

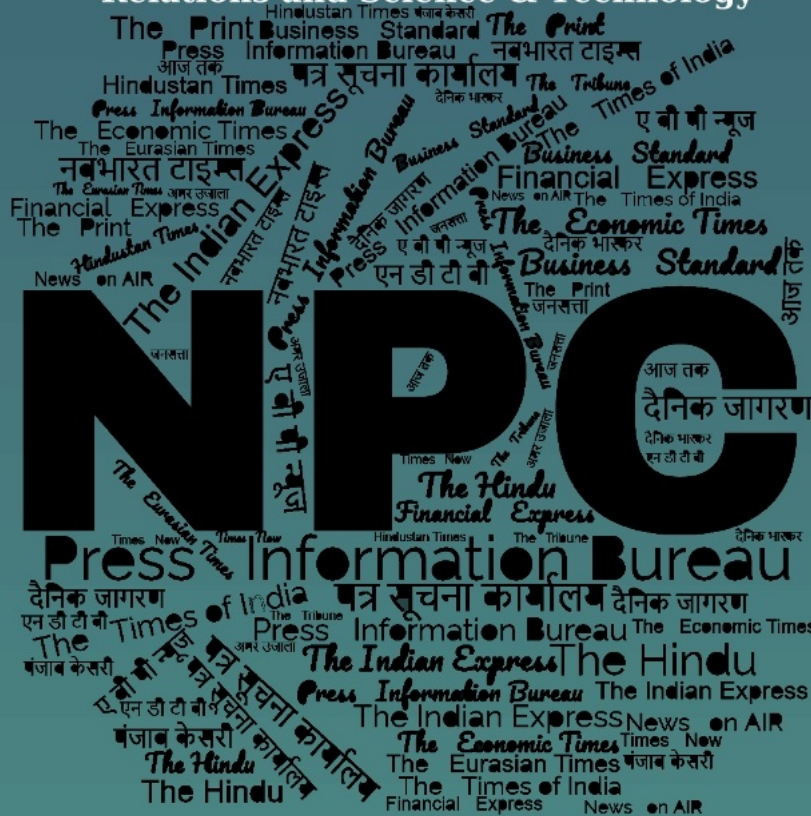
दिसंबर  
Dec  
2024

खंड/Vol. : 49 अंक/Issue : 230  
13/12/2024

# समाचार पत्रों से चयनित अंश Newspapers Clippings

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

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



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

# CONTENTS

S. No.	Title	Source	Page No.
<b>DRDO News</b>			<b>1-4</b>
1	DRDO: इंडियन लाइट टैंक ने हासिल की बड़ी उपलब्धि, 4200 मीटर से अधिक की ऊंचाई पर कई रेंज में लगाया सटीक निशाना	<i>Amar Ujala</i>	1
2	Indian Light Tank achieves major milestone by firing a number of rounds accurately at High Altitude	<i>The Economic Times</i>	2
3	डीआरडीओ के वैज्ञानिक ने छात्रों में भरा उत्साह का उड़ान	<i>Hindustan</i>	3
4	कानपुर में बने पैराशूट इस्तेमाल करेंगे भारतीय फाइटर पायलट, विदेशों पर निर्भरता होगी कम	<i>Aaj Tak</i>	4
<b>Defence News</b>			<b>5-29</b>
<b>Defence Strategic: National/International</b>			
5	9th India-Thailand Defence Dialogue held in New Delhi to explore new initiatives to further strengthen bilateral defence cooperation	<i>Press Information Bureau</i>	5
6	Nepali Army Chief General Ashok Raj Sigdel Conferred Honourary Rank Of General Of Indian Army And Met Hon'ble Raksha Mantri During Day Two Of Official Visit To India	<i>Press Information Bureau</i>	6
7	Nepal's Chief of Army Staff calls on Raksha Mantri in New Delhi; Both sides discuss ways to further bolster bilateral defence cooperation	<i>Press Information Bureau</i>	7
8	CCS clears two big ticket arms deals worth RS 21100 crore	<i>The Times of India</i>	8
9	India, France, UAE strengthen defence ties with Desert Knight air combat exercise	<i>The Economic Times</i>	9
10	World War III predictions coming true? NATO plans big spending hike on missiles, radars, and jets to counter Russian threat	<i>The Economic Times</i>	10
11	German Co, eyeing P75I contract, offers to make submarines in India	<i>The Economic Times</i>	12
12	पाक के ड्रोन को हवा में ही मार गिराएंगे भारत के 'हंटर-किलर', बॉर्डर पर AI तकनीक से होगी निगरानी	<i>The Tribune</i>	13
13	75 years of excellence: High Altitude Warfare School of Indian Army celebrates platinum jubilee	<i>The Week</i>	15
14	China eyes high-quality growth in border areas. Is this a subtle message to India?	<i>The Week</i>	16
15	With Rajnath Singh's Moscow trip, India's 'strategic autonomy' is on overdrive	<i>The Week</i>	17
16	Guam defence breakthrough: How US conducted ballistic missile intercept test to showcase power against	<i>The Week</i>	18

	evolving Pacific threats		
17	India, Estonia firming up ties in cyber, defence: Ambassador Ajaneesh Kumar	WION	19
18	Israeli defence firms seek to expand footprint in India, MRO & innovation centre come up	The Print	21
19	India, Iran, and Armenia hold second trilateral consultations in Delhi	Business Standard	22
20	Hazel Hypersonic Missile: Russia Threatens To Use “Game Changing” Weapon Designed To Demoralize Forces, Demolish Enemies	The EurAsian Times	23
21	China’s Hypersonic Jumbo Aircraft Hits Mach 6 In Test Flight; Can Travel From Beijing To New York In 2 Hours	The EurAsian Times	25
22	India, UK Join Hands To Build Indian Navy’s Amphibious Warships Fleet; Here’s Why LPD’s Are Vital For Delhi	The EurAsian Times	27

### Science & Technology News

30-43

23	Union Minister Dr Jitendra Singh Chairs the 2nd Annual General Meeting of Biotechnology Research and Innovation Council (BRIC) Society	Press Information Bureau	30
24	“IIT Ropar’s AWaDH and Khalsa College of Engineering & Technology, Amritsar Join Forces to Launch 09th Cyber-Physical Systems in Punjab Region: A Leap in Innovation and Technical Education”	Press Information Bureau	31
25	Researchers develop recipe to predict crack emergence in clay, holds promise in improving quality of paints used for coatings	Press Information Bureau	33
26	Scientists develop flexible near-infrared plasmonic devices for wearable sensors and medical imaging tools	Press Information Bureau	36
27	Parliament Question: Support To Universities In Fostering Research Culture	Press Information Bureau	37
28	Parliament Question: National Mission On Interdisciplinary Cyber Physical Systems	Press Information Bureau	38
29	ISRO demonstrates indigenous engine capability ahead of Gaganyaan mission	The Economic Times	39
30	Gaganyaan’s radio equipment to undergo tests at ESA’s German facility	The Indian Express	40
31	IITB Prof’s model to test semiconductor’s reliability makes waves	The Times of India	41
32	Hanle, Ladakh identified as prime location for quantum communication ground station	News Nine	42

## DRDO: इंडियन लाइट टैंक ने हासिल की बड़ी उपलब्धि, 4200 मीटर से अधिक की ऊंचाई पर कई रेंज में लगाया सटीक निशाना

रक्षा मंत्रालय ने गुरुवार को बताया कि भारत के स्वदेशी हल्के टैंक ने 4,200 मीटर से अधिक की ऊंचाई पर लगातार सटीकता के साथ कई रेंजों पर कई राउंड फायर करके एक 'बड़ी उपलब्धि' हासिल की है। 25 टन वजनी बेहद बहुमुखी भारतीय लाइट टैंक (आईएलटी) को चीन के साथ सीमा पर सेना की लड़ाकू क्षमताओं को बढ़ाने के लिए विकसित किया गया है। सितंबर में रेगिस्तानी इलाकों में पहले चरण के परीक्षण के बाद टैंक का नवीनतम परीक्षण किया गया।



### पहाड़ी सीमा क्षेत्रों में तैनात होंगे आईएलटी-भारतीय सेना

रक्षा मंत्रालय ने कहा, 'भारतीय लाइट टैंक ने लगातार सटीक परिणामों के साथ 4200 मीटर से अधिक की ऊंचाई पर कई रेंजों पर कई राउंड फायर करके एक बड़ी उपलब्धि हासिल की है।' भारतीय सेना 350 से अधिक हल्के टैंकों को तैनात करने पर विचार कर रही है, जिनमें से ज्यादातर पहाड़ी सीमा क्षेत्रों में होंगे। हल्के टैंक के विकास का उद्देश्य चीन की तरफ से समान श्रेणियों के टैंकों की तैनाती का मुकाबला करना माना जा रहा है।

### लार्सन एंड टुब्रो ने किया है इंडियन लाइट टैंक निर्माण

इस लाइट टैंक को भारतीय सेना की अनंतिम स्टाफ गुणात्मक आवश्यकताओं के अनुसार रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) की चेन्नई में मौजूद प्रयोगशाला, कॉम्बैट व्हीकल्स रिसर्च एंड डेवलपमेंट

एस्टेब्लिशमेंट की तरफ से परिभाषित, डिजाइन और विकसित किया गया है। इसका निर्माण इंडस्ट्री पार्टनर लार्सन एंड टुब्रो प्रिसिजन इंजीनियरिंग एंड सिस्टम्स की तरफ से किया गया है।

### **रक्षा मंत्री राजनाथ सिंह ने सभी को दी बधाई**

वहीं रक्षा मंत्री राजनाथ सिंह ने हल्के टैंक के उच्च ऊंचाई वाले सफल परीक्षणों के लिए डीआरडीओ (रक्षा अनुसंधान एवं विकास संगठन), भारतीय सेना, भारतीय वायु सेना और एलएंडटी को बधाई दी। मंत्रालय ने एक बयान में कहा, 'भारतीय वायु सेना की तरफ से आईएलटी की एयरलिफ्ट क्षमता का भी प्रदर्शन किया गया। ऐसी क्षमता से सड़क या रेल के माध्यम से पहुंच में आने वाली दुर्गम और कठिन परिचालन स्थितियों में आईएलटी की त्वरित तैनाती में सहायता मिलेगी।'

### **टैंक को लगभग तीन साल पहले किया गया था डिजाइन**

अधिकारियों ने कहा कि टैंक को लगभग तीन साल पहले डिजाइन किया गया था और इसका समग्र विकास चरण बहुत तेजी से आगे बढ़ा है। मंत्रालय ने कहा, 'आंतरिक प्रदर्शन परीक्षणों के इन दो चरणों के साथ, जिन्हें भारतीय सेना और भारतीय वायु सेना की तरफ से सक्रिय रूप से समर्थन दिया गया था, आईएलटी को उपयोगकर्ता परीक्षणों के लिए पेश किए जाने से पहले कुछ और परीक्षणों से गुजरना होगा।' रक्षा अनुसंधान एवं विकास विभाग के सचिव और डीआरडीओ के अध्यक्ष समीर वी. कामत ने उद्योग साझेदार एलएंडटी समेत पूरी लाइट टैंक टीम को उनके प्रयासों के लिए बधाई दी।

<https://www.amarujala.com/india-news/indian-light-tank-ilt-has-achieved-a-major-milestone-by-firing-a-number-of-rounds-drdo-2024-12-12>



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Thu, 12 Dec 2024*

## **Indian Light Tank achieves major milestone by firing a number of rounds accurately at High Altitude**

Indian Light Tank (ILT) has achieved a major milestone by firing a number of rounds at different ranges at an altitude of more than 4200m, at a High Altitude Location with consistently accurate results. This was subsequent to the Phase I trial in desert environment in September 2024. This light tank has been defined, designed and developed by Combat Vehicles Research & Development Establishment, the Chennai-based laboratory of Defence Research and Development Organisation (DRDO) against the Provisional Staff Qualitative Requirements of Indian Army. It is manufactured by the Industry Partner Larsen & Toubro Precision Engineering & Systems.

ILT is being designed as a 25-ton class armoured fighting vehicle to meet the requirements of the Armed Forces for High altitude applications. In an integrated manner, the design to realisation to demonstration at high altitude has been achieved in three years. The airlift capability of ILT was

also demonstrated by the Indian Air Force. Such a capability would assist in quick deployment of ILT in operating conditions which are remote and difficult to access through road or rail. With these two phases of internal performance trials, which were actively supported by the Indian Army and the Indian Air Force, ILT would be undergoing some more trials before being offered for User trials.

