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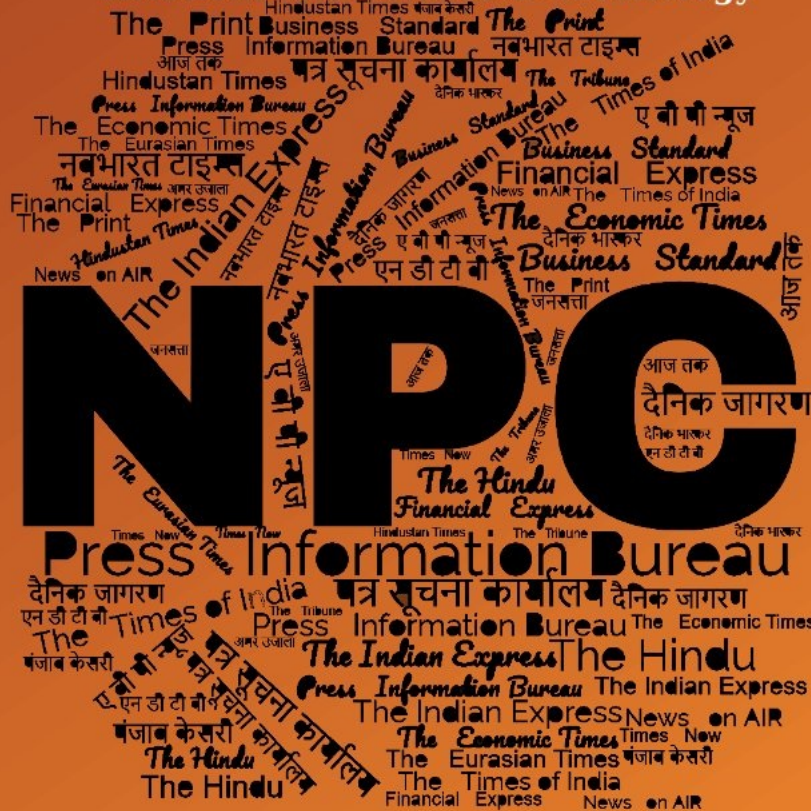
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# समाचार पत्रों से चयित अंश Newspapers Clippings

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

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Mon, 06 Nov 2023

## India Initiates Long-Range Surface-To-Air Missile Programme

India has initiated a programme to develop long-range surface-to-air missile (LRSAM) systems for the Indian Air Force (IAF) to strengthen its air-defence capabilities, an official at India's state-owned Defence Research and Development Organisation (DRDO) told *Janes* in early November. According to the official, the LRSAM programme – termed 'Project Kusha' – is “in the initial phase of design”.

The LRSAM system will be designed and developed by the DRDO, and it is envisaged to detect and neutralise aerial threats such as stealth fighters, aircraft, ballistic and cruise missiles, precision-guided munitions, and unmanned aerial vehicles (UAVs) to ranges of nearly 350 km, the official added. The Indian Ministry of Defence (MoD) has cleared five units of the LRSAM systems – with similar capabilities to the Russian S-400 Triumf self-propelled SAM systems – for the IAF, a recent clipping from the DRDO's newspaper issue said.

According to India's state-owned broadcaster DD News, the programme is valued at over USD2.5 billion, and it seeks to build a three-tiered air-defence system with interceptor missiles capable of hitting at 150, 250, and 350 km.

The IAF aims to operationally deploy the system by 2028–29, DD News added. The DRDO recently developed the medium-range surface-to-air missile (MRSAM), a domestic variant of the Israeli-developed Barak-8 SAM system, in collaboration with Israel Aerospace Industries (IAI), Rafael Advanced Defense Systems, and several local private and public sector companies.

The MRSAM – already inducted and deployed with the Indian army, air force, and navy – can intercept multiple targets at ranges up to 70 km.

<https://www.janes.com/defence-news/news-detail/india-initiates-long-range-surface-to-air-missile-programme>



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

**Ministry of Defence**

*Mon, 06 Nov 2023*

### **Crest Unveiling Ceremony ‘Surat’ Indian Navy’s Project 15b Warship**

The crest of Indian Navy’s latest, under-construction, guided missile destroyer ‘Surat’, was unveiled by Shri Bhupendra Patel, the Chief Minister of Gujarat, at a vibrant ceremony in the city of Surat, in presence of Adm R Hari Kumar, the Chief of the Naval Staff, and senior dignitaries and officials from the State Government and the Indian Navy.

