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## HAL Delivers Heaviest Semi-Cryogenic Propellant Tank to ISRO

The heaviest Semi-Cryogenic propellant tank (SC120-LOX) ever fabricated by HAL has been delivered to Indian Space Research Organization (ISRO). The Propellant Tank was handed over by Mr. M K Mishra, GM of Aerospace Division, HAL to Mr. T.K.B. Kumaresh Babu, GM (LHWC), Head of the resident team of LPSC, ISRO in the presence of Mr. P Srinivasa Rao, GD(SR)-LPSC, at a function held in HAL. The semi cryo-liquid oxygen (LOX) tank – the first developmental welded hardware is a part of the SC120 stage intended for payload enhancement by replacing the L110 stage in existing Mk-III launch vehicle. Last year, HAL had delivered the biggest ever cryogenic Liquid Hydrogen tank (C32-LH2) which is four meters in diameter and eight meters in length, much ahead of contractual schedule. HAL has mastered the skills and technologies required for fabricating welded propellant tanks. Till date, its Aerospace Division has delivered 244 propellant tanks and 95 water tanks to ISRO for the space programmes of PSLV, GSLV Mk-II and GSLV Mk-III of diameter 2.1, 2.8 and 4 meters where the length of the tank varies from 2.5 meters to 8.0 meters. As a strategic reliable partner HAL has been associating with ISRO for India's prestigious space programs since last five decades. HAL has delivered critical structures, tankages, satellite structures for the PSLV, GSLV-Mk II and GSLV-Mk III launch vehicles. Various new projects like PS2/GS2 integration, Semi-cryo structure fabrication and manufacturing of cryo and semi cryo engines are being taken up at HAL, for which installation and commissioning of unique infrastructures are nearing completion. HAL has supported ISRO right from the developmental phase of Crew Module Atmospheric Re-entry Experiment, PAD Abort test for Crew Escape for Human Space Mission and is currently supplying hardware for full-fledged launch vehicle GSLV Mk-III for prestigious *Gaganyaan* programme.



Source: <https://hal-india.co.in/>

## CURRENT AFFAIRS

### **Hon'ble PM Shri Narendra Modi launches the Indian Space Association (ISpA)**

The Hon'ble Prime Minister Shri Narendra Modi today launched the Indian Space Association (ISpA) - the premier industry association of space and satellite companies. Also present on the occasion were Shri Ashwin Vaishnav, Union Minister of Communications, Electronics & IT; Shri Ajit Doval, National Security Advisor of India; Dr Jitender Singh, Hon'ble Minister of State – Department of Space; Gen Bipin Rawat, Chief of Defence Staff of India; Shri K Sivan, Chairman, ISRO and Shri Pawan Goenka, Chairman, IN-SPACE. Speaking on the occasion the Hon'ble Prime Minister Shri Narendra Modi said: "Today is the day the Indian space sector receives new wings. For 75 years since independence, Indian space has been dominated by a single umbrella of Indian government and government institutions. Scientists of India have made huge achievements in these decades, but the need of the hour is that there should be no restrictions on Indian talent, whether it is in the public sector or in the private sector. In a way, the country has given a new gift to the talent of India's entrepreneurs by opening up India's space sector in its 75th year of independence. Let this collective power of India's population take the space sector forward in an organized manner. The Indian Space Association (ISpA) will play a huge role in this." ISpA aims to contribute to the Government of India's vision of making India Atmanirbhar and a global leader in the space arena, which is fast emerging as the next growth frontier for mankind. The association will engage with stakeholders across the ecosystem for the formulation of an enabling policy framework that fulfils the Government's vision. ISpA will also work towards building global linkages for the Indian space industry to bring in critical technology and investments into the country to create more high skill jobs. ISpA is represented by leading home grown and global corporations with advanced capabilities in the space and satellite technologies. Its founding members include Bharti Airtel, Larson & Toubro, Nelco (Tata Group), OneWeb, Mapmyindia, Walchandnagar Industries and Alpha Design Technologies. Other core members include Godrej, Hughes India, Ananth Technology Limited, Azista-BST Aerospace Private Limited, BEL, Centum Electronics, Maxar India."The Hon'ble Prime Minister has demonstrated bold and visionary leadership in unleashing reforms across industries and ISpA shares his vision of making India a leader in space with a strong 'Make in India' element. With our large talent pool, growing prowess of home grown technology startups and private enterprises the country is at an inflexion point of what will be a giant leap in the space arena. At ISpA, we look forward to working with stakeholders across the value chain to bring one view of the industry to the table and unlock barriers to growth." added Sunil Bharti Mittal, Chairman, Bharti Enterprises. Mr. Jayant Patil, Whole time Director - Defence & Smart Technologies, is the first Chairman of ISpA and Mr. Rahul Vatts, Chief Regulatory Officer Bharti Airtel and Director – OneWeb India is the Vice Chairman. Lt Gen. A.K. Bhatt (Retd) is the Director General of the Association. Speaking on the occasion Mr. Jayant Patil said: "India has the potential to become a technology leader and frugal service provider to the global space industry. Led by ISRO, the nation has built a formidable homegrown foundation for the next phase of growth and even launched the lowest cost mission to Moon and Mars. Globally, private enterprise are increasingly contributing to unlocking the possibilities of space. ISpA aims to be a forum of the space industry in the Indian private sector and partner the Government of India and other key stakeholders across space industry segments in making the nation self-reliant in the area as well as to become a global service provider. We thank the Hon'ble Prime Minister for his blessings to this initiative." Lt Gen A K Bhatt (Retd.) added that "ISpA plans to work in very close coordination with IN-SPACE to further the space vision of the Government." According to ISRO, the current size of the global space economy stands at about USD 360 billion. However, India accounts for only about 2% of the space economy with a potential to capture 9% of the global market share by 2030.

