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# समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO  
Technologies, Defence Technologies, Defence Policies,  
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### **IIT-BHU, DRL-DRDO to Work Jointly on Medical, Technical Needs of Security Forces**

IIT-BHU director profPramod Kumar Jain said the institute in association with the Defence Research Laboratory (DRL-DRDO), Tezpur Assam will work together in solving the unmet technical and medical needs of the security forces. The IIT-BHU, Varanasi had signed an MoU with Defence Research Laboratory (DRL-DRDO), Tezpur Assam on Friday to foster the rate (speed) of drug discovery and development projects for military veterans to strengthen the defence front of India.

Prof Jain and DV Kamboj, director, DRL, Tezpur had signed the MoU.

“This MoU will give a much-needed platform to work together to solve the unmet technical and medical needs of the security forces in the field, cross-pollination of ideas to nurture new technologies and their adoption and dissemination for wider benefits of security forces at large,” Jain said.



*The MoU was signed by IIT-BHU director profPramod Kumar Jain and director of DRL-DRDO DV Kamboj.*

He further said, “One of the key components is continuous education of security officers to keep them abreast of the latest in research and technologies relevant to the security needs.” As per the pact, DRL-DRDO will provide advanced and unique research facilities that will enable the faculty and scholars of IIT-BHU to conduct cutting-edge research in the area of drug development and transform it into a centre of excellence. DRDO scientists and engineers will

work with the academic research faculty and scholars in addressing the different scientific problems to find innovative solutions.

Faculty members and researchers in various engineering and science departments of IIT-BHU will participate in the research programme/projects under the MoU. The institute will provide cooperation and consultancy, duly supported by research for feasibility studies and prototype development. "The partnership between DRL-DRDO and IIT-BHU will significantly boost the efforts towards enhancing sustenance capability, obsolescence management, indigenization and achieving self-reliance," Jain added.

<https://www.hindustantimes.com/cities/lucknow-news/iitbhu-drl-drdo-to-work-jointly-on-medical-technical-needs-of-security-forces-101658596301610.html>

## Defence News

## Defence Strategic: National/International



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

**Ministry of Defence**

*Sat, 23 Jul 2022 8:46 PM*

### **Maritime Partnership Exercise between Indian Navy and Japan Maritime Self Defense For**

A Maritime Partnership Exercise (MPX) was conducted between Japan Maritime Self Defense Force and Indian Navy on 23 Jul 22 in Andaman Sea. INS Sukanya, an offshore patrol vessel and JS Samidare, a Murasame class destroyer, undertook various exercises including seamanship activities, aircraft operations and tactical manoeuvres as part of the operational interaction. The two countries have been carrying out regular exercises in IOR towards reinforcing maritime association. The exercise were aimed at enhancing interoperability and streamlining seamanship and communication procedures. This exercise is part of the ongoing efforts between the two navies towards ensuring safe and secure international shipping and trade in Indian Ocean Region.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1844278>

*Fri, 22 Jul 2022*

## **In a Major Policy Reform, CGDA Gets New Mandate to Audit Military and DRDO for Performance and Efficiency**

Military reforms are just not about setting policies for the procurement and military structuring as much it is about suggesting systemic improvements towards establishing inherent efficiency of the entire logistics ecosystem; critical assessment of economy, efficiency and effectiveness of programs, systems, activities and procedures. How does that work for the world's second largest military? Also, at USD 76.6 billion, USD India's military expenditure was the third highest in the world in 2021. The size of the military and its staggering expenditure make the planning and management a complex task and much difficult to measure and audit its outcome. Until now the whole system worked only on the transactional values of the military expenditure—capital as well as revenues.

To address such anomalies, in a sweeping reform, Ministry of Defence (MoD) has brought in the new elements – Performance and Efficiency Audit– aimed at recommending systemic improvements. On July 14, MoD issued an order to the Controller General of Defence Accounts (CGDA) to include performance and efficiency audits of the activities undertaken by the defence services and organisations. The scope and the conduct of auditing based on “performance” and “efficiency”, for the first time, extend to capital equipment, weapon systems, and platforms. It will measure and audit the objective and independent information, highlighting the shortcomings in planning, implementation, systems affecting outcomes in specific and quality of expenditure in general.

The Defence Accounts Department, headed by the Controller General of Defence Accounts is mandated to carry out internal audit of all expenditure and receipts besides accounting and payment functions. Secretary (Defence Finance) functions in the dual capacity of representative of Ministry of Finance in the field of Defence Expenditure and as Chief Accounting Officer for the Defence Services, discharging this responsibility through the CGDA. Controller General of Defence Accounts as chief of Internal audit support Defence Secretary.

How crucial is the role of this branch of audit is evident that various critical reports have often drawn maximum attention of the media and Parliament in the post 1990 era for some of the Audit Reports and paras presented to Parliament. In 1989, it was C&AG's Report on Bofors that created a furor in press and Parliament. In 2001, it was C&AG's Report on Kargil War purchases (Operation Vijay). Other Reports that drew widespread attention were: 'Design and Development of Main Battle Tank'; Development of Multi Barrel Rocket Launcher System (the Report appeared in 1999); and Aircraft Accidents in Indian Air Force (Report of 1998).

### **Performance and Efficiency Audit in Ministry of Defence**

In order to strengthen the Overall Internal Oversight and Risk Management Framework, it has been decided to broaden the present mandate of Internal Audit conducted by CGDA from the transaction-based compliance audit to outcome-based Performance/Efficiency Audit, aimed at recommending systemic improvements of a holistic nature. The Scope and mandate of

Performance and Efficiency Audit to be carried out by CGDA is outlined. Performance and Efficiency Audit will be aimed at highlighting the shortcomings in planning, implementation, systems affecting outcomes in specific and quality of management in general. According to the statement in the Order issued, this will constructively promote economy, effectiveness and efficiency in governance by creating the necessary environment of accountability and transparency in the organization and ensure that the operations are effectively carried out through continuous improvement.

The greater aspect of such process is actually about moving beyond the confines of compliance and regulatory Audit. Performance & Efficiency Audit will focus on objective and reliable examination of whether programs, systems, activities or organizations are performing in accordance with the pre-assigned roles/objectives and whether there is room for improvement. The new dimension brought into the standard auditing practices will be a complex exercise especially in the world of military. As per the internal guidelines, the broad indicative areas will spill over the all aspect of defence procurement. The auditing will incorporate the critical scrutiny of provisioning review exercise and provisioning cycle including assessment of optimum inventory levels, review of scaling & authorization, and also examination of all business processes involved in IT systems for handling logistics, inventory management, provisioning cum procurement and tendering prioritization of procurement.

The performance of various organizations handling provisioning, procurement, tendering and quality assessment will be scrutinized. The Efficiency audit will broaden the scope of contract management, inventory, Financial Planning & budget and processing, with an objective to improve the entire procurement and expenditure system. Another crucial aspect is the inclusion of maintenance and services of Platforms to ascertain the technical life of the Assets. The mandate of audit further broadens towards the utilization of assets of all types constructed out of funds provided from the Consolidated fund of India

#### **Who's who in the Apex Committee (ACPEA)**

Further, to make the Internal Audit mechanism more responsive and to incorporate a robust risk management framework for strengthening Internal Oversight, an Apex Committee on Performance & Efficiency Audit (ACPEA) has been constituted within the Ministry. The Defence Secretary will chair the committee along secretary defence (Finance). The apex committee is constituted with the vice chiefs of the three services, chief of integrated staff committee (CISC), Director General (Acquisition), CGDA and DG (R&M) Defence Research and Development Organisation (DRDO). Other key members include additional Secretary, DMA and Additional Secretary, DoD.

#### **The auditing functionality**

The main functions of Apex Committee on Performance & Efficiency Audit (ACPEA) involve the monitoring and taking actionable notes on Key observations of Performance Audit Reports. The key element if such conduct is to identify the specific areas for the Performance and Efficiency audit. But the most crucial element is just not about the audit findings but recommend actionable measures to rectify the anomalies if there is any. Such findings will be presented to defense minister. The objective is to strengthen the mechanism to address overall Internal Oversight and Risk Management Framework in defence procurement and related areas.

## **The complex framework**

The detailed procedure and approach for carrying out such audit, including the broad structure of Audit teams will be worked out by CGDA. It will be a complex task. Due to sensitivity considerations involved, Audit of Defence Services is somewhat different than other audits. The difference is not so much in regard to the audit procedures and systems but mostly in regard to audit response to the concerns of Defence Ministry regarding sensitivity of some audits. Another special feature of Defence Audit Reports is that unlike the Audit Reports of other wings, no press briefs are issued in case of Defence Audit Reports. While the Internal Audit Teams carrying out Performance and Efficiency Audit will have unfettered access to information, documents and files, the key challenge will be to assimilate the various intangibles.

This is indeed a much broader mandate for CGDA from its existing template of conducting transaction-based compliance audit. For example, auditing military platforms for its performance and efficiency will require military experts at specific level; even the setting the elements and standards for the auditing of such systems and platforms will be a huge task. According to CGDA, the frame work is being worked out and will be presented to the APEX committee to set the final guidelines to conduct audit on such parameters. This mandate for audit in the Defence Accounts Department is derived from the Military Finance Department in India, which was working under the crown. The mandate as above includes audit of sanctions accorded by all authorities lower than Govt. of India including Services headquarters.

