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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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Thu, 18 June 2020

## **DRDO's made in India automatic sanitiser dispensing unit now available in small version**

Announcing a first of its kind innovation, Riot Labz presents a small version of Oakmist – automatic mist based hand sanitiser dispensers, named “Oakmist Mini” which were designed and developed by Defence Research and Development Organisation (DRDO). This Mini version is being launched to meet the sanitisation needs of Indian households.

Oakmist mini is explicitly designed for the sanitisation needs of the Indian households during this pandemic and carries a one year warranty. Oakmist mini has been endurance tested for more than 100,000 spray cycles and is housed in an aluminium body. It uses a high precision ultrasonic sensor to detect the hands to spray a mist of hand sanitiser. Oakmist mini has a capacity of around 1200 ml and works with any liquid sanitiser based on IPA (Isopropyl Alcohol) or Ethanol.



The packaging also includes a bottle of 500 ml high-quality hand sanitiser, wall mounting screws, a 2.5 Amp power adapter and a premium mat to collect any tertiary spillage if it happens. Also included in the packaging is a collapsible funnel to assist in sanitiser refilling. With its copyrighted design Oakmist mini is a very trendy option to replace the clutter of hand sanitisers that lay at our entry doors. A user can order the product from [www.oakmist.com](http://www.oakmist.com) or via their mobile app.

Shishir Gupta, CEO and founder of Riot Labz, says, “OakMist is proud to serve Indians at large in these trying times, where sanitisation is a necessary means for survival. This mini-unit is explicitly designed for the sanitisation needs of the Indian households during this pandemic.”

The Oakmist Mini will provide a further boost in the adoption of the DRDO's contactless touchless sanitiser which is already in use at locations like the Supreme Court, Rashtrapati Bhawan, the PMO, Ministry of Home Affairs, Chennai and Ahmedabad airports, etc. Company officials have informed that in recent days there has been an increase in orders by private organisations, offices and shopping malls for the product.

<https://www.expresscomputer.in/news/drdo-made-in-india-automatic-sanitiser-dispensing-unit-now-available-in-small-version/58219/>

## 30,000 ventilators funded by PM-CARES to arrive by August, PM says supply has started

*Prime Minister Narendra Modi had said in his address to chief ministers earlier in the day that the supply of made-in-India ventilators had started under the PM-CARES Fund. In May, Rs 2,000 crore was allotted from the fund for procuring 50,000 ventilators. This will double the number of ventilators in the country and help save lives of Covid-19 patients*

*By Aman Sharma*

Mysuru-based Skanray Technologies told ET on Wednesday that it has started delivering ventilators built under its license by Bharat Electronics Limited (BEL), being funded by the PM-CARES Fund, to the government and that 30,000 of them will be delivered by August.

Prime Minister Narendra Modi had said in his address to chief ministers earlier in the day that the supply of made-in-India ventilators had started under the PM-CARES Fund. In May, Rs 2,000 crore was allotted from the fund for procuring 50,000 ventilators. This will double the number of ventilators in the country and help save lives of Covid-19 patients.



BEL works under the defence ministry.

Of the ventilators to be procured under the fund, 30,000 will be supplied by Skanray Technologies. The company's managing director, Vishwaprasad Alva, told ET in an emailed response that "30,000 units of Skanray's CV200 advanced ICU ventilator are being manufactured at Bharat Electronics Limited (BEL) for the Government of India (GOI)... of which a few thousand have already been delivered and the entire 30,000 is targeted to be delivered by August".

State-owned BEL is working with the Centre on this government-to-government order and is supplying directly to it, said Alva. He said the responsibility of Skanray Technologies is to "transfer the design and product manufacturing technology" and that the company is "supporting BEL to indigenise some critical imported components to qualify the localised parts", besides helping with some software features and design upgrades along with Defence Research and Development Organisation (DRDO) scientist.

No other agencies or private parties are involved, he said, "making the transaction very transparent and efficient".

BEL works under the defence ministry. "CV200 Ventilators are being manufactured by BEL under license from Skanray Technologies. It is priced competitively considering its configuration, features and performance. BEL's CV200 Ventilator bears the PM Cares logo to ensure traceability and accountability, as it is being procured under this Fund," the CMD of BEL, MV Gowtama wrote on Twitter. He said the CV200 manufactured by BEL is a high-end ventilator.

Skanray Technologies started manufacturing ventilators in 2014 and is India's only ICU ventilator exporter, Alva said, adding that it is exporting to 80 countries. "We have grown to be the country's largest med-tech company, with 50 products," he said.

<https://economictimes.indiatimes.com/industry/healthcare/biotech/healthcare/30000-ventilators-funded-by-pm-cares-to-arrive-by-august-pm-says-supply-has-started/articleshow/76430257.cms>



Thu, 18 June 2020

## **Aligarh Muslim University installs sanitising machines and temperature scanners**

Aligarh: In a bid to prevent employees, students and visitors from contracting coronavirus; the Aligarh Muslim University (AMU) has installed automated mist based sanitiser dispensers, sanitisers with paddle stands and wall hanging contactless temperature scanners at various entry points of the university. Contactless temperature scanners have also been given to the guards deployed at different university gates to check temperatures of all visitors.

While four DRDO developed automated mist based sanitiser dispensers have been installed at the main entrance gate of the Administrative Block Building; the Vice Chancellor's Office, Registrar/Finance Office, Public Relations Office and Admission Section have been also provided with these dispensers.

Paddle based sanitiser dispensers have been positioned at the Property Office, CPO and Service Book Sections and two wall hanging contactless temperature scanners (infrared forehead thermometers) are been placed at the main entrance gate of the Administrative Block.

The university has also provided 30 contactless temperature scanners (infrared forehead thermometers) to various mosques in campus premises, while two such scanners have been provided to the security guards to check temperature of visitors at Administrative Block main gate. One contactless temperature scanner each has also been given to the gallery of the Registrar/Finance /Office, Public Relations Office, Property Office, Admission Section, CPO and Reserve at Caretaker for any emergency.

The decision to install these sanitising machines and temperature scanners was taken in a meeting of seven-member committee that featured AMU Registrar, Mr Abdul Hamid (IPS), Finance Officer, Prof S M Jawed Akhtar and Controller Examinations, Mr Mujib Ullah Zuberi.

<https://indiaeducationdiary.in/aligarh-muslim-university-installs-sanitising-machines-and-temperature-scanners/>

ज्ञान प्रसार एवम् विस्तार  
के 50 वर्ष

Thu, 18 June 2020

## The strength of India and China's defence forces compared

By Navdeep Yadav

- *China ranked second in military spending with military outlays totalling up to \$261 billion. Whereas, India ranks third with military outlays totalling to \$71.1 billion.*
- *China ranks third in aircraft strength with 3,210 aircraft in comparison to India which ranks fourth with 2,123 aircraft.*
- *India's DRDO has been conducting trials of ballistic missile Prithvi-1 which has 150 km-range, and Prithvi-2 with 250 km-range.*

In 2020, China had the largest active military force in the world, with about 2.18 million active troops. India, the United States, North Korea, and Russia rounded out the top five countries with the largest active-duty military forces, according to Statista.

China ranked second in military spending, as it has done since 2008 with military outlays totalling up to \$261 billion. Whereas, India ranks third with military outlays totalling to \$71.1 billion, according to Stockholm International Peace Research Institute.

China ranks third in aircraft strength, according to Global firepower. It has 3,210 aircraft in comparison to India which ranks fourth with 2,123 aircraft. Most importantly, China has two times the number of fighters and interceptors than India. It also has 507 serviceable airports compared to 346 airports in India.

An Indian Air Force fighter jet touches down on the Agra Lucknow Expressway on Monday November 21, 2016 BCCL

China's tank strength stands at 3,200 plus compared to India's stupendous 4,200 plus, according to Global firepower. But China's armoured fighting vehicles are at a staggering 33,000, and India pales into insignificance with just over 8,600.

In an impressive display of capabilities of mechanised warfare platforms in the arsenal of Indian mechanised forces, BCCL

According to the recent data, China has ten times more rocket projectors at 2650 than India's 266. It also has a total of 777 naval assets compared to 285 in India, with 74 submarines versus 16 owned by India. China also has 36 destroyers compared to 11 owned by India.

Preparation to be commissioning INS Khanderi the 2nd Kalvari - class scorpene submarine on Saturday September 28, 2019 at naval dock

India's DRDO has been conducting trials of ballistic missile Prithvi-1 which has 150 km-range, and Prithvi-2 with 250 km-range whereas China has various ballistic missiles, ranging from short-range missiles to Intercontinental Ballistic Missiles (ICBMs).

<https://www.businessinsider.in/defense/news/difference-between-india-and-china-military-expenses-soldiers-number-aircrafts-tanks-and-missiles/articleshow/76421399.cms>

hindustantimes

Thu, 18 June 2020

### ‘No compromise on borders’: PM Modi spells out India’s stance on row with China

*PM Modi’s sharply-worded statement was aimed not just at reassuring the country that the government was taking steps to protect India’s sovereignty but was also designed to deliver a stern message to Beijing*

*By Shishir Gupta*

India wants peace but is capable of giving a befitting reply if provoked, Prime Minister Narendra Modi said on Wednesday, his first remarks on the border clash between soldiers of the Indian and Chinese army in eastern Ladakh on Monday evening. PM Modi’s sharply-worded statement was aimed not just at reassuring the country that the government was taking steps to protect India’s sovereignty but was also designed to deliver a stern message to Beijing.

India has always promoted peace among nations, PM Modi said on Wednesday afternoon. PM Modi, who is meeting chief ministers via video conference on the Covid-19 pandemic, started with a reference to the border clash in Galwan Valley that cost 20 lives on the Indian side.

Over the next five minutes, PM Modi summarised his government’s stand on the clash and his determination not to let anyone stop India from retaliation if someone does target the country’s sovereignty.

In our neighbourhood, India’s constant effort has been that differences should not become disputes, PM Modi said a throwback to one of the principles that India and China had pledged themselves to at his meetings with Chinese President Xi Jinping.

India has blamed China for the border clash that New Delhi says could have been avoided had the Chinese soldiers scrupulously followed the agreement and not tried to unilaterally change the status quo in the Galwan region.

Colonel Santosh Babu and his men were outnumbered by the Chinese troops who attacked the Indian soldiers, but they still struck back at their adversary. In the process, Col Santosh, according to one estimate by the army, killed or critically injured over 40 Chinese soldiers including a commander of the People’s Liberation Army.

PM Modi referred to the extraordinary courage that they displayed.

“The country will be proud to know that they died after they killed their adversaries (Desh ko Is baat par garv hoga ki vae maarte, maarte, maren hai),” PM Modi said.

The Chinese military or the foreign office has not made public the casualties suffered by the PLA.

Officials said PM Modi’s statement had omitted any reference to dialogue to signal that the government was not looking for a way out. To the contrary, PM Modi underscored that no one could stop India from hitting back if its sovereignty was targeted.

