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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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## Wards in India's largest Covid 19 hospital to be named after Indian Army soldiers killed in Galwan Valley clash: DRDO

*DRDO's announcement comes on a day when Prime Minister Narendra Modi is meeting Indian soldiers in Leh*

*Edited By Abhinav Saahay*

New Delhi: The Defence Research and Development Organisation (DRDO) has decided to name different wards at India's biggest Covid 19 treatment facility in Delhi after Indian Army soldiers who died fighting the Chinese Army in the Galwan Valley on June 15, according to news agency ANI. It attributed the development to the technology advisor to the DRDO Chairman.

Sardar Vallabhbhai Patel is India's largest hospital erected temporarily on the south Delhi premises of a religious organization with the capacity to house and treat 10,000 coronavirus patients at the same time.

The makeshift facility, operationalised recently, is set up in a 1755 sqft by 703 sqft area and is roughly the size of 20 football fields combined. The hospital is being managed by medical experts from the Indo-Tibetan Border Police (ITBP) following a request by the union home ministry. While ITBP is the nodal agency to operate the Chhattarpur facility, the Delhi government is pitching in with administrative support. Volunteers from the religious sect of Radha Soami Beas have also been roped in to run the treatment centre.

The development comes on a day when Prime Minister Narendra Modi is on a day long visit to Leh in Ladakh, where 20 army soldiers were martyred in clashes with Chinese forces that were seeking to alter the status quo on the Line Of Actual control (LAC).

The Sardar Vallabhbhai Patel centre has two segments- Covid Care Centre (CCC), for treatment of asymptomatic positive cases and Dedicated Covid Health Care (DCHC) for treatment of more serious cases. The CCC has 90% beds while DCHC has 10% beds. The DCHC is for the treatment of symptomatic cases and is equipped with an oxygen support system.

The makeshift hospital is divided into blocks and each block consists of 100 beds.

The DRDO is also associated with creation of a 1000 bed Covid hospital with 250 ICU beds at New Delhi in association with Tata Sons. The facility is being operationalised in a record 10 days and it will be operated by the Armed Forces Medical Services.

<https://www.hindustantimes.com/india-news/wards-in-india-s-largest-covid-19-hospital-to-be-named-after-indian-army-soldiers-killed-in-galwan-valley-clash-drdo/story-1O9TOrSIwfa37T3dkn2O6L.html>



Sardar Vallabhbhai Patel Hospital for Covid-19 care has over 10,000 beds .(PTI Photo)

## DRDO to name its Covid hospital wards after soldiers killed in Galwan clash

*DRDO has decided to name different wards of new Sardar Vallabhbhai Patel COVID-19 Hospital in Delhi after the Indian Army troops who lost their lives in the Galwan valley clash last month*

New Delhi: The Defence Research and Development Organisation (DRDO) has decided to name different wards of new Sardar Vallabhbhai Patel COVID-19 Hospital in Delhi after the Indian Army troops who lost their lives in the Galwan valley clash last month.

"In honour of Indian Army troops who lost their lives in the Galwan Valley Clash on June 15, DRDO has decided to name different wards of new Sardar Vallabhbhai Patel COVID-19 Hospital, Delhi after them," said Sanjeev Joshi who is the Technology Advisor to DRDO Chairman.

The centre is ready and is expected to be inaugurated by Home Minister Amit Shah and Defence Minister Rajnath Singh on Sunday.

The centre with 1,000 beds will also have specialised intensive care unit beds and will be fully air-conditioned.

The ICU and Ventilator Ward in the hospital has been named as Col B Santosh Babu Ward.

Meanwhile, Delhi's biggest COVID-19 care centre has been erected at the premises of the Radha Soami Satsang Beas in Chhatarpur area, located near the Delhi-Haryana border, has the capacity to house and treat 10,000 coronavirus patients at the same time.

More than 2,000 Indo-Tibetan Border Police (ITBP) and other Central Armed Police Force (CAPF) personnel, including doctors, are managing operations at the hospital.

The development comes on the day when Prime Minister Narendra Modi visited Leh in Ladakh where 20 Indian soldiers lost their lives in a violent face-off in the Galwan valley on June 15-16 after an attempt by the Chinese troops to unilaterally change the status quo during the de-escalation.

*(This story has been published from a wire agency feed without modifications to the text. Only the headline has been changed.)*

<https://www.livemint.com/news/india/drdo-to-name-its-covid-hospital-wards-after-soldiers-killed-in-galwan-clash-11593820154746.html>



## DRDO का फैसला, अपने कोविड अस्पताल के वार्डों को देगा शहीद सैनिकों के नाम

*DRDO ने ICU यूनिट को शहीद कर्नल और विभिन्न वार्डों को सीमा पर शहीद हुए जवानों का नाम देने का फैसला किया है।*

नई दिल्ली: रक्षा अनुसंधान व विकास संगठन (Defence Research and Development Organisation, DRDO) ने दिल्ली में न्यू सरदार वल्लभभाई पटेल के विभिन्न वार्डों को नया नाम देने का फैसला लिया है और ये नाम गलवन घाटी में चीनी सैनिकों का सामना करते हुए शहीद हुए जवानों की याद



में दिया जाएगा। DRDO चेयरमैन के टेक्नोलॉजी एडवाइजर संजीव जोशी ने बताया, '15 जून को गलवन घाटी में शहीद भारतीय सैनिकों के सम्मान में DRDO ने यह फैसला लिया है।' सेंटर तैयार है और रविवार को गृहमंत्री अमित शाह ( Amit Shah) और रक्षा मंत्री राजनाथ सिंह इसका उद्घाटन करेंगे।

पूरी तरह एयर कंडीशन किए गए इस सेंटर में 1,000 बेड के साथ विशेष आइसियू बेड भी होंगे। यहां के आइसियू और वेंटिलेटर वार्ड का नाम शहीद कर्नल बी संतोष बाबू वार्ड होगा। इस अस्पताल में रख रखाव के लिए डॉक्टरों समेत दो हजार से अधिक इंडो-तिब्बतन बॉर्डर पुलिस (Indo-Tibetan Border Police, ITBP) व अन्य सेंट्रल आर्म्ड पुलिस फोर्स (CAPF) के जवान तैनात किए गए । बता दें कि प्रधानमंत्री नरेंद्र मोदी ने गुरुवार को लद्दाख के लेह में उस जगह का दौरा किया जहां देश के 20 जवानों ने सीमा पर 15 जून को चीनी सेना से डटकर सामना करते हुए जान की कुर्बानी दी थी।



<https://www.jagran.com/news/national-drdo-to-name-its-covid-hospital-wards-after-soldiers-killed-in-galwan-clash-20472370.html>

**The Indian EXPRESS**

Sat, 04 July 2020

## 600 medical personnel from tri-services mobilised to treat patients at Delhi's 1,000 bed Covid hospital

*Union Home Minister Amit Shah is likely to visit the facility on Sunday, sources said. Shah had said last week that a 1,000 bed full-fledged hospital with 250 ICU beds will be developed by the DRDO and Tata Trust within 10 days*

*By Anuradha Mascarenhas*

At least 600 medical personnel from the tri-services across the country have been mobilised to treat coronavirus patients at the 1,000-bed dedicated Covid-19 hospital in New Delhi, which will start functioning from Monday on Ulan Batar Marg near Indira Gandhi International Airport.

Union Home Minister Amit Shah is likely to visit the facility on Sunday, sources said. Shah had said last week that a 1,000 bed full-fledged hospital with 250 ICU beds will be developed by the Defence Research and Development Organisation and Tata Trust within 10 days.

The Armed Forces will provide the medical teams comprising doctors, nurses and paramedical staff for the hospital, which will have 100 critical care beds, 150 high dependency beds with ventilators and 750 oxygen beds along with investigative facilities. The hospital will be managed by teams from the Armed Forces Medical Services (AFMS), which have been specially trained in Covid-19 care.



**The Armed Forces will provide the medical teams comprising doctors, nurses and paramedical staff for the hospital, which will have 100 critical care beds, 150 high dependency beds with ventilators and 750 oxygen beds along with investigative facilities. (Representational)**

According to sources, the medical teams have been mobilised from across the country to ensure functional efficiency of the hospital at short notice. The doctors are from the tri-services and consist of intensivists and other specialists, including community medicine specialists. There are

more than 100 nursing officers, who will be assisted by a team of specially selected paramedical personnel

Delhi now has more than 92,000 coronavirus cases. The Chief of Defence Staff, General Bipin Rawat, had directed Director General Armed Forces Medical Services Lt Gen Anup Banerji to align efforts of the AFMS towards caring for the sudden surge in cases.

The healthcare teams are being coordinated by Lt Gen Madhuri Kanitkar, Deputy Chief Integrated Defence Staff (DCIDS) (Med) at HQ Integrated Defence Staff.

Professional medical teams from the services have also started working on the special train coaches that have been converted into Covid-19 care centres.

<https://indianexpress.com/article/india/600-medical-personnel-from-tri-services-mobilised-to-treat-patients-at-delhis-1000-bed-covid-hospital-6488986/>

**TIMESNOWNEWS.COM**

Sat, 04 July 2020

## **Ahmedabad: Firm forms a pact with DRDO for manufacture of UV disinfection towers**

*Company's Managing Director Sunil Shah stated, "We are hoping to launch the device in the market in the next 10 days."*

Ahmedabad: An Ahmedabad-based Company has recently formed an alliance with the Defence Research and Development Organisation (DRDO) in order to manufacture the ultraviolet (UV) disinfection towers rapid and chemical-free disinfection of high infection-prone areas. In this regard, the Motivation Engineers and Infrastructure Private Limited has formed a technology transfer agreement to manufacture towers.

Company's Managing Director Sunil Shah stated, "We are hoping to launch the device in the market in the next 10 days." The tower is basically a UV based area sanitiser, which has been designed and formed by the Laser Science and Technology Centre (LASTEC), a premier laboratory of DRDO based in the national capital.

Sunil Shah further said, "The tower, which will hit the markets in the next 10 days, can be managed through a mobile application. Though UV rays emitted by the tower could harm humans, the tower with motion sensors switches off on accidental opening of the room or human intervention when the tower is being operated by someone outside the room through remote. It can be operated remotely through phone or computer using Wi-Fi."

Apart from this, another major news from the city comes in the form of another potential COVID-19 vaccine -- following Bharat Biotech's Covaxin -- indigenously developed by Ahmedabad-based Zydus Cadila Healthcare Ltd which has got the nod from the Drugs Controller General of India (DCGI) for human clinical trials, government sources stated.

The entire approval process was fast-tracked following the recommendation by the subject expert committee on the deadly virus, taking in mind the emergency and unmet medical need during the crisis. An official source told PTI, "DCGI Dr V G Somani has given approval for the phase I and II clinical trials (on humans) of the potential novel coronavirus vaccine developed by Zydus Cadila Healthcare Ltd on Thursday after its animal studies was found to be successful."

<https://www.timesnownews.com/ahmedabad/article/ahmedabad-firm-forms-a-pact-with-drdo-for-manufacture-of-uv-disinfection-towers/616042>

# अमरउजाला

Sat, 04 July 2020

## देश में बनेंगे सुपरसोनिक हवाई जहाज को निशाना बनाने वाली मिसाइलों के उपकरण, MSME को दी बड़ी जिम्मेदारी

सार

गुरुवार को रक्षा मंत्रालय की डिफेंस एक्विजिशन कमेटी ने 38,900 करोड़ रुपये के इस सौदे को मंजूरी दे दी है। इस सौदे में दो तरह की भी मिसाइल शामिल हैं। पहली, जो 300 किलोमीटर दूर जमीन पर मार करेगी..