<https://www.financialexpress.com/defence/in-a-major-policy-reform-cgda-gets-new-mandate-to-audit-military-and-drdo-for-performance-and-efficiency/2602692/>

# **Business Standard**

*Sat, 23 Jul 2022*

## **MoD Bans Import of 18 Major Defence Platforms**

*By AjaiShukla*

The Ministry of Defence (MoD) revealed in Parliament on Friday the names of eighteen major defence platforms that can no longer be imported. Instead, they will henceforth be indigenously designed and developed (D&D) by domestic industry. "In continuous pursuit of achieving self-reliance in defence manufacturing under 'Aatmanirbhar Bharat Abhiyan' and in sync with the announcement made in the Union Budget 2022-23 that allocated 25 per cent of the defence R&D budget for industry-led R&D, 18 major platforms have been identified and announced by the MoD for industry led D&D," stated the MoD in a written response to a Parliamentary question. These include army platforms, such as a light-weight tank, self-healing minefields and "plug-and-play housing" for soldiers posted at extreme altitudes. The navy platforms including a 127 millimetre naval gun for capital warships, while the air force platforms include the long-awaited Indian Multi-Role Helicopter (IMRH) and a stand-off airborne jammer.

Defence industry watchers point out that, starting from August 2020, the MoD has issued three lists of defence equipment, the import of which is embargoed. The August 2020 list incrementally bans the import of 101 items, with the embargo growing wider each year. In June 2021, an additional list of 108 defence items was issued by the MoD, progressively banning their

import. Invoking “Atmanirbhar Bharat” repeatedly, the second list – termed “Positive Indigenisation List” – took up to 209, the number of defence items that must be compulsorily procured from Indian companies, the number rising each year out to 2025. On New Year’s Day, 2021, 69 items from the first list were embargoed for import. On January 01, 2022, another 60 items came under the ban. Another 25 will be embargoed for import at the end of 2022; 25 more at the end of 2023; another 21 at the end of 2024 and nine on the New Year of 2026.

It is unclear how this latest import embargo list dovetails with the previous two lists. The defence industry is sceptical about whether these lists create any pressure to indigenise. The army is already procuring the K9 Vajra system that Larsen & Toubro (L&T) builds under a South Korean licence outside Pune, so banning the import of tracked guns is superfluous. Meanwhile, the DRDO, along with private firms Kalyani Group and Tata Aerospace and Defence, is already developing towed artillery guns and Pinaka multi-barrelled rocket launchers. Similarly, the army’s entire requirement of tanks has long been built at Chennai and its infantry combat vehicles at Medak. Banning the import of platforms that are already being built in India serves little purpose.

Similarly, there is little purpose in embargoing the import of naval warships, when most of them are already being built in Indian shipyards. According to official navy figures, of 48 warships under construction, 46 are being built in India; only two frigates are being constructed in Russia. Similarly, Hindustan Aeronautics Ltd (HAL) is already building the majority of the air force’s fighter and trainer aircraft in India, with the recent exception of the Rafale. Banning the import of aircraft such as the Tejas Mark 1A and the Light Combat Helicopter serve little purpose, since these are indigenously designed and manufactured aircraft, as is the HTT-40 basic trainer aircraft. “These 18 platforms (announced on Friday) have been distributed between four indigenous routes prescribed in the Defence Acquisition Procedure-2020, namely, Make-I, Make-II, Special Purpose Vehicle (SPV) and Innovations for Defence Excellence (iDEX),” said the MoD. “These 18 platforms have been identified after extensive consultations between the services, DRDO and the defence industry,” said the MoD.

<https://www.ajaiashukla.com/2022/07/mod-bans-import-of-18-major-defence.html>



*Mon, 25 Jul 2022*

## **India to have Joint Theatre Command of Tri-Services, Says Rajnath Singh**

Rajnath Singh was speaking during a programme organised by the Jammu Kashmir People's Forum in Jammu to pay tributes to the martyrs of the Indian Armed Forces. Defence Minister Rajnath Singh on Sunday said a joint theatre commands of tri-services would be set up to enhance coordination among armed forces. He was speaking during a programme organised by the Jammu Kashmir People's Forum to pay tributes to the martyrs of the Indian Armed Forces, news agency PTI reported. "Keeping in view (joint operations as seen in Operation Vijay in Kargil), we have decided to set up joint theatre commands (in the country)," Singh said. HT had reported in February last year that India was set to begin the initial roll-out of its long-awaited



theaterisation plan, with the Air Defence Command and the Maritime Theatre Command likely to be launched by May 2020, though the commands would take two years to be fully operational. Theaterisation has the full backing of the government.

In June 2021, the government formed an eight-member panel to fine-tune the theaterisation plans and bring all stakeholders on board, especially the Indian Air Force, for speedy roll-out of the new joint structures. The Indian military's theaterisation model, a long-awaited reform, will have inbuilt flexibility to fall back on the current command and control structures to deal with any contingency during the transition phase, an official said. Stabilisation of theatre commands could take up to five years, and it is critical to ensure that there is a mechanism to swiftly return to the pre-theaterisation status quo if a crisis unfolds when the restructuring is underway. Singh, paying homage to martyrs, also said the country cannot forget their supreme sacrifice to safeguard the country's territorial integrity and sovereignty. "It is the duty of the society and the people to give their utmost respect to the martyrs and their families," he said.

"Whatever support you can offer, do to for their families. It is the responsibility of each citizen," he added. The defence minister also said India is moving quickly from being the world's largest importer of defence equipment to an exporter. "India was the world's largest importer (of defence products). Today, India is not the world's largest importer but is among the top 25 nations engaged in defence exports," he pointed out. Singh said the country has started defence exports worth ₹13,000 crore and it has fixed a target to increase it to Rs 35,000 to Rs.40,000 crore by 2025-26.

<https://www.hindustantimes.com/india-news/rajnath-singh-announces-setting-up-of-joint-theatre-commands-of-triservices-101658658809337.html>



Sun, 24 Jul 2022

## India to Manufacture Indigenous Made Carbine for Defence Forces in a Step towards 'Atmanirbhar Bharat'

Yes, it is about atmanirbharata or self-reliance, but more importantly, it is one of the first signs of "jointness," or the army, navy and air force planning to work together in designing and developing a weapon. The *Caracal*, a carbine that the Indian army was planning to buy from the *United Arab Emirates*, has been put aside for the moment, at least and there are plans for an indigenously made carbine for the army, navy and air force. Instead of the 95,000 odd Caracal carbines, there is a plan for 4.2 lakh carbines to be made in *India*. Initial estimates suggest that the allocation for the project is going to be over Rs. 5,000 crores.

The production of over 4 lakh carbines will take time. Which is why there is a plan to allot the contract to two manufacturers, whether in the private or the public sector. This means that the L1 (or the firm with the best bids may get to make over 2 lakh carbines, but the firm that is L2 will get the remaining amount. This will ensure that the weapons are quickly delivered. A decision about splitting of contracts if they take longer than 3 years is yet to be taken but could be in the coming days. This is also something the armed forces favour.

The indigenous manufacture of something like a carbine has been discussed earlier. The argument, sources said, is simply this: why import something like a carbine that is not very high-tech. Why can't it be made in India, even by collaborating with a foreign firm? Such a process has already been initiated with plans for the joint manufacture by India and *Russia* of the AK-203 (*Kalashnikov*) assault rifle in a VIP constituency in *Uttar Pradesh*. A similar project for the carbine is entirely possible and the *defence ministry* is expected to take a decision on this very shortly.

<https://www.timesnownews.com/india/india-to-manufacture-indigenous-made-carbine-for-defence-forces-in-a-step-towards-atmanirbhar-bharat-article-93084510>

# The Tribune

*Fri, 22 Jul 2022*

## **India, China to Make Fresh Bid to Resolve LAC Standoff**

A couple of high-level meetings between India and China in Central Asia will make further attempts to resolve the standoff in Ladakh. External Affairs Minister S Jaishankar is expected to meet his Chinese counterpart Wang Yi on the sidelines of the Shanghai Cooperation Organisation (SCO) foreign ministers' meeting to be held on July 28 and 29 in Uzbekistan where the issue will be on the top of the agenda. His visit will be followed by Defence Minister Rajnath Singh's visit to Uzbekistan next month to attend the SCO defence ministers' meeting. He is likely to meet his Chinese counterpart General Wei Fenghe with the aim to ease border tensions in eastern Ladakh.

These efforts to resolve the border issue bear a semblance to a similar bid made on the sidelines of SCO Ministerial meetings in 2020 when Singh and Jaishankar had met their counterparts in Moscow on September 4 and 10. At his last meeting with Wang earlier this month, Jaishankar had called for an early resolution of all outstanding issues along the LAC by disengagement and de-escalation. "India is engaged in talks with China, focusing on a path to resolve outstanding issues in eastern Ladakh that involves disengagement, de-escalation and some degree of stability in the border areas for overall improvement in the ties," MEA spokesperson Arindam Bagchi had said on Thursday.

<https://www.tribuneindia.com/news/nation/india-china-to-make-fresh-bid-to-resolve-lac-standoff-414816>

# The Tribune

Sat, 23 Jul 2022

## China Building Infra for Pak Army at LOC, Indian Agencies Tell Government

Indian security agencies have informed the government that a Chinese construction company had set up its office in Pakistan-occupied Kashmir (PoK) and was controlling work being executed in areas adjoining Muzaffarabad and Athmuqam. The company had been renovating bunkers and building new ones since May, the agencies said. Chinese firms have carried out construction in PoK in the past too, but it's the first time such a project has been undertaken right at the LoC. The area fell under Pakistan army 32 division in Kel sector abutting PoK's Neelum valley. The sites have been camouflaged, something done in the past too.