The crest of Surat depicts the famous lighthouse at Hazira (Surat), located at southern entrance of the Gulf of Khambhat. Built in 1836, this lighthouse was one of the first lighthouses in India. The Asiatic lion on the crest, which is also the state animal of Gujarat, symbolises the ship’s majesty and strength. Equipped with the latest advancements in naval warfare technology and combat capabilities, the warship Surat stands as a powerful embodiment of the navy’s commitment to maritime security and national defence. This is well depicted by the wavy sea depicted on the crest. On the threshold of joining the Indian Navy’s fleet, Surat promises to serve as a formidable sentinel, safeguarding the nation’s maritime frontiers and upholding its strategic interests in the region

Named after the vibrant city of Surat, renowned for its rich maritime history and shipbuilding legacy, the warship Surat also embodies the enterprising and self-reliant spirit of its namesake.

The fourth ship of the indigenously designed and constructed Project 15B (Vishakhapatnam Class) destroyers, Surat represents a remarkable leap in naval technology and capabilities. The ship has been constructed using innovative block construction methodology, wherein the ship’s hull has been assiduously assembled at distinct geographical locations before being integrated at the Mazagaon Dock Limited (MDL) in Mumbai. While also highlighting intricate precision and engineering excellence, this methodology underscores the growing refinement of India’s shipbuilding prowess.

Project 15B follows the success of the Project 15A (Kolkata Class) and serves as a testament to India’s steadily growing naval prowess. Construction of the warship Surat exemplifies the nation’s

dedication to indigenous cutting-edge maritime technology and commitment to strategic military advancements.

Slated to join active service next year Surat and her able bodied crew will serve the nation proudly in the decades to come. In addition to the Chief Minister and the Chief of Naval Staff, the vibrant ceremony of the unveiling of the ship's crest was attended by VAdm Dinesh Kumar Tripathi, Flag Officer Commanding in Chief Western naval Command, RAdm Anil Jaggi, Flag Officer Commanding Gujarat Naval Area, senior officers of the Indian Navy and several luminaries of Surat city from the political and commercial fields.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1975179>



*Mon, 06 Nov 2023*

## **PM Modi hold talks with Iranian President; discusses Israel-Hamas conflict, Chabahar Port**

Indian Prime Minister Narendra Modi engaged in a telephone conversation with Iranian President Ebrahim Raisi, during which he voiced his apprehensions about terrorist activities and civilian casualties, amidst the Israel-Hamas conflict.

In the course of their discussion, PM Modi underscored the significance of averting an escalation, guaranteeing the uninterrupted distribution of humanitarian assistance, and expediting the restoration of peace and stability in the region. The two leaders also celebrated the advancements in bilateral cooperation between India and Iran, particularly regarding the Chabahar port.

"Good exchange of perspectives with President Raisi of Iran on the difficult situation in West Asia and the Israel-Hamas conflict. Terrorist incidents, violence and loss of civilian lives are serious concerns. Preventing escalation, ensuring continued humanitarian aid and early restoration of peace and stability are important. Welcomed the progress in our bilateral cooperation, including on the Chabahar port," PM Modi posted from his official handle.

Since Israel's declaration of war on Hamas following the terror group's outbreak of chaos in southern Israel on October 7, PM Modi has maintained frequent telephone dialogues with global leaders. On Friday, Prime Minister Modi had a conversation with UAE President Mohammed Bin Zayed, where they discussed their concerns regarding the escalating situation and the loss of civilian lives in the midst of the Israel-Hamas conflict.

PM Modi also spoke to the Egyptian President Abdel Fattah al-Sisi about the counter-offensive following the October 7 terror attacks and the ongoing international efforts to deliver humanitarian aid to the conflict-torn Gazan region.

<https://ddnews.gov.in/international/pm-modi-hold-talks-iranian-president-discusses-israel-hamas-conflict-chabahar-port>



## **As China Woos Bhutan, Delhi & Thimphu pledge to Boost Ties**

PM Narendra Modi met visiting Bhutanese King Jigme Khesar Namgyel Wangchuck amid growing concerns over China's efforts to forge a bond with Thimphu and reaffirmed India's "abiding commitment" to its unique ties of friendship and cooperation with Bhutan. The two countries also announced a slew of measures to expand trade and connectivity.