Raksha Mantri Shri Rajnath Singh complimented DRDO, Indian Army, the Indian Air Force and L&T on the successful High Altitude Trials of the Light Tank. Secretary Department of Defence R&D and Chairman DRDO Dr Samir V Kamat congratulated the entire Light Tank Team including Industry Partner L&T for their efforts.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2083984>

## हिन्दुस्तान

Thu, 12 Dec 2024

### डीआरडीओ के वैज्ञानिक ने छात्रों में भरा उत्साह का उड़ान

डीआरडीओ के अपर निदेशक डॉ. राजेश कुमार त्रिपाठी ने गुरुवार को सेंट जेवियर्स स्कूल के छात्रों में वैज्ञानिक बनने के लिए उत्साह भरा। उन्होंने सरकारी और गैर-सरकारी नौकरियों के अवसरों पर प्रकाश डालते हुए छात्रों को विषय चयन और करियर प्लानिंग में विवेकपूर्ण निर्णय लेने की सलाह दी।

डॉ. त्रिपाठी ने असफलता को आत्म प्रेरणा का स्रोत मानकर आगे बढ़ने और माता-पिता व शिक्षकों के प्रति आदरभाव बनाए रखने की प्रेरणा दी। पर्यावरण संरक्षण को लेकर उन्होंने छात्रों से वृक्षारोपण का महत्व समझने का आह्वान किया। कनाडा और अमेरिका के लोगों की पर्यावरणीय जागरूकता का उदाहरण देते हुए उन्होंने कहा कि भारत को भी इस दिशा में आगे बढ़ना चाहिए।

जीवन में अनुशासन, सकारात्मक सोच और हर अनुभव से सीखने का महत्व समझाते हुए उन्होंने छात्रों से हर चुनौती को अवसर में बदलने की बात कही। वहीं स्कूल की छात्राओं मुग्धा पांडे, पूजा चतुर्वेदी, सौम्या, और मान्या ने सरस्वती वंदना और स्वागत गीत प्रस्तुत कर माहौल को भावपूर्ण बना दिया। डॉ. त्रिपाठी का प्रेरणादायक संबोधन छात्रों के दिलों तक पहुंचा। सभागार में मौजूद सैकड़ों छात्रों ने तालियों की गड़गड़ाहट से उनका स्वागत किया।

प्रधानाचार्य वीके शुक्ला ने डॉ. त्रिपाठी का आभार व्यक्त करते हुए उनकी युवावस्था और सेंट जेवियर्स से जुड़े पुराने संस्मरण साझा किए। उन्होंने कहा कि इस सत्र ने छात्रों के विचारों को नई दिशा दी है। उनके व्यक्तित्व और उनकी वैज्ञानिक दृष्टि की सराहना करते हुए कहा कि उनका यह प्रयास छात्रों को प्रेरित करने वाला है। कार्यक्रम का संचालन गोपाल जी त्रिपाठी ने किया। इस अवसर पर विद्यालय के सभी शिक्षक एवं छात्र मौजूद रहे।

<https://www.livehindustan.com/uttar-pradesh/deoria/story-drdo-director-inspires-students-at-st-xavier-s-school-for-scientific-careers-201734008670628.html>



Thu, 12 Dec 2024

## कानपुर में बने पैराशूट इस्तेमाल करेंगे भारतीय फाइटर पायलट, विदेशों पर निर्भरता होगी कम

भारतीय वायु सेना के पायलटों के लिए अब अमेरिका या अन्य यूरोपीय देशों से पैराशूट मंगाने की जरूरत नहीं पड़ेगी. कानपुर की ऑर्डनेंस पैराशूट फैक्ट्री (OPF) तेजस विमानों के पायलट के लिए सीट इजेक्शन पैराशूट बना रहा है. अभी भारतीय वायुसेना लड़ाकू विमानों के लिए विदेशों से सीट इजेक्शन पायलट पैराशूट खरीदती थी.

DRDO की इकाई एरियल डिलीवरी रिसर्च एंड डेवलपमेंट एस्टेब्लिशमेंट (ADRDE) के इंजीनियरों ने इस पैराशूट का डिजाइन तैयार किया है. ताकि तेजस विमानों को उड़ाने वाले फाइटर पायलटों को आपात स्थिति में सुरक्षित जमीन पर लौटाया जा सके.

डिजाइन को मंजूरी मिलने के बाद रक्षा मंत्रालय के PSU ग्लाइडर्स इंडिया लिमिटेड की इकाई ओपीएफ कानपुर ने इस पैराशूट को बनाया. ओपीएफ इंजीनियर के अनुसार तेजस मार्क 1 ए फाइटर जेट की अधिकतम गति 2205 km/hr से ज्यादा है. यह 50 हजार फीट की ऊंचाई तक उड़ान भर सकता है.

### फाइटर पायलट पैराशूट के लिए अलग वर्कशॉप

ऐसे में इमरजेंसी में पायलट को सुरक्षित उतारने के लिए सीट इजेक्शन पायलट पैराशूट बनाने की सेना ने मांग की है. इस पर काम शुरू हो गया है. फैक्ट्री के महाप्रबंधक एमसी बालासुब्रमण्यम और वर्क मैनेजर रूपेश कुमार ने इस पैराशूट को बनाने के लिए अलग से वर्कशॉप शुरू कर दिया है. इसमें 65 महिलाएं काम कर रही हैं.

### कीमत में आधी, ताकत में अंतरराष्ट्रीय स्तर की

इस पैराशूट का कुल वजन 8 किलोग्राम होगा. लंबाई लगभग 12 मीटर. इस फैक्ट्री में निर्माण होने वाले पैराशूट की लागत विदेशों से आने वाले पैराशूट से लगभग आधी कम है. लेकिन ताकत अंतरराष्ट्रीय स्तर की होगी. इसकी कीमत करीब 8 लाख रुपए तक होगी. कानपुर में पैराशूट बनने से आत्मनिर्भर भारत का सपना भी पूरा होगा.

### दो तरह के पैराशूट बना रही है कानपुर की फैक्ट्री

यहां पी7, जगुआर, मिराज, सुखोई, तेजस, मिग जैसे विमानों के पैराशूट बनाए जा रहे हैं. लड़ाकू विमानों में दो तरह की पैराशूट का इस्तेमाल होता है. एक पायलट पैराशूट और दूसरा ब्रेक पैराशूट. यहां लगभग सभी विमानों के दोनों ही तरह के पैराशूट बनाए जा रहे हैं.

<https://www.aajtak.in/defence-news/story/indian-air-force-pilot-will-use-kanpur-made-parachute-rptc-2119587-2024-12-12>



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Thu, 12 Dec 2024*

### **9th India-Thailand Defence Dialogue held in New Delhi to explore new initiatives to further strengthen bilateral defence cooperation**

The 9th India-Thailand Defence Dialogue took place in New Delhi on December 12, 2024. The meeting was co-chaired by Joint Secretary (International Cooperation) Shri Amitabh Prasad and Thailand's Deputy Permanent Secretary for Defence Gen Tharapong Malakam.

Both sides agreed for early establishment of Joint Working Group to effectively steer and monitor the cooperation in the areas of defence industry. Both sides also agreed to conduct Subject Matter Experts Exchange between Indian and the Thai Armed Forces to carry forward and institutionalise regular engagement in niche domains.

The Indian co-chair highlighted the potential of domestic defence industry with capacity and capability to cooperate with the Royal Thai Armed Forces in its defence acquisition plans. Thailand appreciated the capability of Indian defence industry ecosystem and proposed exploring possibilities for co-design, co-production and co-development in the field of defence industry.

The dialogue is a significant milestone in intensifying defence relations with Thailand. Thailand is a maritime neighbour and a valued partner in India's 'Act East' Policy and the Indo-Pacific region. Thailand's 'Act West' Policy complements India's 'Act East' Policy providing basis for substantive elevation of bilateral relations.

Earlier in the day, the Deputy Permanent Secretary laid a wreath and paid homage to the fallen heroes at National War Memorial, New Delhi. The Thailand delegation also visited National Museum and paid respects to the Holy relics of Lord Buddha placed at Museum.

As part of the visit, the Thailand delegation will visit DRDO headquarters and discuss ways to enhance defence industrial capabilities by cooperation in defence research and joint production.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2083914>



*Thu, 12 Dec 2024*

## **Nepali Army Chief General Ashok Raj Sigdel Conferred Honourary Rank Of General Of Indian Army And Met Hon'ble Raksha Mantri During Day Two Of Official Visit To India**

Suprabal Janasewashree General Ashok Raj Sigdel, Chief of the Army Staff (COAS) of the Nepali Army, continued his official visit to India today, marking a historic and symbolic moment in Nepal-India defence relations. On the second day of his visit, General Sigdel was conferred with the Honourary Rank of General of the Indian Army, a unique and cherished tradition between the two armies that further strengthens the military ties. General Sigdel also called on Shri Rajnath Singh, Hon'ble Raksha Mantri before departing for Pune.

### **Investiture Ceremony at Rashtrapati Bhawan**

The highlight of the day was the prestigious Investiture Ceremony held at Rashtrapati Bhawan, where General Sigdel was formally conferred with the Honourary Generalship of the Indian Army by Smt Draupadi Murmu, Hon'ble President of India. This special honour reflects the longstanding and exceptional bond between the Nepali and Indian Armies, a tradition that dates back over 70 years and symbolises the close military cooperation between the two nations.

As part of the ceremony, General Sigdel was formally bestowed with a new appellation as the Honourary General of the Indian Army, with a change in his rank plate, a gesture that underscores the deep mutual respect and the strengthening of defence relations. This prestigious recognition is a testament to the leadership and significant contributions of General Sigdel in fostering greater defence cooperation between Nepal and India.

### **High Tea with Dignitaries at Rashtrapati Bhawan**

Following the ceremony, General Sigdel interacted with a number of dignitaries and senior officials during a High Tea at Rashtrapati Bhawan. This gathering provided a platform for further discussions on matters of mutual interest, enhancing bilateral ties, and exploring avenues for greater collaboration between the two armed forces.

### **Call-on with Hon'ble Raksha Mantri**

General Sigdel called-on Shri Rajnath Singh, Hon'ble Raksha Mantri. The meeting served as a significant opportunity to reinforce the longstanding and strategic defence ties between the two nations. The discussions were centred around issues of common interest.

### **Reciprocal Lunch at the Nepal Embassy**

In the afternoon, General Sigdel hosted a Reciprocal Lunch at the Embassy of Nepal in New Delhi. This lunch served as an opportunity for informal discussions between senior officials, diplomats, and other prominent figures. The event was an important moment for reinforcing the warm bilateral relationship between Nepal and India, reflecting both nations' commitment to peace, stability, and strategic cooperation.

### **Symbolic Gesture and Future Collaboration**

As part of his visit, General Sigdel also planted a sapling at Manekshaw Centre, located opposite upcoming Thal Sena Bhawan in New Delhi. This gesture symbolises the deep rooted and enduring relationship between the Nepali and Indian armies, serving as a mark of commitment by both partners.

In the evening, General Sigdel departed for Pune, where he will continue his visit with further engagements. Day two of General Ashok Raj Sigdel's visit to India was marked by significant milestones that reflect the close and enduring friendship between the Nepali and Indian Armies.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2083792>



**Press Information Bureau  
Government of India**

**Ministry of Defence**

*Thu, 12 Dec 2024*

## **Nepal's Chief of Army Staff calls on Raksha Mantri in New Delhi; Both sides discuss ways to further bolster bilateral defence cooperation**

**Shri Rajnath Singh reiterates India's intent to strengthen relations with its neighbors in line with 'Neighborhood First Policy'**

Chief of Army Staff of Nepal Gen Ashok Raj Sigdel called on Raksha Mantri Shri Rajnath Singh in New Delhi on December 12, 2024, and held discussions on a number of issues pertaining to the bilateral relations. Raksha Mantri highlighted the various facets of defence cooperation including training, regular exercises, workshops & seminars to enhance the capability of Nepal Army as well as supply of defence equipment and stores.

Shri Rajnath Singh also expressed deep satisfaction regarding the present status of extremely robust bilateral ties between the two countries. He also conveyed that, as close neighbors, India and Nepal share similar perspectives on many issues of mutual concern. He reiterated India's intent to strengthen relations with its neighbors, in tune with the 'Neighborhood First Policy'.

Raksha Mantri congratulated the Chief of Army Staff of Nepal for the conferment of Honorary rank of General of the Indian Army. Gen Ashok Raj Sigdel is on a four-day visit to India.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2083785>

## THE TIMES OF INDIA

*Thu, 12 Dec 2024*

### **CCS clears two big ticket arms deals worth RS 21100 crore**

In a move that will add some much-needed firepower to the armed forces, two major defence deals for 100 more K-9 Vajra artillery guns and 12 Sukhoi-30MKI fighter jets, collectively worth Rs 21,100 crore, have been cleared by the cabinet committee on security.

The CCS on Thursday gave the final nod for the Rs 7,600 crore contract for 100 K-9 Vajra self-propelled tracked gun systems to add to the 100 such 155mm guns already inducted through the joint venture between L&T and South Korean Hanwha Defence, top sources told TOI.

The Rs 13,500 crore deal for the 12 Sukhois, which will be manufactured by Hindustan Aeronautics (HAL) under licence from Russia, along with associated equipment and spares, in turn, was given the green signal by the CCS last week.

“The deal for the 12 Sukhois was inked by the defence ministry (MoD) with HAL on Thursday. While the Sukhois will be manufactured by the Nashik division of the HAL and have an indigenous content (IC) of 62.6%, the additional K-9 guns will have around 60% IC,” an official said.

The Army has deployed some of the first 100 K-9 Vajra guns, which were originally procured for deserts at a cost of Rs 4,366 crore, in eastern Ladakh after equipping them with “winterised kits” for the high-altitude area amid the military confrontation with China.

“With a strike range of 28-38 km, the 100 new guns will come with the winterised kits to ensure their batteries, oil, lubricants and other systems do not freeze in sub-zero temperatures. The ongoing Russia-Ukraine war has reinforced the need for long-range, high-volume firepower,” another source said.

The additional 12 Sukhois, in turn, will replace the ones that have crashed over the years. The IAF currently has 259 twin-engine Sukhois, the bulk of them produced by HAL under licence from Russia for over \$12 billion, which constitute around 50% of its combat fleet.

Amid the continuing delay in induction of the indigenous single-engine Tejas Mark-1A fighters, the IAF is grappling with just 30 squadrons when at least 42 are needed to tackle the twin threat from China and Pakistan.

Though the 36 omni-role Rafale fighters, inducted under the Rs 59,000 crore deal with France in Sept 2016, have added some punch to IAF’s combat capabilities, the major depletion in fighter squadrons is a big concern for the defence establishment.

Towards this end, the defence ministry in Sept had also inked the over Rs 26,000 crore contract with HAL for the procurement of 240 AL-31FP aeroengines to sustain the operational capabilities of Sukhois. The aeroengines will be manufactured by the Koraput Division of HAL, with the defence PSU sourcing some components from Russia.

There is also the major indigenous upgrade plan to make 84 Sukhois much more lethal with advanced radars, avionics, longer-range weapons and multi-sensor fusion to ensure they are capable of air combat for another 30 years.