विस्तार

नई दिल्ली: चीन के साथ चल रहे सीमा विवाद के बीच भारत ने अपनी सैन्य प्रणाली को ताकतवर बनाने के लिए कई तरह के रक्षा उपकरण खरीदने की योजना बनाई है। इसमें लड़ाकू जेट विमानों से लेकर सुपरसोनिक हवाई जहाज को निशाना बनाने वाली मिसाइलें भी शामिल हैं।

खास बात ये है कि सैन्य साजो-सामान के अनेक उपकरण अपने देश में ही तैयार किए जाएंगे। इसके लिए कोई बड़े उद्योग धंधे लगाने की जरूरत नहीं पड़ेगी, बल्कि केंद्र सरकार यह अहम जिम्मेदारी अपने सूक्ष्म-लघु-मझोले उद्यमों यानी 'एमएसएमई' को देन जा रही है।

कई उपकरण तो ऐसे होंगे, जिनका 80 फीसदी उत्पादन भारत का एमएसएमई सेक्टर करेगा। इस योजना पर रक्षा मंत्रालय, डीआरडीओ और उद्योग मंत्रालय काम शुरू करेगा। शुरुआत में तीन सौ से अधिक सूक्ष्म-लघु-मझोले उद्यम इस योजना का हिस्सा बनेंगे। बाद में इनकी संख्या बढ़ती जाएगी।

बता दें कि केंद्र सरकार रक्षा क्षेत्र में 'मेक इन इंडिया' का दायरा बढ़ाने के लिए गंभीरता से काम कर रही है। इसके लिए एमएसएमई को भरपूर मौका दिया जाएगा। सरकार ने 33 लड़ाकू जेट विमान और मिसाइल खरीदने की योजना बनाई है।

गुरुवार को रक्षा मंत्रालय की डिफेंस एक्विजिशन कमेटी ने 38,900 करोड़ रुपये के इस सौदे को मंजूरी दे दी है। इस सौदे में दो तरह की भी मिसाइल शामिल हैं। पहली, जो 300 किलोमीटर दूर जमीन पर मार करेगी।

दूसरी, हवा से हवा में मार करने वाली मिसाइल है। इनकी खूबी को बियॉड विजुअल रेंज भी कहा जाता है। इस मिसाइल की दूसरी खासियत यह है कि इसे किसी भी तरह के मौसम में छोड़ा जा सकता है।

अगर बरसात है तो भी ये मिसाइल अपने टारगेट पर पहुंच जाती है। जिस तरह यह मिसाइल दिन में अपने टारगेट पर पहुंचती है, उतनी ही तेजी से रात को मार करती है। सबसे बड़ी विशेषता यह है कि इस मिसाइल के जरिए सुपरसोनिक एयरक्रॉफ्ट को आसानी से निशाना बना सकते हैं।

डिफेंस एक्विजिशन कमेटी ने पिनाक मिसाइल खरीदने को भी मंजूरी दी है। यह मिसाइल जमीन से जमीन पर एक हजार किलोमीटर तक मार करने की क्षमता रखती है। हिंदुस्तान एयरोनॉटिक्स में 12 एसयू-30 एमकेआई एयरक्रॉफ्ट का निर्माण होगा। इस पर 10,730 करोड़ रुपये खर्च होने का अनुमान है।



रक्षा मंत्रालय व उद्योग मंत्रालय ने डीआरडीओ के साथ मिलकर जो योजना बनाई है, उसके तहत उक्त रक्षा सामग्री के अनेक उपकरण एमएसएमई बनाएंगे। जब ये उपकरण खरीदे जाएंगे, तभी संबंधित कंपनी के साथ तकनीक के आदान प्रदान को लेकर करार होगा।

उद्योग मंत्रालय के एक अधिकारी का कहना है कि इसके लिए एमएसएमई कर्मियों को विशेष ट्रेनिंग दी जाएगी। यह जिम्मेदारी डीआरडीओ को सौंपी गई है। सरकार का प्रयास है कि रक्षा क्षेत्र में जो भी साजो-सामान, चाहे वह स्वदेश में बने या कहीं दूसरे मुल्क से आयात किया जाए, बाद में उसके उपकरण स्थानीय स्तर पर ही तैयार हों।

यही वजह है कि अब सरकार ने एमएसएमई सेक्टर को विशेष तत्वजो देनी शुरू की है।

<https://www.amarujala.com/india-news/drdo-and-defence-ministry-given-responsibility-to-msme-to-manufacture-the-missile-equipment>



**The Sentinel**  
*of this land, for its people*

Sat, 04 July 2020

## 'Indigenous systems will immensely benefit forces', says DRDO

*The Defence Research and Development Organisation (DRDO)  
said on Thursday that the armed forces and the industry*

New Delhi: The Defence Research and Development Organisation (DRDO) said on Thursday that the armed forces and the industry will be immensely benefitted by the manufacturing of indigenous systems. DRDO Chairman G. Satheesh Reddy said that air-to-air missile Astra, the Software Defined Radio, Pinaka munitions, and Land Attack Cruise Missile are state-of-the-art systems developed by the DRDO.

Astra is a beyond visual range (BVR) class of air-to-air missile (AAM) system designed to be mounted on fighter aircraft. The missile is designed to engage and destroy highly manoeuvring supersonic aircraft.

The missile has all-weather day and night capability. It is being developed in multiple variants to meet specific requirements.

The Astra Mk-I Weapon System integrated with SU-30 Mk-I aircraft is being inducted into the Indian Air Force (IAF). It can be launched in autonomous and buddy mode of operation with features for lock-on-before launch (LOBL) and lock-on-after launch (LOAL).

The Software Defined Radio (SDR) is a secure indigenous system with legacy communication support and secure digital voice/data communication for Naval application with 3-channel (2V/UHF band and 1HF band) and 4-channel (2V/UHF band and 2L-band) system for tactical communication and single channel operation in V/UHF (Manpack role) and UHF band (Handheld role).

Pinaka is an all-weather, indirect fire, free flight artillery rocket system. It provides a unique capability to accurately deliver a devastatingly lethal and responsive fire against a variety of area targets such as exposed enemy troops, armored and soft skin vehicles, communication centres, air terminal complexes, fuel and ammunition dumps.

The Pinaka weapon system consists of rocket, multi barrel rocket launcher, battery command post, loader-cum-replenishment vehicle, replenishment vehicle and Digicora MET radar. (IANS)

<https://www.sentinelassam.com/national-news/indias-first-indigenous-covid-19-vaccine-expected-by-august-15-486468?infinitescroll=1>







Sat, 04 July 2020

## Mig-29UPG and Mig-29K fleet to get Astra BVRAAM Next

*By Raunak Kunde*

Recent clearance by Defence Acquisition Council for procurement of 248 Astra Mk1 Beyond Visual Range Air to Air Missile (BVRAAM) for the first time has confirmed that next fighter jet which will get the new BVRAAM will be Mig-29UPG fleet and Mig-29K as India slowly moves to integrate indigenous Astra BVRAAM into the entire fleet of fighter jets.

The first lot of 50 pre-production Astra Mk1 BVRAAM already has been delivered to IAF, which will be integrated into existing Su-30MKI fleet and another 100 will go to Mig-29UPG which after avionics upgrade and HAL developed Mission Computer will be next to get software upgrade patch for Astra Mk1 integration with the Zhuk-ME electronically scanned slotted planar array radar. Mig-29UPG also got engine improvements and an expanded capability to conduct air-to-ground missions, which also feature an enlarged “hump” behind the cockpit, for extra fuel.



IAF will start getting 200 Astra Mk1 for Mig-29UPG and Su-30MKI fleet from 2021 onwards but our previous report (200 Astra Mk1 order soon with two different seekers ) hints at possible two seekers. The Indian Navy also flies MiG-29Ks that have many updated features in common with the SMT and UPG variants will also get 48 Astra BVRAAM which will supplement Russian R-77 BVRAAM.

Tejas Mk1A will be third fighter jets which will get Astra Mk1 BVRAAM from 2024 onwards for which IAF might place orders for another 300 lot over 200 currently placed as per information provided to idrw.org. Plans to integrate Astra Mk1 BVRAAM also on Mirage-2000 fleet that has been discussed but it will require French cooperation for source code of the Thales RDY 2 radar for the development of software which will allow Mission computer and Radar to talk to Astra Mk1 missiles for taking out the target.

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<https://idrw.org/mig-29upg-and-mig-29k-fleet-to-get-astra-bvraam-next/#more-230325>

THE FINANCIAL EXPRESS

Sat, 04 July 2020

### PM Modi's surprise visit to Leh: A strong signal to belligerent China

*The most important message that would go across to the Chinese would be that days of "Fait Accompli", similar to earlier occasions are over and India will stand up to any land grab through force and restore status quo*

*By Huma Siddiqui*

Prime Minister Narendra Modi's visit to Leh is a clear signal to China of India's resolve to stand firm in the face of Chinese incursions in Ladakh. The visit could not have come at a more appropriate time. "The visit is not symbolic and carries a meaning to be conveyed to our belligerent neighbour hell-bent on creating instability for its expansionist designs," opine experts.

#### Experts' Views

Sharing his views with Financial Express Online, Lt Gen Vinod Bhatia (ret'd), Former DGMO & Director Centre For Joint Warfare Studies (CENJOWS) says, "His visit to Leh is also a signal to China not to repeat the Galwan treachery during the agreed-upon disengagement process. The visit also supports and appreciates the Army's resolute response. The PM visiting frontline troops boosts the morale of the armed forces and reinforces the political belief in the army's top leadership."

"The visit to the soldiers injured at Galwan is recognition of their gallant fight despite a savage assault by PLA on 15 June. The visit also is a message to the International community of India's firm and just stance to ensure territorial integrity and Sovereignty. PM Modi is known to lead in crisis situations and spending time with troops deployed in borders areas and operations. It reinforces his leadership role and style, being seen in full control," the former DGMO adds.

Says Ranjit Kumar, a senior journalist and a China watcher, "Prime Minister's unannounced visit to forward locations in Ladakh is a huge message not only to China but the international community that India is determined to protect its territorial integrity and sovereignty, no matter what will be the costs and consequences. Chinese soldiers have already learnt a bitter lesson on the night of June 15th in the Galwan valley. Prime Minister Modi has signalled that sacrifices of 20 Indian soldiers will not go waste. His visit to forward location in Nimu has further raised the morale of the Indian army, who are ready to tackle any threat from across the border."

"China has deliberately upped the ante in the border areas of Ladakh, which the Indian army and top political leadership is determined to counter. Hope, China will realise the futility of escalating the border tension and implement the understanding reached during the Army commanders meeting on 6th June and 17th June talks between foreign ministers. By not implementing the consensus reached in the army commanders and foreign ministers discussions, China is showing its



The visit also is a message to the International community of India's firm and just stance to ensure territorial integrity and Sovereignty. (Twitter image)

true colours and has of late acquired the image of not respecting bilateral agreements and international laws and commitments,” Ranjit Kumar opines.

“In the South China Sea region, China has been disrespecting the United Nations Law of the Sea and claiming the maritime areas as belonging to China and illegally declaring the disputed islands as China’s. Similarly, China has been unilaterally extending the line of actual control and raising tensions with India. It is really unfortunate that in the 70th year of establishment of diplomatic relations China has created a warlike situation on the 3488 kms long line of Actual control,” Kumar concludes.

In Brig N K Bhatia’s (ret’d) opinion, “Prime Minister Modi’s visit to any field, formation is a matter of great pride. It for sure boosts the morale of troops in such trying times when they face the challenges of a treacherous neighbour along with an equally hostile, harsh and adverse operating environment.

The most important message that would go across to the Chinese would be that days of “Fait Accompli”, similar to earlier occasions are over and India will stand up to any land grab through force and restore status quo. In such an eventuality things would get tough for the Chinese as well. Chinese may have occupied uncontested areas by deceit but engaging in combat to further gain any territory may be near impossible and would entail heavy costs and loss of lives.”