According to a joint statement issued after the meeting, in which the king and PM agreed India-Bhutan ties were based on utmost trust, Modi reiterated India's continued and full support to the socio-economic development in Bhutan based on the priorities of the Bhutanese government and "as per the vision of His Majesty".

As the king expressed appreciation for India's support and handed an invite to Modi to visit Bhutan, which the PM accepted, the two sides announced 9 steps to expand ties in trade, technology, cross-border connectivity, mutual investments, education and people-to-people contacts.

These included the final location survey for the proposed cross-border rail link between Assam and Bhutan, immigration check-post to facilitate entry and exit of third country nationals by land route for connectivity and tourism, and designation of an additional railway trade route for trade between the two countries. India also agreed to positively consider Bhutan's request for concessional financing in skill development and capacity-building.

India will also provide bridge financing for the period between 12th and 13th Five-Year Plans of Bhutan for India-assisted projects and schemes. In other announcements, they underscored commitment to safeguarding the ecological diversity of the region, allocate additional MBBS seats for Bhutanese students in medical colleges in Assam and double the outlay under Ambassador's scholarship for Bhutanese students pursuing higher education in India.

"The visit of His Majesty, the King of Bhutan reinforced the long-standing tradition of regular high-level exchanges between the two countries," said the joint statement.

The two sides reiterated the importance of cooperation in the hydropower sector, and their commitment to advancing it further. "The leaders agreed to extend the existing India-Bhutan energy partnership in hydro to non-hydro renewables, such as solar as well as green initiatives for hydrogen and e-mobility. The Indian side assured Bhutan of necessary technical and financial support for projects in these areas," said the statement.

The leaders agreed that India and Bhutan enjoy long-standing and exceptional bilateral ties characterised by "utmost trust, goodwill, and mutual understanding at all levels". "The two leaders expressed satisfaction with the significant progress made since their last meeting in April 2023. They positively assessed expanding partnership between the two countries, including in new areas

of connectivity in its broadest form, cross-border trade infrastructure, trade and mutual investments, energy, health, education, skill development, space technology, and environment conservation, and close people-to-people contacts,” said the joint statement.

<https://timesofindia.indiatimes.com/india/as-china-woos-bhutan-delhi-thimphu-pledge-to-boost-ties/articleshow/105022369.cms?from=mdr>



*Tue, 07 Nov, 2023*

## **6th India-Malaysia Joint Commission Meeting to be held in New Delhi today**

External Affairs Minister Dr S Jaishankar and his Malaysian counterpart Dr Zambry Abdul Kadir will co-chair the 6th India-Malaysia Joint Commission Meeting in New Delhi today. The Joint Commission Meeting will review the progress of Enhanced Strategic Partnership in the area political, defense, security, economic, trade and investment, health, science and technology, culture, tourism and people to people ties. Both sides will also discuss regional and multilateral issues of mutual interest.

Dr. Zambry Abdul Kadir is also scheduled to call on Vice President Jagdeep Dhankhar today. Ahead of the Joint Commission Meeting, India-Malaysia Senior Officials' Meeting was held in New Delhi yesterday. It was co-chaired by Secretary (East) in Ministry of External Affairs Saurabh Kumar and Deputy Secretary General in Ministry of Foreign Affairs of Malaysia Ahmad Rozian Abd Ghani. Both sides held a preparatory meeting for the 6th India-Malaysia Joint Commission Meeting.

<https://newsonair.gov.in/News?title=6th-India-Malaysia-Joint-Commission-Meeting-to-be-held-in-New-Delhi-today&id=470859>

# THE ECONOMIC TIMES

*Mon, 06 Nov 2023*

## **EU appoints Military Attache in Mission in India**

The European Union (EU) has posted a military attache in its mission in India, in reflection of growing defence and strategic cooperation between the two sides, people familiar with the matter said on Monday. It is for the first time that the EU appointed a military attache to India. The overall strategic ties between India and the 27-nation EU have been on an upward trajectory in the last few years. India is among a select group of countries where the EU has appointed military attaches.

