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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,  
International Relations and Science & Technology

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# THE ECONOMIC TIMES

*Mon, 18 Jul 2022*

## **Govt Aspires to Turn India into Global Drone Hub: DRDO Chairman G. Satheesh Reddy**

Defence research secretary and Defence Research and Development Organisation (DRDO) chairman G. Satheesh Reddy said the government wants to turn India into a global drone hub. Speaking at the inauguration of Aero Innovation and Skill Centre (AISC) in Bengaluru on Saturday, Reddy said: “As far as the drone sector is concerned, India is working on its application in defence and civilian sectors. We need to hand-hold the youngsters to boost innovations and the AISC is a way forward. The government is clear that everything should be made in the country and Prime Minister Narendra Modi’s call is very clear that we should make world looks up to us. Today, in the defence and aerospace sectors, there are products which we earlier used to import but are now being made.”

A part of the Aeronautical Society of India (AeSI), AISC Bengaluru will facilitate aspiring entrepreneurs and start-ups to conduct research and development in the aerospace sector. Around 15-20 start-ups will be part of the AISC as of now. The start-ups and entrepreneurs will be mentored by experts from the DRDO, Hindustan Aeronautics Ltd (HAL) and the Indian Space Research Organisation (ISRO), officials said. Satheesh Reddy added that most IIT graduates used to go abroad for higher education and job opportunities even a decade ago, but around 75 per cent of graduates are now opting to stay back in India and work in several sectors, such as aerospace and defence technology, among others. “If we are talking about rolling an aircraft in four years, it is because of the ecosystem that exists today. India will become the largest exporter from the largest importer,” he said. Altair India and the AeSI also signed an MoU to bridge the skill gap between the industry and academics and to nurture the start-up ecosystem in the aerospace and defence sectors. As a technology partner, Altair will extend support in terms of free access to technology, solutions and mentorship to AeSI and AISC aspirants.

<https://auto.economictimes.indiatimes.com/news/industry/govt-aspires-to-turn-india-into-global-drone-hub-drdo-chairman-g-satheesh-reddy/92960333>



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

**Ministry Of Defence**

*Mon, 18 Jul 2022 09:02 PM*

### **Joint Press Release of the 16th Round of India-China Corps Commander Level Meeting**

The 16th round India- China Corps Commander Level Meeting was held at Chushul-Moldo border meeting point on the Indian side on 17th July 2022. Building on the progress made at the last meeting on 11th March 2022, the two sides continued discussions for the resolution of the relevant issues along the LAC in the Western Sector in a constructive and forward looking manner. They had a frank and in-depth exchange of views in this regard, in keeping with the guidance provided by the State Leaders to work for the resolution of the remaining issues at the earliest. The two sides reaffirmed that the resolution of remaining issues would help in restoration of peace and tranquility along the LAC in the Western Sector and enable progress in bilateral relations.

In the interim, the two sides agreed to maintain the security and stability on the ground in the Western Sector. The two sides agreed to stay in close contact and maintain dialogue through military and diplomatic channels and work out a mutually acceptable resolution of the remaining issues at the earliest.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1842508>

## **Business Standard**

*Mon, 18 Jul 2022*

### **Self-Reliance in Defence Forces Important For India of 21st Century: MODI**

Prime Minister Narendra Modi on Monday addressed a seminar titled 'Swavlamban' organised by the Naval Innovation and Indigenisation Organisation (NIIO) wherein he underlined India's goal of self-reliance in defence forces. Addressing the gathering, the Prime Minister said that the

goal of self-reliance in the defence forces is very important for India of the 21st century, and organising the first 'Swavlamban' (self-reliance) seminar for a self-reliant Navy is an important step in this direction.

The Prime Minister said that the resolution of creating 75 indigenous technologies in this period of making new resolutions for India is inspiring in itself, and expressed confidence that it will be fulfilled very soon. "We have to work to continuously increase the number of indigenous technologies. Your goal should be that when India celebrates 100 years of Independence, our Navy should be at an unprecedented height," he said. Referring to the importance of oceans and coasts in India's economy, the Prime Minister said that the role of the Indian Navy is continuously increasing and therefore self-reliance of the Navy is of critical importance.

Recalling the glorious maritime tradition of the country, the Prime Minister said the defence sector used to be very strong even before Independence as India was an important supplier of defence equipment during World War II. "Our howitzers and machine guns made at the Ishapur Rifle Factory were considered the best. We used to export a lot. But then what happened that at one point in time we became the world's biggest importer in this field," Modi asked. The Prime Minister said that a self-reliant defence system is critical for the economy and also from the strategic point of view. He said the country has worked in mission mode to reduce this dependence after 2014. "Innovation is critical and it has to be indigenous. Imported goods can't be a source of innovation," he said. In the last eight years, the Prime Minister noted that the government has not only increased the defence budget, but "we have also ensured that this budget is useful in the development of the defence manufacturing ecosystem in the country".

"Today, a large part of the budget earmarked for the purchase of defence equipment is being spent on procurement from Indian companies," Modi said, as he complemented the defence forces for preparing a list of 300 items that will not be imported. As India is establishing itself on the global stage, Modi said there are constant attacks through misinformation, disinformation and false publicity. "The forces that are harming India's interests, whether in the country or abroad, have to be thwarted in their every effort," Modi said. "As we are moving forward with the 'whole of the government' approach for a self-reliant India, a similar 'whole of the nation' approach is the need of the hour for the defence of the nation. The collective national consciousness is the strong basis of security and prosperity," the Prime Minister concluded.

[https://www.business-standard.com/article/current-affairs/self-reliance-in-defence-forces-important-for-india-of-21st-century-modi-122071801411\\_1.html](https://www.business-standard.com/article/current-affairs/self-reliance-in-defence-forces-important-for-india-of-21st-century-modi-122071801411_1.html)



*Mon, 18 Jul 2022*

## **My Jawans will have Weapons that Opponents Won't Even Think of: PM Modi**

Prime Minister Narendra Modi on Monday said a new defence ecosystem is being developed in India where imports are being brought down and exports are on the rise. Speaking at a naval event in Delhi, Modi said, "We developed the habit of being dependent on foreign countries for

even the simplest products. Like drug addicts, we were addicted to the products imported from abroad. To change this mindset, we worked on a mission mode after 2014, after learning from the approach of the past, to create a new ecosystem of defence with the help of 'Sabka Prayas'."