“Both sides are engaged in talks and that’s the only positive aspect of the current standoff. It should dawn on the opposing side that India is not only capable of defending its territory but also capable of opening up new frontiers should the situation so require.

As things stand today China’s actions have invited international condemnation. But that overtly seems to have had little impact on its conduct. However, India standing up to China and giving it back in equal measure in the unarmed combat duel on 15 June would have surely sent a suitable response to the Chinese,” Brig Bhatia observes.

#### **PM visits Leh**

Applauding the troops posted in the Galwan Valley for showing “fire and fury” to the enemies, PM Modi in a veiled reference to China’s attempt to take over territory in Ladakh, he said the “age of expansionism is over”.

He was accompanied by Chief of Defence Staff Gen Bipin Rawat and Army chief Gen MM. Naravane, and was given a detailed briefing by the 14 Corps Commander Lt Gen Harinder Singh. Besides interacting with the personnel from the ITBP, Air Force and the Army in Nimu, he also visited the military hospital and met those who were injured in the violent face-off on June 15.

<https://www.financialexpress.com/defence/pm-modis-surprise-visit-to-leh-a-strong-signal-to-belligerent-china/2012801/>

The Indian EXPRESS

Sat, 04 July 2020

## **‘Your bravery will be source of inspiration’: PM Modi meets soldiers injured in Galwan faceoff**

*Earlier, addressing personnel of the Army, Air Force and ITBP at Nimu, PM Modi sent out a clear message to China and said that the "era of expansionism is over"*

New Delhi: During his unannounced visit to Ladakh amidst the tense border situation with China, Prime Minister Narendra Modi Friday interacted with the soldiers injured in the Galwan faceoff last month. He told them that their bravery will be a “source of inspiration for times to come” and added that 130 crore Indians are proud of them.

“The bravehearts who left us, have not gone without a reason. Together, you all also gave a befitting reply (karara jawab bhi diya hai),” he told the injured soldiers while interacting with them at an army hospital in Leh.



In the worst flare-up on the Line of Actual Control in more than five decades, 20 Indian Army personnel, including the commanding officer of 16 Bihar Regiment, were killed on June 15 in violent clashes with Chinese troops in the Galwan valley where disengagement of troops on either side was underway. Beijing has acknowledged that there were Chinese “casualties” too in the Galwan Valley.



Prime Minister Narendra Modi interacts with soldiers injured in Galwan faceoff.

Earlier, addressing personnel of the Army, Air Force and ITBP at Nimu, PM Modi sent out a clear message to China and said that the “era of expansionism is over”. “This is the era of development... History has proved that expansionist forces have either lost or were forced to turn back,” he added. The Prime Minister also said that bravery is a pre-requisite for peace and that those who are weak can never initiate peace.



PM Modi today met the injured soldiers as well as the local military leadership, including Lt. General Harinder Singh, XIV Corps Commander among other senior officers.

Modi, accompanied by Chief of Defence Staff General Bipin Rawat and Army Chief General MM Naravane, arrived at Nimu earlier this morning. This was the first high profile visit from the executive leadership to the region ever since the border standoff erupted in early May.

Addressing the soldiers, Modi said: “Your courage is higher than the heights where you are posted today. When the safety of the country is in your hands, then there is a belief. Not only me, but the entire nation believes in you and is not worried. You inspire every citizen to work day and night. Our resolve for ‘Atmanirbhar Bharat’ (self-reliant India) has become stronger because of you and your strong resolve. The valour shown by you has shown India’s strength on the global front.”



He added: “India’s enemies have seen your fire and fury. Those who are weak can never initiate peace. Bravery is a pre-requisite for peace. Your will power is as strong and firm as Himalayas; the whole country is proud of you.”

Besides the injured soldiers, Modi also met the local military leadership, including Lt. General Harinder Singh, XIV Corps Commander.

Situated at a height of 11,000 feet, Nimu is among the tough terrains. It lies on the banks of the river Indus and is surrounded by the Zaskar range.

While paying tributes to the soldiers during his Mann ki Baat address last Sunday, Modi had said: “Those who cast an evil eye on Indian soil in Ladakh have got a befitting response. India honours the spirit of friendship... she is also capable of giving an appropriate response to any adversary, without shying away. Our brave soldiers have proven that they will not let anyone cast an evil eye on the glory and honour of Mother India.”

Defence Minister Rajnath Singh was initially scheduled to visit Ladakh today along with the Army Chief, but his visit was deferred on Thursday.

Friday marks Naravane’s third visit to Ladakh since the standoff began in May. He visited the XIV Corps headquarters in Leh on his first visit, while on his second, he met the injured soldiers and visited forward areas.

Lt. General Harinder Singh, on the other hand, has met his Chinese counterpart for three high-level military discussions so far, the last being on Tuesday. The discussions have been inconclusive, suggesting that more military and diplomatic meetings will be required to end the stalemate.

Both sides had “emphasised the need for an expeditious, phased and step-wise de-escalation as a priority,” at the meeting held at Chushul, which is on the Indian side of the Chushul-Moldo Border Personnel Meeting (BPM) point in eastern Ladakh. The previous two meetings, on June 6 and June 22, had been held on the Chinese territory at Moldo.

Indian and Chinese troops have been involved in a face-off at multiple locations in the region. The friction points include North bank of Pangong Tso, Hot Springs, Vohra Post and Galwan Valley.

While at Pangong Tso, China has built substantial structures till Finger 4, which is 8 km west of India’s claim of LAC at Finger 8; they have also built some structures at Patrolling Point 14 in the Galwan Valley.

China has also crossed the border at Depsang Plains, which is close to India’s strategically-important Daulat Beg Oldie post near Karakoram Pass in the north.

The other major concern has been the heavy military build-up in the depth areas by China, which has been mirrored by India by moving in additional divisions and air defence assets.

<https://indianexpress.com/article/india/narendra-modi-in-leh-ladakh-live-updates-india-china-border-dispute-6487966/>



Sat, 04 July 2020

## Indian Army deploys another division in East Ladakh amid border row with China

*The new division, which was moved from Uttar Pradesh, will remain stationed in the eastern Ladakh. Along with it, the artillery of this division will also reach Ladakh*

*By Krishna Mohan Mishra*

New Delhi: In response to China’s increased deployment of troops along Line of Actual Control (LAC), the Indian Army has also deployed another division in Ladakh amid border row with China. A total of four divisions have now been deployed in the East Ladakh following the violent faceoff in the Galwan Valley on June 15.

Prior to May, there was only one division of the Indian Army stationed in this area. In the changed scenario, the Indian Army is making its largest military deployment in Ladakh. Notably, a division comprises 15 to 20 thousand soldiers.

According to sources, the new division, which was moved from Uttar Pradesh, will remain stationed in eastern Ladakh. Along with it, the artillery of this division will also reach Ladakh.

The development has come in the wake of China’s increased deployment of its troops across the LAC because the Indian Army does not want to leave any part of the LAC vulnerable.

Ladakh has an 856-km border with China, starting from Karakoram Pass to Chumur in South Ladakh. From Karakoram Pass to Daulat Beg Oldi, Depsang plain, Galwan Valley, Pangong Lake, Demchouk, Koil, and Chumur, there is a possibility of infiltration from the Chinese side on the LAC.

Earlier in May, two mountain divisions from Uttar Pradesh and Himachal Pradesh were deployed in Ladakh region soon after the border tensions began. The soldiers of these two divisions have been well-acclimatized in eastern Ladakh and then stationed at different important places.

Notably, Sino-India tensions along LAC in Ladakh have not subsided even after two months, and reports came that China is further enhancing its troops, tanks and armored vehicles in the region. The Indian Army, therefore, decided to increase the number of soldiers in the border areas.



Prior to May, an army division stationed near Leh used to monitor the entire area from Siachen to Chumur. The Leh-based 14th Corps keeps an eye on the border area of both Pakistan and China.

The 8th division has the responsibility to secure the border areas of Kargil and Dras on Pakistan side, while the 3rd division keeps vigil on the border touching China.

<https://zeenews.india.com/india/indian-army-deploys-another-division-in-east-ladakh-amid-border-row-with-china-2293481.html>

## THE TIMES OF INDIA

Sat, 04 July 2020

# Ladakh triggers Andamans build-up

By Rajat Pandit

New Delhi: India is now looking to fast-track plans for basing additional military forces in the strategically-located Andaman & Nicobar archipelago, along with the requisite development of infrastructure, as an effective counter to China's expanding strategic presence in the Indian Ocean Region (IOR).

Defence sources on Friday said the long-pending plans for "force accretion" and "military infrastructure development" at the A&N Islands have "gained a sense of urgency" with China's aggressive and expansionist moves both along the 3,488-km Line of Actual Control as well as the IOR.

The Andaman Nicobar Command (ANC) was set up in 2001 as the country's first — and till now the only — "theatre" command with all land, sea and air forces under one operational commander. But it has for long suffered from general apathy, fund crunches, lack of environmental clearances to build infrastructure and, of course, crippling turf wars among the three services.

But that could be a thing of the past now. The ongoing troop confrontation in eastern Ladakh with China is making the defence establishment re-examine ANC's role as India's crucial military outpost that overlooks China's critical sea lanes transporting the bulk of its crude oil imports and other trade through the Malacca Strait. These "choke points" of China can be swiftly threatened, if required, by Indian warships and aircraft operating from the ANC.

"Some initiatives to augment the ANC have already been set in motion, while others are being finalised," said a source. Land allotments and clearances for the extension of the runway at naval air station INS Kohassa at Shibpur in North Andaman, for instance, have just been completed, he added. The plan is to extend the runways at both INS Kohassa and INS Baaz at Campbell Bay in the south of the archipelago to 10,000-ft to support operations by larger aircraft.

India will be able to base additional warships, aircraft, missile batteries and infantry soldiers in the A&N Islands under the overall 10-year infrastructure development "roll-on" plan, which is pegged at Rs 5,650 crore. It also includes an air enclave with a 10,000-ft runway at Kamorta island as well.

### STRATEGIC COUNTER

- 572-island Andaman & Nicobar archipelago straddles major global trade routes
- Dominates Bay of Bengal, Malacca Strait & South-East Asia
- Bulk of China's oil supplies and trade pass through sea lanes in the region
- India's first & only theatre command set up in

A&N in Oct 2001. All Army, Navy, IAF & Coast Guard forces under 1 commander

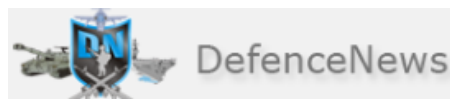
- Can be used as an effective pivot to counter China's expanding strategic presence in Indian Ocean Region





As was first reported by TOI earlier, a plan for “phased military force accretion” at the ANC by 2027 is also being finalised simultaneously. It ranges for additional infantry battalions, surveillance and target acquisition batteries to surface-to-air missile systems, additional flights of Mi-17 V5 helicopters, transport aircraft and Dornier-228 maritime patrol planes, said sources. India, of course, also wants to permanently base fighter jets in the archipelago in the coming years.

<https://timesofindia.indiatimes.com/india/ladakh-triggers-andamans-build-up/articleshow/76778355.cms>



Sat, 04 July 2020

## Russia to deliver S-400 by 2021-end, but will supply missiles and bombs amid LAC tensions

India’s S-400 Triumf air defence system is currently in production in Russia and will undergo a series of trials before its arrival in the country by the end of 2021.

Sources said amid tensions with China at the Line of Actual Control in Ladakh, Russia will supply certain kinds of missiles and bombs for the Indian Air Force and the Army as part of emergency procurement.

Sources also said during the recent visit of Defence Minister Rajnath Singh to Russia, a review of all defence contracts signed and those in pipeline was done.



Diplomatic sources said India has sought emergency delivery of quite a few items.

They said India is aware that according to the contract, the delivery of the S-400 system would begin within 24 months from the payment of the first tranche of the \$5.2-billion dollar deal.