The EU has been focusing on expanding military cooperation with India and many other countries in the Indo-Pacific. In February last year, the European Union vowed to enhance its defence and security engagement with its partners in the Indo-Pacific and announced the extension of the concept of a coordinated maritime presence in the northwest Indian Ocean. The 27-nation bloc came out with a detailed note on its strategy for the IndoPacific following a meeting of its ministerial forum in Paris in February last year. In September, 2021, the EU unveiled its strategy for boosting economic, political and defence ties in the Indo-Pacific.

<https://economictimes.indiatimes.com/news/defence/eu-appoints-military-attache-in-mission-in-india/articleshow/105018807.cms>



*Tue, 07 Nov 2023*

## **Expert Explains: What is a National Security Strategy and why India must have one**

**by Biswajit Dasgupta**

A long wait is said to be coming to an end as the National Security Council Secretariat (NSCS) sets about drafting India's first written National Security Strategy (NSS), according to a report published in The Indian Express on November 4. India has never had such a document — and the debate on whether one is needed is of fairly recent origin, spanning the last two decades or so.

### **Should India have a publicly articulated National Security Strategy?**

In other words, does the public need to know how the Indian government plans to handle national security in all its dimensions? Of course, they must know.

It is basic to their existence and well-being as a body of people that is called the nation. In the absence of a publicly articulated National Security Strategy, there would be a lack of cohesion and common understanding, and diverse interpretations of what may be in the interest of national security.

It is entirely possible that we do not have one so far because we did not, till now, have the strategic maturity and confidence to articulate such a strategy. The growing maturity of our military and strategic communities and changes in our apex security management structure are recent phenomena. This is one of the main reasons why we have now mustered the courage to draft a National Security Strategy.

### **What will it take to draft such a strategy?**

The NSS would have to embrace all aspects of security. Military security would be only one aspect of the canvas, which would include economic, internal, diplomatic, human, climate, food, water, and every other conceivable form of security necessary for the well-being of India's people.



Military and internal security would be a significant enabler for every other kind of security to be guaranteed. The management of defence and internal security would therefore need to be robust and articulated well.

The all-encompassing nature of this strategy would require wide consultations. It is beyond the capability and understanding of a handful of people who staff the NSCS, however brilliant they may be, individually and collectively. Each of the numerous aspects of security is in itself multidimensional, and would impact the manner in which we conduct business.

The preparation of the NSS, therefore, would necessarily be an iterative process. It would need many reiterations of inter-ministerial consultancy and gamed several times over before it is ready for consideration by the Cabinet Committee on Security (CCS) which would then accord final approval.

The NSS would contain several features that may not be appropriate for public release. There will thus be a need for two versions, one for the public and one strictly for a classified readership.

The rising stature of India and its growth projections over the next few decades have made it a significant player in world affairs for the present and the foreseeable future. Many countries see their futures as intertwined with India's growth story. Additionally, complex global, regional, and local geopolitical scenarios will ensure detailed scrutiny and comment on our publicly articulated NSS. It, therefore, has to be an involved exercise with ownership and approval at the highest levels of government.

### **What would be the guiding principles of the NSS?**

Doctrine normally precedes strategy. A doctrine is a set of established or agreed principles that guide actions. A strategy is a plan of action that emanates from doctrine.

While doctrines are more permanent than strategies, they must also remain flexible to cater for changing paradigms and major conceptual shifts. Doctrines must be reviewed periodically to ensure that they remain relevant and do not become dogmas. And with every update in doctrine, the strategy must be reviewed.

Another feature of doctrine and strategy is that they must be taught in order to facilitate a common understanding among planners and practitioners of national security. This is yet another need that the NSS must fulfill.

We are embarking on the drafting of a National Security Strategy without having specifically articulated our National Security Doctrine. However, we do have the longest written Constitution in the world. The drafters of the NSS would do well to prepare for themselves a set of guiding principles culled out from this Constitution that would aid in formulating a strategy that is in consonance with those principles.

### **What doctrines and strategies must the NSS be mindful of?**

There is a hierarchy of doctrines. Doctrines at the national strategic level are formulated and approved at the highest echelons of government — for example, the Nuclear Doctrine. Lower doctrines are formulated at the military-strategic, operational, and tactical levels for different levels of war-fighting (in the military) or tackling internal disorder (for police/ paramilitary forces).

Each higher doctrine and its accompanying strategy must guide the formulation of associated lower doctrines. The NSS must serve this critical doctrinal function.