Beijing had earlier sent its men and machines to Pakistani soil opposite Bikaner in Rajasthan when a forward airbase was upgraded and more than 350 stone bunkers and border outposts were refurbished. The justification for the rising Chinese presence has centred around the "threats" to the China-Pakistan Economic Corridor and the Chinese nationals working on various projects.

<https://www.tribuneindia.com/news/nation/china-building-infra-for-pak-army-at-loc-indian-agencies-tell-government-415084>



Fri, 22 Jul 2022

## BEL Signs Rs. 250-Cr Deal with Defence Ministry to Supply Anti-Submarine Warfare Systems

IAC MOD C has been indigenously developed by BEL in association with DRDO

Bharat Electronics (BEL) announced the signing of a contract worth Rs.250 crore with the Ministry of Defence, Government of India, for the supply of nine integrated ASW complex (IAC) MOD 'C' Systems. IAC MOD 'C' is an integrated anti-submarine warfare (ASW) system for all surface ships of the Indian Navy. It computes fire control solutions and facilitates the firing of ASW weapons such as torpedoes and rockets. The fire control system can be customised to meet the requirements of any platform of interest—from small to large ships configuration.

The system also facilitates counter-measure capability for incoming torpedoes through the decoy launching system. IAC MOD C has been indigenously developed by BEL in association with the Defence Research and Development Organisation (DRDO). BEL is a multi-product, multi-technology, multi-unit conglomerate offering products and systems in the areas of Military

communications, radars, missile and naval systems, electronic warfare and avionics, C4I systems, electro-optics, tank electronics and gun or weapon system upgrades and electronic fuses in the defence segment. Its non-defence business segment includes homeland security and smart cities, solar, satellite integration and space electronics, railways, and more.

<https://www.thehindubusinessline.com/companies/bel-signs-250-cr-deal-with-defence-ministry-to-supply-anti-submarine-warfare-systems/article65671073.ece>



Sat, 23 Jul 2022

## **Government Lists out Major Manufacturing of Defence Products in Parliament**

**Ships and Submarines:** Various classes of Frigates, Corvettes, Missile Boats, different class of Destroyer (P-15, P-15A, P-17, P-17A), Submarine (SSK Class Scorpion class), Fast track crafts, Dredger, Landing Craft Utility, Missile Craft Survey vessels, Offshore Patrol Vessels, Tugs and Fuel Barges. **Missile and Under Water Weapons:** Anti-Tank Guided Missile (Milan, Konkurs, Invar), Akash Missile System, Medium Range Surface to Air Missile, Astra Missile, Pinaka Rocket system, Light weight Torpedo, Heavy Weight Torpedo, Anti-Torpedo Decoy Launching Systems, Counter Measures Dispensing System and various types of Launchers. **Electronic Equipment:** C4I systems, Communications System, Electronic Warfare and Avionic System, Electro Optic System, Naval System, Radars, Tank Electronics, Thermal engine sight, larger bases equipment, fuses, different types of Ruggedized cables and harness of battle tanks.

**Armoured and Heavy Vehicles:** Main Battle Tanks (T-72, T-90, Arjun), Infantry Combat Vehicles, BMP-II, Artillery Guns of different calibre (81 mm Mortar, 105 mm, 122 mm, 125 mm, 130 mm and 155 mm), Medek Gun CRN-91, AK 630 M Gun, High mobility vehicles (4x4, 6x6 8x8, 10x10 & 12x12), Heavy Recovery Vehicles, Vehicles Launched Assault Bridge, Dozers Excavators, Motor Graders, Trailers, Towing Tractors, Armoured Ambulance, Multi-Purpose Vehicle and other Ground Support / Handling Equipment for Fighter aircrafts. **Air Borne Platforms:** Fighter Aircrafts (SU30MKI, Light Combat Aircraft, Civilian aircraft (Dornier Do-228), Helicopters (Advanced Light Helicopter Dhruv, Light Utility Helicopter (LUH), Light Combat Helicopter (LCH), Cheetal and Chetak), Engines and accessories and over haul of variety of Aircrafts/Helicopter/Engine. **Ammunitions:** Large calibre ammunitions (105 mm, 122 mm, 125 mm, 130 mm and 155 mm), Medium calibre ammunitions (20 mm, 30 mm, 81 mm, 84 mm), Small calibre ammunitions (5.56 mm, 7.62 mm & 9 mm), Explosive, Propellants Bombs and Rockets.

**Metallurgical Materials:** Special Alloys, Special Grade Alloys Steel, Aluminium alloys, Titanium alloys, forging and casting for vital defence equipment, and Armour for various applications. **Small Arms:** 7.62x39 mm Trichy Assault Rifle, 12.7 mm Air Defence Gun, 33 mm Cannon, MAG Gun 7.62 mm, LMG 5.56 mm, Carbine 9 mm, JVPC 5.56 mm, Revolver .32m, .32 Pistol, 7.62x51 Sniper, 5.56 INSAS, 9mm Pistol, 7.62x39 GHAATAK and 12 Bore Pump

Action Gun. Other Items: Clothing items and accessories, different varieties of Parachutes (Man carrying, Pilot, Break Supply, Drop, Heavy Drop and illuminating).

Defence products manufactured by the DPSUs undergo Final Acceptance Inspection (FAI) by the Quality Assurance agencies viz Directorate General of Quality Assurance (DGQA), Directorate General of Aeronautical Quality Assurance (DGAQA) and Director General of Naval Armament Inspection (DGNAI) as per the Final Acceptance Procedure. Moreover, manufacturing units of Hindustan Aeronautics Limited (HAL), Bharat Electronics Limited (BEL), Bharat Dynamics Limited (BDL), Mazagon Dock Shipbuilders Limited (MDL), Garden Reach Shipbuilders and Engineers limited (GRSE) and Goa Shipyard Limited (GSL) are certified to the contemporary International Quality Management standards such as AS9100D, EMS 14001, ISO 9001 etc.

<http://www.indiandefenseneews.in/2022/07/government-lists-out-major.html>



*Sat, 23 Jul 2022*

## **Defense Ministry to Consider Major Change in Purchase of Weaponry to Ensure Quick Supply to Armed Forces**

In the wake of 'atmanirbharata' or self-reliance, the defence ministry is considering a major change in the purchase of weaponry, that will ensure that the armed forces get their supplies as quickly as possible. The proposal is to ensure contracts to not just the 11 bidder (the manufacturer that has the lowest price after fulfilling all the requirements), but also the bidder that was 12 (the participant that came second in the bidding process). While no decision has been taken as it, sources said this is under active consideration. There are several major advantages for going to both 11 and 12. Most importantly, two manufacturers will be able to work on the same weapon system and their combined capacities, being more than the capacity of one, the production of a large order will happen sooner rather than late.

This means that the armed forces will get their weapon systems earlier than if only one manufacturer was involved. It will also ensure that more Indian firms, both private and public, will get the experience of making defence equipment over a period of time. This could apply to deals where the delivery time is three years or more. Of course, the candidate that is 12 has to match the 11 bidder in terms of price. It isn't clear what percentage of the product will be made by the 11 bidder and what percentage by the 12 bidder, but a 60:40 ratio is being talked about as a ballpark figure. This is a move that has been supported by the armed forces but a defence ministry decision is awaited, but if it does come through, it will be a major change from the '11 takes all' process over the years.

### **Emergency purchases**

Just after the Chinese entered the Galwan area in early May 2020, the defence ministry allowed the armed forces to make emergency purchases of specific weapon systems. This has been done earlier as well, particularly during wars, but this time the defence ministry is thinking of allowing

emergency purchases as the emphasis on atmanirbharata may leave some gaps in the arsenal of the armed forces. The emergency purchases are usually for small amounts of arms and ammunition (each weapon package should cost several hundred crores of rupees) just to ensure there is no shortage if there is an immediate necessity. The system worked very well two years ago.

<https://www.timesnownews.com/india/exclusive-defense-ministry-to-consider-major-change-in-purchase-of-weaponry-to-ensure-quick-supply-to-armed-forces-article-93071513>



*Fri, 22 Jul 2022*

## **Army Buys 20 Swedish Advanced Avalanche Rescue Systems to Detect Trapped Soldiers with Precision**

The Army has got deliveries of 20 avalanche rescue systems from a Swedish firm this month, nearly two years after it placed an order for the equipment as an emergency procurement, News18 has learnt. Defence sources told News18 that each of the rescue systems will be sent to different sector stores of the northern command. So far, only the Gulmarg-based High Altitude Warfare School (HAWS)—which runs specialised training programmes for mountain and winter warfare—had a limited number of rescue systems that were procured last year after successful trials. This is the first time that the Army has procured an advanced avalanche rescue system, a requirement that was long pending in the backdrop of a large number of soldiers getting killed in avalanches and landslides that have taken place in the last few years in the Siachen glacier and other high-altitude areas of Kashmir and the Northeast.

The Army has deployed basic avalanche victim detectors with ground-penetrating radars, but the advanced systems have the added advantage of transponders that makes detection faster, the sources said. The 20 avalanche rescue systems were an emergency procurement in 2020 and sources say that the avalanche which killed two Army personnel in Sikkim in May 2020 prompted the move.

### **How will the new systems work?**

Defence sources told News18 that the rescue systems provided by the Swedish firm Recco will have 150 transponders each. As per the company's website, the detector of the rescue system emits a radar signal that on hitting the reflector is echoed back to the detector, thus pointing the rescuer in the direction of the victim. The reflectors, the website states, are lightweight and passive transponders, comprising a diode and antennae, which do not require power or activation to work. It further states that as a detector gets closer to a reflector, the radar signals turn stronger, giving out the accurate location of the victim to the rescuer.