This Rs 63,000 crore project, which will ensure the new 'Super Sukhoi' are close to fifth-generation fighters in terms of stealth and capabilities, will also soon head for the final clearance by the CCS, as was earlier reported by TOI.

At present, 40 Sukhoi fighters have also been modified to carry the air-to-ground precision-strike BrahMos supersonic cruise missiles, whose range has been extended from 290 to 450-km, to constitute a decidedly deadly weapons package.

<https://timesofindia.indiatimes.com/india/ccs-clears-two-big-ticket-arms-deals-worth-rs-21100-crore/articleshow/116269771.cms>

# THE ECONOMIC TIMES

*Thu, 12 Dec 2024*

## **India, France, UAE strengthen defence ties with Desert Knight air combat exercise**

India, France, and the UAE began a major air combat exercise, "Desert Knight," on Wednesday over the Arabian Sea. The operation aims to enhance trilateral defence cooperation and foster better interoperability among their air forces during complex combat scenarios, as reported by TOI.

The Indian Air Force (IAF) participated with aircraft such as Sukhoi-30MKIs and Jaguars, along with IL-78 mid-air refuellers and AEW&C (airborne early-warning and control) systems, operating from Jamnagar on India's west coast. French Rafale jets and UAE's F-16 fighters were deployed from the Al Dhafra airbase in the UAE.

### **Key Details of the Operation**

The exercise, described as a "large force engagement," featured intensive combat manoeuvres approximately 350-400 km southwest of Karachi over the Arabian Sea. As told to TOI, a source close to the exercise shared, "The Desert Knight exercise will continue for three days. It is the second such trilateral endeavour this year to build synergy among the three air forces as well as improve combat skills, with multiple aircraft types operating in a realistic scenario."

### **Strengthening Defence Amid Geopolitical Tensions**

This trilateral exercise comes as part of broader efforts to strengthen defence ties in strategically crucial regions, including the Indo-Pacific and the Persian Gulf. It also highlights the increasing focus on interoperability among like-minded nations amidst concerns over China's assertive posturing and expanding influence in these areas.

The “Desert Knight” exercise builds on the trilateral framework established in 2022 by the foreign ministers of India, France, and the UAE. This partnership includes collaboration in defence, technology, energy, and environment, among other areas, as outlined in an ambitious roadmap.

In a related development last year, the navies of the three countries conducted their first-ever trilateral maritime partnership exercise. The operation, conducted on the high seas, focused on addressing both traditional and non-traditional security threats.

### **Established Bilateral Partnerships**

India and France have maintained a robust strategic partnership for decades. This cooperation extends to maritime security, counterterrorism, and defence-industrial collaboration. The two nations regularly engage in joint exercises, such as Shakti (army), Varuna (navy), and Garuda (air force), to bolster operational preparedness.

India’s defence partnership with the UAE has also grown significantly. Regular professional exchanges, training programmes, and combat exercises underscore the depth of this relationship. The IAF frequently participates in the multi-nation “Desert Flag” exercise at the Al Dhafra airbase, reflecting India’s broader engagement with the Persian Gulf region.

Exercises like “Desert Knight” serve as a testament to India’s efforts to deepen defence ties with key allies while adapting to evolving global security dynamics. They underscore the importance of collaborative frameworks in building resilience against emerging challenges and ensuring security in critical regions.

<https://economictimes.indiatimes.com/news/defence/india-france-uae-strengthen-defence-ties-with-desert-knight-air-combat-exercise/articleshow/116245509.cms>

## **THE ECONOMIC TIMES**

*Thu, 12 Dec 2024*

### **World War III predictions coming true? NATO plans big spending hike on missiles, radars, and jets to counter Russian threat**

NATO is considering a significant increase in its defence spending target, aiming to address critical capability gaps amid heightened security concerns from Russia and pressures for greater European military self-reliance. As told to Bloomberg, officials familiar with the discussions, the alliance is planning to raise the benchmark from the current 2% of GDP to as much as 3% by 2030. The

proposed targets include bolstering air defences, offensive weaponry, and nuclear deterrence capabilities.

### **Gradual Increase in Defence Goals**

The plan suggests an interim spending goal of 2.5% GDP before achieving the 3% target by the end of the decade. NATO Secretary General Mark Rutte, speaking on the need for enhanced capabilities, remarked, “I have a number in my mind, but I’m not going to mention it now. But clearly, when you look at the capability targets, [when] you look at the gaps still there ... It is clear that, with 2%, you cannot get there.”

The alliance’s foreign and defence ministers are expected to address these targets in their February meeting, with a final agreement anticipated at the 2024 leaders’ summit in The Hague. However, officials acknowledge that meeting this timeline may be challenging.

### **Push from the US and European Responsibilities**

The proposal aligns with calls from the United States for NATO members to assume a greater share of defence responsibilities. Former President Donald Trump previously pressured European allies to increase their contributions, warning that the US could withdraw from the alliance if spending levels did not rise.

“There are capability gaps we need to fill to be able to defend Europe from Russia without the US,” said Armida van Rij, a senior research fellow at Chatham House, emphasising the importance of European defence independence, as told to Bloomberg. This sentiment is echoed by Rutte, who has stressed the need to strengthen Europe’s military industrial base, calling reliance on US resources unsustainable.

### **Disparities Among NATO Members**

Defence spending varies widely across NATO’s 32 members. While countries like Poland are leading with a record 4.7% of GDP allocated to defence, others, including Italy and Spain, fall significantly short of the current 2% benchmark. Italy, which spends 1.49% of its GDP on defence, is already under scrutiny for budgetary overspending under the EU’s Excessive Deficit Procedure.

Prime Minister Giorgia Meloni’s government has committed to reaching 2% by 2028 but acknowledges the challenges of going beyond that. Italian Defence Minister Guido Crosetto said, “I don’t know in what timeframe, but certainly Trump will accelerate this push ... It will not even be 2%. It will be 2.5% if not 3%.”

Similarly, Spain, contributing only 1.28% of GDP to defence, has sought to shift focus toward other benchmarks, such as its commitment to allocate 20% of defence spending to research and development. Prime Minister Pedro Sánchez highlighted this aspect, noting Spain’s substantial troop contributions to NATO missions.

### **Urgent Modernisation Needs**

European leaders and analysts agree that current spending levels are insufficient to meet NATO’s evolving defence needs, particularly given the ongoing war in Ukraine. German Defence Minister Boris Pistorius warned, “Russia would be in a position to attack a NATO country by 2029.”

Germany has recently met the 2% target for the first time and supports increased spending to prepare for future threats. The UK, which spends 2.3% of GDP on defence, plans to increase this to 2.5%. However, defence officials admit that even this level may fall short of enabling the UK to meet NATO's updated requirements. "The UK can't meet its current NATO 'ask' at 2.5% of GDP," a senior British military official told the Financial Times.

### **Broader Financial and Political Challenges**

While increasing defence spending is seen as a necessary step to address security threats, it poses significant challenges for European economies already strained by fiscal pressures. Rutte acknowledged these difficulties, stating, "Politics is making choices in scarcity, and there's always a lack of money and always too many priorities ... Keeping a country safe should be a critical priority for leaders." Additionally, the EU is exploring innovative financial mechanisms to support defence investments. Andrius Kubilius, the EU's new defence commissioner, proposed a joint borrowing mechanism secured against European NATO members' spending commitments. This initiative is part of a broader plan to secure €500 billion for defence over the next decade.

### **Strategic Implications for NATO**

The proposed increase in spending targets aims to address both immediate security concerns and long-term strategic challenges. NATO's non-US members have collectively raised defence spending by approximately \$100 billion over the past two years, largely in response to Russia's invasion of Ukraine. "With all the tasks facing us, in terms of the defence of Ukraine and NATO's minimum capability requirements, this discussion is going to come, whatever happens," a German official said in a Financial Times report, highlighting the urgency of the issue.

The upcoming summit in The Hague will serve as a critical platform for finalising these commitments. If successful, the new targets could mark a pivotal shift in NATO's approach to collective defence, strengthening its ability to respond to future threats while fostering greater financial and operational independence within Europe.

<https://economictimes.indiatimes.com/news/defence/world-war-iii-predictions-coming-true-nato-plans-big-hike-on-missiles-radars-and-jets-to-counter-russian-threat/articleshow/116246955.cms>

# THE ECONOMIC TIMES

*Thu, 12 Dec 2024*

## **German Co, eyeing P75I contract, offers to make submarines in India**

Recent conflicts have unlocked a significant demand for naval assets and there is an opportunity to create a global submarine and warship building hub in India that can churn out platforms at lower costs for exports, Germany's leading maritime company has said.

Thyssenkrupp Marine Systems (TKMS), which is bidding for a major contract to manufacture six new diesel electric submarines in India for a Navy order, said it is looking to expand its footprint and has pitched for the creation of a joint warship building hub, estimating that it can be up to 50% cheaper to make submarines and warships here.

"Together with MDL (Mazagaon Dockyards Limited, which is the partner for the submarine contract), there could be a hub for technology, which will generate more orders. This is really an opportunity to go beyond the P75I (the submarine contract), which will generate, of course, more jobs," TKMS CEO Oliver Burkhard said.

TKMS-MDL is in a fierce contest with L&T-Navantia (Spanish company) to supply new conventional submarines to the Navy. The next step towards finalising a winner - the completion of a technical oversight committee report - is expected to take place before the end of January.

TKMS is placing itself as a reliable partner for India to develop future technologies, saying it has the full support of the German government as well. "We want to foster the partnership over this project, (which) will be the entry from a strategic perspective to the (larger) attainable market. It can double and triple within 10 years," he said.

Burkhard said Europe is facing a capacity crisis as the demand for military systems has skyrocketed after the Russia-Ukraine conflict. He identified potential joint export markets in southeast Asia as well as South America.

He added as production costs in Germany are high due to high engineering wages, there could be a significant cost advantage to Make in India for domestic as well as export orders. He said the Germany offer for a larger warship building hub has already been conveyed to India through multiple channels.

<https://economictimes.indiatimes.com/news/defence/german-co-eyeing-p75i-contract-offers-to-make-submarines-in-india/articleshow/116263301.cms>



*Thu, 12 Dec 2024*

## पाक के ड्रोन को हवा में ही मार गिराएंगे भारत के 'हंटर-किलर', बॉर्डर पर AI तकनीक से होगी निगरानी

सीमा पार से दुश्मन के ड्रोन हमलों से निपटने के लिए सेना अपनी स्वदेशी तकनीक के साथ तैयार है। दुश्मन ने ड्रोन से हमले की नापाक साजिश रची तो सेना की टाइगर डिवीजन की हंटर-किलर ड्रोन की जोड़ी मिलकर उसे हवा में ही मार गिराएगी।

जम्मू में अंतरराष्ट्रीय सीमा की सुरक्षा की जिम्मेदारी संभालने वाली सेना की टाइगर डिवीजन ने इस उन्नत रक्षा प्रणाली टाइगर वायु रक्षक अटैक सिस्टम (टिवरा) का डिजाइन तैयार किया है। यह एक किलोग्राम विस्फोटक ले जा सकेगा।

इस उन्नत ड्रोन प्रणाली में एक टोही ड्रोन लक्ष्य का पता लगाने के लिए टोही मिशन पर उड़ता है और खतरे को भांपते ही लक्ष्य की जानकारी दूसरे किलर ड्रोन को भेजता है और यह तुरंत उसे इसे निशाना बनाने के लिए हरकत में आ जाता है।

### **आतंकी हमलों के निपटारे में मिलेगी मदद**

सेना का यह नवाचार भविष्य में युद्ध या आतंकी हमलों की स्थिति में काफी कारगर साबित हो सकता है। सेना अब इसके उत्पादन के लिए विभिन्न एजेंसियों से संपर्क साध रही है। सूत्रों के अनुसार इस वायु रक्षा प्रणाली का परीक्षण भी सफल रहा है।

वर्ष 2021 में जम्मू में टाइगर डिवीजन मुख्यालय के पास जम्मू एयरफोर्स स्टेशन पर दो ड्रोन से हमला किया गया था। इस हमले में दो वायुसैनिक घायल हुए थे। उसके बाद से सेना ने एंटी ड्रोन प्रणाली पर तेजी से काम शुरू किया है।

ऐसे हमलों को ध्यान में रखकर तैयार किया गया टिवरा भविष्य की ड्रोन चुनौतियों का सामना करने में अहम भूमिका निभाएगी। सैन्य सूत्रों के अनुसार टाइगर वायु रक्षक अटैक सिस्टम का परीक्षण सफल रहा है।

रूस-युक्रेन युद्ध हो या इस्राइल-फलस्तीन संघर्ष ड्रोन हमले काफी कारगर साबित हो रहे हैं। इसके साथ ही एंटी ड्रोन प्रणाली की आवश्यकता महसूस की जा रही है। यही वजह है कि सर्व प्रथम पश्चिमी सीमा पर तैनात किया जा सकता है।

### **ड्रोन हमले के लिए तैयार**

भविष्य में इस अटैक सिस्टम का इस्तेमाल दुश्मन द्वारा ड्रोन के स्वार्म ( झुंड) अटैक का सामना करने के लिए भी हो सकता है। ऐसे में नए वर्ष में भारतीय सेना इसे अपने बेड़े में शामिल करने की दिशा में कार्रवाई कर सकती है।

स्वार्म अटैक (SWARM Attack) में ड्रोन का एक झुंड एक साथ हमला करता है। विश्व के कई हिस्सों में ड्रोन के समूह का इस्तेमाल स्वार्म अटैक के लिए किया जा चुका है। ऐसे में टिवरा युद्ध के मैदान में मानवरहित हवाई प्रणालियों के भविष्य को नए सिरे से परिभाषित करने की दिशा में पहल है।