He said 'aatmanirbharta' (self reliance) in defence is very crucial for the India of 21st century. "Creating 75 indigenous techs for the Navy by August 15 next year is the first step. The goal should be to take India's defence to unprecedented heights by the time we celebrate 100 years of Independence." To change this mindset, we worked on mission mode after 2014, after learning from the approach of the past, to create a new ecosystem of Defence with the help of 'Sabka Prayas': PM Narendra Modi. Modi further spoke about the weapons the country's soldiers will have in the coming days. "We have the talent. It's not smart to let my soldiers go to the field with the same 10 weapons that the world has... I can't take the risk. My jawan will have what the opponent won't even think of..." he said.

Modi said in the last eight years, his government increased the defence budget and ensured that it is useful in the development of defence manufacturing ecosystem in India. "A large part of the budget earmarked for purchase of defence equipment is being spent on procurement from Indian companies. In the last four-five years, our defence imports have come down by about 21 per cent. We are moving fast from being a major defence importer to becoming big exporter," he added. The PM unveiled 'SPRINT' (Supporting Pole-Vaulting in R&D through iDEX, NIIO & TDAC), a collaborative project of NIIO and DIO. Earlier, defence minister Rajnath Singh said, "We've achieved self-reliance in many areas & due to which, a new image of India has emerged in the world. Under 'AatmaNirbhar Abhiyaan', Navy spent over 64% of its capital budget for domestic procurement in last financial year & this year it'll increase up to 70%."

<https://www.hindustantimes.com/india-news/like-addicts-pm-modi-slams-dependence-on-defence-imports-at-navy-event-101658146672129.html>



*Mon, 18 Jul 2022*

## **Indian Start-Up Makes Pilot-Less Drone for Indian Navy; PM Modi Unveils Varuna**

India's first human carrying platform — pilot-less drone made its debut in New Delhi in the presence of Prime Minister Narendra Modi. The makers of this indigenous pilot-less 'Varuna' drone startup Sagar Defence Engineering demonstrated this in his presence. The Prime Minister was there to address the Naval Innovation and Indigenisation Organisation (NIIO) seminar 'Swavlamban' which took place at Dr Ambedkar International Centre in New Delhi. This 'Varuna' drone has been designed and developed by a startup and has the capacity to carry one person inside. According to the founder and CEO of Sagar Defence Engineering Nikunj Parashar, "It was a proud moment for us when the Prime Minister witnessed the demonstration of our product here in New Delhi."

During the demonstration the pilot-less drone flew around two meters above and then moved forwards before coming back to land. Mr Parashar said, “This this drone has been made specifically for the use by the Indian Navy. Varuna has been developed in two parts. One being the technology which helps it to land and take off from moving warships and the second being the platform itself. The landing and taking off technology has been developed in tandem with Indian Navy DSR and the Varuna is currently being developed along with NTDAC (Naval Technology Development acceleration cell).”



*During the demonstration the pilot-less drone flew around two meters above and then moved forwards before coming back to land*

Also, “30 such drones which can land and take off from warships have been delivered to the Navy, and it is also the first time ever that the Indian Navy is inducting drones on warships.” Initially it can be used for moving /transferring materials. There are four auto-pilot models which help the drone to continue flying even if some fans fail to function. This new vehicle has the capability to be used for inter-ship transfer of material and personnel. And is capable of carrying out autonomous take-off and landing even when the ships are moving.

Presently, the land-based trial is on and in the next three months the drone will be sent for sea trials. Besides using it to transfer materials from one ship to another, this can also be used for medical evacuation. This means, in case of emergency, personnel can be evacuated from sea, and immediately taken to the hospital.

Last month Sagar Defence Engineering had given a demonstration of the new personal air mobility vehicle to the Deputy PM of Australia who had visited INS Hansa in Goa. Sharing details about the pilot-less ‘Varuna’ drone, company’s CEO highlighted some of the features: It has a range of 25 kms with a payload of 130 kgs; and around 25-33 minutes of endurance. While expressing his appreciation of the Indian Navy, Mr Parashar said that they were given the contract and were asked to complete it in one and a half years.

<https://www.financialexpress.com/defence/indian-start-up-makes-pilot-less-drone-for-indian-navy-pm-modi-unveils-varuna/2597988/>

## Future Cartridge Could Feature Materials Other Than Brass: Expert

Next month India is set to celebrate 75 years of India's independence and towards that end the government is focusing on "Atmanirbhar Bharat" in the defence sector. Amidst the two years of global pandemic of COVID-19 and now the ongoing Russia-Ukraine war, the focus is on building in India and ensuring that the dependence on importing different weapons systems and platform lessens. "If we are to sail through the choppy waters of the coming decade with an Uber assertive adversary on our eastern border and a weakened but vengeful one on our western border, our national security objectives will require the building of a military industrial complex, a cyber fortress, outer-space ventures and every other piece of technology that can shape the future of our battlefields," explained a senior officer who wished to remain anonymous.



*The US mounted an ambitious Next Generation Squad Weapon (NGSW) programme which was the most ambitious prototyping initiative in decades. It aimed to replace both the M4A1 and the M249 light machine gun.*

Infantry systems have traditionally remained unchanged over the years. The US military continued to favour the M4, undertaking upgrades in the last decade to the M4A1 Carbine. According to an Indian army officer, "In the same time, the Indian INSAS rifle that came in to service post Operation Pawan, came face to face with its shortcomings. A realisation dawned that we wouldn't be able to sustain a prolonged insurgency, let alone a war with that weapon." The US mounted an ambitious Next Generation Squad Weapon (NGSW) programme which was the most ambitious prototyping initiative in decades. It aimed to replace both the M4A1 and the M249 light machine gun.

### Why?

Because the soldier wanted more range and more lethality than the incumbent 5.56×45 mm ammunition could provide, and so was introduced the new 6.8×51 mm cartridge. The winner



system from Sig Sauer entered the competition with a hybrid case cartridge – part composite and brass. This would help make the ammunition lighter whilst increasing range and lethality. Most interesting of all, the NGSW competition also featured a new breed of polymer cased ammunition developed by True Velocity. While the NGSW weapons were talked about more often, there is no doubt in any military mind that the landscape of war will be changed by the innovations in small caliber ammunition.