#### **About Indian Space Association**

Echoing the Hon'ble Prime Minister's vision of Aatma Nirbhar Bharat and encouraged by the recent reforms in the space sector carried out by the Government, ISpA aspires to be the collective voice of the Indian Space industry. ISpA will undertake Policy Advocacy and engage with all stakeholders in the Indian Space domain, including the Government and its Agencies, to make India self-reliant, technologically advanced and a leading player in the space arena.

**Source:** <https://www.isro.gov.in/>

### **HAL's Avionic Equipment Gets ITSOA Certificate for Civil Platforms, First in India**

HAL's avionic equipment 'Air Data Computer (ADC) with Outside Air Temperature (OAT) Probe' has received Indian Technical Standard Order Authorisation (ITSOA) certificate from DGCA for civil platform. The certification is for both

hardware and software. The ADC/OAT is the first avionic equipment in India that has qualified for ITSOA and will pave the way for the fitment on future civil platforms like ALH, Dornier, LUH, SARAS etc. This is an achievement towards mission 'Aatmanirbhar Bharat'. The ADC is used to calculate the air data parameters like pressure altitude, calibrated airspeed, mach number, total air temperature, vertical speed based on static pressure, total pressure and outside air temperature inputs. HAL's Strategic Electronics Research and Development Centre (SLRDC), Hyderabad indigenously designed and developed the first 'Air Data Computer ADC 3600A CVL1' which has environmentally qualified as per DO-160G standard along with in-house developed application software certified as per DO-178C, Level A, required for Civil platforms of aircraft and helicopters.

**Source:** <https://hal-india.co.in/>

## **IAF to have 35 squadrons of fighter jets by next decade**

The Indian Air Force is unlikely to achieve its sanctioned strength of 42 fighter squadrons by the next decade even if all the planned acquisitions happen on time, Chief of the Air Staff Air Chief Marshal V R Chaudhari said here. Even with the timely acquisition of four squadrons of Tejas LCA Mk-I; 5-6 squadrons of advanced medium combat aircraft – the home-grown fifth-generation fighter jet which is in the development phase – and six squadrons of medium multi-role fighter aircraft (the global tender for purchase is yet to be released), the IAF will have only around 35 squadrons of combat jets in the next decade. "We would be around 35 fighter squadrons by the next decade in view of the phasing out of old aircraft and induction of new aircraft," said Air Chief Marshal Chaudhari at a press conference ahead of the 89th Air Force Day. The IAF will phase out its last four squadrons of MiG-21BIS in the next 3-4 years for which a drawdown plan has been made. The Jaguars, MiG-29s and Mirages would also be decommissioned by the end of the decade, beyond which the force was looking at 83 home-grown Tejas LCA Mark-I, which will start coming from 2024 and the ambitious AMCA to fill up the gap. Asked about procurement 114 multi-role fighter aircraft, the Chief of the Air Staff said the service had received responses from global aviation majors on the Request for Information released for the mega-deal and awaited the government's nod to take the proposal forward. The US's Boeing (F/A-18 Super Hornet Block III) and Lockheed Martin (F-16 Block 70), Swedish Saab (Gripen E), Russian United Aircraft Corporation (MiG-35), French Dassault Aviation (Rafale) and Airbus (Eurofighter Typhoon) have responded to the RFI. But even if the 114 fighter deal and the AMCA programme materialise in time – and that's a big if - India's squadron strength will still be nowhere close to 42 squadrons despite the fact that the IAF prepares for a two-front war with Pakistan and China. The force is in the process of buying 24 phased-out Mirages from France to harvest spare parts from such decommissioned planes to keep India's own Mirage squadrons operational as finding out spares for the 35-year-old fleet remained a challenge after the manufacturer decided to shut the assembly line. Air Marshal Chaudhari said the S400 air defence system would be inducted this year and the IAF would soon award contracts for developing swarm drones; but such advancement would not mean the force could cut down on its fighter strength.

**Source:** <https://www.deccanherald.com>

## **IAF touches the sky with glory at Hindon airbase**

As the Indian Air Force (IAF) marked its 89th anniversary, the air force displayed their might in the sky. The celebrations are under way at Hindon Air Force Station in Uttar Pradesh's Ghaziabad. Sukhoi Su-30 and Rafale were seen during the air display. The 2021 IAF Day parade is being held as a tribute to the heroes of the 1971 war in which India defeated Pakistan, resulting in the birth of Bangladesh. Earlier, Air Force chief Air Chief Marshal V R Chaudhari inspected the parade. He also presented Vayu Sena Medal (Gallantry) to officers on the occasion. Chief of Defence Staff (CDS) General Bipin Rawat, navy chief Admiral Karambir Singh and Chief of Army Staff General MM Naravane also attended the 89th Air Force Day parade at Hindon airbase.