“I would like to assure the nation that the sacrifice of our jawans will not be in vain. For us, India’s unity and sovereignty is the most important and no one can stop us from protecting it. No



one should have a doubt on this point. India wants peace but is capable of a befitting reply in every circumstance,” PM Modi said.

This clear message comes against the backdrop of Chinese PLA’s introducing a fresh claim over the Galwan Valley. This was one of the few areas along the Line of Actual Control where the difference in perception between the two sides was minimal. In New Delhi, the Chinese statement is seen as an effort to create fresh areas of differences even as older differences turn into disputes.

Defence Minister Rajnath Singh, who was also present at the chief minister’s conference along with Home Minister Amit Shah, had earlier in the day described the loss of soldiers “deeply disturbing and painful”.

“The nation will never forget their bravery and sacrifice. My heart goes out to the families of the fallen soldiers. The nation stands shoulder to shoulder with them in this difficult hour. We are proud of the bravery and courage of India’s bravehearts,” the defence minister tweeted.

Shortly after the prime minister’s intervention, Amit Shah also paid rich tributes to the fallen soldiers.

“The pain of losing our brave soldiers while protecting our motherland at Ladakh’s Galwan can not be put in words. Nation salutes our immortal heroes who sacrificed their lives to keep Indian territory safe and secure. Their bravery reflects India’s commitment towards her land,” Shah said.

<https://www.hindustantimes.com/india-news/no-compromise-on-borders-pm-modi-spells-out-india-s-stance-on-row-with-china/story-X2xKmstoBuqaYeWfUriXqL.html>



Thu, 18 June 2020

## **PM's late night meet with top 4 ministers, Army Chief over Ladakh clash**

*This was the last in a series of meetings that took place yesterday as India weighed its response to the most grave escalation at the Line of Actual Control, the de-facto border with China, in five decades*

*By Sunil Prabhu*

New Delhi: The country's top political establishment and the Army Chief met late last night, shortly after the army confirmed that 20 Indian soldiers were killed in a "violent face-off" with Chinese troops at Galwan Valley in Ladakh.

Prime Minister Narendra Modi, Home Minister Amit Shah, Defence Minister Rajnath Singh, Foreign Minister S Jaishankar, Finance Minister Nirmala Sitharaman and Army Chief General MM Naravane were at the meeting that took place around 10 pm. This was the last in a series of meetings that took place yesterday as India weighed its response to the most grave escalation at the Line of Actual Control, the de-facto border with China, in five decades.

Army sources have told NDTV that they are certain that up to 45 Chinese soldiers have been killed or injured in the incident.

The army had on Tuesday morning confirmed the death of a Colonel and two jawans and "casualties on both sides". But in a statement later, the army added that 17 more critically injured were "exposed to sub-zero temperatures... (and) succumbed to their injuries".

India blamed the clashes on "an attempt by the Chinese side to unilaterally change the status quo there", rebutting China's claims that Indian soldiers crossed the border.

An Indian army source in the region told AFP the incident involved no shooting but "violent hand-to-hand scuffles". The soldiers threw punches and stones at each other and the Chinese troops allegedly used rods and nail-studded clubs during the fight that lasted for hours until midnight on Monday, according to reports.



China's defence ministry confirmed the incident had resulted in casualties but did not give details.

The United States -- which has mounting frictions with China, but sees India as an emerging ally -- said it is hoping for a "peaceful resolution", and that it was monitoring the situation closely.

The UN called for both sides to "exercise maximum restraint".

Beijing claimed Indian soldiers "crossed the border line twice... provoking and attacking Chinese personnel, resulting in serious physical confrontation between border forces on the two sides".

Foreign ministry spokesman Anurag Srivastava, rejecting China's aggressive claims, said the clash arose from "an attempt by the Chinese side to unilaterally change the status quo" on the border.

The violence followed weeks of tension since May 9, when several Indian and Chinese soldiers were injured in a clash involving fists and stone-throwing at Naku La in Sikkim.

The massive escalation took place while both sides were in talks to resolve tensions at the border and spoke of "consensus".

Agence France Presse quoted sources and news reports as suggesting that Chinese troops remained in parts of the Galwan Valley and of the northern shore of the Pangong Tso lake that they had occupied in recent weeks.

India and China fought a brief war in 1962 in which China took territory from India. Further deadly clashes followed in 1967, but the last violent clash that resulted in deaths was in 1975, when four Indian soldiers were ambushed and killed along the dividing line in Arunachal Pradesh.

In 2017 there was a 72-day showdown after Chinese forces moved into Doklam plateau on the China-India-Bhutan border.

After that PM Modi and Chinese leader Xi Jinping held two summits.

<https://www.ndtv.com/india-news/prime-minister-narendra-modis-late-night-meet-with-top-4-ministers-army-chief-over-ladakh-clash-with-china-2247472>

## THE TIMES OF INDIA

Thu, 18 June 2020

### Galwan clash: Army, Navy, Air Force raise alert level

New Delhi: Front-line bases of the Indian Army and the Air Force along the nearly 3,500 km de-facto border with China were on Wednesday put on high alert in view of a major clash between Indian and Chinese troops in Galwan Valley in eastern Ladakh that left 20 Army personnel dead, official sources said.

The Indian Navy has also been asked to raise its alert level in the Indian Ocean Region where Chinese Navy has been making regular forays.

The decision to raise the alert level of the three forces were taken at a high-level meeting Defence Minister Rajnath Singh held with Chief of Defence Staff Gen Bipin Rawat and the three service Chiefs, sources said.

The Army has already rushed in additional troops to all its key front-line bases and formations along the Line of Actual Control (LAC) in Arunachal Pradesh, Uttarakhand, Himachal Pradesh and Ladakh, they said.

The Indian Air Force has already raised the alert level in all its front-line bases tasked to keep an eye on the LAC, the de-facto border.



The sources said the Navy is increasing its deployment in the Indian Ocean Region to send across a strong message to the Chinese Navy.

<https://timesofindia.indiatimes.com/india/galwan-clash-army-navy-air-force-raise-alert-level/articleshow/76426994.cms>

# THE ECONOMIC TIMES

Thu, 18 June 2020

## Fighters, warships moved to forward bases after bloodiest day in Ladakh

*The turn of events on Monday night along the Line of Actual Control took the top brass by surprise*

*By Pranab Dhal Samanta*

New Delhi: The government has given powers to the armed forces to make emergency procurements to stock up its war reserves in the wake of escalating conflict with China along the Line of Actual Control.

**Flashpoints In Eastern Ladakh**

- Patrol Point 14 in Galwan Valley
- Patrol Points 15, 17 in Gogra-Hot Springs
- Finger 4 area along Pangong Tso

**How Confrontations Began**

- Chinese PLA starts building strength along LAC in Eastern Ladakh
- PLA mobilises troops, takes part in an exercise on the Tibetan plateau near LAC
- Deploys 6,000 troops, heavy vehicles, tanks and artillery
- Violent clashes, involving sticks and stones, at Galwan and Pangong Tso on May 5 and 6, resulting in injuries to both sides
- India rushes thousands of troops
- Both sides have set up camps opposite to each other
- PLA intrudes into Indian territory in Galwan Valley, Gogra and Finger 4 area along Pangong Tso (India claims LAC lies at Finger 8)
- Chinese objects to bridge and road construction by India at Galwan
- At Finger 4 area, Chinese troops stop Indian patrols from moving beyond this point, cutting off an area of over 50 sq km
- Moves artillery and tanks to mirror Chinese deployments

**Talks**

- Several rounds of talks between local division, brigade and battalion commanders of both sides have taken place
- Talks at the military and diplomatic level on to defuse situation
- Talks between 14 Corps Commander Lieutenant General Harinder Singh and his counterpart Major General Liu Lin on June 6 at Chushul-Moldo point

**Current Status**

- After talks, limited disengagement, including thinning of troops, has taken place at Galwan Valley and Gogra
- Pangong Tso a bone of contention between two countries
- Talks for Chinese troops to vacate Finger 4 area has not resulted in progress

While India has initiated dialogue to contain the conflict in Ladakh, sources said, the government did not want to leave anything to chance at this stage, especially after the violence on Monday night.

ET has learnt that Chief of Defence Staff General Bipin Rawat has been asked to coordinate with the three services on prioritising the requirements, where necessary.



Those familiar with the details told ET that the Navy has also been given the go-ahead to deploy its assets near the Malacca Strait and, if needed, anywhere else in the Indo-Pacific to counter Chinese action.

Air Force assets, including fighters, too have been moved up to forward locations. The first signs of discomfort in the Indian camp started when the Chinese side a few days ago began pressing hard for another round of Corps Commander-level meeting to kickstart talks on the Pangong Tso.

The PLA even moved a request for a Corps Commander-level meeting on June 16. The Indian side, however, declined and had conveyed to their Chinese interlocutors that a higher-level meeting would only be possible after complete disengagement from Galwan.

This decision was taken at the highest levels, added sources. The issue on the table from an Indian standpoint were two semi-permanent structures with tents on PP (Patrolling Point) 14 in Galwan.

The Chinese troops had moved back some distance following local commander-level talks but had refused to remove these structures. At PP 17, China had apparently raised objection to some Indian hutments.

In the recent past, sources said, Chinese troops have acted in a pattern where they move up, build tented structures and then move back after talks without demolishing what they had made.

It's learnt that this was flagged off by the Army as a way to make reoccupation easier at these heights. However, pending resolution of these issues on Galwan, China was keen to start conversation on Finger areas of Pangong Tso.

At that stage, sources said, a high-level meeting took place in Delhi last Friday where it was decided that India will insist on complete resolution of dispute in Galwan before moving on to Pangong Tso

The turn of events on Monday night took the top brass by surprise. South Block was, in fact, gearing up for a more protracted conversation on getting Chinese troops to move back from Finger 4 in Pangong Tso. It was felt that Chinese PLA would be more belligerent there as it had moved into advantageous ground.