### **सेना के अधिकारी ने किया डिजाइन**

टाइगर वायु रक्षक अटैक सिस्टम को सेना की रायजिंग स्टार कोर की टाइगर डिवीजन के अधिकारी मेजर अनमोल टंडन ने तैयार किया है। दिल्ली में नवाचार योद्धा कार्यक्रम के दौरान अपनी प्रदर्शित टाइगर वायु रक्षक अटैक प्रणाली में सेना ने बड़ी दिलचस्पी दिखाई है।

इस समय इस प्रणाली को सेना की जरूरतों के अनुसार बड़ी संख्या में तैयार करने के विकल्पों पर विचार हो रहा है। इस अटैक सिस्टम के सेना में शामिल होने पर जम्मू कश्मीर, लद्दाख जैसे सीमांत प्रदेशों में इसका इस्तेमाल सीमा पार से दुश्मन द्वारा पैदा की जाने वाली चुनौतियों का सामना करने के लिए होगा।

टाइगर वायु रक्षक अटैक सिस्टम (टिवरा) एक अत्याधुनिक मानव-मानव रहित टीम तकनीक पर आधारित है। इसे आधुनिक युद्धक्षेत्र में दक्षता के लिए डिजाइन किया गया है। इस तकनीक में हंटर व किलर ड्रोन मिलकर दुश्मन के ड्रोन का पता लगाने के साथ उसे मार गिराने के लिए त्वरित प्रहार करते हैं।

इस तकनीक में हंटर ड्रोन हवा में दुश्मन के ड्रोन को तलाश ऑपरेटर को लाइव फुटेज स्ट्रीम करता है। हंटर ड्रोन द्वारा संभावित लक्ष्य की पहचान कर लेने के बाद ऑपरेटर तय लक्ष्य पर हमला करने के लिए किलर ड्रोन को भेजता है।

किलर ड्रोन अपने लक्ष्य को लाक कर उस पर मारक प्रहार करने के लिए हरकत में आ जाता है। किलर ड्रोन एक किलो बिस्फोटक के साथ दुश्मन के ड्रोन से टकराकर उसे तबाह कर देता है।

## एआइ आधारित होगी प्रणाली

यह प्रणाली आर्टिफिशियल इंटेलीजेंस (एआइ) से लैस होगी और ऐसे में स्वयं आसपान में इसे दुश्मन के हमले से पहले भी सक्रिय किया जा सकता है और खतरा देख तुरंत किलर को सक्रिय कर देगा।

यह स्वयं लक्ष्य तलाशने, वास्तविक समय पर त्वरित निर्णय लेने में भी सहयोग करेगा और अपने स्तर पर भी दुश्मन पर हमला करने में सक्षम है।

सैन्य सूत्रों के अनुसार थलसेना अध्यक्ष जनरल उपेन्द्र द्विवेदी भविष्य की जरूरतों को ध्यान में रखकर तैयार की गई इस अटैक सिस्टम से प्रभावित हुए हैं।

उन्होंने नवाचार योद्धा कार्यक्रम के दौरान इस तैयार करने वाले मेजर अनमोल टंडन से सिस्टम के बारे में सारी जानकारी हासिल करने के साथ भविष्य की युद्ध चुनौतियों का सामना करने के लिए इस अहम नवाचार की सराहना की है।

<https://www.jagran.com/jammu-and-kashmir/srinagar-indian-armys-tivra-drone-a-game-changer-in-counterung-drone-threats-border-will-be-monitored-with-ai-technology-23847370.html>

**THEWEEK**

*Thu, 12 Dec 2024*

## **75 years of excellence: High Altitude Warfare School of Indian Army celebrates platinum jubilee**

The High Altitude Warfare School (HAWS) of the Indian Army, on Wednesday, marked 75 years of exemplary service in training and operational excellence in mountains, snow-bound areas, and glaciated regions of the country.

Established in 1948 as the Army Ski Training School, HAWS has evolved into a premier training institute renowned for imparting specialised combat skills to the Indian Army, paramilitary forces, special missions, and members from friendly foreign countries, a statement from a Srinagar-based defence spokesman said.

Speaking about the platinum jubilee of the establishment, the spokesperson said, "The grand celebrations commemorated the school's rich legacy of contributions to national defence, adventure sports, and mountaineering. It was a moment to reflect on HAWS' sterling accomplishments, including its pivotal role in historic military operations such as Operation Meghdoot (1984) and Operation Vijay (1999)."

On the occasion, homage was paid to the indomitable spirit of the 'mountain warriors' whose courage and skill have upheld HAWS' ethos and safeguarded national interests, the spokesman said.

"A repository of gallantry awards, commendation plaques, and medals-cum-podium finishes in adventure climbing and winter sports, HAWS holds a cherished place in military history and civilian arena. Often referred to as 'White Devils', the institution embodies excellence,

perseverance, and innovation in the face of extreme challenges and hardships." the spokesman said.

The platinum jubilee of HAWS served as an occasion to honour its heroes, recognise its legacy, and renew the commitment to excellence in military training, he added. "With its unparalleled expertise and operational significance, HAWS continues to be a cornerstone of India's defence preparedness, strengthening its reputation as a global leader in high-altitude warfare training."

<https://www.theweek.in/news/defence/2024/12/12/75-years-of-excellence-high-altitude-warfare-school-of-indian-army-celebrates-platinum-jubilee.html>



*Thu, 12 Dec 2024*

## **China eyes high-quality growth in border areas. Is this a subtle message to India?**

No border area shall be left behind in advancing Chinese modernisation, said Chinese President Xi Jinping even as he stressed the importance of boosting governance and high-quality development in the border areas of the country.

While presiding over a group study session of the Political Bureau of the Communist Party of China (CPC) Central Committee recently, Xi noted that modernising the system and capacity for governance in the border areas is a major part of Chinese modernisation.

While there was no particular mention of borders that China shares with India, his comments come days after India's External Affairs Minister S. Jaishankar said in the Lok Sabha that work is progressing on some strategically important roads in Ladakh and added that the adoption of new technologies in high-altitude, remote, inaccessible and permafrost areas has also been significant.

According to news agency Xinhua, Xi emphasised China's commitment to supporting border areas in leveraging their unique advantages to achieve high-quality development.

Further, urged border areas to increase the momentum and vitality of development through reform and opening up. It is essential to prioritize national security and social stability as the bottom-line requirement for governance in border areas, he observed.

He also called for deepening research into major theoretical and practical issues related to governance in border areas.

<https://www.theweek.in/news/defence/2024/12/12/china-eyes-high-quality-growth-in-border-areas-is-this-a-subtle-message-to-india.html>

## **With Rajnath Singh's Moscow trip, India's 'strategic autonomy' is on overdrive**

India's central diplomatic tenet of 'strategic autonomy' or 'single-mindedly pursuing its national interests without belonging to any power block', is helping it take a position that is one of friendliness while reaping the benefits of being so with both Russia and the US.

It is also a play of words. With the US, India shares a 'Comprehensive Global Strategic Partnership', while it is a 'Special and Privileged Strategic Partnership' with Russia.

The Indian practice of 'strategic autonomy' has its roots in the Nehruvian concept of non-alignment as a result of which it developed warm ties with both the US and Russia, leaders of a bipartisan world order since the end of the Second Great War and during the Cold War that followed.

The recent Russia visit of Defence Minister Rajnath Singh for the 21st meeting of the India-Russia Inter-Governmental Commission on the Military-to-Military Technical Cooperation (IRIGC-M&MTC) and the narrative that followed is an exercise of that position.

A Russian defence ministry release on Wednesday quoted Singh as saying: "Despite geopolitical challenges and great pressure on India both in public and in private, India has made a conscious decision that the country will not only continue close contacts with Russia but will also deepen and expand our interaction. We will always be with our Russian colleagues."

The minister's statement is indicative of the 'great pressure' the US-led West mounted on India to restrict and curtail bilateral ties with Russia. And that India had stood its ground.

Among other things, India is dependent on Russia for military supplies and an overwhelming 65 per cent of Indian military equipment is of Russian origin, including submarines, tanks and military aircraft. The second important component of the bilateral ties is oil which India has imported from Russia in substantial quantities and on favorable terms of trade, especially after the imposition of economic sanctions on Russia and the breakout of the Ukraine conflict.

In 2021, India had just 2 per cent of its crude oil imports from Russia. But in June 2024, it rose to 42 per cent of India's total crude oil imports.

Just five months ago, Prime Minister Narendra Modi had waxed eloquent on India-Russia ties after a meeting with Russian President Vladimir Putin in Moscow. Modi had said, "The temperature sometimes falls below zero in Russia but the temperature is always above zero in Indian-Russian relations... Russia remains India's trusted friend in any weather."

On the other hand, India's ties with the US have been that of incredible warmth and cordiality.

In August, Singh had signed the Security of Supplies Arrangement (SOSA) pact with the US which encourages the defence industrial ecosystems of both countries to work together, and enhances the supply chain resilience.

SOSA is just one of the several military foundational agreements that India and the US have inked that seek to integrate military services, assets and technologies. The other pacts are the Logistics Exchange Memorandum of Agreement (LEMOA), signed in 2016, the Communications Compatibility and Security Agreement (COMCASA) of 2018 and the BECA (Basic Exchange and Cooperation Agreement) of 2020.

India is also keenly awaiting the supply of aero-engines for Indian military fighter aircraft and Predator drones from the US.

While India continues to partner the US and Russia on several important multilateral forums, a fair balancing of ties with both the powers is an underlining of the fact that Indian diplomacy has indeed matured.

<https://www.theweek.in/news/defence/2024/12/12/with-rajnath-singhs-moscow-trip-indias-strategic-autonomy-is-on-overdrive.html>



*Thu, 12 Dec 2024*

## **Guam defence breakthrough: How US conducted ballistic missile intercept test to showcase power against evolving Pacific threats**

In what is being hailed as a “critical milestone in the defence of Guam” the Missile Defense Agency of the US conducted a live intercept of a ballistic missile target from Guam, the US island territory in Micronesia, in the Western Pacific.

According to the US Department of Defence, the test, designated as Flight Experiment Mission-02, marked a significant step taken in the defense of Guam and provided critical support to the overall concept for the future Guam defense systems as it showcased the readiness of the US to defend against evolving adversary threats.

Deputy Pentagon Press Secretary Sabrina Singh said MDA's Guam test represented the first ballistic missile defense test executed from that US territory. During the test, the Aegis Guam System intercepted an air-launched medium-range ballistic missile targeted off the coast of Guam.

“The test entailed the Aegis Guam System integrating with a specialised radar and vertical launching system. That integrated system fired a Standard Missile-3 Block IIA, which intercepted an air-launched medium-range ballistic missile target off the coast of Guam's Andersen Air Force Base,” a statement from the Department of Defence said.

The test supported the overall concept, requirements validation, data-gathering and model maturation for the future Guam Defense System.

The intercept, conducted with the support of Indo-Pacific Command and other Defense Department partners, was a "tremendous group effort", said MDA Director, Air Force Lt. Gen. Heath Collins.

Joint Task Force-Micronesia Navy Rear Adm. Greg Huffman said the test confirmed the ability of the US to detect, track, and engage a target missile in flight.

<https://www.theweek.in/news/defence/2024/12/12/guam-defence-breakthrough-how-us-conducted-ballistic-missile-intercept-test-to-showcase-power-against-evolving-pacific-threats.html>



*Fri, 13 Dec 2024*

## **India, Estonia firming up ties in cyber, defence: Ambassador Ajaneesh Kumar**

Indian Ambassador to Estonia Ajaneesh Kumar has said India is looking to firm up ties with the Baltic state in Cyber & Defence domain. Speaking to our correspondent Sidhant Sibal, Ambassador Ajaneesh said ties are 'going in the right direction, day by day' & 'defense, like other tech areas, has been one of the sectors where I see possibilities'.

He gave the example of how Rashtriya Raksha University, (RRU) Gandhinagar Gujarat and Estonian company CybExer have signed an MoU involving Cyber Ranges. Ajaneesh Kumar is the first resident Indian ambassador to the country. India opened its embassy in Tallinn in 2021 as it increases engagement with the Baltic states. Estonia opened its Embassy in New Delhi headed by a C.d'A in February 2012, with the first resident Ambassador presenting his credentials on 22 February, 2013. Full interview:

**WION: How do you see India, Estonia relationship?**

Ajaneesh Kumar: If I have to say that, in short, how is the relationship progressing, I would say it is going in the right direction, day by day. I feel that we are bringing some content to the relationship, and succinctly, I can say that it is strengthening. So I as an ambassador, I feel good about it.

**WION: What kind of cooperation there is between India and Estonia when it comes to cyber security.**

Ajaneesh Kumar: Cyber security is indeed something which Estonia can rightly say that is proud of. They have the Center of Excellence in Tallinn for both NATO as well as the EU-Lisa. There is a collaboration right now. There is an MOU partnership between Rashtriya Raksha University, (RRU) Gandhinagar Gujarat and CybExer, one of the leading cyber companies of Estonia, and this

is one of the so called Lock Shield certified company. So they have been doing good work in India. I understand that they have been busy doing exercises, cyber exercises, with all kinds of parties in India, both from the private sector as well in the government.

**WION: So essentially, is India helping in building cyber security ranges for Estonia, if I'm correct to understand**

Ajaneesh Kumar: No. CybExer collaborates with RRU, and when they do their cyber exercises, I think CybExer helps them, construct this range or organize this range, where these practices could be held.

**WION: Defense is another element of the relationship that can be talked about. So if you can talk about essentially both countries are working on that..**

Ajaneesh Kumar: Defense, like other tech areas, has been one of the sectors where I see possibilities. And Estonian companies I think they know the Indian market. They know that we are a major defense producer and exporter, and companies like at least the two companies which I am aware, they are already interacting with our companies. And in the days and years to come, I'm quite hopeful that there'll be some more in the pipeline.