### **AK 203 rifles and the good old 7.62×39 cartridge for the rifles**

Meanwhile, the Indian armed forces decided to go with the AK 203 rifles and the good old 7.62×39 cartridge for the rifles. “The problem is that this is a hand me down Russian system that may not be very effective for our mission criteria. It’s efficient but not accurate. Justifying the loss of accuracy for reliability would have been fine in the early decade of the century but not any longer,” explained the officer quoted above. For the carbine modernization programme, there is an intent to go with an indigenously developed rifle featuring the 5.56×45 mm NATO round – the same round that the NGSW programme aims to replace. The question therefore arises: “Are we a nation that should stick to hand me downs and not so lethal ammunition whilst the world is inclined to move away from those?” And, “Should we at least try and mount a ground up R&D effort to develop our own cartridge and weapon systems in sync with our mission criteria?” Military experts are positive on this but skeptical since the near term requirements on modernization cannot be held hostage while we work on innovation.

However, industry players offer a different perspective. “SSS Defence, a Bangalore based defence venture active in both small arms and ammunition believes that the military should be open to mount a solicitation for prototyping a weapon and featured cartridge. This should be time bound and dictated by user requirements. The armed forces should play a project management and feedback role in the effort while staying away from dictating the technology. A future cartridge could feature materials other than brass that are available in plenty and not susceptible to global embargoes, composite material or polymer. Indeed, the likelihood of an embargo or squeeze on material supply in the future should be considered as a potential risk. If the Second World War could be influenced by a strategy of bombing ball bearing manufacturing plants, a supply squeeze on brass can be a death knell for the infantry soldier.”

Indeed, a solicitation similar to the NGSW is one that may be a solution to our long term intent and opens up the possibility of innovation from a new crop of indigenous small arms and ammunition players – SSS Defence, Kalyani Group to name just a few. Interestingly, the effort could also build partnerships among these firms and new startup’s operating in the areas of nanotechnology, light weight materials and coatings.

### **SSS Defence Talks to Financial Express Online**

Talking to Financial Express Online, Vivek S Krishnan, Chief Executive Officer, SSS Defence, said, “SSS Defence is among the few indigenous developers of systems that has commenced production of small arms from its Bangalore facility. The JV between SSS Defence and Companhia Brasileira de Cartuchos (CBC) Brazil, an ammunition company, is expected to shortly commence production from Anantapur, AP.” “This facility will produce all small and medium caliber rounds for India and the export market. The company has already received export contracts from military clients in the region, a key “Atmanirbhar Bharat” success that is now being showcased globally,” he added. CBC of Brazil is the world’s second-largest

ammunition manufacturer. And in a recent conversation with Financial Express Online, Ambassador André Aranha Corrêa do Lago of Brazil had said that the joint initiative between the two could be scaled up by 2025.

<https://www.financialexpress.com/defence/future-cartridge-could-feature-materials-other-than-brass-expert/2597765/>



*Tue, 19 July 2022*

## **Home Ministry Issues Fresh Guidelines for Procurement by CAPFs from Defence PSUs, Strengthens Hands of DGs**

The Central Armed Police Forces (CAPFs) can now procure various items, mainly arms and ammunition, more swiftly as the ministry of home affairs (MHA) has enhanced the powers of the director generals (DGs). The ministry in a recent communication regarding procurement from Defence Public Sector Undertakings (DPSUs) that were created from the erstwhile Ordnance Factory Board (OFB) has finalised the guidelines and also asked DGs of forces to decide their priorities. Central Armed Police Forces such as the CRPF, BSF, SSB, ITBP, CISF, NSF, and Assam Rifles purchase arms and ammunition and other types of equipment and items from the Defence Public Sector Undertakings. These seven DPSUs offer machine guns, small arms, assault rifles, grenade launchers, LMG, etc, which CAPFs will acquire from them.

According to the home ministry communication describing new guidelines, now procurements have been divided into two categories: critical and non-critical. The director generals have been empowered to decide the lists of both types of items as per their forces' requirements so that important items needed on priority can be procured swiftly. "CAPFs will categorize their requirement of Arms & Ammunition (A&A) and other items which they used to procure from erstwhile OFB, into two categories Critical items and Non-critical items. DG of the respective CAPF will be the authority to decide the categorization of critical and non-critical items. List of critical and non-critical items may be issued with the approval or DG of respective Force under intimation to PM Division (MHA)," the communication says.

The ministry has said that in the financial year 2022-23, CAPFs may procure critical items (including arms and ammunition) from DPSUs through a single tender enquiry under Rule 166 of OFR, 2017, and the procedure laid down in the Manual for Procurement of Goods, 2017. "Earlier, procurement of important items including arms and ammunition used to take time. There was no segregation of items required immediately and those that can be procured in the next few months. Every force has its own priority, needs some important items in time, mainly weapons and ammunition due to deployment in hypersensitive areas," a senior government official told News18.

"By giving powers to the DGs to decide what are critical items for the forces that will be needed on priority and what are not, the process of procuring arms and ammunition along with other items can be done swiftly. Various procurements were stuck mainly of the CRPF and BSF due to no clarity on the new process after the government dissolved the OFB," a senior government

official added. For non-critical items, the forces will adopt the old format of open tender and call everyone to get the cheapest price possible. The ministry is keen to procure made-in-India items and forces are trying to reduce dependency on foreign companies, an official said.

<https://www.news18.com/news/india/home-ministry-issues-fresh-guidelines-for-procurement-by-capfs-from-defence-psus-strengthens-hands-of-dgs-5581375.html>



*Tue, 19 July 2022*

## **Korea and Spain Defence Majors Ready to Participate in 75 (I) Submarine Project**

Even though the Defence Ministry has again extended the deadline for submitting the Request for Proposals (RFP) for the advanced submarine project to November 30, South Korean Daewoo and Spanish Navantia has shown interest in building the long endurance diesel submarine under the strategic partnership model with India. The RFP was first issued in July 2021 and extended to November 30, 2022, from June 30, 2022, deadline. The decision to extend the deadline was taken as certain clauses relating to “joint and several penalties” needs to be amended in the RFP document. The amended clauses will be taken up by the Defence Acquisition Committee (DAC) for approval shortly. Under the strategic partnership model, India has identified Mazagoan Docks Limited (MDL) and Larsen & Toubro (L&T) to tie up with foreign defence majors in South Korea, Spain, Germany, France, and Russia to build six air independent propulsion (AIP) diesel attack submarines for the Indian Navy at the cost of over ₹40,000 crore.