**Source:** <https://www.deccanherald.com/>

## Signature of 1971 war memories in Air Force Day flypast

Fifty years after the historic Tangail Airdrop that decidedly changed the course of the 1971 war in India's favour and leading to the creation of Bangladesh, the Indian Air Force will remember one of the defining moments of the Bangladesh war in a unique manoeuvre. At the 89th Air Force Day parade at Hindon, a Dakota aircraft will fly in a "Tangail formation" allowing two paratroopers from the IAF and one from the Indian Army to jump from the aircraft in memory of one of the most unforgettable moments of the 1971 campaign. In December 1971, the 2 Para regiment of the Indian Army was inserted behind enemy lines to capture Poongli bridge on Jamuna river to cut off Pakistan's 93 Infantry Brigade that was retreating from the north to defend Dhaka. Subsequently, the para commandos advanced towards Dhaka with troops from the Maratha Light Infantry through the unguarded Manikganj-Dhaka link. The flypast at Hindon will also witness a drill named "Meghna" involving a Mi17 and two Chinook helicopters to remember a crucial helibridge established across the mightily Meghna river in 1971 by Mi4 choppers to ferry tanks, artillery and men. A formation called "Pratap" involving a Dakota and two Dornier aircraft will fly in the memory of then IAF Air Chief Marshal Pratap Chandra Lal, who planned and oversaw the east Pakistan campaign, sources in the IAF told DH. Flying half-a-dozen formations named after milestone events of the 1971 war is a part of the golden jubilee celebration by India and Bangladesh to mark the surrender of the Pakistan Army and liberation of Bangladesh. Five top IAF fighter pilots would fly LCA Tejas, Rafale, Mirage-2000, Jaguar and MiG-29 combat jets in a missing man formation named Sekhon in the memory of Flying Officer Nirmal Jit Sekhon, the only IAF recipient of the Param Vir Chakra for his lone defence of Srinagar Air Base against a Pakistan Air Force air raid during the 1971 war. Another 1971 war linked drill in the flypast would be "Vinash" with five Hawks, which would fly in "L" formation to signify the role the IAF played in the Battle of Longewala, depicted on celluloid in the film Border. There would also be a formation named "Tiranga" involving a C-17 and nine Hawks from the Surya Kiran team in which the C-17 will make a Gnat formation after the Hawks peel off to remember the role played by the sub-sonic Folland Gnat aircraft flown by the IAF and the heroic dogfight at the Battle of Boyra. The IAF flypast comes towards the fag end of the year-long celebrations by the two nations. During this year's Republic Day parade, a 122-member proud contingent of the Bangladesh Armed Forces marched on the Rajpath carrying the legacy of legendary Muktiyoddhas of Bangladesh, who fought against oppression and mass atrocities and liberated Bangladesh in 1971.

Source: <https://www.deccanherald.com>

## India successfully flight-tests ABHYAS off Odisha coast

India successfully flight-tested the indigenously developed High-speed Expendable Aerial Target (HEAT), ABHYAS, from the Integrated Test Range (ITR), Chandipur off the coast of Bay of Bengal in Odisha, DRDO officials said. The flight-test was conducted by the Defence Research and Development Organisation (DRDO) at its ITR, Chandipur near here. The vehicle can be used as an aerial target for the evaluation of various missile systems. The performance of the target aircraft was monitored through telemetry and various tracking sensors including Radars and Electro Optical Tracking System (EOTS), official sources said. Defence Minister Rajnath Singh congratulated the DRDO for the successful flight trial of ABHYAS. The current test was carried out as a part of developmental flight trials. Expression of interest for the production of the vehicle has already been floated for bidding by Indian companies. This indigenous target aircraft, once developed, will meet the requirements of High-speed Expendable Aerial Targets (HEAT) for Indian Armed Forces, they said. ABHYAS is designed and developed by DRDO's Aeronautical Development Establishment (ADE), Bengaluru. The air vehicle was launched using twin under-slung boosters which provide the initial acceleration to the vehicle. It is powered by a gas turbine engine to sustain a long endurance flight at subsonic speed, they said adding that the target aircraft is equipped with MEMS (Micro-Electro-Mechanical Systems) based Inertial Navigation System (INS) for navigation along with the Flight Control Computer (FCC) for guidance and control. The vehicle is programmed for fully autonomous flight. The check-out of air vehicles is done using a laptop-based Ground Control Station (GCS). Dr G Sathesh Reddy, Secretary, Department of Defence R&D and Chairman, DRDO also congratulated the teams associated with the successful flight test of 'ABHYAS' and termed it as a force-multiplier considering its accuracy and effectiveness.