**WION: So my last question to you is, what took so long, perhaps, when it comes to establishment of an Indian Mission here in Estonia,**

Ajaneesh Kumar: I would not say that we took too long, if I recall right in 2013 February, the first Resident ambassador of Estonia presented his credentials in Delhi, and we were we had announced the opening of our embassy here In 2019 bad luck intervened, and we had Corona. So the decision got postponed by some time. And late December 2021 we had a CdA here, and I arrived on 11th of March The following year, 2022 so not, not late, really. And from thereafter, you can see that the relationship is only going in the right direction. So I have nothing to complain about.

**WION: And essentially, are we looking at high level engagement?**

Ajaneesh Kumar: Well, there have been regular interactions at high level between our two countries. 2024 itself saw three ministerial visits to India. We had the foreign minister visiting India in January for the Raisina Dialogue. We had Minister for Economy and IT at that moment of time he participated in Vibrant Gujarat. And very recently, we had the agriculture minister visit India. So I think, as you say, for a small country and a new mission, three ministerial visits and interactions at various international forum like the one which we just had between our honorable External Affairs Minister and his Excellency, the foreign minister of this country, I think it augurs very well for our country that we keep meeting And when we meet. It's a sign of only, strengthening of bilateral relations and friendship between the two countries.

<https://www.wionews.com/world/india-estonia-firming-up-ties-in-cyber-defence-ambassador-ajaneesh-kumar-783609>

## **Israeli defence firms seek to expand footprint in India, MRO & innovation centre come up**

Israeli defence companies are seeking to expand their footprint in India, including having more tie-ups with local firms while also setting up possible manufacturing plants and increasing their sourcing from here, ThePrint has learnt.

Multiple Israeli sources told ThePrint that capacity building is a big focus area for Israel given the conflict it is in with regard to the Hamas, the Hezbollah, Iran and, now, in Syria. Incidentally, Israel's military has already started sourcing from India. In May, Spain had refused port call to a Danish-flagged merchant vessel carrying one such consignment from India to Israel.

“It would be naive to assume that Israeli companies, even without the government's directions, are not increasing their sourcing from India or looking at expanding their footprint in India. India is an important partner for us and offers multiple opportunities,” a source said, regarding the new dynamics of defence partnership between the two countries.

Meanwhile, it is not just sourcing as the Israeli companies are also looking at setting up innovation centres in India. For example, the Israel Aerospace Industries (IAI) launched its NeuSPHERE Innovation Acceleration Program in India last month. This is the second such IAI initiative, after the previous was launched in Washington earlier this year.

The NeuSPHER programme aims to provide a platform for Indian deep-tech startups to co-create cutting-edge innovation, accelerate their growth and expand globally. IAI's NeuSPHERE Innovation Acceleration Program focuses on the Indian technology startup community, in particular inventive deep-tech startups focusing on big data, signal and image processing, advanced navigation systems, AI and autonomy, XR-maintenance and training, green energy, advanced production, quantum, edge computing, Human Machine Interfaces, and wearable technology.

“We see India as a super power and someone who does a lot of focus on technology and looking for new things. Given IAI is a global company with a wide portfolio, we want to partner with young Indian start-ups and see them grow. Accelerating can benefit both,” Brig. Gen. Eytan Eshel (retd.), Executive Vice-President of Technology, Chief Technology Officer (CTO), R&D and Innovation of IAI, told ThePrint.

He underlined that NeuSPHER is not a venture capitalist firm but more like a partner. About what kind of stake the IAI will take in the Indian start-up and who will own the intellectual property rights, he said, “We are seeking a very limited amount to express our willingness to support them along the way. We are focused on technology”.

Talking about IP rights, he said it will rest with the Indian start-up though the IAI will have “some rights” to use it. “The IP rights will be the young Indian company. We will have some rights in

order to use it. This is why we take a very limited equity to show that we have an interest in this company to flourish and go their way. We are not venture capital but more as a partner and trying to ensure the company succeeds,” he said.

Eshel said that they are looking to fund very young companies, which are in pre-seed stage of funding, and hence the amount allocated could range from a few tens of thousands of dollars to about 100,000 dollars. Meanwhile, the IAI has already expanded its footprint in India in terms of Maintenance Repair and Overhaul (MRO) facilities for ELTA systems, acquired by it last year.

Founded in 2004, HELA Systems of ELTA delivers comprehensive support for radar systems, including top-tier field services and advanced D-level repair capabilities for various radar units.

“This is the first MRO we are opening now. We started in 2004 in Hyderabad for manufacturing and repair. In 2023, the IAI acquired this company and we decided to start a new MRO to increase our capacity,” HELA Systems CEO Yaniv Mizrahi told ThePrint. The MRO facility was also launched last month.

Mizrahi said that while the company has about 80 engineers spread across India to give on site customer support to Indian clients, they are hiring more to meet new requirements. He said that today major modules of systems go to Israel for repair but the plan is to do everything here. “We are now trying everything in India. This will reduce the turnaround time for our customers.”

He added that with this new India registered venture, they will be able to get annual maintenance contracts from the tri-services directly. “We will now get AMC contracts directly from customers. These contracts will be in Rupee. Earlier, ELTA and IAI in Israel used to get the orders, which were then routed to us. We have already got two big request for proposals (RFPs) from two customers,” he said. With this launch, he said, we are demonstrating our dedication to supporting India’s strategic needs through world-class radar solutions, empowering local professionals and fostering innovation.

<https://theprint.in/defence/israeli-defence-firms-seek-to-expand-footprint-in-india-mro-innovation-centre-come-up/2399026/>

## Business Standard

*Fri, 13 Dec 2024*

### **India, Iran, and Armenia hold second trilateral consultations in Delhi**

The second India-Iran-Armenia trilateral consultation was held on Thursday, where the three sides discussed a wide range of matters, including connectivity initiatives, engagement in multilateral fora, and regional developments, the Ministry of External Affairs press release stated.

The discussion in the trilateral consultations was led by Joint Secretary of the Pakistan, Afghanistan, and Iran Division JP Singh from the Indian side, along with delegations from Iran

and Armenia. From Iran, the Director General of the South Asia Division in the Ministry of Foreign Affairs of Iran, Hashem Ashja' Zadeh, led the discussion; meanwhile, Armenia was represented by the Head of the Asia-Pacific Department in the Ministry of Foreign Affairs of Armenia, Anahit Karapetyan.

"The 2nd India-Iran-Armenia Trilateral Consultations took place in New Delhi today. Discussions covered connectivity initiatives, multilateral engagement & regional developments. Emphasis was placed on enhancing trade, tourism, cultural exchanges & strengthening people-to-people ties," the MEA stated in a post in X.

The discussions also covered ways to promote trade, tourism, and cultural exchanges while strengthening people-to-people ties, the MEA stated.

The last trilateral consultation between the three nations was held in the Armenian capital of Yerevan in April 2023.

During the consultations, the delegations emphasised the importance of fostering close cooperation under the International North-South Transport Corridor (INSTC) and highlighted the role of Chabahar Port in facilitating this initiative. The Armenian side also provided a briefing on its connectivity initiative, "The Crossroads of Peace."

"The delegations emphasised the need for fostering close cooperation under the INSTC and highlighted the role of Chabahar Port in this regard. The Armenian side briefed the participants on its connectivity initiative, "The Crossroads of Peace," the MEA stated in a statement.

The three sides further reaffirmed their commitment to continued cooperation under the trilateral format and also agreed that the next round of consultations would be held in Iran at a mutually convenient date and time.

[https://www.business-standard.com/external-affairs-defence-security/news/india-iran-and-armenia-hold-second-trilateral-consultations-in-delhi-124121300068\\_1.html](https://www.business-standard.com/external-affairs-defence-security/news/india-iran-and-armenia-hold-second-trilateral-consultations-in-delhi-124121300068_1.html)



*Fri, 13 Dec 2024*

## **Hazel Hypersonic Missile: Russia Threatens To Use “Game Changing” Weapon Designed To Demoralize Forces, Demolish Enemies**

Russia needs to send another message to the United States by launching an Oreshnik (Hazel) missile at Ukraine, according to the former Deputy Permanent Representative of Russia to the UN, Konstantin Dolgov. Konstantin Dolgov, the former Deputy Permanent Representative of Russia to the UN, made the remarks in response to statements from the US Department of Defense that Russia might launch another experimental Oreshnik missile in the coming days.

On December 11, Pentagon Deputy Press Secretary Sabrina Singh claimed that intelligence assessments indicated a potential launch of the Oreshnik missile in the next few days. However, she downplayed its significance, stating that the Oreshnik missile is not viewed as a game-changer on the battlefield.

“The Oreshnik is not a game-changer,” Singh said at a press briefing, “but rather just another attempt by Russia to terrorize Ukraine, which will fail.” The Pentagon official declined to provide additional details about the intelligence assessment, citing its sensitive nature. In response, Dolgov rejected the notion that the Oreshnik missile was meant to intimidate Ukraine, as suggested by the Pentagon. He argued that any weapon is designed to destroy the enemy, damage infrastructure, and demoralize forces.

He pointed to the reactions from Kyiv after the missile strike, which he claimed indicated the attack’s success in achieving those goals. Dolgov further stated that the first strike with the Oreshnik had not sufficiently “taught” the United States a lesson, claiming that the US was indifferent to the suffering of Ukrainians.

He stressed that the missile had already impacted the course of the conflict and that Russia might continue using the Oreshnik, potentially targeting decision-making centers in Kyiv, as President Vladimir Putin had previously suggested. Putin has previously described the Oreshnik missile as “impossible to intercept” and announced that it has the destructive power of a nuclear weapon, even with a conventional warhead. He also warned that Russia could use the missile to strike key targets in Ukraine if Kyiv continues to use Western-supplied long-range weapons against Russian forces.

### **The Oreshnik Missile: What We Know So Far**

Russian President Vladimir Putin revealed the Oreshnik missile in late November, announcing that it had been used for the first time in Ukraine. Its use was seen as a direct response to Ukraine’s use of advanced Western weapons like the ATACMS and Storm Shadow missiles on Russian soil.

He described the missile as traveling at speeds up to 10 times the speed of sound, or Mach 10, comparing its trajectory to that of a meteorite. Though Ukrainian military officials reported that it reached speeds of Mach 11. Putin further said that the missile is impervious to missile defense systems.

The Oreshnik missile gained global attention primarily due to its long-range capabilities, which are believed to surpass most other weapons deployed in the war. US analysts have said the Oreshnik may be a modified version of the Rubezh RS-26 ballistic missile. Missiles of this class typically have a range of up to 3,410 miles, which enables them to strike virtually any target in Europe. In addition, Moscow has suggested that the Oreshnik could be armed with nuclear payloads.

General Sergei Karakayev, the head of Russia’s Strategic Missile Forces, confirmed that the Oreshnik could deliver either nuclear or conventional warheads and could reach any European target with its impressive range. Unlike shorter-range Russian weapons already in use in Ukraine, the Oreshnik provides the Kremlin with an escalatory tool that avoids the need to deploy nuclear weapons.

In their analysis for the UK-based Royal United Services Institute (RUSI), Dr. Sidharth Kaushal and Matthew Savill stated, “A large missile like this sends a more potent message around potential nuclear use, as well as ‘punishing’ Ukraine for the use of ATACMS and Storm Shadow. The primary audience for this message is probably NATO and the coalition of international backers of Ukraine, rather than Ukraine itself – a not-so-subtle reminder that Russia has a wider arsenal of different and larger missile types.”

However, the missile used in the November attack on a missile manufacturing plant in Dnipro carried conventional warheads. Yet, Putin has portrayed it as an extraordinarily destructive weapon, claiming that its warheads can reach temperatures of over 7,000 degrees Fahrenheit. He added that a simultaneous launch of multiple Oreshnik missiles could cause devastation similar to a nuclear strike. Some experts believe Russia may only have a limited number of Oreshnik missiles, but questions remain about how quickly the country can produce more.

<https://www.eurasiantimes.com/russia-acknowledges-need-to-send-another-warning/>



*Fri, 13 Dec 2024*

## **China’s Hypersonic Jumbo Aircraft Hits Mach 6 In Test Flight; Can Travel From Beijing To New York In 2 Hours**

In a remarkable technological breakthrough, a prototype of a revolutionary hypersonic aircraft developed by China reached the incredible speed of Mach 6 during testing in the Gobi desert. The hypersonic aircraft with an unusually large or bulky body was launched by Chinese scientists into the sky, achieving a speed that might allow it to travel from Beijing to New York in two hours, South China Morning Post reported. Currently, an average passenger plane takes about 12 to 14 hours to travel 11,000 kilometers between the two cities.

The test was originally conducted by Cui Kai, the project’s leader and a researcher at the Institute of Mechanics under the Chinese Academy of Sciences in 2021, but it was kept under wraps for three years due to technological sensitivity. On December 10, the Chinese Academy of Sciences shared Cui’s remarks and a video of the prototype’s liftoff on Chinese social media. According to reports, a scaled-down prototype of the aircraft achieved a high speed of Mach 6.56, or more than six times the speed of sound. The SCMP report stated that the test gave early validation to a concept that was considered implausible when it was initially introduced six years ago.

“At the time, everyone thought it was a crazy idea,” Cui Kai was quoted as saying. “We faced almost universal skepticism. Fortunately, we chose to persevere. I always believed that innovation thrives amid doubt.” The aircraft tested by Cui’s team has a bulky body, a stark departure from slender-body hypersonic aircraft seen in the past. “It features a fat and round fuselage and cape-shaped wings on its back,” notes the report while asserting that the future hypersonic aircraft may be able to transport as much cargo or passengers as current jumbo planes.

The nearly 20-minute test flight ostensibly solved a long-standing problem for aircraft designers: as flying speed increases, the amount of usable space within the cabin diminishes. The report emphasized that because of their extremely constrained interior space, all hypersonic aircraft that can currently reach speeds exceeding Mach 5 are only used for military purposes like missiles and unmanned reconnaissance planes. “At high speeds, the front of a large airframe experiences significant downward pressure, impairing its climbing ability.”