As of now, South Korean Daewoo Shipbuilding and Marine Engineering and Spanish company Navantia, who have proven AIP technology has shown interest in building the submarines under Project 75 India of the Indian Navy. While the national security planners had considered to extend the on-going Project 75 diesel attack submarine project by extending the production line at MDL to three more submarines, the move was over-ruled in favour of the fuel-based AIP project as the latter have higher endurance and more potent. In layman terms, a diesel attack submarine must come to surface once a day to charge its diesel batteries, while the AIP submarine must surface once a week to do the same. Hence, the AIP equipped submarine with land attack ballistic missile onboard is a more potent weapon in equatorial waters due to lateral inversion in the tropics.

While French Naval Group, Russian Rosoboronexport and TKMS Germany have not shown interest with French now focusing on nuclear powered sub-surface platforms and Germany using latest lithium cell technology, the South Korean and Spanish defence majors are keen to participate in the project. The South Korean defence major Daewoo has already commissioned the first AIP equipped submarine Dosan Ahn Changho in 2019, while Spanish Isaac Peral was launched in April 22, 2021 at Cartagena Shipyards. Both the submarines have land attack missiles including ballistic and cruise missiles on board. The Indian Defence Research and Development Organization (DRDO) has also developed the AIP technology and will be retrofitted on Project 75 submarines when they come for mid-life upgrade. The first of the six

indigenous Scorpene class submarine, INS Kalveri, was commissioned in the Indian Navy in 2017. Three more have been commissioned in the Indian Navy since then.

<https://www.hindustantimes.com/india-news/korea-and-spain-defence-majors-ready-to-participate-in-75-i-submarine-project-101658195574099.html>



*Mon, 18 Jul 2022*

## **India and Africa to Explore Opportunities in Defence, Maritime Security and More at Two Day Conclave**

Starting tomorrow India and leaders of the African continent will gather in New Delhi to discuss the strategic role of India-Africa partnership in changing the geo-political scenario. During the two days meeting which comes amidst the ongoing Russia-Ukraine war, both sides will explore ways of further strengthening bilateral ties as well as discuss emerging economic opportunities as African Continental Free Trade Area (AfCFTA) gains ground.

### **Who all are expected to be present?**

India is hosting a Conclave on India-Africa Growth Partnership in New Delhi under the aegis of Ministry of External Affairs and Ministry of Commerce and Industry. The 17th CII-EXIM Bank Conclave on India-Africa Growth Partnership will be inaugurated by Vice President Venkaiah Naidu in New Delhi and External Affairs Minister Dr S Jaishankar and Minister of Commerce & Industry, Consumer Affairs, Food & Public Distribution and Textiles, Piyush Goyal will be present too. From the African continent Vice President of Mauritius Marie Cyril Eddy Boissézon, Deputy PM of Namibia Netumbo Nandi-Ndaitwah, Gambia's Vice President Badara A Joof, and Zambia's Vice President Mutale Nalumango have already arrived in New Delhi.

### **What will be discussed?**

Besides bilateral and regional discussions, the focus of the two day event from July 19-20 will be on is going to be on specific areas including Defence, Maritime Security, Healthcare & Pharmaceuticals, Power and Energy, IT / ITES, Infrastructure and Financial Partnerships, Agriculture & Food processing, Power and Energy, Skill Development and Consultancy, and more. Also, during the conclave the possibility of Trilateral Partnerships will be explored too. There will be 40 ministers and over 600 delegates from around 40 countries including — Ethiopia, Equatorial Guinea, Gabon, Ghana, Namibia, Nigeria, Sudan, Sierra Leone, Malawi, Niger, Mauritius, The Gambia, Togo, Burkina Faso, Zimbabwe, Congo, Cameroon, Eswatini and Zambia. Also participating in the conclave will be 400 delegates representing various sectors.

The two day Conclave is expected to sensitize Indian industry about the opportunities under the African Continental Free Trade Agreement (AfCFTA). Wamkele Mene, Secretary-General of AfCFTA, is likely to be participating in the Conclave. As has been reported earlier in Financial Express Online, AfCFTA has its secretariat in Accra, Ghana and it is the largest free trade area not only in geographical size but also by the number of member states' population.

## **India and Africa's Trade Partnership**

So there are 47 Indian missions in the African continent which is the second largest recipient of India's concessional loan. Almost USD 12.26 billion under Line of Credits, more than 193 projects has been completed, and presently 66 projects are being executed. India has always been extending a helping hand to the continent which plays a very important role in India's maritime security as well as trade. During the global pandemic almost 150 tonnes of medical aid was dispatched from New Delhi to more than 25 African nations.

<https://www.financialexpress.com/defence/india-and-africa-to-explore-opportunities-in-defence-maritime-security-and-more-at-two-day-conclave/2597794/>

# THE ECONOMIC TIMES

*Tue, 19 Jul 2022*

## **Indian Foreign, Defence Ministers and NSA to Shape SCO Agenda**

India will make significant contributions to a series of ministerial meetings in late July and August that are being organised to prepare the agenda for the SCO Summit from September 15 to 17. External affairs minister S Jaishankar, defence minister Rajnath Singh and national security adviser Ajit Doval are set to attend the meetings. The SCO Summit this year is being held under the Uzbek presidency amid major geopolitical developments. While Jaishankar is expected to be part of foreign ministers' meeting on July 28-29, Singh and Doval can take part in SCO meetings in the run up to the summit being held in the historic city of Samarkand. The summit being held in the backdrop of Ukraine developments will focus on supply chains, connectivity and logistics in Eurasia besides cross-border terror, extremism and Afghanistan's future, ET has learnt. New Delhi's recent decision to conduct international trade in national currencies will contribute to increasing trade with the Eurasian region.

India, which takes over the SCO presidency in 2023, has been pushing for optimum use of Chabahar Port following operationalisation of INSTC as a parallel to the Belt and Road Initiative (BRI) led by China. Iran is expected to be formally admitted as SCO member at this year's summit. Experts on the Eurasian region indicated to ET that Iran's entry into SCO will boost India's connectivity forays in the resource-rich Eurasia and Russia. New Delhi expectedly will push for connectivity corridors that are inclusive in nature and do not violate sovereignty like the China-Pakistan Economic Corridor that passes through Pakistan Occupied Kashmir. Connectivity apart, India is interested to develop linkages between industries of the SCO member states. On Friday, heavy industries minister Mahendra Nath Pandey said India is committed to collaborate with industrialists of SCO member states to explore mutually beneficial opportunities.