**Source:** <https://www.deccanherald.com>

## **Air Chief Marshal VR Chaudhari takes over as the Chief of the Air Staff**

Air Chief Marshal VR Chaudhari PVSM AVSM VM ADC took over as The Chief of the Air Staff (CAS) at a ceremony at Air Headquarters (Vayu Bhawan) today. An alumnus of NDA, the CAS was commissioned in Dec 82 in the fighter stream of the IAF. He has flown more than 3800 hours on multiple fighter and trainer aircraft. During his career spanning almost four decades, the CAS has tenanted many significant command and staff appointments. He has commanded a MiG-29 Squadron, two Air Force Stations and Western Air Command. His staff appointments include Deputy Chief of Air Staff, Senior Air Staff Officer at HQ Eastern Air Command, Assistant Chief of Air Staff Operations (Air Defence), Assistant Chief of Air Staff (Personnel Officers), Deputy Commandant of Air Force Academy and Air Assistant to Chief of the Air Staff. A Cat 'A' Qualified Flying Instructor, he has served as an instructor at Flying Training Establishments and has also been an Air Force Examiner. He was a pioneer member of the Suryakiran Aerobatic Display Team. An alumnus of Defence Services Staff College, Wellington, he has served as a Directing Staff there. He has also served as Directing Staff at DSCSC in Zambia. Prior to assuming the present appointment, he was the Vice Chief of the Air Staff. CAS is a recipient of Param Vishisht Seva Medal (PVSM), Ati Vishisht Seva Medal (AVSM), Vayu Sena Medal (VM) and is honorary ADC to the President of India. In his address to the IAF, Air Chief Marshal VR Chaudhari said that he was honoured and privileged to have been entrusted with the responsibility of leading the Indian Air Force. Extending greetings to all Air Warriors, Non Combatants (Enrolled), DSC personnel, civilians and their families, CAS expressed absolute faith and confidence in their ability to accomplish all assigned tasks with resolute dedication while maintaining IAF's operational capability at an all-time high. Outlining the focus areas for Commanders and personnel, CAS said, "Protection of our Nation's sovereignty and integrity is to be ensured at any cost". He added that enhancement of operational capability through integration of newly inducted platforms, weapons and equipment with existing assets and dovetailing the same in concepts of operations would remain a priority area. He spoke on aspects of acquisition of new technology, promotion of indigenization and innovation, strengthening of cyber security, rapid adaptation of training methods to meet future demands and sustained work to nurture human resources. CAS urged all to "always uphold the ethos and credo of the 'Air Warrior', and strive to be an asset to the IAF in any role tasked for".

**Source:** <https://pib.gov.in/>

## **After successful maiden sea trials, Vikrant to sail out for Phase-II trials**

The maiden sea trials of the indigenous aircraft carrier Vikrant have progressed very well and the second phase of trials are expected to begin end October with the third phase planned in December, a defence official said. "Vikrant is expected to be delivered to the Navy in April and likely to be commissioned in August 2022," the official said which would also coincide with 75 years of Independence. Simultaneously, work is under way on the aviation complex of the carrier for which a Russian team is here. The aviation trials will continue once the carrier is commissioned and they would be done with the Mig-29K aircraft in service with the Navy, the official said. Extremely satisfactory results During the maiden sea trial in August, Vikrant's performance, including hull, main propulsion, power generation and distribution and auxiliary equipment were tested. The results were extremely satisfactory and the engine showed 100% performance and some issues which had come up were being addressed, the official said. Vikrant, designed by the Navy's Directorate of Naval Design and built by Cochin Shipyard Limited, is 262m long, 62m at the widest part and height of 59m including the superstructure and Indigenous aircraft carrier Vikrant returns to Kochi Port after a successful maiden sea voyage on August 8, 2021. | Photo Credit: Thulasi Kakkat 4 has more than 76% indigenous content.. There are 14 decks, including five in the superstructure and over 2,300 compartments designed for a crew of around 1,700 people, with separate accommodation for women officers. In the Phase-II of the trials, complete habitat, including each of the over 2,300 compartments, would be thoroughly checked, the official said. Twin engine carrier fighters The Navy had floated

a Request For Information (RFI) issued in 2017 to procure 57 twin engine carrier fighters and the responses are being evaluated. As reported by The Hindu earlier, the number was to be downsized from 57 to 36. A final decision is yet to be taken and the number could be downsized further, it has been learnt. This is in the backdrop of a new indigenous Twin Engine Carrier Based Deck Fighter (TEBDF) being designed and developed by the Defence Research and Development Organisation (DRDO) and Aeronautical Development Agency (ADA). Concurrently with sea trials of Vikrant, plans are afoot for the trials of the fighter jets in the fray for the tender. "Initially, trials will be done on the Shore Based Test Facility (SBTF) at Goa and then on the aircraft carrier," the official said. The aircraft likely to be tested are Boeing F/A-18 Super Hornet, Dassault Aviation Rafale and Saab Gripen-E. In preparation for the trials, Boeing had last December shown the comparability of its F/A-18 Super Hornet with the Navy's Short Takeoff but Arrested Recovery (STOVAR) system by launching it from a ski-jump from a shore based facility at Naval Air Station Patuxent river in Maryland, U.S.. The Navy had contracted 45 Mig-29 Kaircraft from Russia and currently in service which Navy officials had stated earlier that there will not be enough aircraft to operate from both carriers. The TEBDF under development is progressing well and the first flight is planned in 2026, the official said. The Navy is working closely with the DRDO and the ADA on the project, officials on both sides said. Medium weight fighter The TEDBF is envisaged as a twin-engine medium weight fighter with an all up weight of 26 tonnes and wing folding and is meant to replace the Mig-29Ks in service, said Dr. Girish S Deodhare, Distinguished Scientist and Programme Director (Combat Aircraft) & Director, Aeronautical Development Agency (ADA) recently. On the progress of TEDBF, Dr. Deodhare had said the Preliminary Service Quality Requirements (PSQR) were defined over 6-8 months in which two configurations were evolved in coordination with the Navy. "From that one of the configuration preferred by the Navy was selected and the PSQRs are final," he had stated. In January 2020, the DRDO had demonstrated successful arrested landing of Naval Light Combat Aircraft (LCA) on INS Vikramaditya and subsequently, 18 take-offs and landings were conducted in five days. The TEDBF is being taken up from the experience of the Naval LCA.