<https://economictimes.indiatimes.com/news/defence/armed-forces-to-stock-up-war-reserves/articleshow/76415783.cms>

**Timeline**

- May 5-6:** Indian and Chinese troops clash in Pangong Tso, resulting in injuries to both sides
- May 9:** They also clash in Naku La, Sikkim, resulting in injuries to both sides
- Following clashes, India and China move additional troops to LAC**
- May 12:** Chinese military helicopters seen flying close to LAC in Eastern Ladakh. IAF Su-30 fighters carry out sorties in the area
- May 23:** Army Chief Naravane visits Leh-based 14 Corps headquarters to review situation.
- May 26:** PM Modi meets top military brass. This was followed by top four generals briefing defence minister Rajnath Singh
- May 27:** Chinese President Xi Jinping orders the military to scale up battle preparedness
- June 1:** China says overall situation along the LAC is stable and controllable
- June 2:** Major general-rank officers hold deliberations. Meeting inconclusive
- June 6:** Commander of Leh-based 14 Corp, Lieutenant General Harinder Singh, and China's Major General Liu Lin, Commander of South Xinjiang Military Region, hold talks
- June 13:** General Naravane says the situation along the borders is under control
- June 16:** 20 Indian soldiers have died in Ladakh's Galwan Valley, the Indian Army said in a statement

## गलवां घाटी में झड़प के बाद थल सेना, नौसेना, वायु सेना ने बढ़ाई चौकसी

पूर्वी लद्दाख में गलवां घाटी में भारतीय और चीनी सेनाओं के बीच झड़प के बाद भारत की तीनों सेनाओं ने अपनी चौकसी बढ़ा दी है। चीन के साथ लगी करीब 3,500 किलोमीटर की सीमा पर भारतीय थल सेना और वायु सेना के अग्रिम मोर्चे पर स्थित ठिकानों को बुधवार को हाई अलर्ट कर दिया गया। आधिकारिक सूत्रों ने यह जानकारी दी है।

गलवां घाटी में सोमवार की रात चीनी सैनिकों के साथ झड़प में भारत के 20 सैन्यकर्मी शहीद हो गए। भारतीय नौसेना को हिंद महासागर क्षेत्र में अपनी सतर्कता बढ़ा देने को कहा गया है, जहां चीनी नौसेना की नियमित तौर पर गतिविधियां होती हैं।

सूत्रों ने बताया कि प्रमुख रक्षा अध्यक्ष (सीडीएस) जनरल बिपिन रावत और सेना के तीनों अंगों के प्रमुखों के साथ रक्षा मंत्री राजनाथ सिंह की उच्च स्तरीय बैठक के बाद तीनों बलों के लिए अलर्ट का स्तर बढ़ाने का निर्णय किया गया।

उन्होंने बताया कि अरुणाचल प्रदेश, उत्तराखंड, हिमाचल प्रदेश और लद्दाख में वास्तविक नियंत्रण रेखा (एलएसी) के पास अग्रिम मोर्चे पर तैनात सभी ठिकानों और टुकड़ियों के लिए सेना पहले ही अतिरिक्त जवानों को भेज चुकी है। सेना के एक शीर्ष अधिकारी ने कहा, 'आपसी संपर्क के नियम अब से अलग होंगे। प्रधानमंत्री ने इसके बारे में व्यापक नीति का उल्लेख किया है।'

### आक्रामक कार्रवाई का दृढ़ता के साथ जवाब देंगे

चीन को एक कड़ा संदेश देते हुए प्रधानमंत्री नरेंद्र मोदी ने कहा कि भारत शांति चाहता है किंतु यदि उकसाया गया तो वह माकूल जवाब देने में सक्षम है। साथ ही उन्होंने कहा कि भारतीय जवानों का बलिदान व्यर्थ नहीं जाएगा। रक्षा मंत्री राजनाथ सिंह ने शाम को प्रधानमंत्री मोदी से मुलाकात की और उन्हें किसी भी घटना से निपटने के लिए एलएसी के पास सैन्य ताकत को बढ़ाने के लिए उठाए गए कदमों के बारे में जानकारी दी।

सूत्रों ने बताया कि भारतीय वायु सेना ने भी अग्रिम मोर्चे वाले अपने सभी ठिकानों पर अलर्ट बढ़ाते हुए एलएसी पर नजर रखने को कहा है। सूत्रों ने बताया कि चीनी नौसेना को कड़ा संदेश देने के लिए भारतीय नौसेना हिंद महासागर क्षेत्र में अपनी तैनाती बढ़ा रही है। सूत्रों ने बताया कि सशस्त्र बल चीनी सेना की किसी भी आक्रामक कार्रवाई का दृढ़ता के साथ जवाब देंगे।

इस दौरान, दोनों सेनाओं के मेजर जनरल स्तर की वार्ता का एक और दौर हुआ, जिस दौरान गतिरोध वाले बिंदुओं पर दोनों पक्षों के बीच एक समझौते को लागू करने के तरीकों पर चर्चा की गई। पूर्वी लद्दाख के गलवां और कई अन्य क्षेत्रों में गत पांच मई से दोनों सेनाओं के बीच गतिरोध बना हुआ है।

<https://www.amarujala.com/india-news/india-china-indian-army-navy-and-air-force-increased-vigil-after-clash-in-galwan-valley>



Thu, 18 June 2020

## Indian Army planning to change rules of engagement with China after Ladakh standoff: Report

*In the wake of the bloodshed at the border, it was reported that the Army is reviewing its decades-old rules of engagement with China*

*By Manmath Nayak*

New Delhi: Two days after the fatal altercation in which 20 soldiers lost their lives in eastern Ladakh's Galwan Valley, media reports on Wednesday suggested that the Indian Army is planning to change the rules of engagement with China.

In the wake of the bloodshed at the border, it was reported that the Army is reviewing its decades-old rules of engagement with China.

Earlier in the day, External Affairs Minister S Jaishankar had a telephonic conversation with Chinese Foreign Minister Wang Yi and conveyed a strong message to China saying that the "unprecedented" incident in the Galwan Valley will have a "serious impact" on the bilateral relationship.

On the call, Jaishankar held the "pre-meditated" action by Chinese army directly responsible for the violence that left 20 Indian Army personnel killed.

Jaishankar conveyed to his Chinese counterpart Wang Yi India's protest in the "strongest terms" and said the Chinese side should reassess its actions and take corrective steps.

On the other hand, the Chinese Foreign Ministry issued a statement, saying the two sides agreed to "cool down the situation on the ground as soon as possible", and maintain peace and tranquillity in the border area in accordance with the agreement reached so far between the two countries.

The EAM further told Wang that the Chinese action reflected an intent to change the facts on ground in violation of all agreements between the two countries to not change the status quo along the Line of Actual Control.

However, it was the first high-level engagement between the two sides after the standoff between the two armies began in eastern Ladakh on May 5 following a violent clash in the Pangong lake area.

<https://www.india.com/news/india/indian-army-planning-to-change-rules-of-engagement-with-china-after-ladakh-standoff-report-4060919/>

## DH Deciphers | Why are India and China fighting at the border?

*By Anirban Bhaumik, Muthi-ur-Rahman Siddiqui*

The ongoing border standoff between India and China has claimed the lives of Indian soldiers for the first time since 1975. The standoff began on the northern bank of Pangong Tso (lake) in eastern Ladakh on May 5. Chinese soldiers built a bunker, denying Indian soldiers access to an area they regularly patrolled earlier.

China then accused of India trespassing on its territory in the Galwan Valley, a little north up, and building “defence facilities”. While both the sides decided to move away from Galwan Valley, the disengagement process took a fatal turn on June 15, killing an Indian army colonel and two soldiers. What explains these violent skirmishes amid the pandemic?

### **What is the India-China boundary dispute all about?**

India claims that China is illegally occupying about 38,000 sq km of its territory in Aksai Chin, which borders eastern Ladakh. Pakistan also ceded to China about 5,180 sq km of the Indian territory in 1963. China also claims approximately 90,000 sq km of Indian territory in Arunachal Pradesh and about 2,000 sq km in Himachal Pradesh and Uttarakhand.

### **What's happening in eastern Ladakh?**

The two sides have deployed additional troops along the disputed boundary in eastern Ladakh, and the build-ups resulted in escalation of tension over the past few weeks. While the two sides decided to withdraw troops from the Galwan Valley, the violent faceoff took place when the disengagement process was on. The standoff in the Pangong Tso area hasn't been resolved.

### **Where are Galwan Valley and Pangong Tso?**

Galwan River flows from Aksai Chin to Ladakh. China claims the area to the west of the river as its territory. India claims that the entire Aksai Chin belongs to it.

Pangong Tso is the highest saltwater lake in the world, located at an altitude of 4,350 metres and spread over an area of over 600 square kilometres. It extends from eastern Ladakh in India to Tibet in China.

### **Why is Pangong Tso a trouble spot in India-China border areas?**

India and China do not have a mutually accepted boundary between them. The Line of Actual Control serves as the de facto border on the western side but the two sides have differences in perception about the alignment of the LAC.

The LAC cuts through Pangong Tso, but the two sides do not agree where exactly the line goes through. The spurs of the mountain range on the northern bank of Pangong Tso jut towards the lake like a palm with the protrusions looking like fingers.

They are, in fact, demarcated on the maps as Fingers, with Finger 1 at the western end and Finger 8 at the eastern end. China claims that the LAC, after cutting through Pangong Tso, goes through Finger 4. India, on the other hand, claims that the line goes through Finger 8.

### **What triggered China's aggression?**

What apparently rattled the Chinese was a road and a bridge Indian army built recently — linking the forward positions on the bank of Pangong Tso with another 255-kilometre-long road, which is known as DSDBO road and which connects Darbuk and Shyok with its military base in Daulat Beg Oldie. The construction of infrastructure by India closer to the LAC was perceived by the Chinese army as preparations by the Indian army for a military move towards Aksai Chin. China has been wary of New Delhi's intent in the region ever since Home Minister Amit Shah

reasserted India's claim on Aksai Chin while speaking in the Lok Sabha on August 6, 2019 — a day after the government initiated a move to strip Jammu and Kashmir of its special status.

### **How did India-China relations come to such a pass despite the recent bonhomie?**

The first "informal summit" between Prime Minister Narendra Modi and Chinese President Xi Jinping in Wuhan in April 2018 brought about a thaw in India-China relations after the 72-day-long military face-off in Doklam Plateau the previous year. But while New Delhi went the extra miles to avoid hurting the sensitivities of China on issues like Tibet and Taiwan, Beijing continued with its China-Pakistan Economic Corridor project which passes through areas India accuses Pakistan of illegally occupying.

<https://www.deccanherald.com/national/dh-deciphers-why-are-india-and-china-fighting-at-the-border-850489.html>

## THE ECONOMIC TIMES

Thu, 18 June 2020

# South China Sea: Beijing has a major natural advantage in the geopolitical power game

*South China Sea has been a bargaining chip in China's pocket since the beginning of its rise in the global order*

*By Ankita Sen*

Hundreds of miles away from the scene of the current Sino-Indian dispute lies another perpetual theatre of war where China is a permanent player — the South China Sea, where tiffs over competing claims frequently degenerate into maritime muscle-flexing.

China, Vietnam, Taiwan, Malaysia, the Philippines and Brunei all lay claims to these waters. Rival countries have wrangled over territory in the South China Sea for centuries, but tension has steadily increased in recent years following China's rapid rise in military prowess.

The possibility of a sudden armed conflict there is never far away, given its importance in three major settings — location, strategic resources, and military advantages.

One-third of the world's shipping pass through here, carrying over \$3 trillion in trade each year, making this stretch the second-most used sea-lane in the world.

As for strategic resources, the region has proven oil reserves of around 7.7 billion barrels, with an estimate of 28 billion barrels in all. Natural gas reserves are estimated to total around 266 trillion cubic feet.

The most vital of them all, the country controlling this maritime route will have natural military advantages — making this region the geopolitical pivot to controlling the rest of Asia.