Addressing the second meeting of Ministers of Industry of the SCO virtually, the heavy industries minister said, "with mutual cooperation, we can give new direction to socio-economic and industrial development" in the region. "The minister also highlighted India's determination to enhance cooperation with SCO by playing an active, positive, constructive role in the

organisation. He reiterated India's commitment to collaborate with industrialists of SCO member countries to explore mutually beneficial opportunities," a government release said. Pandey also highlighted India's robust industrial environment and reiterated that despite disruptions due to the Covid-19 pandemic, its performance has significantly improved in 2021-22.

<https://economictimes.indiatimes.com/news/india/indian-foreign-defence-ministers-and-nsa-to-shape-sco-agenda/articleshow/92964657.cms>



*Tue, 19 Jul 2022*

## **What IAF Chief's Thumbs Down for Separate Air Defence Command Means for India's Military Theaterisation Plans**

The genie of Theaterisation of Indian defence forces is out of the bottle again. Indian Air Force (IAF) chief Air Chief Marshal Vivek Ram Chaudhari, on July 15, said that the proposed creation of a separate air defence command "may prove counterproductive" as air defence was inextricably linked to counter aerial and other offensive operations. The comments come in the backdrop of the country's biggest but protracted military reforms exercise of integrating 17 single-service commands of the army, air force and navy into five theatre commands. Of the three services, the IAF has been apprehensive about the proposed Theaterisation; top IAF officials have been vehemently opposing it, citing the air force's limited assets. Chaudhari, while addressing a seminar in Delhi, however, agreed on the need for close coordination between all elements of the armed forces to ensure effective air defence.

Military Theaterisation was the brainchild of the late General Bipin Rawat, who took over as India's first chief of defence staff (CDS) in January 2020. The primary task was streamlining coordination between the army, navy and IAF and the creation of theatre commands for synchronised operations in future wars. Like in the US and China, General Rawat had plans to have five commands—northern, western, peninsular, air defence and maritime commands. India's military planners were to start the process by setting up an air defence command and maritime theatre command in the first stage of the program. General Rawat, who died in a helicopter crash last December, was of the view that there was a marked lack of synergy between the three military wings because they operated in isolation.

Sounding a note of caution, IAF chief Chaudhari said an independent air defence command was more likely to cause self-harm due to lack of common identification and communication protocols. As an example, some analysts cite the incident of the IAF mistakenly shooting down its own helicopter in Jammu and Kashmir's Budgam on February 27, 2019 during a dogfight between the Indian and Pakistani air forces in the aftermath of the Indian air strikes in Balakot. All six occupants of the IAF helicopter were killed.

Agreeing with the IAF chief's comment, Air Marshal M Matheswaran (Retd), former deputy chief of Integrated Defence Staff (IDS) at Headquarters, IDS, says: "He (IAF chief) is right. Clubbing everything together can become chaotic and unmanageable." In July last year, General Rawat had triggered a controversy by terming the IAF—the world's fourth largest air force—a

“supporting arm”, like the artillery or engineers, in the proposed military Theaterisation. Speaking at the same event, then IAF chief Air Chief Marshal R.K.S. Bhadauria had emphatically differed with General Rawat, saying: ”Air power has a huge role to play. In any of the integrated battle areas, it is not an issue of support alone. A whole lot of things go into any air plan. And those are the issues that are under discussion.” Bhadauria’s predecessor BS Dhanoa had, in April 2018, publicly disapproved of the concept of theatre commands, arguing that it would require the creation of more assets.

The Indian military currently functions under 17 single-service commands. It has eight commands to manage the China front compared to a single theatre command of the Chinese military responsible for the borders with India. The proposal to set up unified commands was first proposed after the 1999 Kargil war, but the concept remained in limbo, partly over fears that it would trigger an ugly turf war between the three services. If IAF chief Chaudhari’s remarks are any indicator, the issue of Theaterisation still remains hotly debated and polarising within India’s defence establishment.

<http://www.indiandefensenews.in/2022/07/what-iaf-chiefs-thumbs-down-for.html?m=1>



*Tue, 19 Jul 2022*

## **'Atmanirbharta Crucial for Defence': PM Modi Discards Idea of 'Importing' at Navy Seminar**

Prime Minister Narendra Modi on Monday addressed the Naval Innovation and Indigenisation Organisation (NIO) seminar 'Swavlamban' and hailed 'Atmanirbharta' and slammed the nation for relying on others. He also unveiled the 'SPRINT Challenges' aimed at giving a boost to the usage of indigenous technology in the Indian Navy. While addressing the seminar in Delhi, PM Modi said national defence is no longer limited to borders but has a much broader ambit and the armed forces and other stakeholders must work together to bolster the country's military capabilities. He said as India establishes itself on the global stage, there have been constant attacks on it through misinformation and disinformation campaigns. “We developed the habit of being dependent on foreign countries for even the simplest products. Like drug addicts, we were addicted to the products imported from abroad. To change this mindset, we worked on a mission mode after 2014, after learning from the approach of the past, to create a new ecosystem of defence with the help of ‘Sabka Prayas’.”

“'Atmanirbharta' in defence is very crucial for the India of 21st century... Creating 75 indigenous techs for the Navy by Aug 15 next year is the first step; the goal should be to take India's defence to unprecedented heights by the time we celebrate 100yrs of independence,” he added. “In the last eight years, we have not only increased the defence budget, but we have also ensured that it is useful in the development of the defence manufacturing ecosystem in India itself,” he said. “Today, a large part of the budget earmarked for the purchase of defence equipment is being spent on procurement from Indian companies,” he said. “In just the short span of the last 4-5 years, our Defence imports have decreased by around 21%... We are moving forward from being

a defence importer to becoming a defence exporter," PM said. Meanwhile, the two-day Seminar (18-19 July) will provide a platform for leaders from Industry, Academia, Services and Government to come together on a common platform to ideate and come up with recommendations for the Defence Sector.

<http://www.indiandefensenews.in/2022/07/atmanirbharta-crucial-for-defence-pm.html?m=1>

# ThePrint

Mon, 18 Jul 2022

## Indian Army Chief Gen Pande Calls on His Bangladeshi Counterpart

Indian Army Chief General Manoj Pande called on General SM Shafiuddin Ahmed, Chief of Army Staff (COAS), Bangladesh Army on Monday and discussed ways to enhance and strengthen bilateral defence cooperation between the two countries. "General Manoj Pande #COAS called on General SM Shafiuddin Ahmed, COAS #BangladeshArmy and discussed ways to enhance & strengthen bilateral defence cooperation between the two countries," the Indian Army tweeted. The Indian Army chief, who arrived in Bangladesh on Sunday, received a Guard of Honour at a convention centre of the Armed Forces in Dhaka on Monday. "General Manoj Pande COAS received an impressive Guard of Honour at Senakunja Bangladesh. He also planted a tree to commemorate the friendship between the two Armies," Indian Army tweeted.