**Source:** <https://www.thehindu.com>

## **Raksha Mantri gives away DRDO Dare to Dream 2.0 & Young Scientists awards**

Our aim is to equip our forces with latest machinery to deal with any challenge: RM Key Highlights: Three indigenously-developed technologies handed over to the Armed Forces• DRDO Directed Research Policy• & Records Management Policy launched Greater linkages between DRDO and academia emphasised• Developing new indigenous technologies important to strengthen national security• & overall development, says Shri Rajnath Singh Raksha Mantri Shri Rajnath Singh felicitated the winners of 'Dare to Dream 2.0' Contest of Defence Research & Development Organisation (DRDO) in New Delhi on October 04, 2021. The Raksha Mantri gave away awards to 40 winners - 22 in Individual category and 18 in Startup category. He also launched 'Dare to Dream 3.0' to promote innovators & startups and provide a platform for the young ignited minds in the country. Dare to Dream is DRDO's pan-India contest to promote Indian academicians, individuals and startups to develop emerging defence and aerospace technologies/systems. DRDO provides technical and financial support to the winners for realisation of their ideas under the Technology Development Fund (TDF) scheme. Shri Rajnath Singh also gave away DRDO Young Scientists awards for the year 2019. Sixteen DRDO scientists, under the age of 35 years, were awarded for their outstanding contribution in areas of their expertise. Congratulating the winners of 'Dare to Dream' and 'DRDO Young Scientists' awards, Shri Rajnath Singh said, they reflect the energy, enthusiasm and commitment of the youth of the country to create something new. He exuded confidence that the winners in the fields of innovation, design & development will inspire young minds and create path-breaking innovation in future. The 'Dare to Dream' challenge, he said, represents the vision and mission of the Government as also the mandate of DRDO. The Raksha Mantri reiterated the Government's resolve to build a strong and self-reliant 'New India' which, he said, can only be achieved through a collaborative effort. He termed 'effort' and not just 'desire' as the key for an individual, society and the nation to achieve success. Saying that India is one of the oldest countries in experience & culture and the youngest with about 60 per cent of the young population, he encouraged the youth to observe, learn & create new innovations and play their part in taking the country to greater heights. 2 Pointing out that global security concerns, border disputes & maritime affairs have forced the world to focus on military modernisation,

Shri Rajnath Singh reaffirmed the Government's commitment to modernise the Armed Forces and equip them with latest machinery to deal with any challenge. He described the power of the youth as the hope for the country and called upon the young ignited minds to help the Government in achieving the objective of 'Aatmanirbhar Bharat'. "Developing new technologies indigenously is the need of the hour. Our vision of 'Aatmanirbhar Bharat' is to ensure that advanced technologies are developed domestically. It is extremely important not just for strengthening national security but also ensuring overall development of the country," said the Raksha Mantri. Describing private sector participation as crucial to achieving 'Aatmanirbhar Bharat', Shri Rajnath Singh stated that the Government, led by Prime Minister Shri Narendra Modi, has taken a series of reform steps to increase the participation of private industry in the defence sector which has created a suitable growth environment and provided a big boost to indigenous defence capabilities. He listed out some of these steps, including bringing in new categories of acquisition in Defence Acquisition Procedure (DAP) 2020; provision of a specific budget for defence modernisation; notifying two Positive Indigenisation lists; increasing FDI in defence; according top priority to capital procurement and Buy (Indian - Indigenously Designed Developed and Manufactured (IDDM)) to promote indigenous design & development of defence equipment; creating opportunities to build a Mega Defence Programme including fighter aircraft, helicopters, tanks and submarines through Strategic Partnership Model; opening avenues for free Transfer of Technology (ToT) through DRDO and initiatives like Innovations for Defence Excellence (iDEX) and Technology Development Fund. The Raksha Mantri asserted that due to these measures, the number of contracts being awarded to defence industry have increased; new MSMEs & startups have emerged and more employment opportunities created. "We are not only meeting our domestic needs, but are also exporting technology & equipment to foreign countries," he added. Shri Rajnath Singh lauded DRDO for playing a central role in the Government's efforts of achieving self-reliance in defence manufacturing and contributing immensely in enhancing the capacity & capability of the Armed Forces even in the rapidly changing geo-political situation. He said, the recent contracts and induction of Light Combat Aircraft (LCA) Mk-1A, Main Battle Tank Arjun Mk-1A and Medium Range Surface to Air Missile system are some noteworthy contributions. "DRDO is not only trying to match the capabilities of technologically advanced countries, but is also equally engaged in innovation of new technologies. The new generation programmes of DRDO will upgrade our Armed Forces in future as well," the Raksha Mantri hoped. The Raksha Mantri commended DRDO Young scientists' lab and Advance technology Centres for working in futuristic technologies such as nano technology, quantum computing, artificial intelligence, unmanned and robotic technologies. Terming it as the new dimension of 'New India', he called for increased R&D efforts in such futuristic technologies. He stressed on the need to develop dual use technologies which can be beneficial for both Armed Forces personnel and civilians. He urged all the stakeholders to focus on research & development in order to provide state-of-the-art equipment to the Armed Forces. This will help in establishing the country's identity in the international market and achieving the vision of 'Make in India, make for the world', he said. Shri Rajnath Singh exhorted the Industry representatives to take full advantage of the policies of the Government and create an organic synergy with DRDO and other government agencies. Saying that Transfer of Technology from DRDO is bearing fruit, he hoped that in the times to come the industry would develop in-house R&D systems on its own. Cautioning against working in silos and laying special emphasis on identifying cost and time over-run projects and delivering them efficiently in a time-bound manner, the Raksha Mantri called for strengthening the linkages between academia, Industries and DRDO. This collaboration, he said, would ensure overall development. 3 On this occasion, three products/systems indigenously developed by DRDO were also handed over to the Armed Forces. These are: ARINC818 Video Processing and Switching Module: The module, developed for the Indian Air Force, was handed over to the Vice Chief of Air Staff Air Marshal Sandeep Singh. It is a state-of-the-art module with high bandwidth, low latency, channel bonding, easy networking and will cater to 5th generation aircraft development programmes. Sonar Performance Modelling System: Developed for the Indian Navy, the system was handed over to Vice Chief of Naval Staff Vice Admiral Satish Namdeo Ghormade. It is useful for Indian Naval ships, submarines and under water surveillance stations etc. Bund Blasting Device Mk-II: The device, developed for Indian Army, was handed over to the Vice Chief of Army Staff Lt Gen CP Mohanty. It is used to reduce the height of Ditch-cumBund obstacles to enhance the mobility of mechanised infantry during wartime. A Memorandum of Understanding (MoU) was also exchanged between Prof HA Pandya, Vice Chancellor, Gujarat University and Secretary Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy for establishing an Advanced Technology Centre 'Sardar Vallabhbhai Patel Centre for Cyber-Security Research' at Gujarat University