To illustrate this point with an example from the military: the NSS should become the starting point for theaterisation of the Indian armed forces. It should, therefore, state that the Indian armed forces will be constituted into theatres, with the Theatre Commander (TC) being responsible to the Chief of Defence Staff (CDS) for all military operations conducted in the theatre.

The NSS should also provide doctrinal clarity on all aspects that will enable the CDS to draft his Theatre Doctrines, which in turn will guide the TCs to formulate their theatre strategies. Every other lower doctrine or strategy will take guidance from and be in consonance with the higher doctrines. Therefore, apart from lateral consultations, vertical consultations may also be prudent while formulating not just the NSS but lower doctrines as well.

### **How soon can the NSS be expected?**

It is not known how much progress the drafters of the NSS have made so far. This is not an exercise to be carried out in haste; at the same time, there should be no hesitation in putting out an NSS Mark 1 and keep refining it as implementation progresses, and changing circumstances force adaptations. As mentioned earlier, no doctrine or strategy is cast in stone.

So, while we must have an NSS, it will be wise to make haste slowly. Two years from today could be a reasonable timeframe.

<https://indianexpress.com/article/explained/expert-explains-national-security-strategy-9016083/>

## **THE TIMES OF INDIA**

*Tue, 07 Nov, 2023*

### **US, China hold rare talks on Nuclear Arms Control**

The United States and China on Monday held rare talks on nuclear arms control, a new step to ease mistrust ahead of an expected presidential summit next week. The talks - the first meeting specifically on nuclear arms between the two powers since president Barack Obama's administration come as the United States voices alarm over China's growing nuclear arsenal.

No breakthroughs were expected at the one-day talks in Washington, which follow a visit by Foreign Minister Wang Yi.

"We have continually called on the PRC to substantively engage on arms control issues and reducing strategic risk," State Department spokesman Vedant Patel told reporters, referring to the People's Republic of China.

"This engagement will continue efforts to responsibly manage the relationship and ensure competition does not veer into conflict," he said. President Joe Biden is expected to meet his Chinese counterpart next week on the sidelines of an Asia-Pacific summit in San Francisco in the first meeting between the leaders of the world's two largest economies in a year. Monday's talks were taking place between Mallory Stewart, the US assistant secretary of state for arms control, verification and compliance, and Sun Xiaobo, the director general of the Chinese foreign ministry's

arms control department. In Beijing, foreign ministry spokesman Weng Wenbin said that the two sides will "exchange views on a wide range of issues such as the implementation of international arms control treaties and non-proliferation."

The Pentagon in a congressionally mandated report last month said that China was developing its nuclear arsenal more quickly than the United States earlier anticipated. China possessed more than 500 operational nuclear warheads as of May 2023 and is likely to have more than 1,000 by 2030, it said. The United States currently possesses about 3,700 nuclear warheads, trailing Russia's roughly 4,500, according to the Stockholm International Peace Research Institute, which counts 410 warheads for China.

Former president Donald Trump's administration, concerned about China's growing arsenal, insisted on including Beijing in a successor to the New START treaty on nuclear weapons between Russia and the United States. President Joe Biden on taking office agreed to extend New START to February 2026.

<https://timesofindia.indiatimes.com/world/us/us-china-hold-rare-talks-on-nuclear-arms-control/articleshow/105021287.cms?from=mdr>



*Mon, 06 Nov 2023*

## **Poland to roll out SitaWare across Abrams fleet, support vehicles**

Systematic's SitaWare Frontline command-and-control (C2) software will be installed in all of the Polish Land Forces' Abrams main battle tanks (MBTs), and the service will also receive the company's SitaWare Headquarters system, *Janes* has learnt.

The 18th Mechanised Division's M1A1 and M1A2 System Enhancement Program version 3 (SEPV3) Abrams MBTs and various support vehicles will be equipped with the mounted battle management system (BMS) – SitaWare Frontline – Systematic announced on 2 November.

A company spokesperson told *Janes* that SitaWare Headquarters – which functions at higher levels of command – is included as part of the contract in order to support connectivity with the Polish Armed Forces' other C2 systems.

It was previously reported by *Janes* that the M88A2 Heavy Equipment Recovery Combat Utility Lift and Evacuation System (HERCULES) armoured recovery vehicles (ARVs) and M1110 Joint Assault Bridges (JABs) would be equipped with SitaWare Frontline as well as the M1A2 SEPV3 Abrams variant.