*Indian Army chief Gen Pande calls on his Bangladeshi counterpart*

"General Manoj Pande COAS laid a wreath at ShikhaAnirban and paid tributes to the #Bravehearts who laid down their lives for the Liberation of Bangladesh," it said in another tweet. The Indian Army Chief, who is on a four-day visit to Bangladesh, was accompanied by his spouse Archana Pande and a three-member delegation on this trip, according to the statement released by Indian Embassy in Dhaka. During this visit, the Indian Army Chief is scheduled to pay courtesy calls to the Bangladesh Prime Minister, Sheikh Hasina and her Security Affairs Advisor. He will also pay courtesy calls to service Chiefs of the Bangladesh Army, Navy, Air Force, and PSO Armed



Forces Division of Bangladesh and will meet other senior officers of the Bangladesh Armed Forces.

“The Indian Army Chief will visit Defence Service Command & Staff College Mirpur and will share his experience with student officers and faculty of the Armed Forces War Course. The General officer will also visit Bangladesh Institute of Peace Support Operation Training. The visit of the Indian Army Chief will further strengthen the close and fraternal ties existing between the Armed Forces of the two countries,” the statement reads. India and Bangladesh enjoy robust and multifaceted bilateral cooperation in diverse areas, including trade and connectivity, energy and power, water resources, border management, defence and security, culture and people-to-people links.

As part of the Swarnim Vijay Varsh, both countries celebrated Maitri Diwas on 6 December 2021 in India and Bangladesh. Maitri Diwas was also commemorated in 18 countries – Belgium, Canada, Egypt, Indonesia, Russia, Qatar, Singapore, United Kingdom, Australia, France, Japan, Malaysia, Saudi Arabia, South Africa, Switzerland, Thailand, the United Arab Emirates and the United States of America. The India-Bangladesh relationship is an important element of India’s “Neighbourhood First” policy. The year 2021 was of special significance as both countries celebrated 50 years of diplomatic relations, five decades of Bangladesh’s independence and the birth centenary of its Father of the Nation Bangabandhu Sheikh Mujibur Rahman. The cooperation between the two countries is also to be seen in combating the Covid pandemic. India gifted 3.3 million Covishield vaccines to Bangladesh to assist in its ongoing effort to fight the pandemic. This was the largest tranche of Made-in-India Covid-19 vaccines gifted to any country by India.

<https://theprint.in/world/indian-army-chief-gen-pande-calls-on-his-bangladeshi-counterpart/1044618/>

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*Mon, 18 Jul 2022*

## **IAF Chief Backs Indigenous fighter Aircraft Initiatives; 'Committed To Induct LCA Mark2'**

IAF Chief VR Chaudhari said that the IAF fully supports indigenous fighter aircraft programmes and has already committed to purchasing 6 squadrons of LCA Mk2. Air Chief Marshal VR Chaudhari stated on Monday that the Indian Air Force fully supports indigenous fighter aircraft programmes and has already committed to purchasing six squadrons of the under-development LCA (light combat aircraft) Mark2 combat aircraft and will place additional orders for these aircraft once production of them begins. Speaking to ANI, IAF chief VR Chaudhari on Monday said, "Indian Air Force has already given commitment for the induction of six squadrons of Light Combat Aircraft Mark 2 fighter jets. We will decide on additional numbers once the production of these aircraft starts." It is pertinent to mention that LCA Mk2 who is also called HAL Tejas Mark2 is intended to be the replacement for the aircraft-- Mirage 2000 and Jaguar fighters when they are due for phasing out after a decade.

### **Will induct aircraft under Make In India programme: IAF Chief**

Notably, the IAF chief said that they have already placed orders for four squadrons of the LCA Mark 1A and has committed to induct at least seven squadrons of the fifth generation Indian fighter Advanced Medium Combat Aircraft (AMCA) which is also progressing very fast. Sharing the details of IAF's future aircraft Air Chief Marshal told ANI that for inductions IAF is only considering introducing aircraft under the Make in India programme, which includes the LCA Mark 1A, LCA Mark 2, AMCA, and the 114 multirole fighter aircraft. It is pertinent to mention that the government of India through its Make in India and Atmanirbhar Bharat is already pushing for indigenous manufacturing of defence weapons as well as equipment as well.



### **Air Chief Marshal bats for more coordination among forces**

IAF chief VR Chaudhari on Friday called for close coordination between the forces on the ground for enhanced aerospace safety, adding further that the creation of an air defence command may prove to be counterproductive. Speaking at the 8th Edition of the Air & Missile Defence Seminar & Exhibition organised by the Centre for Joint Warfare Studies (CENJOWS) in New Delhi, Air Chief Marshal VR Chaudhari said, "While there is a need for close coordination between all elements within the same airspace to ensure aerospace safety as well as effective Air Defence, creation of an air defence command may prove counterproductive because, Air Defence operations are inextricably linked to counter air operations and all offensive operation, as the success or failure of one, will dictate the demands on the other."

Speaking further on air defence command, he stated that air defence and offensive missions are interdependent and if they are executed in isolation, these would not only be disjointed but, also ineffective in the design or execution of the joint strategy. Stating the modern 4.5 and 5th generation aircraft have the Omni-role capability, Chaudhari said that restricting those aircraft to any one role would lead to their underutilisation.

<https://www.republicworld.com/india-news/general-news/iaf-chief-backs-indigenous-fighter-aircraft-initiatives-committed-to-induct-lca-mark2-articleshow.html>

## **Air Force to Induct 114 Multirole Fighters, Advanced Combat Aircraft Under Make-In-India Initiative: IAF Chief**

With an eye to bolster airpower capabilities through indigenisation, the Indian Air Force is aiming to induct 114 multirole fighters, Advanced Medium Combat Aircraft (AMCA) and Light Combat Aircraft MK-1A & MK-2 under the 'Make-in-India' programme in the near future. The details of the induction were put forth by the Air Chief Marshal VR Chaudhari on Sunday. He mentioned that the move will not only provide a major fillip to the Indian Air Force but also bring a huge boost to the Indian Aviation ecosystem as part of the Aatmanirbhar initiative. "On the aircraft front, we are looking ahead for the AMCA and the LCA MK-1A and also the LCA MK-2 a few years from now. The case for 114 MRFA is also progressing well. With this, it will not only strengthen the Air Force but also bring a huge boost to the Indian Aviation industry," IAF Chief Air Chief Marshal VR Chaudhari said.