### **Chinese claims & the Nine-Dash Line**

The South China Sea has been a bargaining chip in China's pocket since the beginning of its rise in the global order. Here, Beijing operates from a position of strength, with physical control over critical islands. Possession of these gives Beijing a clear upper hand and the ability to exert strategic authority over these waters, regardless of the rights and interests of other neighbouring nations.



For China, the South China Sea also acts as a natural shield in terms of national security.



China has followed up on its expansive claims with island-building and naval patrols.

It has been a cause for concern for others ever since Beijing unilaterally put forward the Nine-Dash Line — which stretches hundreds of miles south and east from its most southerly province of Hainan — in 2009 to declare the South China Sea as its territorial waters.

Being neither treaty-based nor legally maintainable, China's claim is tenuous. Nonetheless, keeping the specifics of the Nine-Dash Line ambiguous has provided China with a useful tool to buy time in critical situations.

For China, the South China Sea also acts as a natural shield in terms of national security. It provides relative "sanctuary" for its second-strike nuclear submarines that would be its insurance in case of a first strike against it.

In terms of trade too, the South China Sea is an important route for China — with 80 per cent of its energy imports and 39.5 per cent of total trade passing through here.

### **India's stake**

Over the past decade, China has been using coercion on four major fronts: in the East China Sea, South China Sea, China-India border, and toward the US on the question of freedom of navigation.

Of these, only the border feud impacts India directly. However, the significance of the South China Sea in emerging geopolitical equations cannot be overlooked anymore.

Even though India is not an active player in the high-stakes jostle for the control of these waters, it will hardly remain an unaffected bystander in case the power structure there changes drastically.

Nearly \$200 billion worth of Indian trade passes through the South China Sea and thousands of its citizens study, work and invest in the Association of Southeast Asian Nations (ASEAN) countries, China, Japan and the Republic of Korea.

This makes it an area of high strategic necessity for India. If China comes to establish unrivalled sway over these waters, that could upend a huge part of the existing trade and geopolitical set-up.

Access to the major waterways in Southeast Asia is an important consideration for Indian policymakers, as is the need to build capacity in member states of the ASEAN. Both are central to New Delhi's Indo-Pacific vision.

In other words, what happens in the South China Sea is very much India's business too. It must find ways to play its cards right, so that it can leverage these disputed waters when the time comes to hold Beijing to account for its brazen border breaches and other transgressions.

<https://economictimes.indiatimes.com/news/defence/south-china-sea-beijing-has-a-major-natural-advantage-in-the-geopolitical-power-game/articleshow/76423659.cms>



## **Explained: What happened in Nathu La in 1967, the last time shots were fired in the India-China border dispute?**

*The last military skirmish between India and China took place at Nathu La in September 1967. Before the skirmish escalated to artillery guns and threats of fighter jets, there was a scuffle between the soldiers of the two armies*

*By Sushant Singh*

As reports of deaths of Indian soldiers in a violent faceoff on Ladakh border emerged, many took solace from the fact that no rounds were fired during the physical clash with the Chinese soldiers.

While this certainly makes these deaths more brutal than being shot and killed, it also gives hope that an escalation to kinetic means – rifles, howitzers, rockets, missiles and fighter jets – can be avoided between the two nuclear neighbours.

The history of the conflict between the two sides, however, splashes some cold water on such hopes.

The last military skirmish between India and China took place at Nathu La in September 1967. Before the skirmish escalated to artillery guns and threats of fighter jets, there was a scuffle between the soldiers of the two armies.

The clash eventually left 88 Indian soldiers dead. More than 300 Chinese soldiers were killed.

In the weeks and months ahead of the clash, the Indian side had decided to fence the border with three layers of barbed wire. Work started on August 20, 1967.

On August 23, about 75 Chinese in battle dress, carrying rifles fitted with bayonets, advanced slowly towards Nathu La in an extended line, and stopped at the border. The Political Commissar — identifiable by a red patch on his cap, and the only one who could speak some English — read out slogans from a red book, which the rest of the party shouted after him.

The Indian troops were “standing to”, watching and waiting. After about an hour, the Chinese withdrew. But they returned later, and continued their protests.

On September 5, as the barbed wire fence was being upgraded to a concertina coil, the Political Commissar had an argument with the Commanding Officer of the local infantry battalion, Lt Colonel Rai Singh. Thereafter, work stopped.

Work was, however, resumed on September 7. This provoked about 100 Chinese soldiers to rush up, and a scuffle ensued. Beaten down by the Jats, the Chinese resorted to stone-pelting, and the Indians responded in kind.

On September 10, the Chinese sent across a warning through the Indian embassy: “The Chinese Government sternly warns the Indian Government: the Chinese Border Defence Troops are closely watching the development of the situation along the China-Sikkim boundary. Should the Indian troops continue to make provocative intrusions, the Indian Government must be held responsible for all the grave consequences.”

The corps commander had ordered the fence to be completed on September 11. That day, as work started, the Chinese came to protest, led by the Political Commissar. Lt Col Rai Singh went out to talk to them.

Suddenly, the Chinese opened fire, and Singh fell to the ground, injured.



Seeing their CO hit, the infantry battalion attacked the Chinese post. But they suffered heavy casualties, including two officers, who were both given gallantry awards. Soldiers in the open were mowed down by Chinese machine gun fire.

The Indians responded with artillery fire, and pummelled every Chinese post in the vicinity. Many more Chinese perished in these heavy fire assaults than the number of Indians who were killed in the initial engagement.

Taken aback by the strong Indian response, the Chinese threatened to bring in warplanes. When the Indians refused to back off, the Chinese news agency Xinhua denied these plans.

Having sent its message militarily, India, on September 12, delivered a note to the Chinese, offering an unconditional ceasefire across the Sikkim-Tibet border beginning 5.30 am on September 13. This was rejected, but the situation remained largely peaceful until the 14th.

On September 15, the Chinese handed over the bodies of Indian soldiers with arms and ammunition, saying they were acting in the interest of “preserving Sino-Indian friendship”.

On October 1, another skirmish erupted at Cho La, but the Indians again repulsed the Chinese.

<https://indianexpress.com/article/explained/explained-what-happened-in-nathu-la-in-1967-india-china-border-dispute-6462532/>

# जागरण

## भारतीय वायु सेना में है सीमा पर आधे घंटे में टैंक व तोपखाना पहुंचाने की क्षमता

Thu, 18 June 2020

**पश्चिमी लद्दाख में सेना सियाचिन ग्लेशियर में पाकिस्तान के मंसूबों को नाकाम बनाने की मुहिम पर है। वहीं पूर्वी लद्दाख में चीन के बढ़ते कदमों को रोकने में जुटी है।**

**विवेक सिंह**

जम्मू: पूर्वी लद्दाख में वास्तविक नियंत्रण रेखा (एलएसी) के पास भारतीय वायुसेना के विमानों की गूंज और चीन की गीदड़भभकियों के सामने डटे जवानों के हौसले ने चीन के विस्तारवादी मंसूबों पर पानी फेर दिया। एलएसी के पास तक सड़क नेटवर्क और सेना की तैयारियों ने ड्रैगन की हताशा को और बढ़ा दिया है। इसी हताशा में चीनी सैनिक भारतीय दल पर हमले की हिमाकत कर बैठे। अब जवाबी कार्रवाई के डर से उनके पसीने छूट रहे हैं।

अगर आमने-सामने की स्थिति का आकलन किया जाए तो पूर्वी लद्दाख में भारतीय सेना व वायुसेना मजबूत स्थिति में हैं। युद्ध के मैदान में भारतीय जवानों के हौसले का जवाब नहीं है और कारगिल में पाकिस्तान के साथ चीन को भी इसका संदेश मिल चुका है। अब दौलतबेग ओल्डी समेत तीन एडवांस लैंडिंग ग्राउंड बनने से सैन्य क्षमता में कई गुणा इजाफा हुआ है। अब भारतीय वायुसेना देश के अन्य हिस्सों से महज तीस मिनट में टैंक, तोपखाना और जवानों को लद्दाख पहुंचा सकती है। पिछले दिनों चिन्कू हेलीकॉप्टर और तेजस विमानों की गूंज बीजिंग तक सुनाई दी गई थी। दो साल पहले वायुसेना ने 500 टन के साजो सामान से भरे ग्लोब मास्टर समेत अपने सोलह बड़े विमानों को उतारकर चीन को स्पष्ट संकेत दे दिया था कि अब वह किसी गलतफहमी में न रहे। सेना की मजबूती और चीन से उसके कब्जे वाले अकसाई चिन इलाके को वापस लेने के मोदी



पश्चिमी लद्दाख में सेना सियाचिन ग्लेशियर में पाकिस्तान के मंसूबों को नाकाम बनाने की मुहिम पर है। वहीं पूर्वी लद्दाख में चीन के बढ़ते कदमों को रोकने में जुटी है।

सरकार के दावों से भी चीन की नौद उड़ा दी है। पूर्वी लद्दाख के अक्साई चिन का 38 हजार किलोमीटर चीन के कब्जे में है।

### कारगिल के बाद ही सदमे में है चीन

सेना के सेवानिवृत्त ब्रिगेडियर अनिल गुप्ता का कहना है कि कारगिल में ऊंची पहाड़ियों पर सेना के युद्धकौशल को चीन की सेना ने परखा था। उसे लग रहा है कि अब भारत की ताकत कई गुणा मजबूत हो गई है और भविष्य में उसकी चुनौती बढ़ सकती है। रणनीतिक रूप से भी आवश्यक है कि चीन को आगे बढ़ने से रोका जाए। यह गलवन घाटी ही वर्ष 1962 के भारत-चीन युद्ध का केंद्र बिंदु रहा है।

### पक्का निर्माण करने की थी साजिश

चीन ने मई माह में विवाद क्षेत्र में पुलों और सड़कों का निर्माण रोकने के लिए किया था। उसके बाद चीन ने गलवन, पेंगोंग त्सो इलाके में स्थायी बुनियादी ढांचा बनाना शुरू कर दिया। उच्च पदस्थ सूत्रों के अनुसार सोमवार रात को गलवन में चीनी सेना का ट्रक कंटीले तार लेकर आया था। तार लगाकर कब्जा पक्का करने की साजिश को सेना ने नाकाम कर दिया। चीनी सैनिकों ने पत्थरों व कंटीले तार लगी लाठियों से जानलेवा हमला किया।