Sources say more such systems are already in use with civil organisations and the military is likely to procure more of them that could be used in a range of rescue operations aside from avalanches, to rescue victims trapped in landslides or building collapses. A defence source told News18 that each system will cater to 50 Army personnel at a time, with three reflectors attached

to a soldier when he is out on patrol or other operations in an avalanche-prone area. “When a person is trapped in snow, it is the first 25 minutes that are the most critical. His chances of survival go down after that. And when that happens, one does not know his position. Hence three transponders will be attached to a soldier,” the source said, adding that the new systems will aid in the effective detection of a soldier in such an eventuality.

### **Past Instances**

Despite high precautions taken by the Army in deploying troops to high-altitude avalanche-prone areas, a large number of soldiers are killed in snowslides. About 35,000 troops are deployed in high-altitude areas across the Army’s eastern and northern commands and there are over 2,000 troops posted in Siachen and nearby areas. Sixty-one people were killed this month in a landslide that hit Tupul in the Noney district of Manipur, of which half were Territorial Army soldiers. In February, an avalanche in Arunachal Pradesh killed seven Army personnel. Data shared by the government in Parliament in February 2020 showed that the Army had lost six personnel to avalanches in the Siachen Glacier in 2019, and 11 others in other parts of the country. In December 2019, the government told Parliament that 74 Army personnel had died in avalanches alone in the previous three years.

One of the reasons for such high casualties is the limited number of people available for recovery operations. The strength can be increased by getting additional troops from other posts using helicopters, but such operations are dependent on the prevailing weather conditions. The rescue teams carry avalanche victim detectors and coloured avalanche chords for easy detection of victims trapped in the snow. They also carry other equipment such as ice axes, shovels, ropes, and hypothermia blankets.

<https://www.news18.com/news/india/army-buys-20-swedish-advanced-avalanche-rescue-systems-to-detect-trapped-soldiers-with-precision-5601703.html>



*Sat, 23 Jul 2022*

## **Super Hornets may Pip Rafales in Indian Navy’s Carrier-Based Fighter Aircraft Procurement: ORF Report**

*By AdityaBhan*

With at least 26 aircrafts to be procured under the Indian Navy’s ongoing Multi-Role Carrier Borne Fighters (MRCBF) programme, and the initial requirement of 57 aircrafts creating the scope for acquiring greater numbers, the two contenders going head-to-head are the Rafale Marine (M) aircraft and the F/A-18 Super Hornet. The trials have concluded, with the Indian Navy having received the complete data from the tests conducted at the shore-based test facility (SBTF) in Goa. The time left to choose an aircraft and place orders is limited because INS Vikrant, India’s second aircraft carrier, is likely to be commissioned into the service of the Indian Navy on 15 August 2022. While INS Vikrant—India’s first indigenously constructed aircraft carrier—can host the Indian Navy’s MiG 29K’s, their underwhelming availability and

limited numbers imply that they cannot operate at their full potential from either of India's aircraft carriers. Hence, the urgent requirement for additional fighter aircrafts.

In a recent report favouring the F/A-18's chances, it is claimed that not only has the aircraft successfully completed the SBTf trials, but has also done so with payloads exceeding the Indian Navy's requirements for ski-jump take-off. The aircraft took off from the testing facility's ski jump carrying two AGM-84 Harpoon missiles, each weighing 550 kg, for a total loadout of 1,100 kg. The F/A-18 can fold its wings to fit into the elevators of INS Vikrant, while this is a complex task with the Rafale M because its wings cannot be folded. Also in favour of the Super Hornet is the availability of the twin-seater variant, F/A-18F, while the Rafales only come in single-seat configuration. Further, the F/A-18 can fold its wings to fit into the elevators of INS Vikrant, while this is a complex task with the Rafale M because its wings cannot be folded. While the Rafale M's wingspan of 35 feet 9 inches is less than the Super Hornet's 44 feet 8.5 inches, the latter's wingspan can be reduced to 30.5 feet after folding its wings, making it 5 feet less than the Rafale M.

Moreover, commonality of weapons and engines with Indian aircrafts also enhances the F/A-18's appeal. The Indian Navy's future twin-engine deck-based fighter shall initially use the F-414 engine, which is also used to power the Super Hornet. The aircraft also enjoys weapons commonality and interoperability with the Indian Navy's P-8I Neptune long-range multirole maritime patrol aircraft. In addition to these technical considerations, the recent approval of Countering America's Adversaries through Sanctions Act sanctions waiver for India by the United States (US), in context of the former's purchase of Russian S-400 air defence systems, could also act as a geopolitical catalyst for the Indian Navy's purchase of Super Hornets. This can be viewed as a confidence-building measure which is significant when viewed against the backdrop of the lack of mutual trust between the US and India in the past, and the lack of any such waiver for Turkey after it inked a deal to purchase the S-400 in 2017. In fact, Turkey was stripped off its fifth-generation F-35 aircrafts, as a result of the sanctions.

The scenario with respect to the Indian Air Force (IAF) is quite different from the Indian Navy, with the Rafale's M88 engine manufacturer having approached the Indian Ministry of Defence with a proposal to set up its largest aircraft engine maintenance, repair, and overhaul facility in India. This increases the likelihood of selection of the Rafale in the IAF's 114 multi-role fighter aircraft procurement. The aircraft also enjoys weapons commonality and interoperability with the Indian Navy's P-8I Neptune long-range multirole maritime patrol aircraft.

However, from the Indian Navy's perspective, the Block-III variant of the Super Hornet on offer is a decent aircraft given its lowest maintenance cost among all twin-engine tactical fighter aircraft operated by the US armed forces. Even in terms of its avionics, the Block-III variant is quite advanced, and India requires such fighter aircrafts to counter China which is building new variants of its carrier-borne J-15 fighter aircraft with J-15D as a designated electronic warfare (EW) platform. The E/A-18G Growler, which utilises the same airframe as the F/A-18 Super Hornets, can present the Indian Navy with formidable EW capabilities in times to come.

The US is constantly working to maintain its technological edge over China, and equipping newer technologies on the Super Hornets provide the US Navy an advantage over China's People's Liberation Army Navy (PLAN). The same weapon systems can subsequently be operated by the Indian Navy on its Super Hornets, with an eye on the increasing presence of the PLAN in the Indian Ocean Region. Hence, purchase of Super Hornets can herald the beginning



of a closer long-term relationship with the US, which shall be beneficial for India, and especially the Indian Navy, in countering the hegemonic blue-water ambitions of the PLAN.

<http://www.indiandefensenews.in/2022/07/super-hornets-may-pip-rafales-in-indian.html>



*Sun, 24 Jul 2022*

## **INS Tarkash Exercises with French Navy**

As part of deployment in Mediterranean sea, INS Tarkash participated in a Maritime Partnership exercise with FNS Commandant Birot, west off Sardinia Islands, Italy on 19 July 2022. The exercise included replenishment approaches, communication drills, VBSS operations, cross-deck visits and sea boat operations. As part of a cross-deck visit, Captain R Paillereau, Commanding Officer, FNS Commandant Birot, embarked INS Tarkash and interacted with Captain Abraham Samuel, Commanding Officer, INSTarkash. Personnel from INS Tarkash also visited the French warship and interacted with the ship's crew. The cross-visits helped the crew gain insight into operations conducted by both ships. The exercise terminated with the traditional steam past.

<http://www.indiandefensenews.in/2022/07/ins-tarkash-exercises-with-french-navy.html>



*Sun, 24 Jul 2022*

## **CAATSA Realities**

In 2018, India signed the \$5 billion S-400 Air Defence System deal with Russia. This was despite the relatively recent denomination of 'Major Defence Partner' status with the United States in 2016. But the environmental dynamics were different as a Republican (traditionally more pro-India on security) President i.e., Donald Trump, was in the White House and the Russia-Ukraine war had not broken out. Despite Trump's kneejerk threat of a US reaction, 'India is soon going to find out', his Secretary of State, Mike Pompeo, and the Secretary of Defence, James Mattis, had quietly played down the issue, contextualising India's strategic compulsions. At stakes were the Countering America's Adversaries Through Sanctions Act (CAATSA) imperatives that sought to sanction any nation that engaged in major defence deals with Russia, Iran or North Korea (amongst other factors). With India purchasing the sophisticated S-400 Air Defence System from Russia ~ it was tantamount to seriously red flagging the CAATSA provisions.

No less than the United States' own NATO (North Atlantic Treaty Organisation) ally, Turkey, was sanctioned under CAATSA for purchasing the same S-400 system. While the Damocles Sword of 'sanctions' remained on India, the United States took no punitive decision ~ soon, the dispensation changed to the Democrats under Joe Biden and the US-Russian equation went into a

further tailspin, with the war in Ukraine. As the Biden administration remained mired in the affairs of Ukraine, its frustrations with Russia and its strategic footprint globally, got even more sensitive ~ at a logical crossroad was the pending decision of a CAATSA sanction on India. However, despite the topical focus on Russia in Washington DC, there is absolutely no doubt on Capitol Hill on the primacy of China (rather than Russia) to challenge and reframe the world order with its expansionist ‘military-industrial’ establishment. US Secretary of State, Anthony Blinken, clearly posited Beijing ~ as opposed to Moscow ~ to pose, ‘the most severe long-term challenge to the international system’.