On AMCA, the Indian Air Chief said, "We have already committed seven squadrons of Advanced Medium Combat Aircraft. The numbers for the LCA MK-2, we will take a call as and when the first production model comes out and we start inducting the aircraft into the airforce and we can always increase the quantity based on its performance and rate of induction," he added while informing about the number of units of the aircraft that the Indian Air Force is planning to induct. Notably, India's state-owned aerospace & defence firm Hindustan Aeronautics Limited (HAL) has started manufacturing India's Advanced Medium Combat Aircraft (AMCA) in association with DRDO's Aeronautical Development Agency in March this year. The AMCA programme entered a crucial phase with the starting of manufacturing activities. It is noteworthy that the plan envisages equipping the Indian Air Force (IAF) and Indian Navy with a 5.5 Generation twin-engine stealth fighter.

### **Inside the design & development of AMCA**

While the design and development will be carried out by HAL and ADA, private defence firms will also be roped in to manufacture the combat jet. The advanced stealth aircraft will be a multirole fighter capable of carrying out air superiority, ground strike, suppression of enemy air defences and electronic warfare missions. Notably, the first two squadrons in AMCA Mark 1 configuration will be powered by an imported engine, another five squadrons with advanced features (Mark 2) will use made-in-India 125-kilonewton engines along with 6th Generation technologies. It is important to note that the new engine for the fighter will be jointly developed by India's Defence Research and Development Organisation (DRDO) and Safran of France.

The advanced stealth aircraft will bolster India's air arsenal by enhancing air superiority. Further, the naval version of aircraft will become the primary combat jet operating from the Indian Navy's aircraft carriers. Apart from stealth features, the advanced aircraft will encompass three-dimensional thrust vectoring, made-in-India Uttam active electronically scanned array (AESA) radar, and internal weapons bay to bolster the stealth capabilities of the aircraft.

## **Induction of LCA Mark 2**

Backing the indigenous fighter aircraft programmes, the Indian Air Force has also given the commitment to buy six squadrons of the under development LCA Mark 2 combat aircraft and the force would place more orders for these planes once their production begins, IAF mentioned. The LCA Mark 2 fighter is intended to be the replacement for the Mirage 2000 and Jaguar fighters when they are due for phasing out after a decade. Further, Air Force has already placed orders for four squadrons of the LCA Mark 1A and has committed towards inducting at least seven squadrons of the fifth generation Indian fighter Advanced Medium Combat Aircraft (AMCA). Notably, the Indian Air Force has also decided that all its future surface-to-air ground weapon systems would be indigenously developed and a large number of made-in-India radars have already been deployed in operational areas.

<https://newsonair.com/2022/07/18/air-force-to-induct-114-multirole-fighters-advanced-combat-aircraft-under-make-in-india-initiative-iaf-chief/>



*Mon, 18 Jul 2022*

## **The Possible Supply of Iranian Drones to Russia Could Have Serious Repercussions**

US National Security Adviser Jake Sullivan caused a sensation during a White House briefing on Monday when he said that, according to US information, the Iranian government was preparing to supply Russia with several hundred drones, including weapons-capable drones. This, he said, would give "a significant boost to Moscow's efforts to find and destroy Western-supplied artillery and weapons systems that have slowed the advance of Russian troops in Ukraine in recent weeks." Sullivan clarified that it was not clear if Tehran has already delivered these drones to Russia but claimed that preparations are underway to train Russians on the use of these weapons and that initial training could start at the end of this month. Furthermore, he claimed that Russia's attacks against Ukraine in recent weeks are coming at the "severe" cost of depleting its own weapons. It should be noted that drones have already played an important role in the war in Ukraine. The Ukrainian army has scored its first success against the Russian invaders using Bayraktar drones, bought from Turkey, which destroyed many Russian tanks, surface-to-air missile systems, and command posts.

They were also extensively used for reconnaissance purposes for artillery forces, for firing missiles from a distance, and for dropping bombs on targets. According to press reports, the Biden Administration has supplied Ukraine with "Switchblades" which are small, kamikaze (suicide) drones, and is thinking about providing Kyiv with larger drones that can be armed with Hellfire missiles. For its part, Russia used its Orlan-10 drones in the war for reconnaissance and electronic warfare. However, as the war drags on it seems that the number of drones available to each side has been significantly reduced, and both countries make efforts to acquire as many drones as they can. Kremlin Spokesman Dmitry Peskov refused to comment on the issue and

added that President Vladimir Putin had no plans to discuss this issue during his trip to Tehran next Tuesday.

Putin is scheduled to meet with Turkish President Recep Tayyip Erdogan in the Iranian capital on July 19 to discuss safe corridors for grain exports in the Black Sea as well as a potential Turkish operation in Syria. However, it cannot be ruled out that Putin, in addition to economic cooperation with the Iranian regime, may discuss the supply of drones. The response of Tehran to US claims about the drones was that Iran opposes the war in Ukraine and supports a cease-fire, while at the same time blaming "NATO provocations" for the conflict. In the past decade, Iran has become a major manufacturer of quite versatile drones, like the Shahed-129, believed to be a clone of the US Predator UAV. Experts believe that Shahed-129 is the product of reverse engineering by Iranian technicians of a US Predator that crashed in Iran some years ago. Tehran has a long history of supplying drones to several pro-Iran militias in Iraq and Syria as well as to Houthis in Yemen, which have been used in attacks on oil installations and refineries in Saudi Arabia and civilian targets in the United Arab Emirates as well as on U.S. and allied military bases in the Middle East.

Iran's drones can carry warheads and operate in a kamikaze fashion or "loitering munition" roles and are also used for surveillance. Loitering munitions are incredibly versatile weapons that can destroy equipment costing millions of dollars with a minimal investment that a soldier with minimal training can handle. Jeremy Binnie, a Middle East Defense Specialist in Janes Media, says that Russia is probably interested in acquiring Iranian drones because "the Iranians have developed Unmanned Aerial Vehicles (UAVs) that extensively use commercial off-the-shelf components, making them cheap, that have been acquired despite extensive sanctions." It is noteworthy that Jake Sullivan's disclosure that Russia is rushing to get Iranian drones was made the day before US President Joe Biden started his first official trip to the Middle East which included Israel, the West Bank and Saudi Arabia. Biden is under pressure from his Middle East allies, as the chances of reaching an agreement with Tehran to revive the nuclear deal are rapidly diminishing and Iran is believed to be close to having enough material to build at least one nuclear bomb, to come up with a solid plan of constraining Iran.