Sources said even though the contract for the system, which will be India’s air defence umbrella and the main pillar of the Indian Air Force’s defence grid, was signed in October 2018, the payment took time because both countries had to find a way around the US sanctions against Russia.

Initially, it was expected that the first of the five S-400 systems will start coming in by the end of 2020. Following this, the rest of the four systems will be supplied over a period of four years.

“The production process involves a lot of computing and coding, which is very specific to the requirements of a particular customer. There are series of tests that are conducted, which are also followed up by training. The production can’t be simply sped up,” a source said.

The source added it is not like in-use missiles, which can be diverted from Russian forces to India or any other customer.

### Capabilities of S-400

The S-400 is the most modern air defence system in the Russian arsenal meant for export.

It is capable of destroying incoming hostile aircraft, missiles and even drones within a range of up to 400 km. It has a tracking capability of nearly 600 km.

The system has been designed to knock down flying targets, including those equipped with stealth technologies, at a distance of about 400 km. It is also capable of taking out ballistic missiles and hypersonic targets.

Compared to its predecessor — the S-300 — the S-400 has a firing rate that is 2.5 times faster.

As reported by ThePrint earlier, each S-400 battery comprises long-range radar, a command post vehicle, target acquisition radar and two battalions of launchers (each battalion has eight). Each launcher has four tubes.

The S-400 can be armed with four different types of missiles with ranges of 400 km, 250 km, 120 km and 40 km. The long-range radar can track more than 100 flying objects simultaneously while being able to engage a dozen targets.

<https://www.defencenews.in/article/Russia-to-deliver-S-400-by-2021-end,-but-will-supply-missiles-and-bombs-amid-LAC-tensions-861414>



Sat, 04 July 2020

## China's border realignment aimed at gaining tactical advantage before India gets S-400: IAF Vet

For over two months, Indian and Chinese armies have been locked in border stand-off that included a violent skirmish on 15 June in Ladakh. Experts have compared the air power of the two countries as a military build-up has picked up speed along the loosely demarcated 4057-kilometre Line of Actual Control (LAC).

The Indian Air Force has stationed additional air defence and radar systems in the Ladakh region amid reports of Chinese deployment of its S-300 and S-400 air defence systems in adjoining Tibet. The Indian Air Force has also kept ready its BrahMos supersonic cruise-missile-equipped Su-30MKI in the region.



While China's defence ministry spokesperson, senior Colonel Wu Qian, confirmed on 24 June an all-dimensional live-fire exercise to comprehensively test troop joint combat capability in a plateau environment, he mentioned that the exercise was "not targeting any specific country".

Nevertheless, Indian Air Force Chief R.K.S. Bhadauria has observed a "more than usual deployment" by the People's Liberation Army Air Force (PLAAF) in the Ladakh region, where the two sides became entangled in a brief but intense stand-offs beginning in the last week of April. Bhadauria said that his force is prepared for any contingency and confirmed that he has deployed assets in forward bases.

Amid a military build-up on the Indian side, the Chinese state run daily paper Global Times, quoted Chinese experts claiming that India's Mig-29s, Su-30s, Mirage 2000 jets and Jaguar attack aircraft are no match for China's domestically developed J-10C and J-16 fighter jets. Chinese analysts believe that the J-20 stealth fighter jet has a "generational advantage over Indian aircraft, a gap that cannot be fulfilled by any means."

Sputnik spoke to Vijander K Thakur, Indian Air Force veteran and defence analyst, about the technological development and capabilities of the two Asian giants.

**Sputnik:** Due to differences in the perception of Line of Actual Control, there have been skirmishes between India and China. The ongoing stand-off clearly suggests a different attitude from Chinese side, which claims sovereignty over Galwan and a no-man's land at Pangong Tso. Is the unavailability of a missile defence system like the S-400 in India a major reason for this? What difference will it make once India can deploy this system?

**Vijander K Thakur:** It is likely that China's decision to use force to realign the LAC to gain tactical and strategic advantages was a political one, but the decision to do it now, not later, would

have factored in the IAF's planned acquisition of the S-400 system. The average height of the Tibetan plateau is 4,500m. Even low-flying People's Liberation Army Air Force (PLAAF) aircraft would effectively be flying at around 5,000m.

IAF S-400 systems positioned at around 500m elevation, would be able to detect the relatively high-flying PLA fighters and medium-altitude long-endurance drones well before they cross the LAC. On the contrary, PLA S-400 systems positioned at high elevation and masked by high mountains would not be able to detect IAF aircraft flying at around 5,000m.

**Sputnik:** In 2018, the Indian Air Force chief claimed that the Su-30MKI had detected China's stealth fighter, the J-20, in the Himalayan region. Does this give confidence to IAF of an air defence superiority over China?

**Vijander K Thakur:** It's unlikely that the PLAAF will deploy its J-20 fighters for cross-border missions, except in an all-out war. China has nothing to gain from an all-out war with India. If anything, an all-out war with India would alienate China from the rest of the world even more. Such alienation would be a serious threat to the continued rule of the CPC. It is likely that airpower would be used by both countries to facilitate LAC realignment by interdicting tenuous supply lines through the mountains.

Coming to the core of your question, IAF airborne (fighters and AWACS) and ground-based radars can detect PLAAF J-20 stealth fighters. However, the radars would not be able to track the J-20 flight path with enough accuracy to engage them with radar-guided missiles. However, there would be other important factors in play. The PLAAF has a limited number of operationally-deployed J-20 stealth fighters. Operating from high-altitude airbases on the Tibetan plateau, the range of these fighters would be constrained. PLAAF air bases are relatively further recessed from the LAC, as compared to IAF bases.

Under the circumstances, it would not be possible for the PLAAF to effectively keep J-20 fighters on patrol 24/7 over the LAC. Since the IAF can detect the presence of J-20 fighters, it can easily avoid running into them accidentally. The IAF would use gaps between J-20 patrols for interdiction and ingress (helicopter/C-130 drops) missions. Because of the distance of their operating air bases from the LAC, the J-20 fighters wouldn't be in a position to intercept IAF strikes or air drops along the LAC.

**Sputnik:** Many consider that the availability of combat drones in China's People's Liberation Army will play a crucial role. What is the strength of Indian armed forces in UAVs and how would India counter China's combat drones?

**Vijander K Thakur:** All the three services are using drones for reconnaissance, surveillance and intelligence gathering. We currently don't have armed drones.

As in May 2015, India had around 176 MALE (Medium Altitude Long Endurance) UAVs, almost all procured from Israel. Of these, 108 were Searcher UAVs and 68, Heron UAVs.

**Sputnik:** What would be the role BrahMos-A and China's anti-missile system in the unlikely event that there is a conflict?

**Vijander K Thakur:** Because of its high supersonic speed and accuracy, the BrahMos-A represents a very potent threat to PLA command and control centers. The flight path of the missile can be programmed to maximize terrain masking, ruling out interception by adversary AD systems. Launched after ingressing into Chinese controlled (occupied Tibet) airspace and set to fly a lo-lo flight profile, the missile could be used to hit supply bases deep in adversary controlled territory.

<https://idrw.org/chinas-border-realignment-aimed-at-gaining-tactical-advantage-before-india-gets-s-400-iaf-vet/#more-230328>



## Explained: Standoff in week 9, what are India's options on China border now?

*India-China border dispute: What options are available to India to restore status quo ante on the Line of Actual Control (LAC) in the region?*

*By Sushant Singh*

New Delhi: The stand-off between the Indian and Chinese armies in eastern Ladakh is now in its ninth week. A conversation between the two foreign ministers, three rounds of Corps Commander-level talks, other discussions at the diplomatic and military levels have failed to break the impasse. On Friday, Prime Minister Narendra Modi said the “enemies of India have seen the fire and fury of our forces”, and warned that “India’s commitment to peace should not be seen as its weakness”.

What options are available to India to restore status quo ante on the Line of Actual Control (LAC) in the region?

### **Option 1: Evict the Chinese by force, destroy what they built**

The most straightforward course of action would be for Indian soldiers to push out the Chinese from the new areas that they have occupied in the last eight weeks, and destroy all the infrastructure China has built on the Indian side of the LAC.

This, however, will almost certainly lead to military escalation and in a full-blown war. Even the limited attempt to evict the Chinese from the observation post near PP14 on June 15 led to the clash in which 20 Indian soldiers and an unspecified number of Chinese lost their lives.

In the areas where the Chinese have come over to the Indian side of the LAC, the Indian Army may not be well disposed, due to constraints of terrain or infrastructure, to execute such a precisely targeted operation successfully. Also, some of the areas that the Chinese have entered are claimed by both countries, with no agreement over the alignment of the LAC. This will make it difficult for New Delhi to garner international support for its move.

**Probability:** Unlikely.

### **Option 2: ‘Quid pro quo’ tactic**

There are areas on the LAC that are not strongly defended by the Chinese, where Indian soldiers can move in and occupy a swathe of Chinese territory. At the negotiating table, the two sides can then exchange the occupied territories, and restore status quo ante. This option has been discussed at the highest levels — most noticeably in the 2012 policy document ‘Non-alignment 2.0’ — and is believed to have also been war-gamed by the military. According to strategic affairs analyst Ashley Tellis, the 2013 Chinese incursion in Depsang was reversed within three weeks after the Indian Army moved to the Chinese side in Chumar, and did some construction of their own. In the negotiations that followed, the two sides agreed to return to their earlier positions.

The ‘QPQ’ option exists even now, as the entire LAC from Ladakh to Arunachal Pradesh cannot be physically defended by the Chinese army. But such proactive options have a certain window of opportunity, which may have been lost after eight weeks of tensions. Also, it carries the risk of military escalation, as the Chinese may misread it as a larger military attack, or see it as a provocation.



**Probability:** Unlikely, but possible.

**Option 3: Hold the line and negotiate**

In this scenario, the Indian Army “holds the line” by deploying in strength along the LAC to ensure that the Chinese do not ingress deeper. This stops the Chinese at their current positions, while preparing Indian defences and allowing for a buildup of troops for any eventuality that may arise. The forces also get time to build up arsenal and stocks through import of critical material.

Talks are held simultaneously, including, if required, at the highest political level, to ensure the Chinese side returns to status quo ante. These are backed up by non-military moves against the Chinese, in the economic and trade domains, as has been witnessed recently. It allows New Delhi to demonstrate its resolve to the Chinese, while signalling to the world that it is a responsible power that would not be reckless.

Advantage can be taken of the prevailing global mood against the aggressive Chinese behaviour against numerous countries on various issues. It could allow for the formation of newer diplomatic, security, and trade partnerships to put China under pressure.

The downside is the prolongation of the standoff, possibly into winter, which would impose a heavy logistic and financial burden on the Indian Army. It also carries the risk of an accidental escalation, in case of an incident between soldiers on two sides who are deployed eyeball-to-eyeball in an environment of high tension for a long time. And the biggest risk is that the Chinese may not actually concede anything on the ground even as Indians continue to hold the line — the continued Chinese deployment and new constructions could alter the status quo permanently.

**Probability:** Most likely.

**Option 4: A limited war**

It can be limited in terms of geography — say, only in Ladakh, or in time — for a few days before India unilaterally declares a cessation of hostilities. This would be a very bold move; it carries the greatest risk of a full-blown war against a well-prepared adversary. Also, China has integrated theatre commands, where the full Sino-Indian border is seen as a single front under their western theatre command. It may not keep the war limited to the areas India would want it to, and stretch the Indian military fully.

This option also needs a heavy commitment of military resources, which will impact India’s post-Covid economic revival. There will be no global appetite to take sides, and Pakistan could simultaneously open another front. The only advantage is of sending China a strong message — because a bigger power, in this case China, has to win unequivocally, whereas not getting defeated can in itself be seen as a win for India.