This latest announcement reveals that all of the Polish Land Forces' 366 Abrams MBTs – 116 M1A1 Firepower Enhancement Package (FEP) and 250 M1A2 SEPV3 – will be equipped with

SitaWare Frontline. The first 14 M1A1 Abrams were delivered in June 2023, including three M88A2 HERCULES vehicles, while the first M1A2 SEPv3 deliveries are expected from 2025.

Along with the Abrams MBTs, the Polish Land Forces will eventually receive 38 M88A2 HERCULES and 25 M1074 JABs, rather than the originally requested M1110 variant. A Systematic spokesperson confirmed to *Janes*

<https://www.janes.com/defence-news/news-detail/poland-to-roll-out-sitaware-across-abrams-fleet-support-vehicles>



*Mon, 06 Nov 2023*

## **Defense & Security 2023: Thailand progresses D11A development**

The Defence Technology Institute (DTI) – an agency under the Thai Ministry of Defence – has furthered the development of the D11A, a local version of Elbit Systems' multicalibre Precise and Universal Launching System (PULS).

A DTI official told *Janes* at the Defense & Security 2023 exhibition in Bangkok on 6 November that development of the first D11A prototype was completed in late 2022 and that the Royal Thai Army (RTA) has recently set up a test and evaluation committee to assess whether the system meets the force's tactical requirements.

The official said an initial requirement for the RTA is for the D11A to be able to fire surface-to-surface Global Positioning System (GPS)-guided rockets within the RTA's inventory that have a range of 40 km. The capability at longer ranges is expected to be achieved incrementally.

A decision by the RTA's test and evaluation committee is expected before the end of the current fiscal year, which ends in September 2024.

Subsequent stages of the procurement will include an assessment by the RTA standardisation committee and then contract signing, which is dependent on the available budget.

In tandem with this process, the DTI also plans to build a second D11A prototype in line with a development agreement signed with the RTA several years ago.

This programme was previously delayed by supply chain challenges related to the Covid-19 pandemic.

<https://www.janes.com/defence-news/news-detail/defense-security-2023-thailand-progresses-d11a-development>

*Mon, 06 Nov 2023*

## **Canada claims unsafe PLA Interception of Helicopter**

Canada's Department of National Defence (DND) has said that Chinese combat jets aggressively intercepted a helicopter operating with the Royal Canadian Navy (RCN) over the South China Sea.

In a statement issued on 3 November, the DND said a Sikorsky CH-148 Cyclone helicopter operating from HMCS *Ottawa* (FFH 341) was intercepted by two People's Liberation Army (PLA) Shenyang Aircraft Corporation (SAC) J-11 combat aircraft on 29 October.

“Though the initial encounter was safe, two subsequent encounters were deemed unsafe,” the DND said. “With successive passes, one jet eventually conducted a pass over the CH-148 Cyclone helicopter with little separation, causing the helicopter to experience turbulence and take appropriate actions to remain safe.”

According to the DND, another J-11 intercepted the same CH-148 as it conducted a second sortie later in the day. During this second sortie, the J-11 “launched flares directly in front of the helicopter”, the DND said. “[The] helicopter[’s] pilot had to manoeuvre to avoid the flares and reduce the risk of ingesting a flare into the helicopter’s rotor and intakes,” the DND said, adding that the helicopter was undamaged during the encounter.

<https://www.janes.com/defence-news/news-detail/canada-claims-unsafe-pla-interception-of-helicopter>

## **Science & Technology News**



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

**Ministry of Science & Technology**

*Mon, 06 Nov 2023*

## **Newly Developed Affordable Radiative Paint can Reduce Electricity Consumption for Cooling Buildings**

A new affordable, eco-friendly radiative cooling paint, specifically engineered to effectively cool structures like buildings, pavers, and tiles in hot weather conditions can diminish electricity consumption and offer essential relief during sweltering summer days.



Cooling technologies are an integral part of human life due to the increased global warming and urban heat island effects. Active cooling devices such as air-conditioners (AC), electric fans, and refrigerators consume enormous electrical energy. Along with this vast energy demand, active cooling devices also emit a large proportion of greenhouse gases, leading to an increase in the earth's surface temperature.