This problem was solved by Cui by adding a broad wing surface above the airframe to convert this downward pressure into upward lift. But even this led to an unheard-of level of complexity in the design. So, Following the concept’s public release in 2018, Cui’s team carried out numerous wind tunnel experiments and further improved the design.

According to Cui, the cost of each test was hundreds of thousands of yuan. The test flight of 2021 was successful because the tests were repeated multiple times to confirm the viability of different models. Cui did not reveal the status of the full-scale construction of the aircraft or the anticipated date of its first flight.

“For such cutting-edge technology, we still face numerous challenges that need to be addressed directly, including issues related to power, materials, and structure,” Cui said. “We have only completed a small fraction of the work and taken a modest step forward.”

Despite a paucity of details, EurAsian Times understands that China has been working on making commercial hypersonic travel a reality for several years. The SCMP report noted, “The team’s efforts could help revolutionize human transport, turning the concept of “one-hour global travel” from science fiction into reality.”

### **China’s Quest With Commercial Airliner Technology**

There is a fierce race among many nations to develop hypersonic technology. By 2035, China plans to create a small fleet of crewed hypersonic aircraft that can reach any location on Earth in a matter of hours. In 2018, a Chinese research team claimed to have developed a new design for an extremely fast aircraft that would transport tons of goods and dozens of passengers from Beijing to New York in just two hours. Cui and his colleagues at the Chinese Academy of Sciences in Beijing conducted aerodynamics tests for China’s latest hypersonic aircraft prototypes in a wind tunnel using a scaled-down copy of the aircraft.

Later, reports in 2021 indicated China was developing a hypersonic airliner capable of transporting 10 passengers to anywhere in the world in less than an hour. The 148-foot-long (45-meter) plane was reportedly about a third the size of a Boeing 737 and had delta wings identical to Concorde’s (the world’s first supersonic airliner) but with the tips pointed skyward. The following year, in 2022, reports noted that China had finished the first testing of a small hypersonic prototype aircraft for civilian use in preparation for developing a full-sized hypersonic aircraft that can fly six times the speed of sound.

The prototype was known as Nanqiang No. 1 and was expected to be a model that would be a technology demonstrator for a hypersonic airliner. The report stated that the scientists hoped to conclude the test program and move on to building a flyable prototype by 2025. China’s nemesis, the United States, is also working on hypersonic aircraft technology. According to some accounts,

the US Air Force plans to introduce the SR-72 “Darkstar,” a Lockheed Martin aircraft that is the fastest in the world with a Mach 6.0 speed.

In the late 1950s, American engineers took the lead in investigating the potential of hypersonic technology, including planes and missiles, marking the beginning of hypersonic research. The ambitious X-15 program saw the US military launch manned hypersonic test aircraft. However, once the United States got involved in the Vietnam War in 1968, the program’s encouraging advancements were halted.

Since hypersonic aircraft were thought to be less applicable to the unique requirements of combating rebels in jungle terrain, the focus switched away from them. The United States later shifted its attention to international counterterrorism efforts. On the other hand, China, stepped up its efforts to build hypersonic weapons and aircraft and carried out regular flight tests. In fact, Beijing frequently made use of publicly accessible American hypersonic research that had been supported over many years by the US government. And if the new claims are to be believed, Beijing appears to have come very far with the hypersonic aircraft development—much farther than the West may have previously anticipated.

<https://www.eurasiantimes.com/chinas-hypersonic-jumbo-aircraft-hits-mach/>



*Thu, 12 Dec 2024*

## **India, UK Join Hands To Build Indian Navy’s Amphibious Warships Fleet; Here’s Why LPD’s Are Vital For Delhi**

The Indian Navy’s quest to acquire amphibious warships or Landing Platform Docks (LPD) has been hanging fire for over a decade. The proposal is gathering steam now, with India collaborating with the UK to design and develop electric propulsion systems for its futuristic LPDs. The designs will also draw from the UK’s shipbuilding experience.

This is a big development for Indian shipbuilding, which is plugging capability gaps. It could also pave the way for collaboration to make submarines under AUKUS or aircraft carriers. To work towards it, a joint working group has established a subordinate working group to accelerate the launch phase. Both sides are working to develop the electric propulsion technology for the Indian Navy’s new LPDs, which are planned to be launched in 2030. The new LPDs will also draw from the UK’s shipbuilding progress.

“While working on the new designs, lessons will be drawn from the UK’s progress from Type 23 frigates, through to LPD, Type-45 destroyers, Landing Ship Docks and onto the Queen Elizabeth class aircraft carrier,” UK Defence Adviser in India Commodore Chris Saunders posted on X. The next-generation electric propulsion technology offers immense benefits, such as lower emissions,

noise, and vibration. Warships driven by electric propulsion are “unsurpassed for their quietness of operation.”

Electric propulsion is known for its reliability. Apart from periodic safety checks, the crew is not permanently stationed in the engine rooms. The propulsion system can also be managed remotely. Electric propulsion improves response time during operational needs, with smoother maneuvering and positioning, and quick response when an increase in speed is required.

Currently, the Indian Navy operates one US-acquired INS Jalashwa (the former USS Trenton), an Austin-class amphibious transport dock with a sealift capability for over 3500 troops and a squadron of armored vehicles. INS Jalashwa was added to the Indian Navy’s inventory after the Tsunami in 2004.

When one of the largest humanitarian missions was launched in the wake of the natural disaster in 2004, it highlighted a major shortcoming of the force, considered to be the first responder in the Indian Ocean Region (IOR)—it did not have amphibious assault ships (LPDs), which help move men and materials. When these LPDs were not carrying helicopters, tanks, and troops for landing at the enemy’s coasts, they carried humanitarian aid and operated as floating hospitals.

The Indian Navy has issued the request for proposals twice since 2004 – once in 2011 and another one in 2021. The 2011 proposal could not be fructified owing to accounting problems between Indian and foreign designers. The Navy issued the tender in 2013, but it scrapped it in 2020 because the Indian Navy’s requirements for the LPDs had changed. The process for procuring four more LPDs was again set in motion in 2021.

The RFI issued in 2021 sought LPDs with a maximum length of around 200 meters and capable of ferrying 900 troops. Unlike the western LPDs, which have little offensive armament onboard, the Indian Navy envisaged deploying 16 surface-to-surface missiles. The ship should also have 32 short-range surface-to-air missiles and be able to replace the fast-firing guns with ‘directed energy weapons,’ namely lasers and microwaves that can fry the guidance seekers of missiles and UAVs.

The LPDs should be able to carry at least 6 main battle tanks and roughly 60 heavy trucks. These vehicles would be ferried to the shore in a smaller amphibious craft that would be deployed from an LPD dock. In addition, the LPD will have 14 helicopters (two heavy-lift choppers and 12 special operations rotary aircraft). The special operations helicopters would carry troops and light cargo to battlefields.

Considering futuristic warfare, these LPDs will be able to deploy aerial and underwater unmanned vehicles. The Indian Navy’s intended LPD needs to be capable of “transporting and landing a combined arms force and sustaining their operations ashore.” These warships will be able to sustain a body of troops for prolonged durations and carry on board a full range of combat cargo required for undertaking and sustaining the operations ashore.

LPDs will undertake out-of-area contingencies (OOAC) through their inherent capability to transport and deploy forces ashore, arrive quickly in the area, and sustain operations at sea for prolonged durations. These vessels will also act as Command Centres for the Amphibious Task Force Commander, Landing Force Commander, and Air Force Commander.

In peacetime, it will also undertake Humanitarian Assistance and Disaster Relief Missions. The LPDs will also provide medical facilities for the treatment of battle casualties. According to the RFI, the first of the four LPDs was expected to be delivered in a maximum of 60 months, followed by delivery of one vessel every 12 months. Considering the tender is still far from being awarded, India's amphibious capability will lag behind for some time.

### **Importance Of Amphibious Ops**

The importance of amphibious landings has been underscored since the D-Day landings at Normandy, France, and the Pacific Island campaign in World War II. It is more relevant today in the Indo-Pacific region. The Indo-Pacific is a region of contested territorial and maritime claims; hence, amphibious platforms are important for deploying and sustaining troops far away. Amphibious platforms play a pivotal role in humanitarian assistance and disaster relief in a region with many island countries.

The Indo-Pacific is a peculiar geography comprising vast swathes of deep open ocean to relatively shallow and congested archipelagic choke points like the Malacca Straits and the South China Sea. Also, the Chinese anti-access/area denial strategy around its reclaimed islands in international waters in the South China Sea makes it imperative for the regional navies to invest in 'green water' capabilities that help them operate closer to shore.

Recognizing it, the US Marine Corps and the US Navy have made amphibious capabilities a key aspect of the US forward-deployment strategy in the Indo-Pacific. China has strengthened its amphibious capabilities with its Type 071 amphibious assault ships (LPDs). With a displacement of nearly 20,000 tons, these vessels are larger than the US Navy's San Antonio LPD-17 class ships. These vessels serve as the backbone of China's future amphibious fleet. They can carry troops, armored vehicles, helicopters, and landing craft.

Beijing has already begun building the Type 075 variant vessel. Three of these warships are expected to be commissioned by 2025. The Type 075 will give the PLA Navy greater capacity and endurance for long-range operations. The Type 075, constructed at the Hudong-Zhonghua shipyards, will provide amphibious power projection, sea control, and air support capability with a helicopter complement and command and control capabilities. It will have a displacement of between 30,000-40,000 tons. Its floodable well-dock can support both Russian and Chinese-designed landing craft air cushions (LCAC).

The futuristic Type 076 vessels are expected to be equipped with electromagnetic catapults, which would enhance their ability to support fixed-wing aircraft and make them more like aircraft carriers.

<https://www.eurasiantimes.com/india-uk-joins-hands-to-build-the-indian-navys/>

# Science & Technology News



**Press Information Bureau**  
**Government of India**

**Ministry of Science & Technology**

*Thu, 12 Dec 2024*

## **Union Minister Dr Jitendra Singh Chairs the 2nd Annual General Meeting of Biotechnology Research and Innovation Council (BRIC) Society**

Announces successful gene therapy trial for Haemophilia conducted with the support of the Department of Biotechnology at Christian Medical college, Vellore; reported by one of the world's most prestigious journals, "New England Journal of Medicine"

BRIC's role prominent in unifying the governance of various premier biotechnology institutions : Dr Jitendra Singh

First Annual Report of BRIC, i3c BRIC-RCB-PhD Programme Brochure and BRIC Alumni Portal launched

The 2nd Annual General Meeting of the Biotechnology Research and Innovation Council (BRIC) Society was held today under the Chairmanship of Union Minister of State (Independent Charge) for Science and Technology, Minister of State (Independent Charge) for Earth Sciences, MoS PMO, Department of Atomic Energy, Department of Space, Personnel, Public Grievances and Pensions, Dr. Jitendra Singh, at the Department of Biotechnology (DBT), CGO Complex, New Delhi. During the meeting, a Presentation was made on Biotechnology Research and Innovation Council (BRIC) by Dr. Rajesh S. Gokhale, Secretary, DBT and DG, BRIC.

On the occasion, Dr Jitendra Singh also announced the successful gene therapy trial for Haemophilia conducted with the support of the Department of Biotechnology at Christian Medical college, Vellore. This has been reported by one of the world's most prestigious journals, "New England Journal of Medicine". Union Minister Dr. Jitendra Singh highlighted the transformative journey of India's biotechnology sector. There is a significant role of BRIC in unifying the governance of 14 premier biotechnology institutions to foster research, innovation, and capacity building.

The Union Minister launched the First Annual Report of BRIC, 2024, the i3c BRIC-RCB-PhD Programme Brochure, and BRIC News, showcasing the achievements and vision of the council. The society approved the Audited Annual Accounts and Auditor's Report for 2023-24, reflecting the council's commitment to transparency and accountability. Dr. Singh appreciated the launch of the i3c BRIC-RCB Ph.D Programme, a globally competitive interdisciplinary initiative designed to promote innovative research and hands-on training. The programme has already enrolled its first batch of 58 students. He also praised the Zero Waste Life Initiative being implemented across BRIC campuses, which underscores sustainability as a core institutional value.

The Union Minister commended the progress made on developing the iBRIC+ Biosciences Innovation Park in the NCR Biocluster. This state-of-the-art facility aims to serve as a hub for biotechnology startups and advanced R&D. The establishment of BRIC-NABI, inaugurated in October 2024 as India's first Biomanufacturing Institute, was also recognized as a major milestone in the nation's biotechnology journey. Dr. Singh underscored the importance of strategic initiatives such as the development of interdisciplinary research networks, which have resulted in the implementation of 24 innovative programmes involving over 90 scientists from various BRIC institutions.

Union Minister Dr. Singh also highlighted the council's governance achievements, including the formation of BRIC's Governing Body and Finance Committee and the successful implementation of a Centralized Accounting System. He emphasized the importance of interdisciplinary collaboration and partnerships with institutions like AIIMS and IITs to enhance research outputs and promote techno-entrepreneurship. He also urged the institutions to adopt innovative training methods, foster transdisciplinary research, and contribute to fulfilling India's vision of self-reliance in biotechnology. In his remarks, Union Minister Dr. Jitendra Singh expressed confidence in BRIC's ability to scale biotechnology research and innovation to address national and global challenges. The meeting concluded with a vote of thanks delivered by Ms. Ekta Vishnoi, Joint Secretary, DBT. BRIC continues to play a pivotal role in driving India's bioeconomy and establishing itself as a global leader in the biotechnology sector.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2083824>



**Press Information Bureau**  
**Government of India**

**Ministry of Science & Technology**

*Thu, 12 Dec 2024*

**“IIT Ropar’s AWaDH and Khalsa College of Engineering & Technology, Amritsar Join Forces to Launch 09th Cyber-Physical Systems in Punjab Region: A Leap in Innovation and Technical Education”**

Innovation and technical education took center stage as Indian Institute of Technology (IIT) Ropar's iHub-AWaDH, in collaboration with Khalsa College of Engineering & Technology (KCET), Amritsar, inaugurated the AWaDH Cyber-Physical Systems Lab under the National Mission on Interdisciplinary Cyber-Physical Systems (NM ICPS), Department of Science and Technology, Government of India. This initiative represents a significant step forward in advancing technical education and fostering innovation in Cyber-Physical Systems (CPS).