### यू समझो भारत की लद्दाख में ताकत

- पश्चिमी लद्दाख में सेना सियाचिन ग्लेशियर में पाकिस्तान के मंसूबों को नाकाम बनाने की मुहिम पर है। वहीं पूर्वी लद्दाख में चीन के बढ़ते कदमों को रोकने में जुटी है। दोनों दुश्मन देश आपसे में मिले हैं। पाकिस्तान ने पूर्वी लद्दाख में अपने कब्जे वाला कुछ भारतीय इलाका चीन को दे दिया था।
- चीन ने लद्दाख में भारत के 36000 वर्ग किमी इलाके पर कब्जा कर रखा है। इसके साथ पाक ने 1963 के चीन-पाक समझौते के तहत भी अपने कब्जे वाला 5180 किमी भारतीय इलाका भी चीन को दे दिया था।
- वास्तविक नियंत्रण रेखा का पाकिस्तान से लगती नियंत्रण रेखा की तरह रेखांकन नहीं हुआ है। वर्ष 1962 के बाद से दोनों सेनाओं अपने अपने जगहों पर कायम है। चीन की ओर से घुसपैठ की लगातार कोशिश होती है पर दोनों सेनाओं के बीच कभी गोलीबारी नहीं हुई। अलबत्ता चीनी सैनिकों की घुसपैठ को विफल बनाने के लिए कई बार झड़पे हुई हैं।
- सीमा सड़क संगठन इस समय 255 किमी लंबी दुरबुक-श्योक-दौलत बेग ओल्डी सड़क को पूरा करने की मुहिम पर है। इस सड़क व उस पर बन रहे आठ पुलों का वर्ष अंत तक पूरा करने का लक्ष्य है। इस सड़क के बनने से सेना के साजो सामान को छह घंटों में वास्तविक नियंत्रण रेखा तक पहुंचाना संभव होगा।

### दो साल में 40 पुल

दो साल में लद्दाख के एलएसी के पास के इलाकों में नदियों और नालों पर 40 से अधिक पुल बने हैं और नई सड़कों का निर्माण तेजी से चल रहा है। पूर्वी लद्दाख में सीमा से 45 किमी की दूरी पर श्योक नदी पर बने कर्नल छिवांग रिनचिन पुल से टी 90 भी गुजारे जा सकते हैं। इसके साथ सेना को हिमाचल के रास्ते जल्द सीमा तक पहुंचाने के लिए पदम-दारचा सड़क का निर्माण तेजी से हो रहा है।

<https://www.jagran.com/jammu-and-kashmir/jammu-indian-air-force-has-the-capability-to-deliver-tanks-and-artillery-in-half-an-hour-on-the-ladakh-china-border-jagran-special-20401978.html>



## What is Necklace of Diamond Strategy?

*Necklace of Diamond Strategy: China is increasing its presence in the Indian Ocean over the past few years through its Debt Trap Diplomacy and Strings of Pearls strategy to contain Indian hold in the Indian Ocean*

*By Arfa Javaid*

Over the past few years, China is expanding its footprint in the Indian Ocean through its 'Debt Trap Diplomacy' and 'String of Pearls Strategy'. Recent satellite images have suggested that China has been modernising its Djibouti military base. Through its debt trap policy, China lures the strategically located nations around India to borrow infrastructural loans. Once the nations are indebted, China pressurizes them to support its geostrategic interests.

Through its String of Pearls strategy, China is expanding its footprints to contain Indian hold in the Indian ocean. It is creating a ring around India through strategically placed nations such as at Chittagong (Bangladesh), at Karachi, Gwadar port (Pakistan) and at Colombo, Hambantota (both in Sri Lanka) and other facilities.

### Necklace of Diamond Strategy

In a counter-action, India has started working on the 'Necklace of Diamond' strategy. This strategy aims at garlanding China or in simple words, the counter encirclement strategy. India is expanding its naval bases and is also improving relations with strategically placed countries to counter China's strategies.



Representational Image: Necklace of Diamond Strategy

### India's Strategic Bases

**1- Changi Naval Base, Singapore:** In 2018, Prime Minister Modi signed an agreement with Singapore. The agreement has provided direct access to this base to the Indian Navy. While sailing through the South China Sea, the Indian Navy can refuel and rearm its ship through this base.

**2- Sabang Port, Indonesia:** In 2018, India got the military access to Sabang Port which is located right at the entrance of Malacca Strait. This strait is one of the world's famous choke point. A large chunk of trade and crude oil passes on to China through this region.

**3- Duqm Port, Oman:** In 2018, India got another military access after Sabang Port in Indonesia. The Duqm Port is located on the south-eastern seaboard of Oman. The port facilitates India's crude imports from the Persian Gulf. In addition to this, Indian facility is located right between the two important Chinese pearls-- Djibouti in Africa and Gwadar in Pakistan.

**4- Assumption Island, Seychelles:** In 2015, India and Seychelles agreed upon the development of the naval base in this region. This gives the military access to India. This base is of strategic importance to India as China desperately wants to increase its presence in the African continent through the maritime silk route.

**5- Chabahar Port, Iran:** In 2016, Prime Minister Modi signed an agreement to built this port. The port provides access to Afghanistan and an important trade route to Central Asia.



## India's Strategic Cooperation

Apart from getting direct access to the strategically placed naval bases, India is also developing new naval bases, developing the old bases and is enhancing relations with other nations to garland China.

**1- Mongolia:** Prime Minister Modi is the first Indian Prime Minister to visit this country. Both the countries have agreed and will collaborate to develop a bilateral air corridor using India's credit line.

**2- Japan:** India and Japan have jointly declared to built the Asia-Africa Growth Corridor (AAGC).

**3- Vietnam:** India is maintaining good relations with Vietnam and has so far sold Brahmos Missile and 4 patrol boats to the country.

**4- Central Asia:** Prime Minister Modi visited all the 5 countries of Central Asia in one go and becomes the first Indian Prime Minister to do this. Within 4 years, trade with Central Asian countries has doubled after his visit.

It can be concluded that India has maintained healthy relations with all the nations in China's periphery. This will give strategic access to India and the pattern can be seen as the necklace of diamond garlanding China in a counter encirclement.

<https://www.jagranjosh.com/general-knowledge/necklace-of-diamond-strategy-1592404137-1>

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Thu, 18 June 2020

## Why is China expanding its military footprints in the Indian Ocean?

*China expanding its footprints in the Indian Ocean: The India-China face-off at Galwan region and China's increasing military footprints in the Indian Ocean has escalated tensions for India*

*By Arfa Javaid*

India-China stand-off at the Line of Actual Control (LAC) in the Galwan valley is not the only thing to worry about as China is expanding its footprint in the Indian Ocean. As per several reports and satellite pictures, China is modernising its military base at Djibouti. Over several years, China has increased its military presence in the Indian Ocean via 'Debt Trap Diplomacy' and 'String of Pearls Strategy'.

In 2017, China set up a logistics support unit at Djibouti port which is now being modernised to a full-fledged naval base with a 1,120-foot pier, as per the satellite images of May 2020. The naval base can now harbour China's largest aircraft carrier-- Liaoning. The images suggest that the naval base is built like a modern-day castle with steep berms topped by towers and two rows of walls.

### **Increasing military footprint in the Indian Ocean**

In January 2020, Gwadar port of Pakistan was in the news as China has built several complexes housing anti-vehicle spikes, security fences and a high wall. These complexes are surrounded by high-security apparatus. In addition to this, China is also planning to deploy nuclear submarines at the Gwadar port which is situated in southwestern Pakistan to surveillance Indian Navy.

Also, the satellite images of February 2020 suggests that China is constructing 60,000 sq km Artificial Island in the Maldives.

Another threat to India is the construction of a permanent submarine base in Cox Bazaar in Bangladesh. This means that China will now have visiting rights to the region and may dock its

submarines near the eastern coast of India. For this purpose, Chinese state-owned company, Powertech Technology Inc, has been contracted.

### **Why is China expanding its footprint in the Indian Ocean?**

China wants to collect intelligence reports of operational requirements against its key adversaries like the US and India. It wants to control smaller nations through its coercive diplomacy. China will enable affecting operations on its adversaries-- India, Japan, the US, Australia, etc.-- after collecting the information with a planned strategy.

However, China has always denied surrounding India through its String of Pearl strategy. It defends its move to militarize the Indian Ocean by citing non-combat activities in the region focussing majorly on investments, counterterrorism, etc.

To counter China's String of Pearls strategy, India has started working on the 'Necklace of Diamond' strategy. Under this, India will be encircling China by building the naval base at Dqum in Oman, Diago Garcia in the UK, Chahbar in Iran, Sabang in Indonesia, Assumption in Seychelles and Changi in Singapore. India is also working to improve relations with Japan, Vietnam and Mongolia.

### **What is Debt Trap Diplomacy?**

Debt Trap Diplomacy is used by China to lure strategically located developing nations to borrow infrastructural loans. If these nations fail to repay the loans on time, China pressurizes them to support its geostrategic interests. Example: After indebting Africa, China will occupy Kenya's immensely profitable Mombasa port.

### **What is the String of Pearls Strategy?**

The string of Pearls Strategy is a geopolitical theory of China and is related to the Chinese intentions in the Indian Ocean-- military, commercial, sea line communication and diplomatic-- to contain Indian hold in the region. China is creating a ring around India through strategically placed nations such as at Chittagong (Bangladesh), at Karachi, Gwadar port (Pakistan) and at Colombo, Hambantota (both in Sri Lanka) and other facilities.

<https://www.jagranjosh.com/general-knowledge/china-expanding-its-footprints-in-the-indian-ocean-1592388741-1>



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Thu, 18 June 2020

## **Is Indian Air Force's current capability enough to 'Fight' China?**

*By Wing Commander Amit Ranjan Giri (Retd)*

The basis of building the Indian Air Force (IAF) till about the mid eighties was mainly with the focus on our western adversary, since other nations sharing a border with India were neither hostile nor held significant martial clout in the region, all but China. For some strange reason, for a very long time, we decided not to talk about the 'Red threat' and 'war gaming' in India which was limited to Pakistan. Despite having fought a war and numerous border skirmishes, it is only during recent times did the military strategy of India start a new chapter, protagonising our northern neighbour.

It's not that China was not a threat earlier, it is just that we, perhaps, did not have an answer and hence found solace the proverbial ostrich way – "look away and the predator wont notice you".

### **'Look East' Is IAF's Flavour of the Season**

The IAFs' philosophy towards China was largely guided by the government's eagerness or rather the lack of it, to allow it to spread its wings, a fact corroborated by the information that, till

very recently, there were no SAM units or credible radar units east of the 82 degree longitude. The entire eastern command of the IAF, in the bygone era, based its war plans on the mobility of Air Defence assets, which were to reach it from the western sector during hostilities. The efficacy of this plan was never put to test in totality, and remained only on paper.

Cut to the present day, and it is a different story. 'Look east' is the IAF's flavour of the season.

War games nowadays start with the Red opponent and then perhaps go on to the dual-front scenario, a very logical and reassuring practice.

On land, the MiG-21 FLs (the oldest of the lot) in a training role, have given way to the Sukhoi Su-30MKIs, the airfields have started to get their wish list of infrastructure, the command, now has some credible SAMs – and the army probably can now look up to the cover provided by the Apaches. It would be unjustified not to mention that half of the Rafales would find their home here in the near future.

### **IAF's War Philosophy**

The war philosophy of the IAF is to decentralise: Individual commands fight the war in their Area of Responsibility, guided by the directions of Air Headquarters. Certain strategic target systems identified and in need of higher clearances, prior to attack, are governed by the decision of the central body at Delhi. Other than these, the Air Officer Commanding in Chief of the respective commands is the sole responsible figure for the conduct of the war there. Adjacent commands have their own tie-ups for edge areas, giving the whole game a seamless fabric.

