely account for "unique characteristics" like limited liquidity and higher viscosity of adjustment. "This reality makes it all the more urgent for us to build deep capacity mathematics," he said.

Murthy explained that LMSI would begin not with students but with teachers. Ten senior number theorists have been chosen to seed the effort. As president, Murthy said he plans to travel across the country, meeting mathematicians firsthand and mapping who is doing what. The aim is to build a network where the "brightest minds" are spotted early, handpicked, and nurtured.

By Dec 2026, LMSI will host the first Indian Congress of Mathematicians, showcasing contributions of Indian-origin mathematicians worldwide.

<https://timesofindia.indiatimes.com/india/india-gets-its-first-privately-funded-institute-for-maths-research/articleshow/123352435.cms>

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## आकाश फतह के बाद समुद्र की गहराईयों तक पहुंचा भारत

Source: Dainik Jagran, Dt. 15 Aug 2025

नई दिल्ली, आइएनएस : आकाश फतह के बाद अब भारत ने समुद्र की गहराईयों में भी अपना कौशल दिखाया है। भारतीय 'एक्वानाट' ने भारत-फ्रांस महासागर मिशन के तहत उत्तरी अटलांटिक महासागर में पांच हजार मीटर की गहराई तक गोता लगाकर 140 करोड़ से अधिक भारतीयों को गर्व से सीना चौड़ा करने का एक और मौका दिया। यह समुद्र के रहस्यों का पता लगाने के स्वदेशी मिशन 'समुद्रयान' से पहले बड़ी उपलब्धि है। यह सफलता ऐसे समय में मिली है कि अंतरिक्षयात्री शुभांशु शुक्ला ने कुछ ही दिनों पहले आइएसएस पर पहली बार भारत का परचम लहराकर 140 करोड़ से अधिक भारतीयों का स्वाभिमान सातवें आसमान पर पहुंचाया था।

पृथ्वी विज्ञान मंत्रालय ने बुधवार को बताया कि अटलांटिक महासागर में फ्रांसीसी पनडुब्बी नटाइल पर सवार दो भारतीयों ने

**4,025** मीटर तक एनआइओटी के विज्ञानी राजू रमेश ने लगाया गोता, मिशन 'समुद्रयान' बड़ी कामयाबी



विशेष जहाज पर सवार एनआइओटी के इंजीनियर जतिंदर पाल सिंह (बाएं) और आर रमेश (दाएं) व अन्य • पीआईबी

कीर्तिमान बनाया। पांच अगस्त को राष्ट्रीय महासागर प्रौद्योगिकी संस्थान (एनआइओटी) के विज्ञानी राजू रमेश 4,025 मीटर नीचे तक पहुंचे। इसके अगले दिन सेवानिवृत्त नौसेना कमांडर जतिंदर पाल सिंह ने 5,002 मीटर की रिकार्ड गहराई तक गोता लगाया। यह मिशन गहरे समुद्र मिशन के अंतर्गत भारत-फ्रांस

सहयोग का हिस्सा था, जिसका उद्देश्य चरम समुद्री वातावरण में वैज्ञानिक अनुसंधान और प्रौद्योगिकी को आगे बढ़ाना था। इससे भविष्य में गहरे समुद्र में होने वाले अभियानों के लिए मार्ग प्रशस्त होने की उम्मीद है। केंद्रीय पृथ्वी विज्ञान मंत्री जितेंद्र सिंह ने कहा, यह उपलब्धि भारत की महत्वाकांक्षी 'मत्स्य 6000'

परियोजना की दिशा में बड़ा कदम है।

अंतरिक्ष और गहरे समुद्र में पहला स्वदेशी अभियान शुरू करेगा भारत : भारत जल्द ही अंतरिक्ष (आकाश) में 'गगनयान' व समुद्र में 'समुद्रयान' के तहत परचम लहराना चाहता है। ये मिशन अंतरिक्ष और समुद्र में भारत का पहला स्वदेशी मिशन होगा। 'गगनयान' में पृथ्वी की 400 किलोमीटर की निचली कक्षा में तीन अंतरिक्षयात्रियों को भेजा जाएगा। इसके बाद पृथ्वी पर सुरक्षित वापसी भी कराई जाएगी, वहीं 'समुद्रयान' भारत का पहला मानवयुक्त गहरा समुद्र मिशन है।

'मत्स्य' को स्वदेशी तकनीक से किया गया है विकसित: स्वदेशी तकनीक से विकसित, 25 टन के चौथी पीढ़ी के यान को विशेष रूप से गहरे समुद्र में अत्यधिक दबाव और तापमान का सामना करने के लिए डिज़ाइन किया गया है, जिसमें टाइटेनियम से बना पतवार है।