The event began with a traditional lamp-lighting ceremony, symbolizing the initiation of a journey towards innovation and excellence. Dr. Manju Bala, Director of KCET, Amritsar, provided introductory remarks and welcomed the Chief Guest of the occasion S. Rajinder Mohan Singh Chhina (Honorary Secretary of the Khalsa College Charitable Society) and Guest of Honour Dr. Jatinder Kaur (Former Executive Director of the Punjab State Council for Science & Technology (PSCST)), Dr. Radhika Trikha (Chief Executive Officer, IIT Ropar – TIF), Mr. Aatif Jamal (Senior Manager, IIT Ropar – I'm TIF), Mr. Desh Raj Dhiman (Project Manager, IIT Ropar- TIF), Mr. Ashutosh Kumar (Firmware Engineer, IIT Ropar – TIF), Mr. Vikas Kumar (Hardware Engineer, IIT Ropar – TIF), Ms. Parry Sood (Programme Manager, IIT Ropar – TIF) and Ms. Sonia Sharma (Young Professional, IIT Ropar – TIF).

The Chief Guest for the occasion, Dr. Rajinder Mohan Singh Chinna, Honorary Secretary, Khalsa College under the Khalsa College Charitable Society, Amritsar, and Pro Chancellor, Khalsa University, Amritsar, delivered the keynote address. He emphasized the importance of fostering technical skills and research in emerging technologies like CPS, which are integral to modern education and innovation.

Dr. Jatinder Kaur Arora, Former Executive Director of Punjab State Council for Science and Technology (PSCST), delivered a special address, highlighting the lab's potential to transform the educational landscape in the region, and spoke about the growing importance of IoT technologies and Cyber-Physical Systems in today's technological ecosystem.

Dr. Radhika Trikha, CEO of iHub-AWaDH, presented and launched a video detailing the AWaDH CPS Lab initiative. She outlined the lab's vision to act as a platform for education, research, prototyping, testing, and collaboration. The AWaDH CPS Lab at KCET is equipped with advanced IoT kits developed by IIT Ropar, offering a 24/7 plug-and-play module for hands-on experimentation. The facility also features cutting-edge resources, including:

- Voltera V-One circuit prototyping machines.
- Gateway, BLE Development Kit, and BLE Node.
- Low Power Camera Module.
- Air Sense and Weather Pro environmental monitoring tools.
- AI & ML workstations provided by Terafac Technologies Pvt Ltd.
- Various sensors for environmental activities.

Following the inauguration, the Project Manager, Desh Raj, along with the technical team, provided a guided tour of the lab, showcasing its cutting-edge facilities. The lab will play a pivotal

role in joint training initiatives such as ‘train the trainers’ and ‘train the students’ modules, offering both theoretical and practical insights into CPS technologies.

This state-of-the-art lab is set to integrate CPS into the curriculum at KCET, promoting a culture of innovation and technical excellence in the Amritsar region. It will serve as a hub for skill development, offering training programs tailored to empower graduates, researchers, faculty, and startups.

The inaugural ceremony concluded with a vote of thanks, marking the beginning of a collaborative effort between KCET, IIT Ropar’s iHub-AWaDH, and other stakeholders. This initiative is poised to empower students and professionals with the skills required to thrive in the evolving landscape of CPS and IoT.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2083764>



**Press Information Bureau**  
**Government of India**

**Ministry of Science & Technology**

*Thu, 12 Dec 2024*

## **Researchers develop recipe to predict crack emergence in clay, holds promise in improving quality of paints used for coatings**

Researchers have been able to accurately predict the exact time of the emergence of the first crack in aged clay. Their research is also applicable to other forms of drying colloidal layers like blood and paint—an information which could help in disease diagnosis, diagnosis of conditions like anemia by observing drying droplets of blood, forensics & painting restoration and improving the quality of paints used for coatings.

Clay, the major ingredient of natural soils, is used as a modifier while formulating paints and coatings. When subjected to desiccation, colloidal clay suspensions and clayey soils crack due to the accumulation of drying-induced stresses. Even when desiccation is suppressed, aqueous clay suspensions exhibit physical aging with their elasticity and viscosity evolving continuously over time as the clay particles self-assemble into gel-like networks due to time-dependent inter-particle screened electrostatic interactions.

Researchers studying material science at the Raman Research Institute (RRI), an autonomous institute of Department of Science and Technology (DST) have proposed a relation between the time of emergence of the first crack, fracture energy (which is the sum of the plastic dissipation and the stored surface energy) and the elasticity of the drying clay sample which can help predict the first crack.

Using a theory called the theory of linear poroelasticity, they estimated the stress at the surface of the drying sample at the time of crack onset. Linear poroelasticity is a theory for porous media flow that describes the diffusion of water (or any mobile species) in the pores of a saturated elastic gel. They equated this stress with a critical stress predicted by a criterion that states that a crack will grow when the energy released during propagation is equal to or greater than the energy required to create a new crack surface (Griffith's criterion).

The relation thus obtained was validated by performing a series of experiments. They further said that the same scaling relation worked for other colloidal materials such as silica gels. The paper was published in the journal *Physics of Fluids*.

“This correlation can be useful while optimizing material design during product development. We can apply this knowledge and suggest tweaking in the material composition at the time of manufacturing of industry-grade paints and coatings, so that they can have better crack resistance and improve the product quality,” said Professor Ranjini Bandyopadhyay, head of the RheoDLS lab and faculty at the Soft Condensed Matter group at RRI.

Using Laponite, a synthetic clay with disk-shaped particles sized 25 - 30 nanometres (nm) and one nm in thickness, the team created multiple Laponite samples with increasing elasticities. Each sample was dried at temperatures ranging from 35 to 50 degrees Celsius in a petri dish. The samples took between 18-24 hours to dry completely and the rate of evaporation and elasticity were measured for each sample. As water evaporated from the Laponite samples, the particles rearranged and stresses developed on the surface of the material.

Higher sample elasticity indicates better ability of the sample to deform under the influence of these stresses.

“The first crack emerged somewhere between 10 – 14 hours. Depending on the sample's elasticity and fracture energy, the emergence time of the cracks varied. The crack onset time decreases with increasing temperature due to faster solvent loss, and therefore a more rapid enhancement in clay elasticity. The sample dries faster at higher temperature, enhancing the rate of stress development on its surface. Clay particles and their interactions influence the crack onset time because they govern the sample solidification rate and, therefore, mechanical properties, such as the fracture energy and elasticity,” said Vaibhav Parmar, the first author of the paper and a PhD student at RRI.

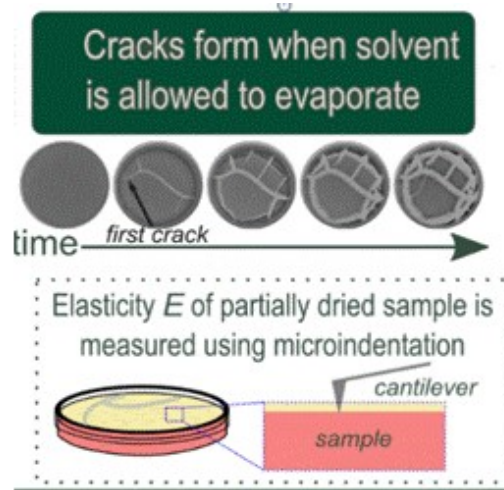
It was also noted that the cracks started developing first at the outer walls of the petri dish and later progressed inwards. Later, networks of cracks developed as the sample aged (passing of time).

The researchers said that crack formation in clay is a complex phenomenon observed over a range of length scales and hence, the need for understanding the drying-induced cracks was imperative. This information could help in better understanding of the geophysical and mechanical processes involved.

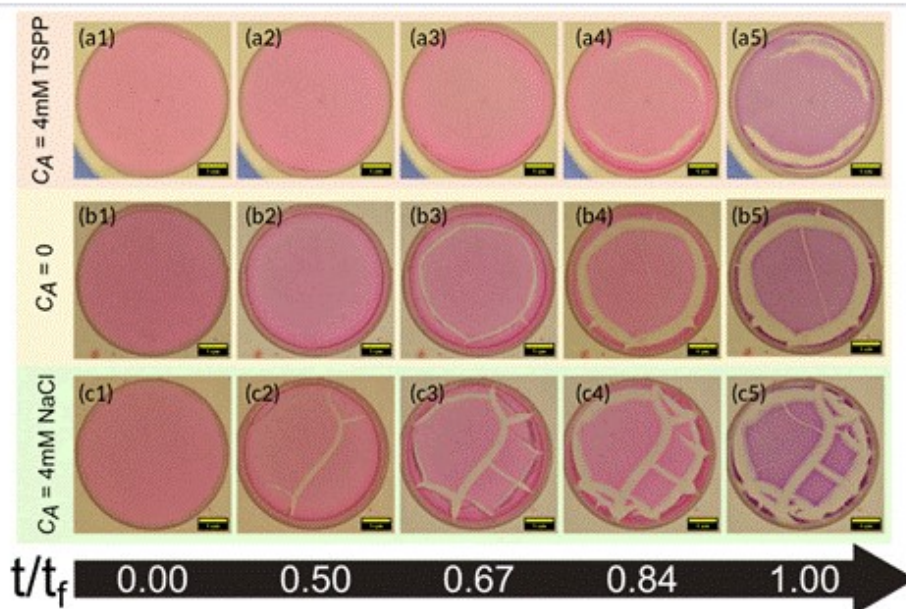
Clay is a highly heat-resistant material. It is an excellent insulator and hence they are the first choice for extreme heat environment applications, like coatings of a spacecraft. Researchers further said that a clay-water mixture would initially behave like a flowing liquid and over time it could turn into a viscoelastic solid, exhibiting properties of both liquid and solid. This study is significant as it tried to observe the effect of physical aging on the desiccation of clay.

“We could conclude that the more elastic the material, lower its fracture energy and faster the cracks developed. We have suggested a recipe for predicting crack formation in terms of the sample elasticity and fracture energy, which can be measured in laboratory experiments. Relations can be developed for cyclic temperature changes to mimic diurnal temperature fluctuations,” said Bandyopadhyay.

The research shows that by either varying the concentration of the material, the salt or the pH levels, it is possible to tune the material’s elasticity and in-turn, its cracking onset. This could be used to delay cracks in coatings on a spacecraft or on a medicine capsule which are done in a controlled environment.



Caption 1 : Emergence of the first crack



Caption 2 : Emergence of cracks with respect to time for samples a, b and c with varying elasticities

<https://pib.gov.in/PressReleasePage.aspx?PRID=2083751>



*Thu, 12 Dec 2024*

## **Scientists develop flexible near-infrared plasmonic devices for wearable sensors and medical imaging tools**

In a significant advancement in nano-photonics, researchers have introduced a new approach to achieve flexible near-infrared plasmonic devices using affordable scandium nitride (ScN) films. This could revolutionize the design of future optoelectronic devices, flexible sensors, and medical imaging tools that rely on NIR light, by introducing scalable and cost-effective plasmonic materials

Plasmonics is a field that leverages the interaction between light and free electrons in metals to create extremely confined electromagnetic fields. Traditionally, plasmonic materials have been rigid and possess limited design possibilities. Most of them like gold or silver, tend to be costly and possess limited versatility.

Prof. Bivas Saha at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, an autonomous institute under the Department of Science and Technology (DST), demonstrated a method to grow flexible plasmonic structures. They produced ScN layers with exceptional quality and flexibility by pairing scandium nitride with van der Waals layer substrates, materials with weak interlayer interactions, thus introducing a new pathway in plasmonic materials research.

The team used a process by which single-crystal layers are deposited onto a substrate, technically called epitaxial growth. The technique they used stacks layers of materials with weak interlayer bonding to enable new device architecture (van der Waals heteroepitaxy).

The study, recently published in *Nano Letters*, highlights the potential of scandium nitride as a promising plasmonic material for applications that require both flexibility and precision in near-infrared (NIR) optics.

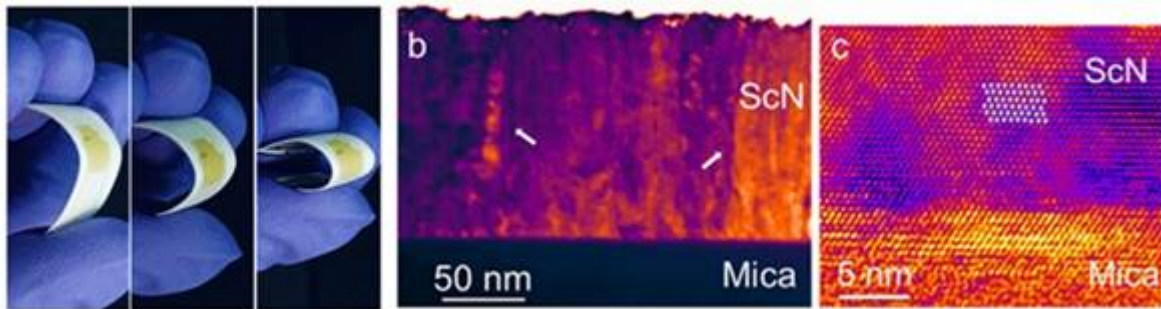
Through precise engineering, the team achieved high-quality epitaxial ScN layers on flexible substrates, creating conditions where plasmon-polaritons—quasiparticles resulting from the coupling of plasmons with photons—can propagate in the near-infrared range.

Prof. Saha's team demonstrated that ScN is a stable material that not only supports NIR plasmonics but also retains its performance when subjected to bending and flexing, making it a frontrunner for flexible device applications.