This crucial realisation offered the plausible window for New Delhi to frame its substantial argument for a waiver under CAATSA, even if the same was denied to a NATO ally i.e., Turkey. After all, it was under the Barack Obama administration with Vice President Biden in tow that the strategic semantic of ‘Pivot to Asia’ was permeated into the US’s foreign policy thinking. India, which was described by the then US Secretary of State, Hillary Clinton, as, ‘an indispensable strategic partner’ in the pivot framework ~ needed more appreciation, inclusion, and leeway in the US foreign policy calculus, as envisaged till then. Clinton had insisted, ‘So called pivot has been about creative diplomacy’ and, ‘there are limits to what hard power on its own can achieve. That’s why, from day one, I’ve been talking about smart power’! Smart power realistically implied as an instance recognising the differences and contexts, when assessing similar actions of ‘allies’ like Turkey and India ~ each had its own merits, nuances and sensitivities, and accepting the differences was key. India’s unique and complex situation and history resurfaced recently with Delhi abstaining on the UN vote condemning the Russian action in Ukraine.

There were security, economic and wider geopolitical considerations at stake for Delhi that prompted it to counter-intuitively join the ranks of China and 33 other nations to vote ‘abstain’, to the discomfort of the US-led bloc. The oft-banded ‘independent foreign policy’ of India can potentially frustrate the traditional American thinking of linearity and absolutism, e.g., Delhi’s regional and civilizational relationship with Iran will always test Washington’s binary approach of ‘with us or with them’. Capitol Hill can no longer afford to view the world from its own insular lens, and if it intends to meaningfully counter China, then understanding the Indian perspective, vulnerability and thinking needs to be inculcated. India is realistically the single biggest security-economic-diplomatic bulwark to China’s expansionism, even within the Quad (Quadrilateral understanding between the Sino wary United States, Japan, Australia, and India).

A significant sign of that vital understanding was seen in the successful voice vote of a legislative amendment in the US House of Representative, seeking waiver to Delhi against CAATSA, despite its purchase of the S-400 from Russia. Passed 330-99, the bipartisan amendment brought by Congressman Ro Khanna, which is yet to be formally passed in both the House and US Senate, signifies the difference in ‘allies’ i.e., India versus even a NATO member, Turkey. Khanna alluded to the significance of the same by hailing it as, ‘the most significant piece of legislation for US-India relations out of Congress, since the US-India Nuclear Deal’. It will certainly lay the foundation for a more nuanced appreciation of India’s position and concerns, as it navigates the sometimes seemingly contradictory journey of its ‘independent foreign policy’. Beyond civil politicians, the American security professionals had recognised this strategic reality as Admiral Harry Harris (former Commander of the US Indo-Pacific Command) had forewarned the US Senate Armed Services Committee in 2018: “Seventy percent of their military hardware is Russian in origin. You can’t expect India to go cold turkey on that.

I think we ought to look at ways to have a glide path so that we can continue to trade in arms within India” ~ this was much before the Chinese aggression in the summer of 2020 which added a completely new dimension to provide the said ‘glide path’. There is also an unsaid dimension of ‘trust’ when assessing an India versus a Turkey ~ the US has in recent times made several high-technology transfers of weaponry and other wherewithal, without any backlash of India ever passing the same to ‘adversaries’. Whereas there is an unmistakable ‘trust deficit’ with Turkey, and one of the immediate fallouts of CAATSA for Turkey was the renegeing of the deal pertaining to the fifth-generation fighter plane, F-35. On the contrary, India has enhanced its security relationship with multiple strategic agreements with the United States e.g., LEMOA, COMCASA and BECA. Considering the evolving churn of the emerging world order, the imminent waiver on CAATSA is both an augury and a necessity, given the strategic reality staring at the USA, wherein a powerful India is key for the so called ‘Free World’ bloc.

<http://www.indiandefensenews.in/2022/07/caatsa-realities.html?m=1>



*Fri, 22 Jul 2022*

## **China Tests a Rocket along LAC that can Hit Critical Indian Army Bases**

China's People's Liberation Army has reportedly tested a rocket near the Indian border along the Line of Actual Control (LAC) recently. News agency ANI quoted local media and wrote that the PLA tested an advanced Multiple Launch Rocket System (MLRS) at an altitude of more than 5,300 metres in the Xinjiang Region that could hit critical Indian military bases. China is likely to deploy the PHL-16 MLRS on the Sino-Indian border, the media reported added. "Chinese Army conducted a live-fire training assessment for a new type of rocket mine-laying vehicle, in the Xinjiang region close to the Indian border of the Xinjiang Military Region. The multiple launch rocket system is expected to be deployed in the Himalayas," as per the report.

The report comes hard on the heels of failed military talks between New Delhi and Beijing for the 16th time at the Chushul-Moldo border on Sunday. On Sunday, the standoff between India and China at several friction points in eastern Ladakh continued. Indian and Chinese troops carried out the disengagement process in several areas in the region as a result of high-level military talks. Yesterday, External Affairs Ministry Spokesperson Arindam Bagchi said India has been looking at this "graded" process to restore peace and tranquillity on the border for progress in bilateral relations. His comments came when asked at a media briefing about China's claim of so-called momentum of recovery in the relations and efforts to project that things between the two sides have changed following a meeting between the foreign ministers of the two countries in March.

"Of course, our point has been that if you can resolve the issues, particularly on disengagement, that would help in de-escalation and restoration of peace and tranquillity along the LAC in the Western sector. That would be the right step towards enabling progress in bilateral relations," he said. However, this week (on Wednesday), a video went viral that showed that the Chinese army carried out a military exercise with attack helicopters over Pangong Lake. The 33-second video

was telecast by the Chinese state media network. The video shows the army aviation brigade attached to the PLA Xinjiang Military Command carrying out an exercise over the world's highest saltwater lake, Pangong Lake, at an altitude of almost 4,350 metres.

China's state media reported that Z-10 attack helicopters joined the drills for the first time, unlike in the past when only transport helicopters carried border defense troops for patrol missions. Since May 2020, when the Chinese military tried to aggressively change the status quo on LAC in eastern Ladakh, both sides have been deployed opposite each other near Patrolling Point 15 which has emerged as a friction point. India has been looking at complete disengagement of troops from the friction points and moving back troops to the pre-May, 2020 situation in the entire sector. The last disengagement of troops on the LAC took place a year ago which led to the limited resolution of the standoff at Patrol Point 17A in Gogra.

Delhi and Beijing reached an agreement in February 2021 to disengage troops from the 135-km Pangong Lake, creating buffer zones until all outstanding border issues are resolved. Over 50,000 soldiers have been stationed since 2020 at forwarding posts along the LAC with advanced weapons to prevent a change in the status quo. The Indian Army has now allotted the Mathura-based 1 Strike Corps to the northern borders to keep a check on the PLA across the Line of Actual Control (LAC).

<https://www.livemint.com/news/india/china-tests-a-rocket-near-lac-that-can-hit-critical-indian-army-bases-11658447491890.html>



*Mon, 25 Jul 2022*

## **Australia Co-Hosts 2022 Indo-Pacific Chiefs of Defense Conference**

The 24th annual Indo-Pacific Chiefs of Defense (CHODs) conference will be held in Sydney from 25 to 27 July 2022. The conference will be co-hosted by Chief of the Defence Force, General Angus J. Campbell, AO, DSC and Commander U.S. Indo-Pacific Command, Admiral John C. Aquilino, providing senior military leaders with the opportunity to come together in the Indo-Pacific. The theme for this year's conference is Promoting the Rules-Based Order in the Indo-Pacific. The conference will focus on climate change and security implications for the Indo-Pacific; advanced technologies and their impact on security, and the implications of the conflict in Ukraine.

Admiral Aquilino said the conference advances conversations from last year's conference and quarterly CHODs events and will continue to highlight issues of strategic importance in the Indo-Pacific. "It's through continuous, open dialogue from engagements like this where our common set of values and our commitment to a secure and prosperous region bring us together to find more ways to increase interoperability and share information and technologies," Admiral Aquilino said. Thirty countries have been invited, with participants representing the Indo-Pacific, Europe, North American and South American regions and other counterparts.

Chief of the Defence Force, General Angus Campbell said co-hosting the conference in Sydney was a great opportunity. “Australia is honoured to co-host the 2022 Indo-Pacific Chiefs of Defense conference with the United States,” General Campbell said. “I look forward to advancing our shared interests in maritime security, health security, humanitarian assistance and disaster relief and information sharing, as we strive to create a more open, inclusive and resilient Indo-Pacific region.”

<https://news.defence.gov.au/media/media-releases/australia-co-hosts-2022-indo-pacific-chiefs-defense-conference>



*Mon, 25 Jul 2022*

## **China’s 2nd Stealth Fighter – Shenyang J-35 ‘Breaks Cover’; Expected to Operate from Type 004 Aircraft Carrier**

*By Ashish Dangwal*

Since its initial, poor-quality images started to surface last year, the aircraft’s development has garnered media attention. At the time, EurAsian described how Beijing could outfit its expanding fleet of aircraft carriers with stealth aircraft. The new pictures show the FC-31 stealth aircraft with the serial number 35003 and a gray tactical paint job. It also has toned down national insignia and other markings that can be seen in the pictures. The aircraft in question is reportedly the second flying prototype and third in all. On the top of the aircraft’s tail fin is a “flying shark” emblem resembling those on PLAN J-15 carrier-based fighter jets. This confirmed its planned naval role and indicated that it has been advancing steadily over the last few months. The latest image also shows that the aircraft has taken some design cues from the American stealth fighter.

The aircraft’s canopy is a front-opening, internally bowed with an integral bulkhead at the back, just like the F-35’s. A and C variants of Lockheed Martin’s F-35 Joint Strike Fighter have rear canopy arrangements that are broadly comparable. The J-35’s engines are particularly noticeable in the latest images of the aircraft. Experts believe this could be the first glimpse of the new WS-21 engines that power this aircraft. The WS-21, sometimes known as the WS-13X, is an enhanced version of the WS-13E. The WS-13E was a more potent afterburning variant of that domestic design. WS-13Es are reportedly used in place of the Russian-made RD-93s found on the first FC-31 prototype. The WS-13 series resembles the RD-93 in terms of both appearance and functionality.