Some strategic assets are controlled by Air HQ and allotted to Commands on the basis of need and requests.

This structure of warfare is robust, time tested and fits into the Indian scheme perfectly.

The picture across the border needs a little deliberation at this point. Thanks to geography, we have a natural barrier protecting us from the dragon's breath. This statement sounds like a "medieval excuse taken from a kindergarten history book" but as far as air warfare is concerned, it holds good even today. The topography of the land is perhaps what has prevented China from following up on one or a few of its frequent border skirmishes with air support. The People's Liberation Army Air Force (PLAAF) is an enviable force by world standards; it is no longer the airforce which projected itself as a substantial mass of second hand technology yet to reach the industry standards.

### **Chinese Air Force's Capability**

Over the years, the PLAAF, covertly and overtly, has gone on to adopt technology which has produced world standard weapon systems.

The Chengdu J-10s and the Shenyang J-11s – which would soon be the backbone of the PLAAF interceptor force – are both based on the Sukhoi Su-27 and the Sukhoi Su-30. Further, the ones to come up are the Chengdu J-20, and on the drawing board, the Shenyang FC-31 also known as the J-31.

The former is of stealth design and is highly inspired by the Lockheed Martin F-22 Raptor, and hence, the perception that this would be mostly used to attack IAF installations rather than shoot down the IAF raiders.

This, however, may not always be true, for a stealth aircraft meant for invisible raids on the enemy's assets, the J-20 has canards – a type of tail plane but fitted in the front – used to increase manoeuvrability of the aircraft, leading one to suspect that a interceptor role is also in the lines even at the cost of foregoing some stealth. Add to this the Russian Su-35, twenty of which were bought off the shelf, suspected to be a feeder line for engine, reverse engineering technology.

### **Is Chinese Base 'Safe' From IAF Fighters?**

Any technology needs to be backed by a lot of other factors for its success – timing and location are a couple of important ones. Most of the major airfields that China's PLAAF has, that can be used against India – six in all – Konga Zong, Hopping, Gar Gunsa, Linzhi, Kashgar and Hotan, are



beyond the elevation of 3000 metres, hence cutting down load-carrying capacity of operating aircraft to almost half.

However, this aspect does not really matter in the air defence of the base. What matters is, in this hilly region, for an air defence system to be effective, detection and identification must be done well in time.

Thus, the Dragon's lair may not be safe from Indian Air Force fighters, if planned and timed correctly. Another natural advantage these bases have is the distance from Indian airfields – most are beyond the reach of legacy aircraft and require air-to-air refuelling capability (AAR), a fact which even the PLAAF too has to reconcile with, while attacking India.

### **Why IAF May Have An 'Advantage' Over China**

The Chinese airforce, in all probability, very much like the IAF, was never built around India as a main threat.

Most of its famed bases are located far too inland to serve any practical purpose for an attack on India, let alone defending its border bases. To add to the problem, the few bases that the PLAAF has, which concerns India, are not mutually supportive – if one is attacked, the other does not come in its defence – something the IAF bases enjoy. The distance between Hotan and its nearest support, Kashgar, is approx 400-500 km, well beyond the supporting distance with present-day technology.

### **SWOT Analysis of Indian Air Force Amid India-China Face-Off**

Analysing the SWOT (strength, weakness, opportunity, threat) it would be safe to say that most of the IAF action during hostilities would be air defence and action in support of the army – Counter Surface Force Operations (CSFO). There would, of course, be airfield raids by the IAF, but not to the extent of what we perceive from the three major wars with Pakistan.

Defending our own airbases would also take some effort. The Surface-to-Surface Ballistic Missile (SSBM) force of China, as long as it is with the conventional warhead, is a major cause of worry for the IAF, but not an apocalyptic scenario. Tip the rocket with a nuke and the entire story changes and becomes unpredictable – hopefully this scenario will be avoided by both sides.

With the ongoing acquisition process of the IAF, both in terms of defensive as well as offensive platforms, the picture looks good.

The PLAAF may require a large portion of the IAF's assets to contain it, but that would mainly be because of the huge perimeter both countries share.

The need of the hour for the IAF would definitely be to upgrade and build up potential, not only against the Red Dragon but also catering for misgivings by the western neighbour when engaged with China.

The challenge is to deal with both simultaneously.

*(Amit Ranjan Giri is a Wing Commander (Retd) of the Indian Air Force. This is an opinion piece, and the views expressed are the author's own. **The Quint** neither endorses nor is responsible for them.)*

<https://www.thequint.com/voices/opinion/india-china-air-force-defence-capabilities-war-preparedness-indian-air-bases-aircraft>



Thu, 18 June 2020

# Why conventional wisdom giving China the military edge over India may not be true

By Brad Lendon

Hong Kong: (CNN) India and China went to war in 1962 over the same Himalayan region where at least 20 soldiers were killed Monday night in a bloody confrontation between the two sides.

A little under six decades ago, one month of combat resulted in a Chinese military victory, with Beijing declaring a cease-fire after securing de facto control of Aksai Chin, an area claimed by both countries. The month-long battle claimed the lives of around 700 Chinese troops and approximately double that on the Indian side.

But the militaries that face off in the Himalayas today are far different from those that fought 58 years ago.

Conventional wisdom has it that China holds a significant military advantage over India, but recent studies from the Belfer Center at the Harvard Kennedy School of Government in Boston and the Center for a New American Security in Washington suggest India maintains an edge in high-altitude mountainous environments, such as the one where the 2020 face-off is taking place.

## Nuclear weapons

No one expects the fresh tensions to explode into nuclear war, but the fact that both China and India have become nuclear powers since their previous encounter cannot be ignored when assessing the balance of power.

Beijing became a nuclear power in 1964 and India in 1974.

Figures released this week by the [Stockholm International Peace Research Institute \(SIRPI\)](#) estimate China has approximately 320 nuclear warheads -- more than double India's 150. Both powers have seen their arsenals grow in the past year, Beijing's by 40 warheads and New Delhi's by 10, according to SIRPI.

Both countries maintain a triad of delivery systems -- missiles, bombers and submarines. Both also ascribe to a "no first use" policy, however, meaning they've pledged only to use nuclear arms in retaliation to a nuclear attack on their country.

## Air forces

India has about 270 fighters and 68 ground-attack aircraft it could bring to bear in combat with China, according to a study published in March by the Belfer Center.

New Delhi also maintains a string of small air bases near the Chinese border from which it can stage and supply those aircraft, the Belfer study, authored by Frank O'Donnell and Alexander Bollfrass, claimed.

China, by contrast, has 157 fighters and a small fleet of ground-attack drones in the region, the Belfer study said. The People's Liberation Army Air Force (PLAAF) uses eight bases in the region, but most of those are civilian airfields at problematic elevations, the study suggests.

"The high altitude of Chinese air bases in Tibet and Xinjiang, plus the generally difficult geographic and weather conditions of the region, means that Chinese fighters are limited to carrying around half their design payload and fuel," the study claims.

Aerial refueling could give the Chinese planes more payload and combat time, but the PLAAF doesn't have enough aerial tankers to get the job done, the study suggests.

The Belfer study also gives the Indian Air Force (IAF), with its Mirage 2000 and Sukhoi Su-30 jets, a qualitative edge in the region, where China fields J-10, J-11 and Su-27 fighters.

The Indian Mirage 2000 and Su-30 jets are all-weather, multi-role aircraft -- while of the Chinese jets, only the J-10 has those abilities.

Meanwhile, India has built up its bases in the region with China in mind, according to an October 2019 report from the Center for a New American Security.

"To weather a potential People's Liberation Army (PLA) attack, India has placed greater emphasis on infrastructure hardening; base resiliency; redundant command, control, and communications systems; and improved air defense," the report claims.

The Belfer study points out that China, facing perceived threats from the United States on its eastern and southern flanks, has strengthened its bases there to the neglect of the Himalayas, leaving at least four PLA airbases vulnerable.

"Indian destruction or temporary incapacitation of some of the four above air bases would further exacerbate these PLAAF operational inflexibilities and weaknesses," it claims.

The Belfer report gives the edge to India's air force in one other area -- experience.

"Recent conflicts with Pakistan give the current IAF a level of institutional experience in actual networked combat," it says.

Lacking such experience, Chinese pilots may have difficulty thinking for themselves in a dynamic aerial battlefield, according to the Belfer report.

"Recent PLAAF exercises with unscripted scenarios have found that pilots are excessively reliant upon ground control for tactical direction," it says. "This suggests that PLAAF combat proficiency may be significantly weaker than often estimated."

### **Ground forces**

While India has the experience in the air, the CNAS report says it is also hardened on the ground, fighting in places like Kashmir and in skirmishes along its border with Pakistan.

"India is by far the more experienced and battle-hardened party, having fought a series of limited and low-intensity conflicts in its recent past," the CNAS report says. "The PLA, on the other hand, has not experienced the crucible of combat since its conflict with Vietnam in 1979."

That month-long border war, launched by China in response to Vietnam's military intervention in Cambodia, is largely considered a defeat for China. The PLA had trouble making gains against Vietnamese troops that were smaller in number but vastly more experienced after fighting US forces during the Vietnam War.

Yet while there may be a big gap in experience in the Himalayas today, there is reportedly parity in the numbers of ground troops. Belfer estimates there are about 225,000 Indian ground forces in the region, as well as 200,000 to 230,000 Chinese.

The numbers may be misleading, however. Counted among those PLA forces are units assigned to keep down any chance of insurrection in Xinjiang or Tibet, or deal with any potential conflict along China's border with Russia.

Moving them to the Indian front in the event of large-scale hostilities presents a logistical problem, as Indian airstrikes could target high-speed rail lines on the Tibetan plateau or choke points in the mountainous terrain closer to the border.

"By contrast, Indian forces are already largely in position," the report says.

However, the CNAS report adds that those Indian forces operate in rough terrain in steep valleys and can't be easily moved to plug breaches that any Chinese incursion might make. In short, the Indian troops too could be vulnerable to Chinese artillery and missile attacks on choke points in the mountains.

Those attacks could come by Chinese artillery or missiles stationed on the Tibetan plateau, which in some cases look right down on Indian border posts, the CNAS report says.

But the question is whether, in the event of large-scale conflict, China has enough missiles to take out all the targets it would need to hit in India.

The Belfer study cites estimates of a former Indian Air Force officer, who predicts China would need 220 ballistic missiles to knock out one Indian airfield for a day. With only 1,000 to 1,200



missiles available for the task, China would quickly run out of the means to shut down India's airfields, it says.

One area where China may be gaining advantage is technology and new weapons. With a larger defense budget and rapidly modernizing military, Beijing can't be counted out to close any gaps in its forces.

"China's economy is five times the size of India's and Beijing's defense spending far outstrips New Delhi's defense budget by a factor of four to one," said Nishank Motwani, international adviser at the National Center for Dialogue and Progress in Afghanistan. "The power differential between China and India is in Beijing's favor and this asymmetry is only widening."