for conducting directed research in cyber security. Shri Rajnath Singh also released two policy documents of DRDO - Directed Research Policy and Records Management Policy 2021. Directed Research Policy provides framework for establishment of Advanced Technology Centres and Research Cells in academic institutes for focussed research on identified subjects such as futuristic surveillance and defensive and offensive capabilities. 'Long Term Directed Research Policy' was recently approved by the Government to support & provide impetus to outcome and application oriented directed research in collaboration with academia. The Records Management Policy aims to further strengthen the records management activities of DRDO. The two-day annual DRDO Directors' Conclave 2021, which began on October 03, 2021, will conclude today. The theme of the conclave is 'Redesigning the processes to meet the national aspirations'. In his address, DRDO Chairman Dr G Satheesh Reddy listed out the recent achievements of DRDO and stressed on developing mechanisms for faster development of advanced technologies and ease of working with industry & academia. He congratulated all the awardees and wished them a bright future. Senior civil and military officials of Ministry of Defence and Industry representatives were among those present on the occasion.

**Source:** <https://pib.gov.in/>

### **CUTN's satellite campus to come up in Trichy soon**

A satellite campus of the Central University Tamil Nadu (CUTN) in Tiruvarur will be set up in Trichy soon, university vice-chancellor M Krishnan has said. Speaking to reporters after the sixth convocation of the university here, the vice-chancellor said that chief minister M K Stalin had promised his support to establish the campus in Trichy. "We met the chief minister last week to discuss the matter. He promised to provide all necessary help. We need around 25 acres of land for the purpose. The chief minister also promised to acquire the required land. All these efforts were made to benefit more students from Tamil Nadu," the vice-chancellor further said. Regular classes, which had been suspended for months following the outbreak of Covid-19, will resume from October 20. "Students of UG third year and PG final year will be asked to attend the class. Those coming to the classes should take both jabs and should also submit the relevant certificates when coming to class," he said. A separate department for sports will be created soon at the University and a special fund has been requested for this, he said. Earlier, Union minister of education and skill development and entrepreneurship Dharmendra Pradhan hoped that the students' dreams would encompass the idea of doing something to better the lives of people less fortunate. In a written message to students on the occasion of the sixth annual convocation via live streaming, he expressed hope that the country is going to witness a massive transformation in the education landscape in the years to come because of the various reforms. He also expressed his pleasure over the fact that the university is revamping the syllabi of various programmes as per the outcome based education (OBE) format. G Satheesh Reddy, secretary, department of defence R&D and chairman, DRDO, ministry of defence highlighted the need for start-ups in the present time. He called upon students to come up with innovative ideas to make available first of its kind technologies by doing core research in academic institutions and convert them into applied research in institutes such as DRDO, he said. The Chancellor of the university, G Padmanaban, presided over the event and conferred the degrees to 1,564 students with an overall pass percentage of 97.4%. Degree certificates will be sent to the students by post, the authorities said.

**Source:** <https://timesofindia.indiatimes.com>

### **Surface to Surface Ballistic Missile, Agni-5, successfully launched from APJ Abdul Kalam Island**

**Key Highlights:**

- Agni-5 capable of striking targets at ranges up to 5,000 kilometres with very high degree of accuracy
- Uses a three-stage solid fuelled engine
- Successful launch in line with India's policy to have 'credible minimum deterrence' that underpins the commitment to 'No First Use'

A successful launch of the Surface to Surface Ballistic Missile, Agni-5, was carried out on October 27, 2021 at approximately 1950 hrs from APJ Abdul Kalam Island, Odisha. The missile, which uses a three-stage solid fuelled engine, is capable of striking targets at ranges up to 5,000

kilometres with a very high degree of accuracy. The successful test of Agni-5 is in line with India's stated policy to have 'credible minimum deterrence' that underpins the commitment to 'No First Use'.