The images also show some Chinese ground staff relaxing under the aircraft. According to defense analysts, this Chinese fighter will need a few more years to reach a mature stage. The J-35 fitted with WS-21 engines was reported to be making a formal appearance at this year’s Zhuhai Air Show, which is scheduled for November, according to a report from the Chinese state-run CCTV television network in June. Experts argue that it is currently difficult to determine how stealthy this design is. However, the continuous development of the aircraft shows Beijing’s intention to deploy a fifth-generation aircraft on its aircraft carriers shortly. In the

new image, an air data probe, often installed on aircraft undergoing various flight testing, is also seen mounted on the J-35.

### **A Crucial Point for China's Growing Naval Power?**

The PLA Navy (PLAN) and the People's Liberation Army Air Force (PLAAF) had previously rejected the Shenyang Aircraft Corporation (SAC)-built FC-31. The project, however, was believed to be resurrected as tensions with the US in the western Pacific increased under former US President Donald Trump. Even during the pandemic, it is said that China made significant progress on this program. "[The J-35 program] is the poster child for military opportunism the PRC has displayed during the COVID epidemic," a NATO intel officer previously told the Bulwark.

"Increased building up of their man-made islands in the South China Sea, escalation of bomber and fighter flights almost daily harassing the Republic of China [on Taiwan], wolf-warrior diplomacy, etc. It is all part of their game of 'how much can we get away with while you are locked at home and not paying attention,'" NATO intel officer added. The J-35's appearance in July 2021 had "caught the attention of US defense policymakers," according to a Breaking Defense report. A retired US naval intelligence officer, Capt. James Fanell told Breaking Defense that the J-35 could be another critical turning point in China's long-term quest for a blue-water carrier-based naval aviation capability. "We are seeing the goals of [now retired] Admiral Wu Shengli coming to fruition as the PLAN continues its transformation into the most powerful navy on the planet," he said.

Fanell further argues that the lack of transparency on the part of the Chinese government is why we keep being "surprised" by developments like the J-35. The naval forces of Beijing are expanding quickly. The FC-31 is also anticipated to take off and land on Type 004, China's planned fourth aircraft carrier, as previously reported by the EurAsian Times. This Type 004 aircraft carrier could be a nuclear-powered ship and would signal its entry as a true maritime power rivaling the United States. All in all, the latest images demonstrate the tenacity of China's aerospace industry and provide much more information about the aircraft than was previously known.

<https://eurasianimes.com/chinas-2nd-stealth-fighter-shenyang-j-35-comes-breaks-cover/>



*Sun, 24 Jul 2022*

## **MoD in Defence Boost with £60m Plan to Build 'Uncrewed' Helicopter Fleet – 100 New Jobs**

The multi-million-pound contract has been awarded to defence industry giant Leonardo, and see the jobs created at Leonardo's Yeovil site in Somerset. Jobs will be highly skilled positions aimed at delivering innovative defence capabilities to the UK's armed forces. The initial stages of the project will run to design and build an unmanned demonstrator aircraft for eventual deployment into the Royal Navy. The three-tonne demonstrator, less than a fifth of the weight of a Merlin helicopter, could provide an innovative alternative to existing aircraft for tracking

adversary submarines. Trials will test the capability of the aircraft to drop “sonobuoys”; small tube-shaped buoys that track and communicate submarine activity enabling the aircraft to alert a crewed helicopter and call for support if a submarine is located.

Designed to operate at a lower cost than crewed aircraft, capabilities derived from the demonstrator could also reduce the exposure of Royal Navy personnel to hostile threats. Speaking of the project, Minister for Defence Procurement Jeremy Quinn said: “The global threat is changing, and it is crucial we remain at the forefront of defence innovation. “Exploring cutting-edge, new defence capabilities through programmes with key British manufacturers, will help to ensure our Armed Forces are equipped to deal with the latest threats.” The aircraft if successful will be able to deploy for intelligence gathering and surveillance missions, freeing up crewed aircraft for alternative jobs.

Sharing his views on the project, Director Develop Royal Navy Rear Admiral James Parkin said: “Proving the benefits of larger uncrewed aircraft (rotary and fixed-wing) will be key to understanding whether such aircraft can effectively contribute to future Royal Navy capabilities, particularly for Anti-Submarine Warfare.” British Royal Navy submarine hunter HMS Portland just this week was reported to have tracked two Russian submarines in the North Sea as they breached the waters near Norway. Such equipment will provide valuable support for such operations in the future.

<https://www.express.co.uk/news/science/1645144/mod-uncrewed-helicopter-Leonardo-yeovil-jobs-britain-defence-news-latest>

## Science & Technology News



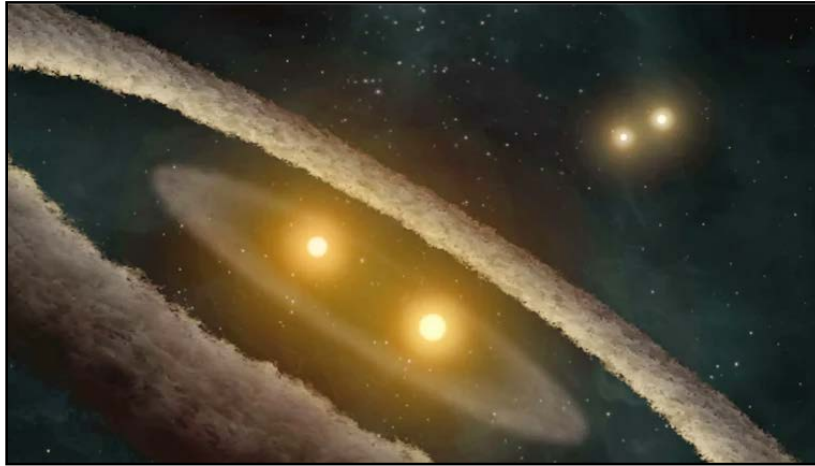
*Fri, 22 Jul 2022*

### **System with Three Suns Detected for the First Time. It Once had Four**

The solar system that we live in is unique from our perspective as life exists in this one small patch of the universe in the Milky Way galaxy. This existence of life is powered by the Sun around which all the planets revolve. Imagine a system with not one, not two but four suns. The system is tightly squeezed close to each other, and astronomers speculate there were four stars in the system until the three gobbled up the fourth. Astronomers have for the first time discovered a unique system that has two binary stars that orbit each other and a larger star orbiting the two. HD 98800 is located 150 light-years away in the constellation TW Hydrae.

The binary stars orbit each other in one day, similar to Earth completing one rotation in 24 hours. The two suns, combined, weigh 12 times the mass of our sun. “As far as we know, it is the first of its kind ever detected. We know of many tertiary star systems (three-star systems), but they are typically significantly less massive. The massive stars in this triple system are very close

together it is a compact system," said Alejandro Vigna-Gomez of the Niels Bohr Institute at the University of Copenhagen. Alejandro is collaborating with his fellow researcher Bin Liu from China to find answers to the question of how this unique combination of a binary set of stars and a revolving bigger star formed. The researchers are baffled at the presence of the third star in the system, which is 16 times the mass of our Sun with a circular inner orbit that goes around the two stars six times every year.



*Artist's interpretation of HD 98800, a quadruple-star system located 150 light-years away.*

The system, due to its high brightness, was first discovered by a community of amateur astronomers, who were sifting through data set from Nasa's Transiting Exoplanet Survey Satellite observatory. Initially, they thought it to be an anomaly and informed professional astronomers who confirmed it to be the unique triple star system. The two researchers then coded the data and ran 1,00,000 iterations on the supercomputer to assess the most likely outcome of this scenario.

“Now we have a model of the most likely scenario on this unique system. But a model is not enough. And there are two ways in which we can prove or disentangle our theory on this formation. One is studying the system in detail and the other is making a statistical analysis of a population of stars. If we go into the system in detail, we shall have to rely on the expertise of an astronomer. We already have some preliminary observations, but we still need to go through the data and make sure we are interpreting it well,” Alejandro explains. The two researchers are now looking at telescopes and observatories spread across the world to look at the unique system.

<https://www.indiatoday.in/science/story/system-with-three-suns-detected-for-the-first-time-it-once-had-four-1978767-2022-07-22>





Sun, 24 Jul 2022

## MIT Scientists Discover that Computers can Understand Complex Words and Concepts

*Models for natural language processing use statistics to collect a wealth of information about word meanings.*

In “Through the Looking Glass,” Humpty Dumpty says scornfully, “When I use a word, it means just what I choose it to mean — neither more nor less.” Alice replies, “The question is whether you can make words mean so many different things.” Word meanings have long been the subject of research. To comprehend their meaning, the human mind must sort through a complex network of flexible, detailed information. Now, a more recent issue with word meaning has come to light. Researchers are looking at whether machines with artificial intelligence would be able to mimic human thought processes and comprehend words similarly. Researchers from UCLA, MIT, and the National Institutes of Health have just published a study that answers that question.

The study, which was published in the journal *Nature Human Behaviour*, demonstrates that artificial intelligence systems may really pick up on highly complex word meanings. The researchers also found a simple method for gaining access to this sophisticated information. They discovered that the AI system they looked at represents word meanings in a manner that closely resembles human judgment. The AI system explored by the authors has been widely utilized to analyze word meaning throughout the last decade. It picks up word meanings by “reading” enormous quantities of material on the internet, which contains tens of billions of words. When words frequently occur together — “table” and “chair,” for example — the system learns that their meanings are related. And if pairs of words occur together very rarely — like “table” and “planet,” — it learns that they have very different meanings.