Chinese state media has recently been heavy on articles and videos of new weaponry being deployed to its Tibetan region for exercises, including the Type 15 light tank and the new 155-millimeter vehicle-mounted howitzer. Both were introduced to the Chinese public at last year's much-hyped National Day military parade in Beijing.

"The weapons were specifically designed with advantages for plateau regions and can play important roles in safeguarding border areas," military experts told the state-sponsored Global Times.

The Chinese outlet on Tuesday --- after the clash with Indian troops the night before -- mentioned the new weapons in a report on war games in the mountainous region.

"These kinds of drills demonstrated the PLA's capability to win a regional, high-elevation conflict in its early stages by decisively eradicating the hostile headquarters and commanders, a PLA veteran who was once deployed in Tibet and asked not to be named told the Global Times," the report said.

### **Allies**

While China may be largely on its own facing off against India in the Himalayas, New Delhi has been developing defense relationships with countries wary of Beijing as a rising military power.

New Delhi has grown closer to the United States military in recent years, with Washington calling India a "major defense partner" while increasing bi- and multilateral training.

In the event of a large-scale Himalayan conflict, US intelligence and surveillance could help India get a clearer picture of the battlefield.

The Belfer report uses the example of what might happen if China was to surge troops from its interior to the front lines in the mountains.

"Such a Chinese surge would also attract attention from the United States, which would alert India and enable it to counter-mobilize its own additional forces from its interior," it says.

India participates in joint military drills with countries like the US, Japan, France and Australia.

"Western troops participating in such war games and exercises regularly have expressed a grudging admiration for their Indian counterparts' tactical creativity and high degree of adaptability," the CNAS report says.

"China's joint training endeavors, on the other hand, thus far have remained relatively rudimentary in scope — with the notable exception of its increasingly advanced military exercises with Pakistan and Russia."

<https://edition.cnn.com/2020/06/17/asia/india-china-military-comparison-hnk-intl-scli/>

## Indian army canteen orders for Pernod, Diageo imported whiskey brands dry up

New Delhi: Pernod Ricard and Diageo, two of the world's biggest spirit makers, have stopped receiving orders for their imported brands from India's defence canteen stores where they were sold at concessional prices, industry sources told Reuters.

The move is seen as part of Prime Minister Narendra Modi's "vocal for local" campaign in which he has called for promotion of indigenous products to make India self-reliant during the coronavirus pandemic, a government measure that critics have called protectionist and against foreign businesses.

India's defence canteens provide access to both local and imported products such as liquor and electronics at less-than-market rates to soldiers, ex-servicemen and their families.

But Pernod Ricard India, whose brands include Chivas and Glenlivet Scotch Whisky, received no orders in May for imported spirits, compared with average monthly orders of 4,500-5,000 cases by defence stores, one source said. One case typically holds six, nine or 12 bottles of liquor.

Diageo India too has not received any orders since May for its imported brands such as the popular Johnnie Walker Black Label whisky and Talisker single malt, a second source said.

Pernod Ricard declined to comment and Diageo did not respond to queries. The defence ministry did not respond.

While no written order has been issued, a senior government official said a formal decision in the matter was imminent.

"We want to encourage indigenous products ... with the PM's campaign, it gets more priority," said the official.

A bottle of Johnnie Walker Black Label costs Rs 3,600 in Maharashtra state's defence canteens, a third lower than the Rs 5,500 retail customers pay there.

"Drinking scotch has become a habit, this move is going to hurt our pockets," said a retired Indian army official who said he purchases five scotch bottles each month for himself and his family.

While imported liquor sales at defence stores generate only about \$17 million in annual sales, the channel generates regular demand for top foreign brands. The canteens sell about \$450 million (£358 million) worth of liquor each year, mostly Indian-made beer, whisky, rum and other spirits, industry sources said.

A formal order to restrict purchases of imported liquor by defence stores will signal an unfriendly business environment, and will be "protectionism when there is nothing to protect," said an executive working at a foreign liquor company in India.

"You can't make scotch in India," said the executive.

In May and June, the defence ministry asked liquor firms to provide details of their brands, the country where they are manufactured and details of imported ingredients used.

The ministry had also sought similar answers from other non-liquor firms, the sources said, but it was not immediately clear which other orders had been halted. — Reuters

<https://www.tribuneindia.com/news/business/indian-army-canteen-orders-for-pernod-diageo-imported-whiskey-brands-dry-up-100454>

### Veteran scientist Madhavan Nair warns against structural changes in ISRO

*ISRO, Nair said, is the best performing government organisation which has not only mastered most sophisticated space technologies totally indigenously, but also provided space missions in a timely manner meeting common mans requirements as well as security needs*

Bengaluru: Veteran space scientist G Madhavan Nair has warned against structural changes in the ISRO, as he sought to draw similarities between the space agency and Elon Musk's SpaceX in terms of having a unified command for delivering efficient performance.

The former Chairman of ISRO (Indian Space Research Organisation) said some of the recent media reports project an alarming picture about Indian space programme on its ineffectiveness to make industrial participation and an idea of possible restructuring to bring about more expansion.

"The public has the right to know the factual situation considering the evolution and growth so far," he insisted.

ISRO, Nair said, is the best performing government organisation which has not only mastered most sophisticated space technologies totally indigenously, but also provided space missions in a timely manner meeting common mans requirements as well as security needs.

It's the far sighted approach which has enabled India to get a front seat among the global space players, he said.

ISRO is a unique organisation not only doing high tech R&D but also applications for societal benefit like tele- education, tele-medicine, disaster management, applications for agriculture, fisheries and infrastructure development, he pointed out.

"India had undertaken planetary missions to the Moon and Mars as well, not leaving out Indian constellation for navigation satellites. All these were accomplished in a shoe- string budget.

India's annual (space) budget is slightly above USD one billion compared to about USD three billion of China and about USD 25 billion of USA."

The government recently said the private sector would be allowed to use ISRO's facilities and assets and provided a level-playing field in satellites, launches and space-based services.

"Lot of hue and cry is made on industry participation," said Nair, during whose tenure of six years as Chairman of ISRO and Secretary in the Department of Space 25 successful missions were accomplished, told PTI on Tuesday.

Right from SLV3, ISROs first satellite launch vehicle (more than four decades ago), onwards, industry had shared the production responsibility and today even the cryogenic engine is manufactured by industries.

"Nearly 60 per cent of ISRO's budget is spent through industry. The fact that the space agency's manpower is stable around 17,000 over the last two decades while the number of missions grew by a factor of 10 is a proof of effectiveness of industrial policy in space activities," he underlined.

As a next step for enabling industry to take up full system realisation, the new entity NSIL (NewSpace India Limited) was formed nearly a year back and it is progressing well, Nair noted.



G Madhavan Nair, Former Chairman, ISRO



Satellite manufacturing, earth observation applications and navigation applications have got enough scope for industry participation and opportunity for start-ups whereas, large rockets are a difficult technology to master, having sensitive dual use applications and has to be closely guarded.

Even in the USA and other countries, secrecy and security norms are stringent in the launch vehicle sector.

Nair said the SpaceX is marvelled as a success story in private space launch vehicle development and it is really so as he recalled the history of the space programme in the US.

After space shuttle failure and retirement, the US space agency NASA was going rudderless on new vehicle development, he said, adding, its industrial partners came up with a USD five billion project to provide a new launcher for manned missions.

In fact this was the opportunity Musk captured taking personal initiative and with his own funds to develop a man-rated vehicle. He did that too extremely well over a 10 year period at one fifth the cost projected by NASA.

"If you study carefully, it is the mismanagement of NASA programmes which led to the success of a private player. It is interesting to note the similarities of Elon Musks SpaceX and ISRO.

Both have a unified system under single command and under a single roof design/production concept. Only very small items or parts available commercially are subcontracted.

This is exactly what ISRO has been following all these years. SpaceX claims that this is the single factor which led to cost cutting substantially compared to the NASA model," Nair elaborated.

SpaceX, he said, had spent nearly USD 800 million as development cost and offering launch at about 11,000 USD per kg. In India, ISROs GSLV Mk3 (launch vehicle) is the same class and of course, without booster recovery.

"Still our development cost was around 300 million USD and payload delivery cost is around 5000 USD per kg, less than half of the US competitor. SpaceX had captured nearly one billion USD orders.

Can any Indian industry or start-ups make use of this opportunity to get at least a hundred million USD business for launch even after developing a launch vehicle? Instead of crying foul all the time, industry should take up such challenges as done by SpaceX," Nair said.

ISRO is not behind anybody else in advanced technology.

In 2009, a Vision-2020 document was prepared by ISRO.

It contained the development plan for two stages to orbit (TSTO), recoverable and reusable launchers (RLV), human space flight (HSP), semi cryogenic engines development, high bandwidth communication satellites, radar and high resolution multi spectral imagery, among others.

But the UPA2 had put off many of these activities, he alleged.

"It was after Modi took over (as Prime Minister), ISRO's plans were put back on track including approval of manned space mission. Now, ISRO is roaring ahead with full steam on the newly approved plans."

"This is the time in which lots of statements are made about structural changes in ISRO.

Immediate question is, what for? All recognise that both the Department of Atomic Energy and Department of Space have a unique structure of overall management by an empowered commission with full delegated powers."

"The special feature of this system is that both the Commission and Department are headed by a carefully selected technocrat. This is the single reason that both these departments are performing most efficiently.

One can't expect perfection in all respects. If there are specific deficiencies it has to be analysed and fixed rather than breaking up the top most performer based on false tall claims," he said.

Nair said all the noises made by a few private players and start-ups (calling for structural changes in ISRO) were without understanding Indian and global scenario.

"Perhaps one wonders whether it is vested interests trying to de-motivate ISRO, which is putting up an exemplary performance."

<https://economictimes.indiatimes.com/news/science/veteran-scientist-madhavan-nair-warns-against-structural-changes-in-isro/articleshow/76420419.cms>

## High performance sodium-ion capacitors based on Nb<sub>2</sub>O<sub>5</sub> nanotubes@carbon cloth

Hybrid sodium-ion capacitors (SICs) bridge the gap between supercapacitors (SCs) and batteries and have huge potential applications in large-scale energy storage. However, designing appropriate anode materials with fast kinetics behavior as well as long cycle life to match with the cathode electrodes remains a crucial challenge.

Recently, the joint research groups from the University of Science and Technology Beijing and Institute of Semiconductors, Chinese Academy of Sciences directly synthesized Nb<sub>2</sub>O<sub>5</sub> nanotubes and nanowire-to-nanotube homojunctions on carbon cloth (CC) via a simple hydrothermal process, which was published in *Science China Materials* (DOI: 10.1007/s40843-020-1278-9). The as-prepared Nb<sub>2</sub>O<sub>5</sub>@CC nanotubes displayed a high reversible capacity of 175 mAh/g at the current density of 1 A/g with the Coulombic efficiency of 97% after 1500 cycles. Moreover, the SICs fabricated with Nb<sub>2</sub>O<sub>5</sub>@CC and activated carbon (AC) electrode materials showed high energy density of 195 Wh/kg at 120 W/kg, power density of 7328 W/kg at 28 Wh/kg and 80% of the capacitance retention after cycling for 5000 cycles.