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## गगनयान की तयारी, अंतरिक्ष की सैर पर जा रही महिला रोबोट

Source: Navbharat Times, Dt. 15 Aug 2025

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■ नई दिल्ली: भारत का महत्वाकांक्षी मानव अंतरिक्ष उड़ान कार्यक्रम एक अहम पड़ाव में प्रवेश करने जा रहा है। भारतीय अंतरिक्ष अनुसंधान संगठन (इसरो) के सूत्रों के मुताबिक इसरो दिसंबर में पहले मानवरहित मिशन का प्रक्षेपण करेगा। इस मिशन में 'व्योममित्रा' रोबोट तीन दिन तक निम्न-पृथ्वी कक्षा (लो अर्थ ऑर्बिट) में घूमेगी। यह मिशन तीन अहम बिना चालक (अनक्रूड) उड़ानों में पहला होगा, जो गगन यान के तहत भारतीय अंतरिक्ष यात्रियों को अंतरिक्ष में भेजने की तैयारी को परखेगा।

**दिसंबर में पहले मानवरहित मिशन का प्रक्षेपण**

गगनयान के तहत 2027 में तीन भारतीय अंतरिक्ष यात्रियों को 400 किलोमीटर ऊंचाई तक भेजना है, जहां वे तीन दिन तक पृथ्वी के चक्कर लगाएंगे और फिर भारतीय समुद्री जल में सुरक्षित उतरेंगे। उससे पहले यह देखना जरूरी है कि अंतरिक्ष यान की तकनीक और सुरक्षा सिस्टम पूरी तरह काम कर रहे हैं या नहीं। दिसंबर का मिशन उसी की तैयारी है।

**2027**

में तीन भारतीय अंतरिक्ष यात्री उड़ान भरेंगे, उसी की है तैयारी



**कब होगा असली मिशन?**

इसरो प्रमुख वी. नारायणन के मुताबिक हम मार्च 2027 में गगनयान का मानवयुक्त मिशन लॉन्च करने के लक्ष्य पर काम कर रहे हैं। पहला टेस्ट दिसंबर 2025 में होगा, फिर 2026 में दो और टेस्ट मिशन होंगे। इनके सफल होने के बाद 2027 में भारतीय अंतरिक्ष यात्री उड़ान भरेंगे।

**गगनयान क्यों है खास?**

■ गगनयान सिर्फ तकनीक का कमाल नहीं, बल्कि भारत की अंतरिक्ष यात्रा में नया अध्याय है। इस मिशन के लिए इसरो ने देश के वैज्ञानिक अनुभव, इंडस्ट्री की ताकत, यूनिवर्सिटी और शोध संस्थानों की विशेषज्ञता का सहारा लिया है।

**3 दिन**

तक पृथ्वी के चक्कर लगाएंगे और फिर भारतीय समुद्री जल में उतरेंगे

**72,00**

से ज्यादा टेस्ट इस मिशन के हो चुके हैं, अभी करीब हजार टेस्ट बाकी

**दिसंबर की उड़ान में क्या?**

अंतरिक्ष यान में मौजूद लाइफ सपोर्ट सिस्टम, नेविगेशन, री-एंट्री यानी वायुमंडल में वापसी और सुरक्षित लैंडिंग की प्रक्रिया का परीक्षण होगा। तापमान के बदलाव जैसी चुनौतियों से कैसे निपटता है, ये देखेंगे।

**लॉन्च कहां से होगा?**

पहली उड़ान का प्रक्षेपण आंध्र प्रदेश के श्रीहरिकोटा स्थित सतीश धवन स्पेस सेंटर से होगा। लॉन्च के बाद यान लगातार डेटा भेजेगा, जिसे वैज्ञानिक जांचेंगे।

**दिसंबर से पहले भी एक टेस्ट**

इसरो दिसंबर से पहले एक 'इंटीग्रेटेड ड्रॉप टेस्ट' करेगा। कू मॉड्यूल को एक तय ऊंचाई से गिराएंगे और पैराशूट से उतारा जाएगा। पता चलेगा कि लैंडिंग सिस्टम सही है या नहीं।



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## Deep Ocean Mission: Samudrayaan in sight, India takes a 5,002m plunge

*Source: The Times of India, Dt. 15 Aug 2025*

In a first-of-its-kind expedition, India sent an aquanaut 5,002m deep into the ocean as part of the country's Deep Ocean Mission, which involves development of crewed and uncrewed submersibles and deep-sea mining technologies, aimed at harnessing resources from the Exclusive Economic Zone and continental shelf.