That approach seems like a logical starting point, but consider how well humans would understand the world if the only way to understand meaning was to count how often words occur near each other, without any ability to interact with other people and our environment. Idan Blank, a UCLA assistant professor of psychology and linguistics, and the study’s co-lead author, said the researchers set out to learn what the system knows about the words it learns, and what kind of “common sense” it has. Before the research began, Blank said, the system appeared to have one major limitation: “As far as the system is concerned, every two words have only one numerical value that represents how similar they are.”

**In contrast, human knowledge is much more detailed and complex.**

“Consider our knowledge of dolphins and alligators,” Blank said. “When we compare the two on a scale of size, from ‘small’ to ‘big,’ they are relatively similar. In terms of their intelligence, they are somewhat different. In terms of the danger they pose to us, on a scale from ‘safe’ to ‘dangerous,’ they differ greatly. So a word’s meaning depends on context.” “We wanted to ask whether this system actually knows these subtle differences — whether its idea of similarity is

flexible in the same way it is for humans.”To find out, the authors developed a technique they call “semantic projection.” One can draw a line between the model’s representations of the words “big” and “small,” for example, and see where the representations of different animals fall on that line.

Using that method, the scientists studied 52-word groups to see whether the system could learn to sort meanings — like judging animals by either their size or how dangerous they are to humans, or classifying U.S. states by weather or by overall wealth. Among the other word groupings were terms related to clothing, professions, sports, mythological creatures, and first names. Each category was assigned multiple contexts or dimensions — size, danger, intelligence, age, and speed, for example. The researchers found that, across those many objects and contexts, their method proved very similar to human intuition. (To make that comparison, the researchers also asked cohorts of 25 people each to make similar assessments about each of the 52-word groups.)

Remarkably, the system learned to perceive that the names “Betty” and “George” are similar in terms of being relatively “old,” but that they represented different genders. And that “weightlifting” and “fencing” are similar in that both typically take place indoors, but different in terms of how much intelligence they require. “It is such a beautifully simple method and completely intuitive,” Blank said. “The line between ‘big’ and ‘small’ is like a mental scale, and we put animals on that scale.” Blank said he actually didn’t expect the technique to work but was delighted when it did. “It turns out that this machine learning system is much smarter than we thought; it contains very complex forms of knowledge, and this knowledge is organized in a very intuitive structure,” he said. “Just by keeping track of which words co-occur with one another in language, you can learn a lot about the world.”

<https://scitechdaily.com/mit-scientists-discover-that-computers-can-understand-complex-words-and-concepts/amp/>



*Sun, 24 Jul 2022*

## **The “Grandest Canyon” in the Solar System: Mars Express Captures Stunning Images of Massive Martian Canyon**

VallesMarineris cuts across Mars similar to how the Grand Canyon cuts across the United States, except the latter is tiny in comparison. At 4000 km (2500 miles) long, 200 km (125 miles) wide and up to 7 km (4 miles) deep, VallesMarineris is spectacular. It is almost ten times longer, 20 times wider, and five times deeper than the Grand Canyon. As the largest canyon system in our Solar System, it would span the distance from the northern tip of Norway to the southern tip of Sicily.

**Ius and TithoniumChasmata in context.** This image from ESA’s Mars Express shows Ius and TithoniumChasmata, which form part of Mars’ VallesMarineris canyon structure. The area outlined by the bold white box indicates the area imaged by the Mars Express High Resolution

Stereo Camera on April 21, 2022, during orbit 23123. Credit: NASA/MGS/MOLA Science Team. There's another significant difference between the two: while the Grand Canyon was created as a result of rock being worn away by the Colorado River, VallesMarineris is thought to have formed through the drifting apart of tectonic plates. The image at the top of this article shows two trenches (or chasma) that form part of western VallesMarineris. On the left (south), is the 840 km-long (522 mile-long) IusChasma, and on the right (north) is the 805 km-long (500 mile-long) TithoniumChasma. Whilst these high-resolution images show incredible surface detail, it is only when we look at an elevation map that we realize how incredibly deep the chasmata are – up to 7 km (4 miles)! At 4809 meters (15,777 feet), the Alps' tallest mountain Mont Blanc would be dwarfed if it was put inside TithoniumChasma.

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*This oblique perspective view of TithoniumChasmata, which forms part of Mars' VallesMarineris canyon structure, was generated from the digital terrain model and the nadir and color channels of the High Resolution*

At the top of TithoniumChasma, a patch of dark sand brings color contrast to the image. This sand may have come from the nearby Tharsis volcanic region. Next to the dark sand dunes are two light-toned mounds (one cut in half by the upper image border). These 'mounds' are more like mountains, rising more than 3000 meters (10,000 feet) in height. Their surfaces have been strongly eroded by Mars' strong winds, indicating that they are made of a weaker material than

the surrounding rock. Between the two mounds we see a series of smaller bumps, as shown in the second perspective view. Investigations by Mars Express have found water-bearing sulfate minerals in this region. This suggests that these bumps may have formed when liquid that once filled the chasma evaporated, although this theory is still hotly debated.

To the lower right of the mound that we see fully (upper right in the second perspective view), we can see parallel lines and debris piles that indicate a recent landslide. This is also visible as a large purple area in the topography image below. The landslide was caused by the collapse of the canyon wall on the right, and is likely to have occurred relatively recently because it has not been strongly eroded. The gnarly floor of Ius Chasma is equally fascinating. As tectonic plates pulled apart, they appear to have caused jagged triangles of rock to form that look like a row of shark teeth. Over time, these rock formations have collapsed and eroded.

### Exploring Mars

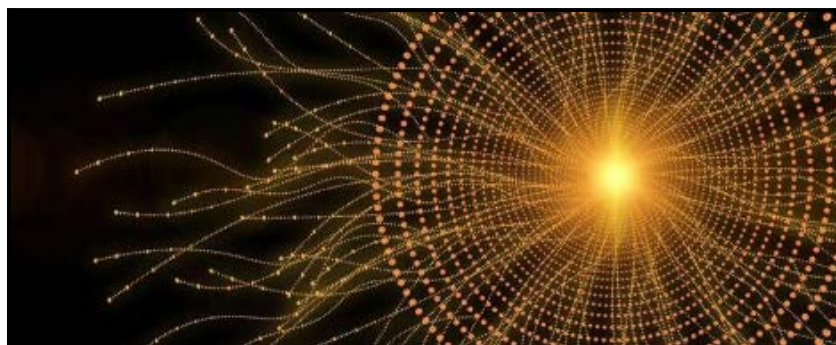
Mars Express has been orbiting the Red Planet since 2003, imaging Mars' surface, mapping its minerals, identifying the composition and circulation of its tenuous atmosphere, probing beneath its crust, and exploring how various phenomena interact in the martian environment. The mission's High Resolution Stereo Camera (HRSC), responsible for these new images, has revealed much about Mars' diverse surface features, with recent images showing everything from brain terrain and wind-sculpted ridges and grooves through monstrous "claw mark" scratches to volcanoes, tectonic faults, river channels, and ancient lava pools.

<https://scitechdaily.com/the-grandest-canyon-in-the-solar-system-mars-express-captures-stunning-images-of-massive-martian-canyon/>



*Fri, 22 Jul 2022*

## How to Tell If Artificial Intelligence is Working the Way We Want it to



About a decade ago, deep-learning models started achieving superhuman results on all sorts of tasks, from beating world-champion board game players to outperforming doctors at diagnosing breast cancer. These powerful deep-learning models are usually based on artificial neural networks, which were first proposed in the 1940s and have become a popular type of machine learning. A computer learns to process data using layers of interconnected nodes, or neurons, that

mimic the human brain. As the field of machine learning has grown, artificial neural networks have grown along with it.

Deep-learning models are now often composed of millions or billions of interconnected nodes in many layers that are trained to perform detection or classification tasks using vast amounts of data. But because the models are so enormously complex, even the researchers who design them don't fully understand how they work. This makes it hard to know whether they are working correctly. For instance, maybe a model designed to help physicians diagnose patients correctly predicted that a skin lesion was cancerous, but it did so by focusing on an unrelated mark that happens to frequently occur when there is cancerous tissue in a photo, rather than on the cancerous tissue itself. This is known as a spurious correlation. The model gets the prediction right, but it does so for the wrong reason. In a real clinical setting where the mark does not appear on cancer-positive images, it could result in missed diagnoses.

With so much uncertainty swirling around these so-called "black-box" models, how can one unravel what's going on inside the box? This puzzle has led to a new and rapidly growing area of study in which researchers develop and test explanation methods (also called interpretability methods) that seek to shed some light on how black-box machine-learning models make predictions.

### **What are explanation methods?**

At their most basic level, explanation methods are either global or local. A local explanation method focuses on explaining how the model made one specific prediction, while global explanations seek to describe the overall behavior of an entire model. This is often done by developing a separate, simpler (and hopefully understandable) model that mimics the larger, black-box model. But because deep learning models work in fundamentally complex and nonlinear ways, developing an effective global explanation model is particularly challenging. This has led researchers to turn much of their recent focus onto local explanation methods instead, explains Yilun Zhou, a graduate student in the Interactive Robotics Group of the Computer Science and Artificial Intelligence Laboratory (CSAIL) who studies models, algorithms, and evaluations in interpretable machine learning.