**Probability:** Highly unlikely.

<https://indianexpress.com/article/explained/explained-standoff-in-week-9-what-are-indias-options-on-china-border-now-6489079/>



*Sat, 04 July 2020*

## Cybersecurity Chief: Can handle hacking threats

Lt Gen Rajesh Pant (retd), National Cybersecurity Coordinator, said today that the country was capable of handling cybersecurity issues. He also exhorted corporates to improve their cyber awareness in order to avoid falling prey to malevolent hackers.

His remarks come against the backdrop of Chinese hackers attempting to debilitate India’s digital services as a spillover of the LAC tensions. Addressing a webinar on cyber crime management during Covid organised by the Federation of Indian Chambers of Commerce &

Industry (FICCI), he said, “Our systems are well in place. More importantly, people handling cybersecurity in our country have an edge over other countries.”

<https://idrw.org/cybersecurity-chief-can-handle-hacking-threats/#more-230337>



Sat, 04 July 2020

## Why India Should Not Buy the F-35A

*By Ramanpreet Singh*

Although the chances, thankfully, are not high, we still often see newspaper articles and political analysts call for India to buy the F-35 Lightning II plane from the United States. This is, however, not a good idea. That, however, does not mean the F-35 is not a good aircraft. With the right tools and weapons support systems, it is a deadly opponent to face. However, it does not make a good case for India to procure such a fighter. India Should not buy the F-35 because we do not have the right support systems and funds to effectively use the F-35.

**History of F-35 :** The F-35 Lockheed is designed and developed by Lockheed Martin. It had its first flight in 2006 and about 500 aircraft are currently in service. The US plans on procuring about 2500 such aircraft. The program is seriously criticized for cost overruns and delays by the US congress.

**F-35 Issues :** According to an article by Business Insider and Defense News, the aircraft despite its reputation and general effectiveness, is still struggling with many issues. The aircraft had serious design flaws that had to be corrected after the production had already started, resulting in increased cost. According to the article, in the past few years, Lockheed Martin was able to correct the majority of the 111 issues on the aircraft in category 1. Category 1 flaws are defined as the most serious flaws that can result in death or injury, and critically restrict combat readiness of the aircraft.



Nevertheless, the aircraft still has issues with batteries falsely reporting failure in cold weather. The engines on the F-35B have trouble creating enough thrust in hot weather to keep the aircraft in the air, often resulting in hard landings. There have been reports by pilots that they are not able to control aircraft pitch, roll, and yaw after performing certain maneuvers. According to the Joint Striker Program Office’s Deficiency Report Metrics document, dated February 28, 2020, the aircraft currently has 883 unresolved design flaws, there are currently no plans to correct 160 of these. These include the problem that the F-35B and the F-35C can only fly supersonic/high speeds for a short period of time due to structural damage to the tail and negate the stealth factor of the aircraft. The F-35 also has software issues with its mission computers. Such design limitations can have severe consequences for a modern air force.

**India’s Case:** Cost is another major issue to consider. The base price of the F-35 is 90 million USD. To upgrade the aircraft to India’s standard would add to its cost as it did in the Rafale. Correcting these designs and software issues would require India to pay for eliminating these corrective actions and would be an added expense. The US will also force India to buy its weapons package rather than integrate Indian, Israeli, or Russian weapons into the aircraft. The US could allow India to integrate its Indian weapons after paying a premium, and the work would have to be done by Americans, and in the United States.. The chances of the US giving integration codes to India is unlikely. This is just the cost of buying the aircraft and upgrading it to India’s standards.



The F-35 will come with additional costs in terms of operation. The operating cost of an F-35A for an hour on average can cost 36,000 USD according to the Joint Program Office. This is the official figure by the US Government presented to Congress. Some reports indicate this cost could be higher. That is how much each fighter will cost the Indian Air Force to fly for an hour for any mission. The F-35A needs specially-built, costly hangars with the unique ability to control precise humidity and temperature, in order to preserve the stealth coating. The F-35 requires RAM coating to be applied to obtain additional stealth. It wears out over time, depending on the operating conditions. All these expenses will add to the cost, at a time when the IAF is already, as an aftermath of the CoronaVirus, struggling for funds .

The IAF will also run into logistical issues. In the past, the IAF has focused mostly on Russian fighters with a Russian and Israeli inventory of weapons and systems. Introducing an American system and weapons inventory will create logistical issues and cost increases. IAF will need specially trained maintenance, pilots, and engineers to service the aircraft. This will require massive training and storage of spare parts. Ex IAF officials have acknowledged the need for streamlining repairs and having fewer aircrafts types in the IAF inventory. It's hard for armed forces to justify increasing costs and bringing in another aircraft type from a different nation. We must move towards having aircraft from fewer nations while introducing indigenous fighters. For example, most nations, such as France and Britain, mostly use two to three active sets of fighters. France uses its home-built Mirage 2000 and Rafale, While Britain uses its Eurofighter Typhoon and American F-35B. Our two biggest adversaries in the region, Pakistan and China, also use 4 and 6 different types of fighters respectively. Pakistan's fighter fleet consists of American F-16, Chinese JF-17, F7P/PG, French Mirage III & V. China uses a mix of homegrown fighters such as J10, J7, J11, and Russian origin SU27, SU30MKK, SU35. China, however, has to worry only about just spare parts from Russia and is actively trying to build spares at home. India, however, uses 7 different fighters, with only Tejas being indigenous. India uses Russian origin SU30MKI, MiG-29, Mig-21, French origin Mirage 2000 and Rafale, and finally British origin Jaguar. We depend on three nations to provide spares for our fleet, which is already problematic. Adding an American fighter to the list will just add to the existing problems of the IAF.

Conclusion: I completely agree that the price tag on the F-35 is undeniably justifiable for some nations. However, to fully utilize the F-35 we need to have many support systems since it's a net-centric fighter. We can not spend so much money on expensive fighters and then spend more on support systems. Let us not forget it is already very unlikely for the US to even get an F-35 without paying a premium, since we are getting a Russian S400 missile defense system.

The best way forward would be to continue developing indigenous fighters and technology with the public-private model. We should also continue to build spare parts at home for Russian and French origin fighters, to limit our reliance on them. The F-35 is a great fighter but it is not for India at this time.

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<https://idrw.org/why-india-should-not-buy-the-f-35a/#more-230356>

## While India should continue search for peaceful solution, military odds are in no way stacked in China's favour

*Over decades India has negotiated an uneasy peace with China, largely through economic compromise and security concession, but this has not worked. While India should not abandon hope of finding a peaceful solution via diplomacy and negotiation, the sombre reality is that China appears to be in no mood to relent*

*By Amit Cowshsih*

With the situation prevailing in Ladakh, this is not the opportune moment for political brinkmanship or speculative assessment about whether India is militarily prepared to face Chinese expansionist designs. The reality is that if push comes to shove, the Indian armed forces will have no choice but to fight with their existing capabilities. Minor augmentation is possible through rushed delivery of already contracted-for material and ammunition and assorted ordnance purchases off-the-shelf, but beyond this there is no magic bullet.

Some analysts believe that the People's Liberation Army (PLA) has a decisive edge over the Indian Army due largely to its superior numerical strength, infrastructure in the Tibet Autonomous Region (TAR) abutting the Line of Actual Control (LAC), weaponry and recently accomplished joint service operations. Even so, it does not necessarily give China a definitive edge, as the potential conflict is unlikely to remain confined to ground forces.

Looked at in the wider context of mountain warfare, arduous and complex at the best of times, the odds are in no way stacked in China's favour.

Firstly, on ground, India has moved additional troops, howitzers, main battle tanks, infantry combat vehicles, varied missile batteries and air defence systems to the LAC in Ladakh. This deployment is backed by BrahMos medium-range supersonic cruise missile, the quickest and the world's most lethal in its class. Other than land, the Indo-Russian BrahMos is also capable of being launched from combat aircraft and frontline warships.

On Thursday, the government approved Rs 18,148-crore procurement of 33 Russian fighters, including 21 upgraded MiG-29 and 12 licence-built Su-30MKI fighters, missiles, and ammunition to boost military capability. This delivered a distinct signal that the perceived paucity of funds and the recession spawned by the COVID-19 pandemic would, in no way, thwart India from squaring up to China's military threat along the LAC.

Besides, unlike the PLA, which has fought just one war with Vietnam over 40 years ago, the Indian Army is battle-hardened. It has fought five wars since 1947, four in which it ably acquitted itself, and has vast experience in hybrid mountain warfare, initially in the north-east and more recently in Kashmir.

Most crucially, the commitment of PLA troops, most of them Han Chinese, to defend distant frontiers populated by rival Tibetan ethnic groups who believe in a living God, is really no match to the commitment Indian troops have to preserving their territories. The fierce loyalty and pride of Indian troops to their paltans is unmatched in most other armies around the world and is a force multiplier.

Secondly, unlike the 1962 border war with China in which India came off worse, the Indian Air Force (IAF) will play a significant role in the event of hostilities. A majority of IAF bases are located in the nearby plains from where combat aircraft like the Russian Sukhoi Su-30MKI, upgraded MiG-29M and retrofitted French Mirage 2000H can operate with a full load of fuel and

weapons. In contrast, the payload of PLA Air Force's (PLAAF's) fighters located at bases across the TAR at heights above 4,000 mts is circumscribed.

Moreover, PLAAF fighters like J-8Fs, J-11Bs and J-16s, reverse engineered from Soviet-era and Russian platforms, are operationally inferior to the IAF's advanced fighters which are also armed with laser munitions with pinpoint accuracy. The procurement of SPICE-2000 bomb kits from Israel, approved recently by the government, will also reinforce the IAF's capability to take out ground targets from a safe distance. By contrast, PLAAF pilots have not operated against a real opponent.

Thirdly, China borders about 14 countries, but has frontier disputes with as many as 18 states. None of these countries is likely to intervene in the event of a Sino-Indian conflict, but New Delhi can expect some, if not all, of them to share intelligence and information, especially in the maritime domain, to thwart added threats in the strategic Indian Ocean Region. Most of these satellite states are inimical towards China and fearful of its blatant hegemony.

Both sides have also placed aircraft carriers at the centre of their maritime force development plans, using elements of Russian technologies. But each side has started from a different base level of experience and of adopting their own path to securing carrier capability.

China is relatively new to carrier operations and has had to start from scratch, with no aircraft, vessel, training pipeline, or operational experience to build upon. By contrast, India celebrated the 62nd anniversary of its aviation wing in May 2015 and can claim 54 years of continuous carrier operations. Indian Navy (IN) officials, therefore, maintain that their "institutional" maturity, experience, and knowledge gives it a decisive operational edge.

Much of China's cockiness stems from its delusion of economic and military invincibility which, looked at objectively, defies reality. In its clash with the Indian Army at Nathu La near Sikkim in 1967, for instance, the casualties suffered by PLA were almost four times those on the Indian side. Again, 12 years later in 1979, China boasted that it had driven Vietnamese troops out of Cambodia. The reality, however, was that Vietnamese troops remained in Cambodia for another decade after China's self-proclaimed victory.

After the clash between Indian Army and PLA troops in the Galwan Valley area along the LAC on the night of 15-16 June, an embarrassed China declined to reveal the casualties it suffered.

Wars are not won by making self-serving claims of military superiority before they are fought; they are won by tangible results on the ground, achieved through superior strategy and tactics and as Napoleon Bonaparte said, lucky generals. When criticised for winning battles simply because of luck, Napoleon retorted: I'd rather have lucky generals than good ones.

Over decades India has negotiated an uneasy peace with China, largely through economic compromise and security concession, but this has not worked. While India should not abandon hope of finding a peaceful solution via diplomacy and negotiation, the sombre reality is that China appears to be in no mood to relent.