As part of Indo-French research collaborations, two Indian aquanauts - Jatinder Pal Singh and Raju Ramesh - successfully completed one deep dive each in the North Atlantic Ocean in the French submersible "Nautilie" on August 5 and 6.

Happening as it did around a month after Shubhanshu Shukla became the first Indian to reach International Space Station, Union earth sciences minister Jitendra Singh Thursday called it India's quest for a double conquest. "We have an Indian going into space and an Indian going into the deep ocean almost simultaneously," he said.

Ramesh, a scientist at National Institute of Ocean Technology, went 4,025m down on August 5, followed by a dive of 5,002m by Navy commander (retd) Singh on August 6.

"This expedition was conducted as part of Deep Ocean Mission. One of the verticals of DOM aims to develop technology to harness non-living ocean resources and a submersible which can carry humans to the deepest parts of the ocean," said M Ravichandran, secretary, ministry of earth sciences.

He said more dives will be undertaken in the same submersible before India conducts a deep dive in indigenous 'Matsya 6000' submersible, which could happen around Dec 2027, under 'Samudrayaan' project.

Group Captain Shubhanshu Shukla, the second Indian to travel to space and the first to visit ISS, is expected to arrive in India this weekend and is set to meet PM Modi before leaving for hometown Lucknow to meet family, reports Surendra Singh. This was revealed by space minister Jitendra Singh, who said Shukla will return to Delhi for National Space Day celebrations on August 23.

<https://timesofindia.indiatimes.com/india/samudrayaan-in-sight-india-takes-a-5002m-plunge/articleshow/123313148.cms>

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# How an ancient plant trick could feed the future

Source: The Times of India, Dt. 18 Aug 2025

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In the grand theatre of evolution, few stories are as remarkable as how plants first grew in hostile terrestrial environments. This is the tale of a molecular messenger that helped early plants thrive on dry land — a discovery that reveals very old secrets still governing plant life today.

Long before flowering plants covered Earth, ancient green lifeforms like mosses and liverworts had already figured out how to regulate their growth. Now, researchers from IISc have uncovered how a key protein involved in this regulation, called DELLA, is dismantled in these primitive plants.

DELLA acts like a molecular brake, slowing down or suppressing plant cell division. This function has been conserved across land plants, from mosses to rice and wheat. But while flowering plants use the hormone, gibberellic acid (GA), to control DELLA, early land plants evolved a different route. One that does not depend on this hormone.

The study, published in Nature Chemical Biology, sheds light on this alternative pathway in a liverwort species called *Marchantia polymorpha*, a flat, green, leaf-like structure that spreads across moist soil. The findings could pave the way for new methods of increasing crop yields by controlling plant growth more precisely — using insights from evolutionary history.

## OLD ENZYME, NEW ROLE

In flowering plants, DELLA is dismantled when gibberellic acid binds to its receptor, GID1. This trio — GA, GID1, and DELLA — form a complex that gets flagged for breakdown by the cell's garbage disposal system, the "26S proteasome". Once DELLA is removed, the plant is free to grow.

But bryophytes like mosses and liverworts, which first colonised land over 500 million years ago, do not have the GID1 receptor. They do produce gibberellic acid, but lack the machinery to use it in the same way. So how did they control DELLA?

This is the question IISc assistant professor Debabrata Laha and team set out to answer. They zeroed in on

# How An Ancient Plant Trick Could Feed The Future

IISc Study Of A 500-Million-Yr-Old Species Finds A Protein That May Be Key To Food Security During Climate Stress



The liverwort '*Marchantia polymorpha*' has helped scientists study plant biology since the 1700s

Called 'pioneer species', liverworts are often the first to grow back in areas affected by wildfires

## SEVERE WEATHER EVENTS HAVE HAD A SERIOUS IMPACT ON STAPLES & FAVOURITES



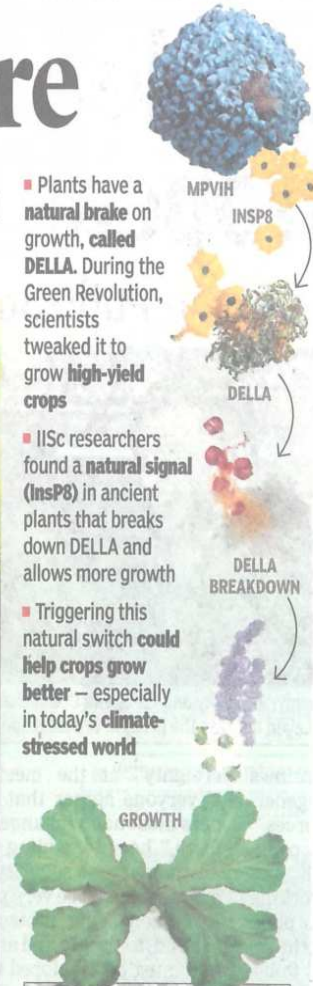
**COFFEE** | In 2024, heavy rains led to a 50% fall in yield of Arabica Coffee in Madikeri, Karnataka