The most popular types of local explanation methods fall into three broad categories. The first and most widely used type of explanation method is known as feature attribution. Feature attribution methods show which features were most important when the model made a specific decision. Features are the input variables that are fed to a machine-learning model and used in its prediction. When the data are tabular, features are drawn from the columns in a dataset (they are transformed using a variety of techniques so the model can process the raw data). For image-processing tasks, on the other hand, every pixel in an image is a feature. If a model predicts that an X-ray image shows cancer, for instance, the feature attribution method would highlight the pixels in that specific X-ray that were most important for the model's prediction.

Essentially, feature attribution methods show what the model pays the most attention to when it makes a prediction. "Using this feature attribution explanation, you can check to see whether a spurious correlation is a concern. For instance, it will show if the pixels in a watermark are highlighted or if the pixels in an actual tumor are highlighted," says Zhou. A second type of explanation method is known as a counterfactual explanation. Given an input and a model's prediction, these methods show how to change that input so it falls into another class. For instance, if a machine-learning model predicts that a borrower would be denied a loan, the

counterfactual explanation shows what factors need to change so her loan application is accepted. Perhaps her credit score or income, both features used in the model's prediction, need to be higher for her to be approved.

"The good thing about this explanation method is it tells you exactly how you need to change the input to flip the decision, which could have practical usage. For someone who is applying for a mortgage and didn't get it, this explanation would tell them what they need to do to achieve their desired outcome," he says. The third category of explanation methods are known as sample importance explanations. Unlike the others, this method requires access to the data that were used to train the model. A sample importance explanation will show which training sample a model relied on most when it made a specific prediction; ideally, this is the most similar sample to the input data. This type of explanation is particularly useful if one observes a seemingly irrational prediction. There may have been a data entry error that affected a particular sample that was used to train the model. With this knowledge, one could fix that sample and retrain the model to improve its accuracy.

### **How are explanation methods used?**

One motivation for developing these explanations is to perform quality assurance and debug the model. With more understanding of how features impact a model's decision, for instance, one could identify that a model is working incorrectly and intervene to fix the problem, or toss the model out and start over. Another, more recent, area of research is exploring the use of machine-learning models to discover scientific patterns that humans haven't uncovered before. For instance, a cancer diagnosing model that outperforms clinicians could be faulty, or it could actually be picking up on some hidden patterns in an X-ray image that represent an early pathological pathway for cancer that were either unknown to human doctors or thought to be irrelevant, Zhou says. It's still very early days for that area of research, however.

### **Words of warning**

While explanation methods can sometimes be useful for machine-learning practitioners when they are trying to catch bugs in their models or understand the inner-workings of a system, end-users should proceed with caution when trying to use them in practice, says Marzyeh Ghassemi, an assistant professor and head of the Healthy ML Group in CSAIL. As machine learning has been adopted in more disciplines, from health care to education, explanation methods are being used to help decision makers better understand a model's predictions so they know when to trust the model and use its guidance in practice. But Ghassemi warns against using these methods in that way.

"We have found that explanations make people, both experts and nonexperts, overconfident in the ability or the advice of a specific recommendation system. I think it is very important for humans not to turn off that internal circuitry asking, 'let me question the advice that I am given,'" she says. Scientists know explanations make people over-confident based on other recent work, she adds, citing some recent studies by Microsoft researchers. Far from a silver bullet, explanation methods have their share of problems. For one, Ghassemi's recent research has shown that explanation methods can perpetuate biases and lead to worse outcomes for people from disadvantaged groups. Another pitfall of explanation methods is that it is often impossible to tell if the explanation method is correct in the first place. One would need to compare the explanations to the actual model, but since the user doesn't know how the model works, this is circular logic, Zhou says.

He and other researchers are working on improving explanation methods so they are more faithful to the actual model's predictions, but Zhou cautions that, even the best explanation should be taken with a grain of salt."In addition, people generally perceive these models to be human-like decision makers, and we are prone to overgeneralization. We need to calm people down and hold them back to really make sure that the generalized model understanding they build from these local explanations are balanced," he adds.Zhou's most recent research seeks to do just that.

### **What's next for machine-learning explanation methods?**

Rather than focusing on providing explanations, Ghassemi argues that more effort needs to be done by the research community to study how information is presented to decision makers so they understand it, and more regulation needs to be put in place to ensure machine-learning models are used responsibly in practice. Better explanation methods alone aren't the answer."I have been excited to see that there is a lot more recognition, even in industry, that we can't just take this information and make a pretty dashboard and assume people will perform better with that. You need to have measurable improvements in action, and I'm hoping that leads to real guidelines about improving the way we display information in these deeply technical fields, like medicine," she says.

And in addition to new work focused on improving explanations, Zhou expects to see more research related to explanation methods for specific use cases, such as model debugging, scientific discovery, fairness auditing, and safety assurance. By identifying fine-grained characteristics of explanation methods and the requirements of different use cases, researchers could establish a theory that would match explanations with specific scenarios, which could help overcome some of the pitfalls that come from using them in real-world scenarios.

<https://techxplore.com/news/2022-07-artificial-intelligence.html>



*Sat, 23 Jul 2022*

## **ISRO expo in Bengaluru: Perfect weekend getaway for space enthusiasts to learn about Gaganyaan, human spaceflight**

This weekend, the Jawaharlal Nehru Planetarium in the city is offering a treat to space enthusiasts: a sneak peek into the Gaganyaan mission, a movie on India's journey in space, interactive model exhibits and much more. The Indian Space Research Organisation (ISRO) Human Space Flight Centre kicked off its three-day 'Human Space Flight' expo on Friday. It is being held as part of AzadikaAmritMahotsav (75th year of Independence) celebrations and aims to showcase India's achievements and further plans in space research. The expo will close on Sunday, July 24.Gaganyaan Orbital Module As one walks past the main stage, where talks and demonstrations are held, a prototype of the Orbital Module is hard to miss.The interactive crew module and the service module will give you a peek into how our astronauts will travel during the much-awaited manned mission.



*The crew module on display at the Expo*

This is a crew module, which works as a habitable space for astronauts during the mission. According to ISRO, the module will have "crew interfaces, human-centric products, life-support systems, avionics and deceleration systems". The crew module is specifically designed to serve the purpose of re-entry so that the crew can be safe during the descent and till they touchdown. An ISRO engineer, who demonstrated the crew module, said the astronauts will be in a curled position – or fetal position – with minimal movement. Prior to the descent, at one point in time, the service module will

be separated from the crew module because of the need for weight optimisation. Using parachutes, the crew module will land in the Indian waters.

Once the crew module lands in the ocean, it will be recovered through a joint operation of the Indian Air Force, the Navy and the Coast Guard. After the touchdown, the ISRO engineer said, the crew will be subject to the rehabilitation of 1-2 weeks, which is still being deliberated, in one of the ISRO facilities as their bodies will go through several changes. While the target is set for 2023, ISRO will conduct several tests "to gain the confidence" as it is "a very important mission". "We are working towards the target, provided all the tests will be successful. It is not that we know everything. There are a lot of challenges. We will do the tests to gain confidence by testing first on the ground. Then we analyse the data.

We are attempting something like this for the first time. If it was easy, most of the countries would have attempted," said a senior ISRO official, who requested anonymity as he was not officially cleared to speak. Earlier, ISRO chairman S Somanath had said: "It is a very important mission. We have to be extremely careful when we send humans to space." A movie, exhibits and events When News9 visited the planetarium on Saturday it was bustling with students, the general public and space enthusiasts. As part of the expo, several activities, including model-plane making, 'build your own space habitat', and 'can you be an astronaut?', are organised for students. Apart from events for students, in the planetarium's sky theatre, there will be a broadcast of The Indian Space Odyssey – Sounding Rockets to Gaganyaan. The movie showcases ISRO's evolution through the years and things like the assembly of a launch vehicle, the mission sequence of Gaganyaan and astronaut training – a definite visual treat for the viewers.

The movie will be screened multiple times throughout the day, the ticket for which will be available 30 minutes before every screening. Talks and demonstrations on subjects like how to become an astronaut and interplanetary space exploration and its challenges were held. R Prathima Zingade, who teaches science at Nagarbhavi's JES Public School, said that the expo was exciting for students. "Students were excited as they got to know many things, especially about the Gaganyaan mission. Being a science teacher, I could also show them the practical applications of concepts we teach in schools," Zingade told News9. Kanishka Deepak, an aerospace engineering student, said "venturing into space is exciting". "I believe the venture into space is exciting – not just in terms of space tourism but even in terms of extraterrestrial research and the expanse of space technology. Being an aerospace student, there is a huge opportunity here at the expo," Deepak told News9.



ISRO's future missions When the expo was inaugurated, ISRO chairman Somanath had a message for Indians: "We must recognise and celebrate the phenomenal growth India has had since independence." "When we reach 100 years post Independence, I must dream that we will have a permanent habitat outside Earth. It will be possible if you are ready and our nation is prepared in that direction to make it happen," Somanath said. "We were once at the forefront in the domain of science and technology in the whole world. We were once an economic superpower. We were suppressed but we are coming up now," he added. While Gaganyaan is the most anticipated and sophisticated programme of ISRO in 2023, it also has several other projects down the pipeline. On Thursday, Union Minister Jitendra Singh told the Rajya Sabha that ISRO was exploring and developing capabilities of space tourism by demonstrating human space flight capability to Low Earth Orbit (LEO), news agency PTI reported. ISRO is also planning Chandrayaan 3 and Aditya L1 – the first solar mission – for the first quarter of 2023.

<https://www.news9live.com/state/karnataka/isro-expo-in-bengaluru-perfect-weekend-getaway-for-space-enthusiasts-to-learn-about-gaganyaan-human-spaceflight-184588>