If anything, Beijing appears inclined to exacerbate tensions by unsubtly involving its surrogates in Nepal and Pakistan, countries it dominates through a combination of financial bullying, security, military and nuclear pacts, but, above all, by exploiting their visceral antipathy for India. Sadly, this can only mean a prolonged military impasse, which could well escalate into a conflict, at huge cost to both sides, including China.

*(This article first appeared in the print edition on July 4 under the title "When push comes to crunch." The writer is former Financial Advisor (Acquisition), Ministry of Defence.)*

<https://indianexpress.com/article/opinion/columns/india-china-ladakh-border-tension-6488929/>



## Skies clear for Mysuru girl to become state's second woman fighter pilot

Everyone has some or the other ambition or dream to achieve when they are in college but very few of them live their dreams or choose the career they wished. Mysuru-based Coluvanda Punya Nanjappa has achieved her childhood dream or call it passion to be a fighter jet pilot.

She has been selected for the training and once she completes it, she will be a fighter pilot, a rare distinction for a woman who has her roots in Kodagu, a land of defence personnel. Though the district has achieved the fame of producing a Field Marshal, a General and innumerable Lieutenant Generals, Brigadiers and Majors in the Indian Army and their equal ranks in the Navy and the Air Force, it is for the first time a woman fighter pilot is emerging from the tiny district.

In fact, she will be the only second woman from Karnataka to be a fighter jet pilot after Meghana Shanbough from Chikkamagalur and is the lone woman in her ongoing training course where there are 40 future fighter pilots.



Last year, Punya became the only women cadet from Karnataka to be selected for the flying branch training at the Indian Air Force Academy. The training for cadets who are selected for the flying branch is divided into three stages. Punya has already completed the Stage-1 of her training at the Academy in Dundigal in Telangana and has been selected to join the fighter stream where she will undergo Stage-II training at Hakimpet, again in Telangana.

The training stages are vivid and is a combination of adventure, skill and deft manoeuvring. They will be trained to engage in air-to-air combat, air-to-ground combat and sometimes electronic warfare while in the cockpit of a fighter aircraft. Fighter pilots undergo specialised training in aerial warfare and dogfighting (close range aerial combat).

After Stage-II, Punya will be commissioned as an officer to undergo Stage-III training. She is likely to be commissioned as an officer in the next passing out parade in December. Punya has always wanted to join the fighter pilot stream and her childhood dream has been realised. A resident of Vijayanagar in city, Punya was selected as a Trainee Pilot of IAF Flying Branch last year.

She is the daughter of Anuradha Nanjappa (a teacher at St. Joseph's Central School) and late Coluvanda P. Bala Nanjappa (he was serving as the Manager of Prabha Theatre), native of Chambebellur in Virajpet taluk of Kodagu district.

Punya completed her schooling at St. Joseph's Central School in Vijayanagar, pursued her PUC at Vijaya Vittala PU College in Saraswathipuram and Engineering at NIE, Mysuru. Punya then took up Air Force Common Admission Test (AFCAT) — an officer recruitment gateway in three branches of Air Force — Flying Branch (Short Service Commission only), Technical branch (Permanent and Short Service Commission) and Ground Duty Branch (Permanent and Short Service Commission).

<https://www.defencenews.in/article/Skies-Clear-For-Mysuru-Girl-To-Become-State%e2%80%99s-Second-Woman-Fighter-Pilot-861418>

## CAPF okays transgender persons' hiring

*The home ministry on Wednesday sought the views of central paramilitary forces (CAPF) to add transgender as the third gender category in relevant application forms ahead of the annual examination for recruiting assistant commandants to be held in December*

*By Neeraj Chauhan*

New Delhi: In what can be seen as a major move towards the inclusion of the transgender community into the mainstream after the Transgender Persons (Protection of Rights) Act was notified earlier this year, officials of the Border Security Force (BSF), Central Reserve Police Force (CRPF), and Sashastra Seema Bal (SSB) on Friday told the Union home ministry that they will recruit transgender persons to the officer cadre post of assistant commandants.

“The CRPF already has a gender-neutral work environment. In view of impending policy guidelines of the Ministry of Home Affairs (MHA), we shall make it further compatible as per the need,” director general A P Maheshwari said.

Indo-Tibet Border Police (ITBP) chief S S Deswal, who also holds additional charge as director general BSF, said, “We have no objection,” speaking for the latter paramilitary force.

The ITBP and the Central Industrial Security Force (CISF) Centre are expected to respond in the next few days, officials familiar with the matter said.

The home ministry on Wednesday sought the views of central paramilitary forces (CAPF) to add transgender as the third gender category in relevant application forms ahead of the annual examination for recruiting assistant commandants to be held in December. The comments of all the central paramilitary forces would be shared with the Union Public Service Commission which conducts the exams, officials aware of the matter said.

The home ministry's letter, first sent out on in June and again on July 1, followed a circular issued by the Department of Personnel Training in April, which directed all central government departments to include transgender as a separate category for recruitment for all posts, including civil services.

There is currently no provision to hire transgender persons in the central paramilitary forces. Vidya Rajput, a member of the Chhattisgarh Transgender Welfare Board said that while the move was welcome, additional seats for transpersons must be created across all government posts. “A socially supportive structure is very important.”

<https://www.hindustantimes.com/india-news/capf-okays-transgender-persons-hiring/story-epFM5affqOjBqH6y12VqFM.html>



Home ministry on Wednesday sought the views of central paramilitary forces (CAPF) to add transgender as the third gender category in relevant application forms ahead of the annual exam for recruiting assistant commandants to be held in December. (ANI file photo)

## Time not right to add to tension, says China

*Prime Minister Narendra Modi's visit to Ladakh came days after  
20 Indian soldiers were killed in a clash there with Chinese troops on June 15*

*By Suthirto Patranobis*

Beijing: Beijing on Friday asked New Delhi to avoid any “strategic miscalculation on China,” and complications of tensions along the India-China border hours after Prime Minister Narendra Modi visited Ladakh amid a stand-off between Indian and Chinese troops there.

Modi's visit to Ladakh came days after 20 Indian soldiers were killed in a clash there with Chinese troops on June 15. Speaking in Ladakh, Modi emphasised the time for expansionism is over. He added India is becoming stronger and its commitment to peace should not be seen as a sign of weakness.

“India and China are in communication and negotiations on lowering the temperatures through military and diplomatic channels. No party should engage in any action that may complicate the situation at this point,” Chinese foreign ministry spokesperson, Zhao Lijian, said at a regular briefing on Friday.

Modi's visit is being closely monitored in China as New Delhi begins a calibrated response, including economic measures, to the standoff.

When asked about a possibility of a ban on Chinese companies from building roads in India, Zhao said New Delhi should focus on “common interests in bilateral relations”.

“Certain politicians in India have been issuing remarks that are detrimental to our bilateral relations... Our bilateral relations need to be held with concerted efforts. The Indian side should work with us towards the same goal, to uphold the general picture of our common interests in bilateral relations,” Zhao said.

“Setting artificial blocks to our concrete and practical cooperation will also harm India's interest. We will take the necessary measures to uphold the legitimate rights of Chinese businesses in India.”

Zhao sidestepped a question about India's security-related concerns that prompted it to ban 59, mostly Chinese mobile applications, on Monday.

“...we should also be aware that India and China are major developing countries; accelerating the renewal and development are historical missions for both of us. To this end, we have to respect and support each other. This is also in the long-term interest of both sides,” he said.

“If we show misgiving and engage in conflicts, this is not the right way and also goes against the shared aspiration of our people.” He added India and China have to follow the consensus reached between the leaders of the two countries about bilateral relations. “The Indian side should not have strategic miscalculation on China. We hope it will work with China to uphold the overall picture of our bilateral relations.”

<https://www.hindustantimes.com/india-news/time-not-right-to-add-to-tension-says-china/story-OKF8I7ysWVysCdqwMiWqkL.html>



## DNA in the water can tell us how many fish are there

By Amit Malewar

According to a new study by National Institute for Environmental Studies, Tohoku University, Shimane University, Kyoto University, Hokkaido University, and Kobe University, it is possible to identify an estimated population abundance of fish species using DNA in the water.

For the purpose, scientists have developed a new method for estimating population abundance of fish species (or, more generally, a target aquatic species) by means of measuring the concentration of environmental DNA in the water.

DNA molecules are released from organisms present, are transported by the flow of water, and are eventually degraded. In a natural environment, these processes can operate in a sophisticated way.

Keiichi Fukaya, a research associate at the National Institute for Environmental Studies, said, “This complicates and limits the traditional approach of population quantification based on environmental DNA where the presence of a definite relationship between the concentration of environmental DNA and population abundance has been critical.”

“We thought that these fundamental processes of environmental DNA, the shedding, transport, and degradation, should be accounted for when we estimate population abundance through environmental DNA.”

Scientists implemented this idea by using a numerical hydrodynamic model that explicitly accounts for the processes to simulate the distribution of environmental DNA concentrations within an aquatic area.

Fukaya explained, “By solving this model in the ‘inverse direction,’ we can estimate fish population abundance based on the observed distribution of environmental DNA concentrations.”

A case study conducted in Maizuru Bay, Japan, confirmed that the estimate of the population abundance of Japanese jack mackerel (*Trachurus japonicus*), obtained by the proposed method, was comparable to that of a quantitative echo sounder method.

“The idea and framework presented in this study form a cornerstone towards quantitative monitoring of ecosystems through environmental DNA analysis. By combining field observation, techniques of molecular biology, and mathematical/statistical modeling, the scope of the environmental DNA analysis will be broadened beyond the determination of the presence or absence of target species,” explained Professor Michio Kondoh from Tohoku University, who led the 5.5-year environmental DNA research project, funded by the Japan Science and Technology Agency (CREST).

### Journal Reference:

1. Keiichi Fukaya et al. Estimating fish population abundance by integrating quantitative data on environmental DNA and hydrodynamic modeling. DOI: [10.1111/mec.15530](https://doi.org/10.1111/mec.15530)

<https://www.techexplorist.com/dna-water-tell-fish/33483/>



Japanese jack mackerel Researchers ‘counted’ Japanese jack mackerel (*Trachurus japonicus*) in Maizuru Bay, Japan, through quantitative measurements of environmental DNA concentration. Credit: Reiji Masuda, Kyoto University.

# The lightest shielding material in the world

*Protection against electromagnetic interference*

## **Summary:**

***Researchers have succeeded in applying aerogels to microelectronics: Aerogels based on cellulose nanofibers can effectively shield electromagnetic radiation over a wide frequency range - and they are unrivaled in terms of weight.***

Electric motors and electronic devices generate electromagnetic fields that sometimes have to be shielded in order not to affect neighboring electronic components or the transmission of signals. High-frequency electromagnetic fields can only be shielded with conductive shells that are closed on all sides. Often thin metal sheets or metallized foils are used for this purpose. However, for many applications such a shield is too heavy or too poorly adaptable to the given geometry. The ideal solution would be a light, flexible and durable material with extremely high shielding effectiveness.

## **Aerogels against electromagnetic radiation**

A breakthrough in this area has now been achieved by a research team led by Zihui Zeng and Gustav Nyström. The researchers are using nanofibers of cellulose as the basis for an aerogel, which is a light, highly porous material. Cellulose fibres are obtained from wood and, due to their chemical structure, enable a wide range of chemical modifications. They are therefore a highly popular research object. The crucial factor in the processing and modification of these cellulose nanofibres is to be able to produce certain microstructures in a defined way and to interpret the effects achieved. These relationships between structure and properties are the very field of research of Nyström's team at Empa.

The researchers have succeeded in producing a composite of cellulose nanofibers and silver nanowires, and thereby created ultra-light fine structures which provide excellent shielding against electromagnetic radiation. The effect of the material is impressive: with a density of only 1.7 milligrams per cubic centimeter, the silver-reinforced cellulose aerogel achieves more than 40 dB shielding in the frequency range of high-resolution radar radiation (8 to 12 GHz) -- in other words: Virtually all radiation in this frequency range is intercepted by the material.