To circumvent these challenges, radiative cooling technology has been developed that provides cool surfaces by emitting thermal radiation directly to the cold universe (around 3K) through the atmospheric transmission window (8 - 13  $\mu\text{m}$ ) without electricity consumption. As a result, passive daytime radiative cooling (PDRC) has drawn much interest recently for many applications such as pavers, tiles, building and automobile cooling, solar cell, and personal thermal management.

At the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) in Bengaluru, researchers, led by Professor Bivas Saha in collaboration with Prasanna Das, Sourav Rudra, Krishna Chand Maurya, have introduced a groundbreaking radiative cooling paint. Developed from a novel MgO-PVDF polymer nanocomposite, this low-cost, solution-processed paint demonstrates significant cooling capabilities with an high solar reflectivity and infrared thermal emissivity.

The experimental findings by scientists of JNCASR, an autonomous institute of the Department of Science and Technology, have shown that the surface temperature of a treated paver decreases by approximately 10°C under intense sunlight-- almost double of the reduction that conventional white paints give.

The researchers developed polymer nanocomposite paint by using a simple solution-processed technique. They used ultra-white and ultra-emissive magnesium oxide (MgO)-polyvinylidene fluoride (PVDF) nano-composite prepared from materials that are earth abundant, cheap, non-toxic and non-harmful. Initially, polymer powders were transformed into a solution using solvent and then, dielectric nanoparticles are dispersed inside the polymer matrix.

After preparation, different spectroscopic techniques were used to characterize the optical properties of the prepared polymer nanocomposite paint. By measuring the temperature of the paint using a thermocouple, excellent cooling performance was demonstrated under hot sunlight.

The optimized MgO-PVDF with a dielectric nanoparticles resulted in large solar reflectance of 96.3% and a record high thermal emission of 98.5% due to Mg—O bond vibrations, and other stretching/bonding vibrations from the polymer. The nanocomposite paint exhibited water-resistant hydrophobic properties and can be easily coated on pavers, wood sticks and so on with high uniformity and good adhesion.

“Our innovative research has led to the development of a cost-effective and environmentally sustainable paint capable of reducing surface temperatures (including buildings, tiles, pavers, etc.) by over 10°C during hot summer days. With the straightforward application of this paint, we envision it offering significant respite during scorching summer days, benefiting both urban and rural areas alike.” said Prof. Bivas Saha, Associate Professor at the Jawaharlal Nehru Centre for Advanced Scientific Research.

The work published in *Advanced Material Technologies*, a Wiley publication, can motivate industries to implement the radiative cooling paint for building cooling applications. These findings in-

dicating that the adoption of MgO-PVDF cooling paint in construction can significantly curtail the reliance on air conditioning, thus contributing to a reduction in associated environmental impacts.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1975071>



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

**Ministry of Science & Technology**

*Mon, 06 Nov 2023*

## **CSIR-CSIO and KAMP: Fostering Tomorrow's Scientific Minds through an Inspiring Journey with Over 100 Young Scholars"**

On November 6th, 2023, CSIR-Central Scientific Instruments Organisation, Chandigarh, hosted a dynamic Scientific Excursion in collaboration with the Knowledge and Awareness Mapping Platform (KAMP), welcoming over 100 enthusiastic students from Gudha International School, Rajasthan.

This transformative excursion delved deep into the realms of science, technology, and innovation, igniting a spark of curiosity and passion for scientific exploration among the students.

The event commenced with an insightful overview of CSIR-CSIO Chandigarh, led by Ms. Aashita Swami (Project Associate, CSIR-CSIO) providing the students with a comprehensive understanding of the institute's pioneering work. Esteemed scientists and researchers from CSIR-CSIO then captivated the young minds through interactive lectures and engaging activities. Notable contributions came from Dr. Aparna Akula (Principal Scientist, CSIR-CSIO) shedding light on 'Intelligent Sensing Systems,' Mr. Ujjawal Prakash Bhushan (Ph.D Engineering, BMA Department, CSIR-CSIO) exploring 'Multi-sensor Fusion-based Dynamic Obstacles Detection,' and Mr. Rahul Jha (IDDP Scholar, CSIR-CSIO) delving into 'Intraoral Dental Inspection for Early Caries Detection.'

Following the enriching lectures, a stimulating Science-based Competition, orchestrated by Ms. Meenakshi Srivastava (Project Associate, CSIR-CSIO) and Ms. Isha (Project Associate, CSIR-CSIO) spurred the students' competitive spirits, encouraging teamwork and innovative thinking.