"Scandium nitride's stability, combined with its compatibility with van der Waals substrates, makes it an exciting candidate for next-generation flexible electronics. Our findings are a step towards realizing advanced plasmonic devices that are not only high-performing but also adaptable to unconventional applications."

This research holds promise for a wide array of industries, from telecommunications to biomedicine, offering a new material foundation for developing next-generation flexible and wearable plasmonic devices. “The results mark a critical step in merging plasmonics with flexible electronics, potentially setting the stage for innovations that leverage the unique properties of near-infrared plasmon-polaritons”-commented Mr. Debmalya Mukhopadhyaya, the first author of this work.

As plasmonics continues to evolve, the innovative use of scandium nitride in Prof. Saha’s research exemplifies the creative potential of materials science and its capacity to redefine technological boundaries.



<https://pib.gov.in/PressReleasePage.aspx?PRID=2083746>



**Press Information Bureau**  
**Government of India**

**Ministry of Science & Technology**

*Thu, 12 Dec 2024*

## **Parliament Question: Support To Universities In Fostering Research Culture**

Department of Science and Technology (DST) is implementing a dedicated programme exclusively for strengthening the research ecosystem in universities called Promotion of University Research and Scientific Excellence (PURSE). So far under PURSE, DST has supported eighty-two (82) universities with a total investment of ₹1227 crores. Additionally, nine more universities have been selected and recommended for support under the PURSE 2024 call.

Furthermore, under the “Fund for Improvement of S&T Infrastructure in Universities and Higher Educational Institutions” (DST-FIST), departments of various universities receive support for scientific infrastructure building. DST support is extended to Sophisticated Analytical Instrument Facilities (SAIF) Centers for acquiring research facilities; many of these centers are located at universities. The Consolidation of University Research for Innovation and Excellence (CURIE) program empowers exclusive women’s universities by supporting research facilities in basic and applied sciences.

State University Research Excellence (SURE) scheme of erstwhile Science and Engineering Research Board (now Anusandhan National Research Foundation (ANRF)), aims to boost research capabilities in state and private universities. Under SURE Scheme, 425 projects have been supported with an investment of ₹117.8 crores to strengthen university research. Recently, ANRF has launched the Partnerships for Accelerated Innovation and Research (PAIR) program to boost university research. This program pairs top-tier institutions (hubs) with emerging ones (spokes) to foster research collaboration, knowledge sharing, and capacity building. This initiative is designed to cultivate research excellence across Indian universities, by collaborations with top-tier institutions.

The Department of Biotechnology (DBT) also contributes to infrastructure development in research institutions through programs like DBT- Boost to University Interdisciplinary Life Science Departments for Education and Research Programme (DBT-BUILDER) and Scientific Infrastructure Access for Harnessing Academia University Research Joint Collaboration (DBT-SAHAJ). These programs aim to enhance research capabilities and foster innovation in the field of biotechnology. DST, DBT, CSIR, MoES and ANRF have been instrumental in advancing university scientific and technological landscape by supporting research grants, fellowships, and infrastructure development initiatives. Substantial support by these organizations have significantly strengthened the nation's university research ecosystem. This information was given by Union Minister of State (Independent Charge) for Science & Technology, Dr. Jitendra Singh in a written reply in the Rajya Sabha today.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2083731>



**Press Information Bureau**  
**Government of India**

**Ministry of Science & Technology**

*Thu, 12 Dec 2024*

## **Parliament Question: National Mission On Interdisciplinary Cyber Physical Systems**

The National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) has established 25 Technology Innovation Hubs (TIHs) across premier academic institutions, specializing in cutting-edge domains such as AI, ML, robotics, cybersecurity, autonomous navigation, quantum technologies etc. One such TIH, namely, I-Hub Quantum Technology Foundation (QTF) at IISER Pune, is specifically focused on advancing Quantum Technologies. The hub promotes start-ups, translational research, and commercialization activities in the quantum technology space. To achieve this, the I-Hub QTF is supporting the below 14 start-ups spanning across different domains of Quantum Technologies, including Quantum Computing, Quantum Communications, Quantum Sensing, & Quantum Materials. These start-ups are being supported through comprehensive

guidelines, developed under the National Quantum Mission (NQM) and officially adopted by I-Hub QTF.

List of supported start-ups is as under:

1. QuNu Labs Private Limited, Bengaluru, Karnataka
2. QPIAI India Pvt. Ltd, Bengaluru, Karnataka
3. Dimira Technologies Pvt. Ltd, Bengaluru, Karnataka
4. PRENISHQ Pvt. Ltd, Bengaluru, Karnataka
5. QuPrayogPvt. Ltd, Mumbai, Maharashtra
6. Pristine Diamonds Pvt. Ltd, Surat, Gujarat
7. QuanastraPvt. Ltd, Hyderabad, Telangana
8. Quan2D Technologies Private Limited, Chennai, Tamil Nadu
9. amPICQ Pvt Ltd, Pune, Maharashtra
10. Quantm Dynamics Corporate Solutions Pvt Ltd, Noida, Uttar Pradesh
11. Atom Jig Pvt Ltd, Bengaluru, Karnataka
12. Sciamo Research & Instruments Pvt Ltd, Bengaluru, Karnataka
13. Brahmasens Technologies, Chennai, Tamil Nadu
14. GDQ Labs Pvt Ltd, Hyderabad, Telangana

Under the National Quantum Mission (NQM), four (4) thematic hubs (T-Hubs) are being established to further advance quantum technologies focusing on key quantum technology verticals, which include Quantum Computing, Quantum Communication, Quantum Sensing & Metrology and Quantum Materials & Devices. Entrepreneurship Development is one of the major mandates of these T-Hubs in their respective technology verticals. This information was given by Union Minister of State (Independent Charge) for Science & Technology, Dr. Jitendra Singh in a written reply in the Rajya Sabha today.

<https://pib.gov.in/PressReleasePage.aspx?PRID=2083729>

**THE ECONOMIC TIMES**

*Thu, 12 Dec 2024*

## **ISRO demonstrates indigenous engine capability ahead of Gaganyaan mission**

Demonstrating its advanced engineering capabilities, the Indian Space Research Organisation (ISRO) on Thursday announced that it has achieved a key milestone in its space programme with

the successful sea-level hot test of the CE20 Cryogenic Engine which has been developed indigenously. The space agency conducted the tests late last month on November 29 in Mahendragiri, Tamil Nadu and announced its success post analyses.

“The C20 cryogenic engine successfully passes a critical test in ambient condition, featuring restart enabling systems—a vital step for future missions,” ISRO said on X.

The CE20 engine powers the upper stage of ISRO’s LVM3 launch vehicle, which has played a pivotal role in missions like Chandrayaan-2, Chandrayaan-3, and is expected to be integral for the upcoming Gaganyaan mission, India's first human spaceflight attempt. According to ISRO so far the engine has successfully powered the upper stage of six LVM3 missions. For Gaganyaan mission its usage will help in enhancing the payload capability of the launch vehicle. The space agency in a statement explained that, “Testing the CE20 engine at sea level poses considerable challenges. This test was done with a multi element ignitor and water injection system at nozzle divergent to prevent flow separation.”

It added that an innovative Nozzle Protection System was devised that has paved the way for “a cost-effective and less complex procedure for acceptance testing of the cryogenic engines.”

“Restarting a cryogenic engine is a complex process. Major challenges are vacuum ignition without nozzle closure and use of multi-element igniter.” ISRO has demonstrated vacuum ignition of the CE20 engine without nozzle closure in earlier ground tests.

<https://economictimes.indiatimes.com/news/science/isros-c20-cryogenic-engine-passes-critical-test-featuring-restart-enabling-system/articleshow/116254273.cms>



*Fri, 13 Dec 2024*

## **Gaganyaan’s radio equipment to undergo tests at ESA’s German facility**

The European Space Agency Thursday announced that the key radio equipment that will be deployed for Gaganyaan mission — India’s first attempt at sending humans into space — will soon undergo tests at one of its facilities in Germany. This pace up in activities pertaining to Gaganyaan comes after the Indian Space Research Organisation (ISRO) signed a Technical Implementing Plan (TIP) with the ESA on December 4.

Under the TIP, the ESA will facilitate Ground Tracking Support for all Gaganyaan missions. On December 6, ISRO and the Indian Navy conducted the demonstration of ‘well deck’, a vital step in recovering the crew module upon its landing on sea surface.

The Gaganyaan mission will carry three Indian astronauts to about 400 km from the Earth’s surface for three days. Prior to the crewed flight, the ISRO has planned two uncrewed preparatory missions and a string of technology development and demonstrations — Gaganyaan-1 (G1) and Gaganyaan-2 (G2). G1 involves testing the safe re-entry of the spacecraft and its orientation upon

its dive into the sea. Gaganyaan-1, expected to be launched in early 2025, will receive support from ESA's Kourou station where a 15m antenna is operating both in S-band and X-band wavelengths. Kourou is located near Cayenne, the capital of French Guiana.

Gaganyaan's radio equipment, about the size of a suitcase, has been shipped to the Ground Segment Reference Facility (GSRF) in Germany. Specific compatibility tests will be performed to ensure that the Gaganyaan's radio transmitter and receiver effectively communicate with ESA's antenna in Kourou in South America. Managed by the European Space Operations Centre (ESOC), the GSRF is used by ESA mission development teams to experiment and tinker with systems which are under development. Here, tests of new or upgraded software or hardware are performed and experiments to identify, address and resolve issues that could potentially affect the missions are conducted. Previously, tests for missions such as Rosetta, Gaia, ExoMars Trace Gas Orbiter, BepiColombo and Solar Orbiter were performed at GSRF.

"The Network Operations Centre at ESA's ESOC mission control centre in Germany will coordinate a series of radio antennas in the global European Space Tracking network (Estrack) that will enable ISRO track, monitor and command the Gaganyaan crew module throughout each mission," said Octave Procope-Mamert, Head of Ground Facility Operations at ESA.

The German Aerospace Center (DLR) and the Spanish National Institute for Aerospace Technology (INTA) will join in tracking the future Gaganyaan missions.

<https://indianexpress.com/article/india/gaganyaans-radio-equipment-undergo-tests-germany-9721664/>

## THE TIMES OF INDIA

*Thu, 12 Dec 2024*

### **IITB Prof's model to test semiconductor's reliability makes waves**

Whether it is a smartphone or a jet, therein lies a silent enabler: the semiconductor chip. Now, a name from India's IIT Bombay has made a mark with his research on this device which powers the digital world. Professor Souvik Mahapatra, a senior faculty in the electrical engineering department, has been felicitated by his peers for the creation of the "Mahapatra Reliability Model."

Chips, often just millimetres wide, house billions of nanoscale transistors and predicting how transistors degrade over time is an intricate science. For over two decades, Prof. Mahapatra has studied complexities of transistor reliability, helping optimise their performance, power, and longevity.

"Semiconductor chips are ubiquitous—they are the unseen engines driving our mobile phones, laptops, washing machines, and even aeroplanes," Mahapatra said.

"But their reliability—ensuring devices perform as intended over time—is paramount. Imagine your video game stalling months after purchase; reliability is what prevents that."

He said, "The degradation of transistors happens gradually, becoming significant only near the end of a product's life."

"We use accelerated stress tests and theoretical models to predict these outcomes during the development phase. "Chandra Mouli, vice president of Device Technology at Micron, hailed Mahapatra's role.

"His understanding of transistor wear-out mechanisms has been invaluable in assessing and mitigating lifetime degradation," he said.

Mahapatra's collaboration with Synopsys led to his model being integrated into the Sentaurus TCAD software for evaluating transistor reliability. Synopsys recently presented Mahapatra with an award at the International Electron Devices Meeting in San Francisco.

<https://timesofindia.indiatimes.com/city/mumbai/iitb-profs-model-to-test-semiconductors-reliability-makes-waves/articleshow/116261002.cms>



*Thu, 12 Dec 2024*

## **Hanle, Ladakh identified as prime location for quantum communication ground station**

Researchers from the Raman Research Institute (RRI) in Bengaluru have mapped out the optimal locations to beam out quantum signals into space from the Indian subcontinent. The prime candidate for demonstrating the cutting-edge technology has been identified as the Indian Astronomical Observatory (IAO) in Hanle, Ladakh. Hanle hosts the first dark sky reserve in the country, a region where light pollution is restricted for a better view of the stars. Demonstrations of uplinks and downlinks with satellites are necessary for developing the capabilities of transmitting finicky quantum signals through the atmosphere, and the Hanle has been identified as a suitable location.

Hanle is a dry and cold desert, not too unlike Mars. The temperatures in winters can plummet to as much as  $-30^{\circ}\text{C}$ , as a result of which there are low levels of atmospheric water vapour and oxygen, both of which are beneficial for communication and astronomy. Head of of the Quantum Information and Computing (QuIC) lab at RRI, Urbasi Sinha says, "Hanle offers all required natural settings suitable for setting up a ground-station and undertaking quantum communication over long distances. India offers such vast and a variety of geographical terrains and this diversity could potentially make this work as a universal template that could be applied anywhere in India or

across the globe. This versatility could make the research invaluable for future quantum satellite projects worldwide”.

Factors considered to choose the ideal siteThe researchers also evaluated the temperature, humidity, atmospheric pressure and meteorological parameters of Mt Abu in Rajasthan and the Aryabhata Institute of Observational Sciences (ARIES) facility in Nainital, Uttarakhand. The researchers considered the locations for communicating with a satellite in Low Earth Orbit, at a maximum altitude of 500 kilometres. The satellite would first be commanded to find and point towards a beacon signal before the quantum communications. The researchers then examined the potential degradation of signals, and determined that Hanle was the best location.

<https://www.news9live.com/science/hanle-ladakh-identified-as-prime-location-for-quantum-communication-ground-station-2771955>

© The news items are selected by Defence Science Library, DESIDOC from Print Newspapers and Authentic Online News Resources (mainly on DRDO, Defence and S&T)