## **Ice crystals control the shape**

Not only the correct composition of cellulose and silver wires is decisive for the shielding effect, but also the pore structure of the material. Within the pores, the electromagnetic fields are reflected back and forth and additionally trigger electromagnetic fields in the composite material, which counteract the incident field. To create pores of optimum size and shape, the researchers pour the material into pre-cooled moulds and allow it to freeze out slowly. The growth of the ice crystals creates the optimum pore structure for damping the fields.

With this production method, the damping effect can even be specified in different spatial directions: If the material freezes out in the mould from bottom to top, the electromagnetic damping effect is weaker in the vertical direction. In the horizontal direction -- i.e. perpendicular to the freezing direction -- the damping effect is optimized. Shielding structures cast in this way are highly flexible: even after being bent back and forth a thousand times, the damping effect is practically the same as with the original material. The desired absorption can even be easily adjusted by adding more or less silver nanowires to the composite, as well as by the porosity of the cast aerogel and the thickness of the cast layer.

## **The lightest electromagnetic shield in the world**

In another experiment, the researchers removed the silver nanowires from the composite material and connected their cellulose nanofibres with two-dimensional nanoplates of titanium carbide, which were produced using a special etching process. The nanoplates act like hard

"bricks" that are joined together with flexible "mortar" made of cellulose fibers. This formulation was also frozen in cooled forms in a targeted manner. In relation to the weight of the material, no other material can achieve such shielding. This ranks the titanium carbide nanocellulose aerogel as by far the lightest electromagnetic shielding material in the world.

**Story Source:**

[Materials](#) provided by [Swiss Federal Laboratories for Materials Science and Technology \(EMPA\)](#).

*Note: Content may be edited for style and length.*

**Journal Reference:**

1. Zihui Zeng, Changxian Wang, Gilberto Siqueira, Daxin Han, Anja Huch, Sina Abdolhosseinzadeh, Jakob Heier, Frank Nüesch, Chuanfang (John) Zhang, Gustav Nyström. **Nanocellulose-MXene Biomimetic Aerogels with Orientation-Tunable Electromagnetic Interference Shielding Performance.** *Advanced Science*, 2020; 2000979 DOI: [10.1002/advs.202000979](https://doi.org/10.1002/advs.202000979)

<https://www.sciencedaily.com/releases/2020/07/200702113703.htm>

**ScienceDaily**

Sat, 04 July 2020

## Research reflects how AI sees through the looking glass

**Summary:**

*Intrigued by how reflection changes images in subtle and not-so-subtle ways, a team of researchers used artificial intelligence to investigate what sets originals apart from their reflections. Their algorithms learned to pick up on unexpected clues such as hair parts, gaze direction and, surprisingly, beards - findings with implications for training machine learning models and detecting faked images.*

**Things are different on the other side of the mirror.**

Text is backward. Clocks run counterclockwise. Cars drive on the wrong side of the road. Right hands become left hands.

Intrigued by how reflection changes images in subtle and not-so-subtle ways, a team of Cornell University researchers used artificial intelligence to investigate what sets originals apart from their reflections. Their algorithms learned to pick up on unexpected clues such as hair parts, gaze direction and, surprisingly, beards -- findings with implications for training machine learning models and detecting faked images.

"The universe is not symmetrical. If you flip an image, there are differences," said Noah Snavely, associate professor of computer science at Cornell Tech and senior author of the study, "Visual Chirality," presented at the 2020 Conference on Computer Vision and Pattern Recognition, held virtually June 14-19. "I'm intrigued by the discoveries you can make with new ways of gleaning information."

Zhiqui Lin is the paper's first author; co-authors are Abe Davis, assistant professor of computer science, and Cornell Tech postdoctoral researcher Jin Sun.

Differentiating between original images and reflections is a surprisingly easy task for AI, Snavely said -- a basic deep learning algorithm can quickly learn how to classify if an image has been flipped with 60% to 90% accuracy, depending on the kinds of images used to train the algorithm. Many of the clues it picks up on are difficult for humans to notice.

For this study, the team developed technology to create a heat map that indicates the parts of the image that are of interest to the algorithm, to gain insight into how it makes these decisions.

They discovered, not surprisingly, that the most commonly used clue was text, which looks different backward in every written language. To learn more, they removed images with text from



their data set, and found that the next set of characteristics the model focused on included wrist watches, shirt collars (buttons tend to be on the left side), faces and phones -- which most people tend to carry in their right hands -- as well as other factors revealing right-handedness.

The researchers were intrigued by the algorithm's tendency to focus on faces, which don't seem obviously asymmetrical. "In some ways, it left more questions than answers," Snavely said.

They then conducted another study focusing on faces and found that the heat map lit up on areas including hair part, eye gaze -- most people, for reasons the researchers don't know, gaze to the left in portrait photos -- and beards.

Snavely said he and his team members have no idea what information the algorithm is finding in beards, but they hypothesized that the way people comb or shave their faces could reveal handedness.

"It's a form of visual discovery," Snavely said. "If you can run machine learning at scale on millions and millions of images, maybe you can start to discover new facts about the world."

Each of these clues individually may be unreliable, but the algorithm can build greater confidence by combining multiple clues, the findings showed. The researchers also found that the algorithm uses low-level signals, stemming from the way cameras process images, to make its decisions.

Though more study is needed, the findings could impact the way machine learning models are trained. These models need vast numbers of images in order to learn how to classify and identify pictures, so computer scientists often use reflections of existing images to effectively double their datasets.

Examining how these reflected images differ from the originals could reveal information about possible biases in machine learning that might lead to inaccurate results, Snavely said.

"This leads to an open question for the computer vision community, which is, when is it OK to do this flipping to augment your dataset, and when is it not OK?" he said. "I'm hoping this will get people to think more about these questions and start to develop tools to understand how it's biasing the algorithm."

Understanding how reflection changes an image could also help use AI to identify images that have been faked or doctored -- an issue of growing concern on the internet.

"This is perhaps a new tool or insight that can be used in the universe of image forensics, if you want to tell if something is real or not," Snavely said.

The research was supported in part by philanthropists Eric Schmidt, former CEO of Google, and Wendy Schmidt.

**Story Source:**

**Materials** provided by [Cornell University](#). Original written by Melanie Lefkowitz. *Note: Content may be edited for style and length.*

<https://www.sciencedaily.com/releases/2020/07/200702152445.htm>

## Researchers solve a 60-year-old puzzle about a superhard material

Skoltech researchers, together with their industrial colleagues and academic partners, have cracked a 1960s puzzle about the crystal structure of a superhard tungsten boride that can be extremely useful in industrial applications, including drilling technology. The research, supported by Gazpromneft Science & Technology Center, was published in the journal *Advanced Science*.

Tungsten borides first captured the imagination of scientists in mid-20th century due to their hardness and other fascinating mechanical properties. One longstanding puzzle has been the crystal structure of the highest W-B phases, the so-called WB<sub>4</sub>, which varied wildly between experimental models and theoretical predictions.

"Experimentally, the crystal structure is determined by X-ray structure analysis. But the large difference in atomic scattering cross sections (heavy tungsten compared to light boron) renders positions of boron atoms in transition metal borides hardly discernable by X-ray diffraction. This can be resolved by neutron diffraction, but any diffraction method can only give the average structure. If the material is disordered, the complete knowledge of its crystal structure (including local arrangement of the atoms) can be obtained only using a combination of experimental techniques (X-ray, neutron diffraction) and computational methods of materials science," Alexander Kvashnin, Skoltech senior research scientist and first author of the study, explained.

In 2017, Andrei Osiptsov and Artem R. Oganov at Skoltech proposed an idea to search for superhard materials to be used for producing composite cutters installed on bits, which are used for drilling oil and gas wells. The idea was well received by Gazpromneft STC LLC, and the collaboration began between the company, Skoltech, and the Vereshchagin Institute for High Pressure Physics of the RAS. Researchers led by Artem R. Oganov of Skoltech and MIPT predicted the existence of WB<sub>5</sub>, tungsten pentaboride, which was expected to be harder than the widely used tungsten carbide and having comparable fracture toughness. The compound was successfully synthesized in the lab at Vereshchagin Institute to complete the research loop. In the new paper, Oganov and his colleagues show that the long-debated WB<sub>4</sub> and the newly predicted WB<sub>5</sub> are actually the same material.

"We studied the W-B system in order to predict the stable structure of higher tungsten borides, as we had already known about this longstanding puzzle. Predicting a new WB<sub>5</sub> structure was a surprise, especially as it has exciting properties as high Vickers hardness and fracture toughness and remains stable at very high temperatures. Then we thought this material should find application in the industry. Our colleagues from the Vereshchagin Institute successfully synthesized it. The diffraction patterns matched theoretical prediction very well, except a few weak peaks that were present in theory, but not in the experiment. Our predicted WB<sub>5</sub> has perfect single crystal structure, but as we showed, experiments produced a closely related disordered WB<sub>5-x</sub> material," Kvashnin explained.

The researchers synthesized this new material, measured its properties, and revealed an unexpected connection between the two compounds: the new material has a crystal structure derived from the WB<sub>5</sub> structure, with some amount of disorder and nonstoichiometry (this means that proportions of its elemental composition cannot be represented by a ratio of small integer numbers). Thus, the new material was denoted not as WB<sub>4</sub> but as WB<sub>5-x</sub>. Its crystal structure was ultimately predicted by USPEX, an evolutionary algorithm developed by Oganov and his students, and elaborated by a microscopic lattice model.

Since WB<sub>5-x</sub> is relatively easy to synthesize, its excellent mechanical properties and stability at high temperatures make it a very promising material for many technologies where tungsten carbide-based composites dominated in the last 90 years.

"This puzzle is solved in full detail. We have a detailed microscopic description of this material and its structure, we know the range of chemical compositions it can adopt, and its properties. Other exciting puzzles are waiting for theorists' attention," said Artem R. Oganov.

**More information:** Alexander G. Kvashnin et al. WB<sub>5-x</sub>: Synthesis, Properties, and Crystal Structure—New Insights into the Long-Debated Compound, *Advanced Science* (2020). DOI: 10.1002/adv.202000775 <https://phys.org/news/2020-07-year-old-puzzle-superhard-material.html>



Sat, 04 July 2020

## ISRO's Mars Orbiter Mission captures image of Phobos, Mars' biggest moon

*The Indian Space Research Organisation (ISRO) on Friday shared an image of Mars' closest and biggest moon, Phobos, captured by India's Mars Orbiter Mission*

*Edited By Ananya Das*

The Indian Space Research Organisation (ISRO) on Friday shared an image of Mars' closest and biggest moon, Phobos, captured by India's Mars Orbiter Mission.

Taking to micro-blogging site Twitter, ISRO shared, "A recent image of the mysterious moon of Mars, Phobos, as captured by India's Mars Orbiter Mission".

Mars Colour Camera (MCC) onboard Mars Orbiter Mission imaged Phobos on July 1 when the MOM was about 7,200 km from Mars and at 4,200 km from Phobos. The spatial resolution of the image is 210 m. This is a composite image generated from 6 MCC frames and has been colour corrected.



Phobos is largely believed to be made up of carbonaceous chondrites. The violent phase that Phobos has encountered is seen in the large section gouged out from a past collision (Stickney crater) and bouncing ejecta. Stickney, the largest crater on Phobos along with the other craters (Shklovsky, Roche & Grildrig) are also seen in this image.