During the visit, students gained an opportunity in understanding the intricacies of laboratory operations and the functionalities of various instruments.

Concluding the event, Mr. Aniket Arora (Nodal Officer for Outreach Activities at KAMP) expressed heartfelt gratitude to Dr. Neerja Garg (PI Jigyasa, principal scientist, CSIR-CSIO) and Dr. Pooja Devi (Co PI Jigyasa, principal scientist, CSIR-CSIO) key figures behind the success of the Jigyasa program.

He emphasized the significance of such initiatives, underlining KAMP's unwavering belief in the power of experiential learning to nurture a profound interest in science and other advancements in India. Furthermore, he shared exciting upcoming activities, including an online Knowledge Sharing Session with ISRO-URSC on November 23rd, a scientific Excursion at CSIR-IITR in December, and a series of planned engagements designed to immerse students in real-world scientific endeavors across eminent CSIR laboratories and research organizations in India.

### **About CSIR-CSIO**

CSIR-Central Scientific Instruments Organisation (CSIO), a prominent constituent unit of the Council of Scientific & Industrial Research (CSIR), stands as a pioneering national laboratory committed to the research, design, and development of scientific and industrial instruments. With a multidisciplinary approach, CSIO plays a pivotal role in fostering the growth of the Instrument Industry in India across diverse applications.

### **About KAMP**

KAMP, an alliance spearheaded by the Council of Scientific & Industrial Research (CSIR) - National Institute of Science Communication and Policy Research (NIScPR) and industrial partner M/S Nysa Communications Pvt. Ltd. (NCPL), endeavors to cultivate creativity, meaningful learning, critical reading, and thinking skills, aiming to unveil the inherent potential of students and ignite their passion for scientific inquiry."

<https://pib.gov.in/PressReleasePage.aspx?PRID=1975141>



*Mon, 06 Nov 2023*

## **IIT Madras opens offshore campus in Zanzibar, Tanzania**

The Zanzibar campus of the Indian Institute of Technology Madras was formally launched on Monday. Currently around 50 students have been admitted in the institute - 35 for Bachelor of Science in Artificial Intelligence and Data Science course and 15 students for M. Tech in AI and DS courses. The final details of admissions will be released shortly, according to the institute authorities.

Around 500 applications were received for the courses and students were selected through an eligibility test and interview. Among the UG students around 15 are Indians and 8 from India have joined the PG programme. As many as 22 students in the UG programme are from Africa and around 40% of the students are women.

Zanzibar President and chairman of the Revolutionary Council Hussein Ali Mwinyi inaugurated the campus. Adolf F. Mkenda, Minister for Education Science and Technology of the United Republic of Tanzania, Lela Mohamed Mussa, Minister of Education and Vocational Training in Zanzibar besides Binaya Srikanta Pradhan, the Indian High Commissioner to Tanzania, former IIT Madras directors M.S. Ananth and Bhaskar Ramamurthi and Dean of School of Engineering and Science and Director-in-charge of Zanzibar campus Preeti Aghalayam were present in person.

Prior to the inauguration, Institute director V. Kamakoti told media persons that the entire exercise of setting up the campus took around six months from the time discussion began with that government till the Ministry of External Affairs signed the agreement with that government.

While the IIT would only invest in sharing its knowledge, the entire expense of setting up the campus will be borne by that government. In the next five years the institute has planned to start five new programmes, including PG and UG.

The courses planned are BS in Electronic Sciences, a B.Tech or M.Tech in Ocean Engineering and a programme in mining. “We have admitted 30 students from Africa for fellowship so that they can be trained to become faculty (for the offshore campus),“ Mr. Kamakoti said.

The existing temporary campus is in Bweleo district, which is 15 km south of Zanzibar town. The institute has also urged public sector banks to facilitate loans for Indian students who wish to study in the Zanzibar campus. The cost of UG education at the campus is around USD 12,000.

The Zanzibar government had committed around ₹1,000 to ₹1,500 crore and 232 acres of sea facing land to set up a campus, Mr. Kamakoti said. The permanent campus will be built by the governments of Zanzibar and India.

<https://www.thehindu.com/news/national/tamil-nadu/iit-madras-opens-offshore-campus-in-zanzibar-tanzania/article67503984.ece>