Sullivan's claim that Tehran plans to replenish the drones Russia lost during the four-month war in Ukraine, makes the danger posed by Tehran more pressing for the US, which must try to bring together its Middle East allies against the Iranian regime and convince them to join the sanctions against Russia. So far, both Israel and Saudi Arabia have resisted joining western efforts to sanction Russia for its invasion of Ukraine. There is speculation that during Biden's trip to Israel and Saudi Arabia, the US President, by highlighting cooperation between Tehran and Moscow, will push Israel and the Gulf countries to strengthen their "secret" cooperation regarding air defense, which exists unofficially. If he can persuade Saudi Arabia to initiate some military cooperation with Israel to counter Iran - the common enemy of both countries- Biden will have scored a big success. On the other hand, it could lead to strengthening the cooperation between Iran and Russia. As Iranian President Ebrahim Raisi told President Putin, during his visit to Moscow, last January: "Now it is time for Russia and Iran to confront the power of the Americans with an increased synergy between the two countries."

<https://www.aninews.in/news/world/europe/the-possible-supply-of-iranian-drones-to-russia-could-have-serious-repercussions20220718070048/>



## **Scientists Solve the Curious Case of Himalayan Glaciers Resisting Global Warming**

Researchers have taken a significant leap toward solving the mystery of why few pockets of glaciers in the Karakoram Range are resisting glacial melt due to global warming, defying the trend of glaciers losing mass across the globe, with the Himalayas being no exception. They have attributed this phenomenon called ‘Karakoram Anomaly’ to recent revival of western disturbances (WDs). Himalayan glaciers are of paramount importance in the Indian context, especially for the millions of dwellers living downstream who rely on these perennial rivers for their day-to-day water needs. They are fast receding under the impacts of global warming, and stifling stress on the water resources is inevitable in the coming decades. In contrast, the glaciers of central Karakoram have surprisingly remained unchanged or slightly increased in the last few decades. This phenomenon has been puzzling glaciologists and providing climate deniers with a very rare straw to clutch at. Dr. Pankaj Kumar, Associate Professor at the Indian Institute of Science Education and Research (IISER) Bhopal, found this peculiar because the behaviour seems to be confined to a very small region, with only Kunlun ranges being another example of showing similar trends in the whole of Himalaya.

A recent study conducted under his supervision has postulated a new theory to explain this defiance of the impacts of global warming in certain pockets as opposed to other glaciers of the region. In a paper published in the American Meteorological Society’s Journal of Climate, his group claimed that the recent revival of western disturbance has been instrumental in triggering and sustaining the Karakoram Anomaly since the advent of the 21<sup>st</sup> century. The study was supported by the Climate Change Programme of the Department of Science and Technology.

It is for the first time that a study brought forth the importance that enhanced WD-precipitation input during the accumulation period plays in modulating regional climatic anomaly. Aaquib Javed, a Ph.D. student of Dr. Kumar and lead author of the study, said, “WDs are the primary feeder of snowfall for the region during winters. Our study suggests they constitute about around 65% of the total seasonal snowfall volume and about 53% of the total seasonal precipitation, easily making them the most important source of moisture. The precipitation intensity of WDs impacting Karakoram has increased by around 10% in last two decades, which only enhances their role in sustaining the regional anomaly.”

The group applied a tracking algorithm (developed at the University of Reading) to three separate global reanalysis datasets to track and compile a comprehensive catalog of WDs impinging the Karakoram-Himalayan region in the last four decades. The analysis for the tracks

passing through the Karakoram reveals the role of snowfall as a crucial factor in mass balance estimations. While previous studies have highlighted the role of temperature in establishing and sustaining the anomaly over the years, it is for the first time that the impact of precipitation in feeding the anomaly has been highlighted. The researchers have also quantified the impact of precipitation in feeding the anomaly. Calculations by the scientists reveal that contribution of WDs in terms of snowfall volume over the core glacier regions of Karakoram have increased by about 27% in recent decades, while precipitation received from non-WD sources have significantly decreased by around 17%, further strengthening their claims. “The anomaly provides a very bleak but nonetheless a ray of hope towards delaying the inevitable. After recognising the importance of WDs in controlling the anomaly, their future behaviour might very well decide the fate of Himalayan glaciers as well,” Dr. Kumar pointed out.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1842366>



*Tue, 19 Jul 2022*

## **High-Flying Experiment: Do Stem Cells Grow Better in Space?**

Researcher Dhruv Sareen’s own stem cells are now orbiting the Earth. The mission? To test whether they’ll grow better in zero gravity. Scientists at Cedars-Sinai Medical Center in Los Angeles are trying to find new ways to produce huge batches of a type of stem cell that can generate nearly any other type of cell in the body — and potentially be used to make treatments for many diseases. The cells arrived over the weekend at the International Space Station on a supply ship. “I don’t think I would be able to pay whatever it costs now” to take a private ride to space, Sareen said. “At least a part of me in cells can go up! “The experiment is the latest research project that involves shooting stem cells into space. Some, like this one, aim to overcome the terrestrial difficulty of mass producing the cells. Others explore how space travel impacts the cells in the body. And some help better understand diseases such as cancer.

“By pushing the boundaries like this, it’s knowledge and it’s science and it’s learning,” said Clive Svendsen, executive director of Cedars-Sinai’s Regenerative Medicine Institute. Six earlier projects from the U.S., China and Italy sent up various types of stem cells — including his team’s study of the effects of microgravity on cell-level heart function, said Dr. Joseph Wu of Stanford University, who directs the Stanford Cardiovascular Institute. Wu helped coordinate a series of programs on space-based stem cell research last year. Earthly applications of much of this research may be a little ways off. At this point, the only stem cell-based products approved by the Food and Drug Administration contain blood-forming stem cells from umbilical cord blood for patients with blood disorders such as certain cases of lymphoma. There are no approved therapies using the kind of stem cells being sent to space or others derived from them, said Jeffrey Millman, a biomedical engineering expert at Washington University in St. Louis. But clinical trials underway involving stem cells target conditions such as macular degeneration,

Parkinson's disease and heart attack damage. And Millman is involved in research that could lead to a new approach for treating Type 1 diabetes. Scientists see great promise in stem cells.

<https://indianexpress.com/article/technology/science/stem-cells-research-stem-cells-space-8037096/lite/>