<https://zeenews.india.com/science/isros-mars-orbiter-mission-captures-image-of-phobos-mars-biggest-moon-2293498.html>



## India now has two coronavirus vaccines set for human trials: All you need to know

*As Zydus Cadila was given the approval for human trials of the coronavirus vaccine contender days after Bharat Biotech got a similar green light for its vaccine Covaxin, India is now set for human studies of two coronavirus vaccines*

*By Chanchal Chauhan*

After Bharat Biotech, which developed a potential novel coronavirus vaccine called Covaxin, Ahmedabad-based Zydus Cadila has been given the green light to begin Phase I and II human trials of another coronavirus vaccine candidate. This is the second coronavirus vaccine to get approval for human trials in India. Novel coronavirus infections continue to climb here with India becoming the world's fourth worst-hit nation.

On Friday, coronavirus cases in India stood at 6,25,544 with 20,903 new cases being registered in a single day.

With drug manufacturers across the world scrambling to develop a vaccine for Covid-19, the disease caused by the novel coronavirus, Ahmedabad-based Zydus Cadila said it has received approval from the Drugs Controller General of India (DCGI) to conduct human studies for its coronavirus vaccine candidate.

Earlier, the drug regulator had given approval to India's first indigenous coronavirus vaccine candidate Covaxin. Covaxin has been developed by the Hyderabad-based Bharat Biotech in collaboration with the Indian Council of Medical Research (ICMR) and the National Institute of Virology (NIV).

### India now has 2 vaccines set for trials: All you need to know

1. Zydus Cadila Healthcare Ltd said it has received approval from DCGI for human clinical trials of its coronavirus vaccine candidate.

2. The approval process was fast-tracked following a recommendation by the subject expert committee on coronavirus, considering the emergency and unmet medical need during the pandemic.

3. The potential vaccine showed a "strong immune response" in animal studies, and the antibodies produced were able to completely neutralise the wild type virus, Zydus said in a statement.

4. Sources have said that the company submitted data of clinical trials on animals to the DCGI, in which the vaccine candidate was found to be successful with respect to "safety and immunogenicity". After this Zydus Cadila was given the approval to begin human trials.

5. Zydus will begin human trials this month in over 1,000 subjects in multiple sites in India, the company said. Phase I and II trials will take around three months to complete.

6. Meanwhile, the ICMR has written to select medical institutions and hospitals to fast-track clinical trial approvals for the vaccine candidate Covaxin.

7. Given the urgency, ICMR is aiming to launch the coronavirus vaccine by August 15. Twelve clinical trial sites have been identified at present.



Another potential coronavirus vaccine candidate has given the green light to conduct human trials in India. (REUTERS/representation)

8. Covaxin is derived from a strain of SARS-CoV-2 isolated by the ICMR's National Institute of Virology.

9. Bharat Biotech is working expeditiously to meet the target, however, the final outcome will depend on the cooperation of all clinical trial sites involved in this project, the ICMR told the selected institutes.

10. The indigenous inactivated vaccine was developed and manufactured in Bharat Biotech's BSL-3 (Bio-Safety Level 3) High Containment facility located in Genome Valley, Hyderabad, India.

No vaccine has yet been approved for commercial use against coronavirus in the world but more than a dozen from over 100 candidates globally are currently being tested on humans.

<https://www.indiatoday.in/india/story/india-now-has-two-coronavirus-vaccines-set-for-human-trials-all-you-need-to-know-1696586-2020-07-03>



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## India's first coronavirus vaccine may be launched by August 15

*A dozen institutes have been selected for clinical trials of the indigenous COVID-19 vaccine (BBV152 COVID vaccine), the government's top medical research body has said*

*By Arvind Gunasekar and Parimal Kumar*

### Highlights

- **Covaxin will be first made-in-India coronavirus vaccine**
- **The virus has infected over 10 million and killed 500,000 people globally**
- **No vaccine has yet been approved for commercial use against COVID-19**

New Delhi: The first made-in-India coronavirus vaccine may be launched by August 15, with the Indian Council of Medical Research (ICMR) fast-tracking efforts to develop "Covaxin" in partnership with Bharat Biotech International Limited. A dozen institutes have been selected for clinical trials of the indigenous COVID-19 vaccine (BBV152 COVID vaccine), the government's top medical research body has said.

The institutes have been asked by the ICMR to step up clinical trials as it is a "priority project" monitored at the topmost level of the government.

"The vaccine is derived from a strain of SARS-CoV-2 isolated by ICMR-National Institute of Virology, Pune. ICMR and BBIL are jointly working for the pre-clinical as well as clinical development of this vaccine," the ICMR said in a letter to the institutes.

The ICMR talked about plans to launch the vaccine for public health use by August 15, Independence Day. Experts have questioned the deadline, since the clinical trial is yet to begin.

"It is envisaged to launch the vaccine for public health use latest by 15th August 2020 after completion of all clinical trials," said the research body.

The final outcome will depend on the cooperation of all clinical trial sites involved in this project, the ICMR told the institutes, advising them to speed up approvals related to clinical trials and ensure that subjects are enrolled starting this week.

"Non-compliance will be viewed very seriously. Therefore, you are advised to treat this project on highest priority and meet the given timelines without any lapse," said ICMR's letter.

Bharti Biotech's application for clinical trial, accessed by NDTV, reveals that the estimated duration of the trial is one year and three months. The sample size of the study is 1,125 people between 12 and 65 years. Out of the 12 institutes picked BY ICMR, seven are yet to establish an "Ethics Committee" to oversee the trial.

"How can ICMR say that the vaccine will be launched for public use by August 15? How can the clinical trial be completed in just one month for a vaccine," wondered Amulya Nidhi of Jan Swasthya Abhiyan, a network of organisations working on public health.

While ICMR has refused to comment on its letter, Satyajit Mohapatra, who is in charge of the clinical trial in SRM Hospital and Research Centre, Tamil Nadu, told NDTV: "ICMR has given a timeframe for completion of Phase 1 of the trial by August. Phase 2 of the study will start after completion of Phase 1, followed by Phase 3."

The Phase 1 is planned for completion in 28 days, which would meet the August 15 deadline. It is not clear how the vaccine can be made available for public use with just the results of the first phase.

Worldwide, scientists are racing to produce a vaccine for the deadly virus that has infected over 10 million, including 600,000 in India, and caused more than 500,000 deaths.

No vaccine has yet been approved for commercial use against COVID-19. More than a dozen possible vaccines from over 100 being developed globally are being tested on humans. Some have shown potential in early-stage trials.

<https://www.ndtv.com/india-news/indias-first-coronavirus-vaccine-may-be-launched-by-august-15-2256269>



**hindustantimes**  
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## Researchers identify 33 molecules that can target 1 Covid-19 protein

*By Snehal Fernades*

Mumbai: Researchers at the Bengaluru-based National Centre for Biological Sciences (NCBS) have identified 33 small molecules out of 3, 30,000 that can target one protein — NSP1 — in the Sars-Cov-2 virus, which causes Covid-19. Identifying these molecules may help with drug discovery and examining existing drugs, approved by the Food and Drug Administration (FDA), that can be repurposed to treat Covid-19.

Using computational biology techniques, the three-member team at NCBS, which is a biological centre of the Tata Institute of Fundamental Research, found that only one in 10,000 screened molecules has the potential to target the protein.

"The choice of target protein, NSP1, is both unique among research at this time and important based on the role the NSP1 protein plays. It stalls host gene expression, could degrade host mRNA, and protects viral (self) mRNA from degradation. It is a great interactor with other proteins as well," said R Sowdhamini, professor of biochemistry, NCBS, and corresponding author of the study which has been accepted by the Journal of Biosciences of the Indian Academy of Sciences.

Researchers said narrowing down to these 33 molecules, which have exhibited stability and strong interaction with the Sars-Cov-2 protein, will save significant time on toxicity tests because some are used in FDA-approved drugs such as Remdesivir — currently being repurposed — while small molecules are mostly found in plants.

In the virtual screening of the molecules with NSP1, the team described FDA-approved anti-viral drugs such as Remdesivir and Edoxudine as "promising" as Covid-19 treatment. Esculin and Acarbose, which are prescribed for inflammation and diabetes respectively but are not anti-viral drugs, were also found to have potential to inhibit the protein.

The 33 molecules which displayed stability in their interaction with NSP1 are found in lactose, glycyrrhizic acid from liquorice plant (also referred to as athimathuram or yastimadhu); corilagin from pomegranates; galangan from blue ginger (also referred to as galangal or sitharathai); and gingerone and shogaol from both ginger and blue ginger.



Having started work based on new computational research since early March, the team said identifying 33 molecules will also translate into saving time, money and effort in experimental examinations.

“We have recommended a set of promising small molecules to bind to NSP1. We hope some of these ligands (molecules) could be useful to combat Covid-19,” said Sowdhamini.

Over the last three months, the team used computational docking algorithms to investigate how the ligands (molecules) would interact to inhibit the protein.

“Scores were provided depending on the strength of favourable and unfavourable interactions. More negative the scores, higher the chance for that molecule to be a potential inhibitor for the NSP1 protein,” said Abhishek Sharma, a joint PhD student in two laboratories and first author of the study.

Sharma added, “After two rounds of filters, the top-ranking molecules were considered. These docking runs took approximately 20 days of computing time, followed by analysis and literature survey”.

Vikas Tiwari, PhD student of the laboratory and the one who performed molecular dynamics simulations to yield the small molecules with the most stable interactions with the NSP1 protein, said, “We found that the small molecule or ‘ligand’ stays on with the protein and does not fly away during our simulations.”

<https://www.hindustantimes.com/cities/researchers-identify-33-molecules-that-can-target-1-covid-19-protein/story-jK8MpYyk654BIs8aW5rITN.html>

**hindustantimes**

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## Why social distance and wearing mask is important? A new study on cough droplets finds out

*The mathematical model designed by the researchers on Covid-19 focusses on the aerodynamics of the droplets to understand how it infects a healthy person*

*Edited By Amit Chaturvedi*

A mathematical model has revealed that respiratory droplets travel between eight to 13 feet before evaporating or escaping, in a new study on the coronavirus disease.

The researchers include scientists from Indian Institute of Science (IISc) in Bengaluru. The research has been published in the journal Physics of Fluids.

Since the beginning of the pandemic, it has been a well-established fact that respiratory droplets are responsible for the transmission of SARS-CoV-2 pathogen which causes Covid-19. These droplets eject when people cough, sneeze or talk.

The mathematical model designed by the researchers focusses on the aerodynamics of the droplets to understand how it infects a healthy person. They compared the droplet cloud ejected by an infected person to the one by a healthy person.

“The size of the droplet cloud, the distance it travels, and the droplet lifetimes are, therefore, all important factors that we calculated using conservation of mass, momentum, energy and species,”



A woman sneezes as a doctor prepares to take a nasal swab to be tested for the coronavirus in Dharmasala. (AP File Photo)

said one of the authors Swetaprovo Chaudhuri, from the University of Toronto in Canada. The experiments were conducted in contact-less environment.

She further explained that the model estimates approximately how long droplets can survive, how far they can travel, and which size of droplet survives for how long.

The researchers, however, noted that the actual situation could be complicated by wind, turbulence, air-recirculation or other things.

“Without wind and depending on the ambient condition, we found droplets travel between 8 to 13 feet before they evaporate or escape,” said Abhishek Saha, a co-author, from the University of California, San Diego in the US.

This finding implies that social distancing at perhaps greater than six feet is essential, according to the researchers. The initial size of the longest surviving droplets is in the range of 18-50 microns, meaning masks can indeed help, they said.

These findings, the researchers said, could help inform reopening measures for schools and offices looking at student or employee density.

While noting that the model doesn't claim to predict the exact spread of Covid-19, researchers noted that it could emerge as a powerful tool in clarifying the role of environment on infection spread through respiratory droplets.

The droplet evaporation or desiccation time is highly sensitive to the ambient temperature and relative humidity, they said.

<https://www.hindustantimes.com/world-news/why-social-distance-and-wearing-mask-is-important-a-new-study-on-cough-droplets-finds-out/story-pPbfHSL2c9kU7yzIjebaFK.html>