**Source:** <https://pib.gov.in/>

## TECHNOLOGY

### **ISRO exploring possibility of developing next-generation astronomy satellite**

The Indian Space Research Organisation is exploring the possibility of developing a next-generation astronomy satellite, an official indicated. ISRO's first mission dedicated for astronomy, AstroSat, launched on September 28, 2015 with its design life of five years, completed six years of its operation. "It (AstroSat) is expected to last some more years", A S Kiran Kumar who as the then Chairman of ISRO led the mission team, and is presently serving as the chair of the apex science committee at the space agency, told PTI. "We can expect some more results to come which will be path-breaking". Asked about the possibility of ISRO launching AstroSat-2, he said: "Not AstroSat-2. Next generation...thinking is going on...depending on how planning happens... follow-on to this (AstroSat) in a different manner are being looked at". According to ISRO officials, data from AstroSat is widely utilised for the study of various fields of astronomy, from galactic to extra-galactic and from users from all over the world. The multi-wavelength space observatory, which has five unique X-ray and ultraviolet telescopes working in tandem, had detected extreme-UV light from a galaxy, called AUDFs01, 9.3 billion light-years away from Earth. The discovery was made by an international team of astronomers led by Dr. Kanak Saha, at the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune and reported in 'Nature Astronomy'. This team included scientists from India, Switzerland, France, the USA, Japan and the Netherlands. AstroSat has also observed for the very first time rapid variability of high energy (particularly >20keV) X-ray emission from a black hole system, officials noted. "AstroSat has been a very successful mission and it has produced results which are globally acclaimed...", Kiran Kumar said. "Large number of papers have also got published"

**Source:** <https://www.deccanherald.com>

### **Anti-drone technology developed, transferred to industries: DRDO chief**

DRDO has developed counter-drone technology and transferred it to industries, which have taken orders from the armed forces and security forces of the country, a senior official of the organisation said. "DRDO has developed anti-drone technology. It has all the necessary elements required to counter drones, whether it is detection, tracking or surveillance and even a process called software and hardware," Defence Research and Development Organisation (DRDO) chief G Satheesh Reddy said. He was speaking to reporters on the sidelines of the foundation stone-laying ceremony of the DRDO-sponsored Kalam Centre for Science and Technology (KCST) at the Central University of Jammu in Samba. Reddy said the technology has been transferred to multiple industries, which have taken orders from the armed forces and security forces of the country. "They are providing it to them. They will be delivering it to them (security and armed forces) to tackle the drones that are coming in (from across the border)," he added. Reddy said the capability of the anti-drone system has been demonstrated multiple times, adding, "It was deployed on the Independence Day and the Republic Day also."

**Source:** <https://www.deccanherald.com>

### **How hypersonic missiles work and who leads the race**

China reportedly tested a nuclear-capable hypersonic glide vehicle from an near-orbital trajectory in August, amid an intensifying race for the next generation of long-range weapons that are harder to detect and intercept. The United

States and Russia have conducted tests of hypersonic weapons in recent months, and North Korea said last month it had tested a newly developed hypersonic missile. How hypersonic missile works Hypersonic missiles travel at more than five times the speed of sound in the upper atmosphere - or about 6,200 km per hour (3,850 mph). This is slower than an intercontinental ballistic missile, but the shape of a hypersonic glide vehicle allows it to manoeuvre toward a target or away from defences. Combining a glide vehicle with a missile that can launch it partially into orbit - a so-called fractional orbital bombardment system (FOBS) - could strip adversaries of reaction time and traditional defences mechanisms. Intercontinental ballistic missiles (ICBMs), by contrast, carry nuclear warheads on ballistic trajectories that travel into space but never reach orbit. Both the US and USSR studied FOBS during the Cold War, and the USSR deployed such a system starting in the 1970s. It was removed from service by the mid-80s. Submarine-launched ballistic missiles had many of the advantages of FOBS - reducing detection times and making it impossible to know where a strike would come from - and were seen as less destabilising than FOBS. Who leads the race The Financial Times reported that China had launched a rocket carrying a hypersonic glide vehicle that flew through space, circling the globe before cruising down toward its target, which it missed by about two dozen miles. In July, Russia successfully tested a Tsirkon (Zircon) hypersonic cruise missile, which President Vladimir Putin touted as part of a new generation of missile systems. Moscow also tested the weapon from a submarine for the first time. The United States said in late September that it had tested an air-breathing hypersonic weapon meaning it sustain flight on its own through the atmosphere like a cruise missile - marking the first successful test of that class of weapon since 2013. Days after the US announcement, North Korea fired a newly developed hypersonic missile, calling it a "strategic weapon" that boosted its defence capabilities, though some South Korean analysts described the test as a failure. Why it matters The recent tests are the moves in a dangerous arms race in which smaller Asian nations are striving to develop advanced long-range missiles, alongside major military powers. Hypersonic weapons, and FOBS, could be a concern as they can potentially evade missile shields and early warning systems. Some experts cautioned against hype surrounding missiles such as the one China tested in August. "China already has ~100 nuclear-armed ICBMs that can strike the US," said Jeffrey Lewis, a missile specialist at the US-based James Martin Center for Nonproliferation Studies, responding to the FT report on Twitter. "Although the glider is a nice touch ... this is an old concept that is newly relevant as a way to defeat missile defences."