**STRAWBERRY** | Production fell by 40% in 2017, largely due to above-normal winter temperatures



**WHEAT** | In 2022, India was forced to halt wheat exports as extreme summer heat affected farms



Plants have a natural brake on growth, called DELLA. During the Green Revolution, scientists tweaked it to grow high-yield crops

IISc researchers found a natural signal (InsP8) in ancient plants that breaks down DELLA and allows more growth

Triggering this natural switch could help crops grow better — especially in today's climate-stressed world



Debabrata Laha & Priyanshi Rana

an enzyme called MpVIH in *Marchantia polymorpha*. This enzyme makes a molecule called InsP8, a type of inositol pyrophosphate — a group of highly charged molecules — which acts as a chemical messenger within the cell.

The team used gene editing to knock out the gene responsible for MpVIH. The result was striking: the modified plants were severely stunted, with abnormal shapes and missing structures like gemma cups, which normally help the liverwort reproduce. These same defects were also seen in plants

that had too much DELLA.

This pointed to a link: was MpVIH controlling DELLA? By introducing just part of the MpVIH enzyme — the section with kinase activity, which catalyses InsP8 production — researchers were able to rescue the defective plants. This showed that the enzyme's ability to make InsP8 was key.

## DELLA BREAKDOWN

The next question was whether InsP8 directly affected DELLA. Biochemical experiments confirmed InsP8 binds to the DELLA protein,

triggering a process that leads to its breakdown.

Specifically, InsP8 binding caused DELLA to be tagged with ubiquitin molecules (small proteins that play a key role in regulating cellular processes), signalling it for destruction by the proteasome. In other words, InsP8 does the same job in *Marchantia* that gibberellic acid does in flowering plants — but through an entirely different route.

"This was a long-standing question in plant biology. We now know how primitive plants managed growth regu-

lation without the GA-GID1-DELLA system," Laha said.

## IN PLANTS TODAY

Although flowering plants use a different system to control DELLA, the IISc team showed InsP8-binding sites are still present in their DELLA proteins. This suggests the ancient system may not have disappeared entirely. It may be in the background, even available for reactivation.

This is where the research connects to modern agriculture. During the Green Revolution, breeders unknowingly



selected crop varieties with mutations in DELLA, leading to “semi-dwarf plants” that were more productive and stable in fertiliser-rich conditions. At the time, little was known about the exact molecular mechanism involved.

Now, understanding how DELLA is regulated — by both old and new pathways — could offer more refined tools to engineer crops for higher output and resilience.

### IN CROP SCIENCE

Laha said the findings open up possibility of manipulating DELLA not just by targeting gibberellin signalling, but also through insight into the inositol pyrophosphate pathway.

This dual approach may allow for finer control of plant growth in different conditions, without the side effects of fully removing DELLA function, which can impede stress tolerance. “As population grows and farmlands shrink, boosting crop productivity becomes essential. This is one possible avenue to do that,” Laha said.

### EVOLUTIONARY INSIGHT

The IISc study offers a rare glimpse into molecular evolution in land plants. DELLA's growth-suppressing role is ancient, but its regulation has evolved: bryophytes used one method, flowering plants another, yet traces of the older route linger.

Studying *Marchantia polymorpha* is more than just historical curiosity. It reveals how cellular systems evolved and how remnants still function.

First author Priyanshi Rana said: “We were excited to learn whether DELLA stability or activity was augmented in MpVIH-defective plants, and it was. That's when the puzzle started coming together.”

### LOOKING AHEAD

While the work has opened new doors, questions remain. How is MpVIH activity itself regulated? How does the InsP8 pathway interact with other growth signals in the plant? Can crop plants be engineered to harness this ancient mechanism in a controlled way?

The IISc team said answering these questions could help design the next generation of crops — ones that grow well despite climate stress, limited water, or shrinking farmland.

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The Tribune  
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ਪੰਜਾਬ ਕੇਸਰੀ ਜਨਸਤਾ  
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