**Source:** <https://timesofindia.indiatimes.com>

## BUSINESS

### **Bharti's OneWeb, ISRO arm collaborate to launch satellite in India from 2022**

Bharti Group-backed OneWeb said it has entered an arrangement with the commercial arm of ISRO, NewSpace India Limited (NSIL), to launch its satellite in India from 2022. The arrangement has been made through a letter of intent (LOI) with NSIL, to use Indian-built PSLV (Polar Satellite Launch Vehicle) and the heavier GSLV-MkIII (Geosynchronous Satellite Launch Vehicle) as potential platforms to launch OneWeb's satellites in India from 2022, the statement said. "The non-binding letter of intent was unveiled at the launch of Indian Space Association (ISpA) in the presence of the Hon'ble Prime Minister of India Shri Narendra Modi," it said. OneWeb is amongst the founding members of ISpA, which strives to be the collective voice of space and satellite companies in India and will work with stakeholders across for the development of India's space ecosystem. The company is building its initial constellation of 648 LEO satellites and has already put 322 satellites into orbit. It plans to start services this year to the Arctic region including Alaska, Canada, and the UK and in the second half of 2022 in India. "By late 2022, OneWeb will offer its high-speed, low latency connectivity services in India and the rest of the world. Service testing on the satellites already in orbit is underway. OneWeb and NSIL will expeditiously convert the LOI into a binding agreement after obtaining all necessary approvals from their respective boards," the statement said. OneWeb chairman Sunil Bharti Mittal said that ISRO has built formidable launch capabilities and India is part of the select group of countries to have a history of successful launches. "OneWeb will be delighted to use ISRO's proven platforms to fulfil its vision of taking broadband connectivity across the earth, oceans and sky," Mittal said. In under a year, the company has launched 322 satellites now in

space. "OneWeb will undertake its 11th launch on the 14th of October with a further 36 satellites on board," the statement said.

**Source:** <https://www.deccanherald.com>

## **Fifth edition of Japan-India bilateral maritime exercise 'JIMEX'**

The 5th edition of the bilateral maritime exercise JIMEX, between Japan and India, was conducted in the Arabian Sea from 06 – 08 October 2021. The exercise saw the ships and aircraft of Japan Maritime Self Defence Force (JMSDF) and Indian Navy (IN) engaging in a high tempo of operations focused on air, surface and sub-surface dimensions of maritime operations as well as the air domain. The IN, under the command of RAdm Ajay Kochhar, Flag Officer Commanding Western Fleet, is participating with indigenous Guided Missile Destroyer, INS Kochi (with Sea King MK 42B helicopter) and the Guided Missile Frigate INS Teg (with SAR capable Chetak helicopter). The IN is also fielding a P8I, a shore-based maritime reconnaissance aircraft, and MiG 29K fighters. The JMSDF is led by RAdm Ikeuchilzuru, Commander, Escort Flotilla Three comprising of the Izumo Class Helicopter Carrier Kaga and the Guided Missile Destroyer Murasame. Both ships are participating with integral SH60K helicopters. Setting the operational tempo from the start, the units exercised War at Sea scenario with P8I (IN) providing maritime reconnaissance support to both navies. The units practiced Replenishment at Sea approaches and undertook fuel rig connect-up between Kaga and Kochi. The exercise also involved complex Over the Horizon Targeting exercises and surface gun shoots on an expendable target. An advanced coordinated anti-submarine exercise involving an underwater target deployed by JMSDF saw surface units and IN's P8I aircraft exercising with seamless coordination. Flag Officers of the two forces also met on the Flight Decks of Kochi and Kaga during flying operations, in keeping with the true spirit of military friendship. The Air Domain operations included advanced anti-aircraft firing exercises on Expendable Aerial Target launched from the deck of INS Kochi and ship controlled Beyond Visual Range (BVR) combat drills by IN's MiG 29K fighters. The exercise involved a high tempo of flying operations with MiG 29K fighters coming in for multiple simulated air strike on surface units, shepherded by the IN's Maritime Patrol Aircraft, Dornier. The inclement weather could do little to hold back IN and JMSDF helicopters from undertaking cross-deck landings, showcasing a high level of interoperability. The precision, coordination and the high level of interoperability reflected not only the high standards of professionalism and preparedness the two navies maintain to counter threats at sea, but also the high level of trust and understanding that they have built over the years. The complex maritime exercises undertaken will enable the two navies to further strengthen their already wideranging strategic partnership and, when required, to jointly safeguard their maritime interests and ensure peace, security and stability in the region.

**Source:** <https://pib.gov.in/>

## **AWARD**

### **Astronautical Society of India confers Aryabhata Award to Secretary DDR&D and Chairman DRDO, Dr G Satheesh Reddy**

Dr G Satheesh Reddy is a pioneer in the area of R&D of advanced avionics, navigation and missile technologies. Dr Reddy is an institution builder and has set up mechanisms to establish robust defence development and production ecosystem. Secretary DDR&D and Chairman DRDO Dr G Satheesh Reddy has been conferred the prestigious Aryabhata Award by Astronautical Society of India (ASI) for his outstanding life-time contribution to the promotion of astronautics in India. The award function was held on October 09, 2021 at UR Rao Satellite Centre Bangalore with participants joining virtually from across the ISRO, DRDO and other academic institutions. Dr G Satheesh Reddy is a pioneer in the area of R&D of advanced avionics, navigation and missile technologies. He has contributed immensely to strategic and tactical missile systems and helped the country become self-reliant in critical defence technologies. He is an institution builder and has set up mechanisms to establish robust defence development and production ecosystem.

Due to his persistent effort, defence research in academic institutes is accelerating towards higher technology readiness level. The ASI is engaged in the dissemination of technical and other information related to astronautics by conducting technical meetings, bringing out technical publications and organising exhibitions.

Source: <https://pib.gov.in/>

## EVENT

### **First Announcement - AEST 2022**

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**On**

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**January, 2022**

**Thiruvananthapuram**

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