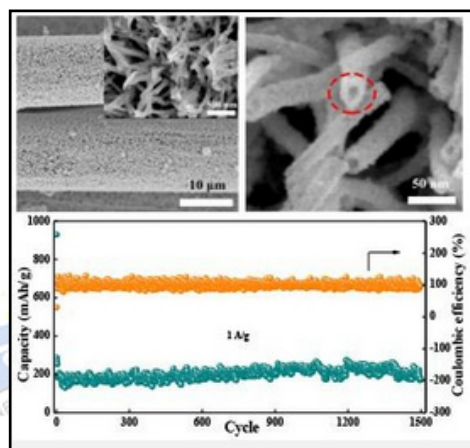


IMAGE: The growth of Nb<sub>2</sub>O<sub>5</sub>-based products on carbon cloth under different pH values. [view more](#)

Prof. Shen stated: "Although Nb<sub>2</sub>O<sub>5</sub> has good chemical stability and large interplanar spacing, its conductivity is relatively poor. To overcome it, we directly grew Nb<sub>2</sub>O<sub>5</sub> nanomaterials with different morphologies on the current collectors (carbon cloth) using the synergetic effect of pyridine and pH value of the acid solution. The physical and electrochemical properties of the prepared materials were systematically studied. Studies found that the nanotubes have large specific surface area and pore volume, which is beneficial for more active sites to be involved in electrochemical reactions. The Nb<sub>2</sub>O<sub>5</sub>@CC nanotube electrode not only possesses good conductivity, but also reduces the volume expansion caused by sodium ion intercalation/de-intercalation. All these advantages contribute to good electrochemical performance in sodium ion capacitors. Additionally, the flexible SIC devices can operate normally at various bendable conditions. The Nb<sub>2</sub>O<sub>5</sub>@CC nanotubes in this work can be promising electrode materials in flexible and wearable energy storage devices".

This research was funded by the National Natural Science Foundation of China (51672308, 51972025 and 61888102).

See the article:

Rui Jia, Yuan Jiang, Rui Li, Ruiqing Chai, Zheng Lou, Guozhen Shen and Di Chen, "Nb<sub>2</sub>O<sub>5</sub> nanotubes on carbon cloth for high performance sodium-ion capacitors", *Science China Materials*. doi: 10.1007/s40843-020-1278-9 <http://engine.scichina.com/doi/10.1007/s40843-020-1278-9>

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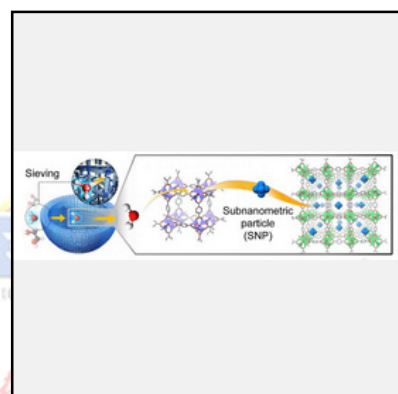
[https://www.eurekalert.org/pub\\_releases/2020-06/scp-hps061720.php](https://www.eurekalert.org/pub_releases/2020-06/scp-hps061720.php)

## Energy storage using oxygen to boost battery performance

Researchers have presented a novel electrode material for advanced energy storage device that is directly charged with oxygen from the air. Professor Jeung Ku Kang's team synthesized and preserved the sub-nanometric particles of atomic cluster sizes at high mass loadings within metal-organic frameworks (MOF) by controlling the behavior of reactants at the molecular level. This new strategy ensures high performance for lithium-oxygen batteries, acclaimed as a next-generation energy storage technology and widely used in electric vehicles.

Lithium-oxygen batteries in principle can generate ten times higher energy densities than conventional lithium-ion batteries, but they suffer from very poor cyclability. One of the methods to improve cycle stability is to reduce the overpotential of electrocatalysts in cathode electrodes. When the size of an electrocatalyst material is reduced to the atomic level, the increased surface energy leads to increased activity while significantly accelerating the material's agglomeration.

As a solution to this challenge, Professor Kang from the Department of Materials Science and Engineering aimed to maintain the improved activity by stabilizing atomic-scale sized electrocatalysts into the sub-nanometric spaces. This is a novel strategy for simultaneously producing and stabilizing atomic-level electrocatalysts within metal-organic frameworks (MOFs).



**IMAGE:** Schematic of the formation process of EG-water complexes and illustration of the penetration process of an isolated water molecule.

Metal-organic frameworks continuously assemble metal ions and organic linkers.

The team controlled hydrogen affinities between water molecules to separate them and transfer the isolated water molecules one by one through the sub-nanometric pores of MOFs. The transferred water molecules reacted with cobalt ions to form di-nuclear cobalt hydroxide under precisely controlled synthetic conditions, then the atomic-level cobalt hydroxide is stabilized inside the sub-nanometric pores.

The di-nuclear cobalt hydroxide that is stabilized in the sub-nanometric pores of metal-organic frameworks (MOFs) reduced the overpotential by 63.9% and showed ten-fold improvements in the life cycle.

Professor Kang said, "Simultaneously generating and stabilizing atomic-level electrocatalysts within MOFs can diversify materials according to numerous combinations of metal and organic linkers. It can expand not only the development of electrocatalysts, but also various research fields such as photocatalysts, medicine, the environment, and petrochemicals."

This study was reported in *Advanced Science* (Title: Autogenous Production and Stabilization of Highly Loaded Sub-Nanometric Particles within Multishell Hollow Metal-Organic Frameworks and Their Utilization for High Performance in Li-O<sub>2</sub> Batteries).

This research was mainly supported by the Global Frontier R&D Program of the Ministry of Science, ICT & Planning (Grant No. 2013M3A6B1078884) funded by the Ministry of Science, ICT & Future Planning, and the National Research Foundation of Korea (Grant No. 2019M3E6A1104196).

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## Researchers develop a compact 28 GHz transceiver supporting dual-polarized MIMO

Researchers at Tokyo Institute of Technology (Tokyo Tech) and NEC Corporation have jointly developed a 28 GHz phased-array[1] transceiver supporting dual-polarized MIMO[2] for fifth-generation mobile communications system (5G) radio units. Advances in 5G will benefit an array of industries ranging from healthcare, manufacturing and transportation to education and entertainment that require high bandwidth and high-quality connectivity.

As countries launch or prepare for 5G services, researchers are continuing to step up efforts to facilitate deployment of 5G infrastructure. Dual-polarized phased-array transceivers are an attractive class of antenna systems that can transmit data simultaneously through horizontal and vertical-polarized waves. Numerous studies have shown that dual-polarized MIMO can improve the data rate and spectrum efficiency in 5G radio units. However, one problem encountered with these systems is cross-polarization leakage[3], which results in degradation of signal quality especially in the millimeter wave band.

Now, Kenichi Okada's Lab at Tokyo Tech's Department of Electrical and Electronic Engineering and NEC corporation in Japan have developed a transceiver capable of canceling cross-polarization interference using a built-in so-called horizontal and vertical (H/V) canceller. Tests have shown that the error vector magnitude [4] in 256QAM[5] can be improved from 7.6% to a more desirable, lower figure of 3.3% using this new leakage cancellation technique. "The cancellation signals are generated for horizontal and vertical polarization at the transmission side so that it can cancel the cross-polarization leakage caused by all through the transmitter/receiver chip, package, printed circuit board and antenna," the researchers say.

The transceiver was fabricated using low-cost, mass-producible silicon CMOS[6] technology, occupying an area of just 16 mm<sup>2</sup>. The researchers anticipate that the new circuitry could be installed in a wide range of applications that will be enabled by 5G in the future. Importantly, they point out that their transceiver will improve spectrum efficiency while keeping equipment size and set-up costs to a minimum.

The findings are being presented at the 2020 Symposia on VLSI Technology and Circuits (VLSI 2020), held online from 14 June. The paper has also been selected as one of the technical highlights at the conference.

This research is supported by the Ministry of Internal Affairs and Communications in Japan (JPJ000254).

### Technical terms

[1] phased-array: Describing an electrically steerable array of antennas.

[2] Dual-polarized MIMO: Dual-polarized multiple-input multiple-output (MIMO) refers to an antenna system for wireless communications that can improve transmission capacity through the use of a plurality of antennae that transmit signals simultaneously.

[3] cross-polarization leakage: A type of signal leakage caused by horizontal and vertical-polarized signals interfering with each other.

[4] Error vector magnitude: A measure of the level of interference, calculated by the difference between the ideal transmitted signal and the actual received signal.

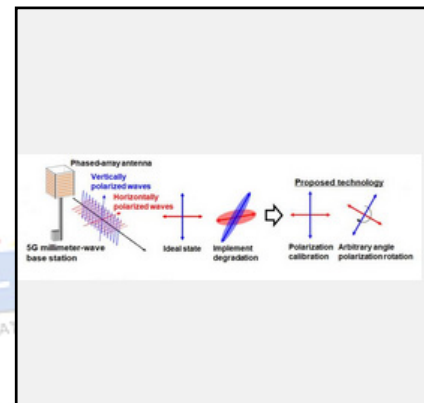


IMAGE: An illustration of leakage cancellation between polarization signals and arbitrary angle polarization rotation. [view more](#)

[5] 256QAM: The highest digital modulation method for converting digital data into radio waves and electric signals.

[6] CMOS: Complementary metal-oxide-semiconductor, the main processing method for creating integrated circuits.

### References

Technology Session (Video) : CF2 - RF & mm-Wave Circuits

Session Title : A 28-GHz CMOS Phased-Array Beamformer Supporting Dual-Polarized MIMO with Cross-Polarization Leakage Cancellation

Authors: Pang, J. et al.

Conference: 2020 Symposia on VLSI Technology and Circuits. <https://vlsisymposium.org/>

### About Tokyo Institute of Technology

Tokyo Tech stands at the forefront of research and higher education as the leading university for science and technology in Japan. Tokyo Tech researchers excel in fields ranging from materials science to biology, computer science, and physics. Founded in 1881, Tokyo Tech hosts over 10,000 undergraduate and graduate students per year, who develop into scientific leaders and some of the most sought-after engineers in industry. Embodying the Japanese philosophy of "monotsukuri," meaning "technical ingenuity and innovation," the Tokyo Tech community strives to contribute to society through high-impact research. <https://www.titech.ac.jp/english/>

### About NEC Corporation

NEC Corporation has established itself as a leader in the integration of IT and network technologies while promoting the brand statement of "Orchestrating a brighter world." NEC enables businesses and communities to adapt to rapid changes taking place in both society and the market as it provides for the social values of safety, security, fairness and efficiency to promote a more sustainable world where everyone has the chance to reach their full potential. For more information, visit NEC at <http://www.nec.com>.

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## TECHNOLOGY NETWORKS

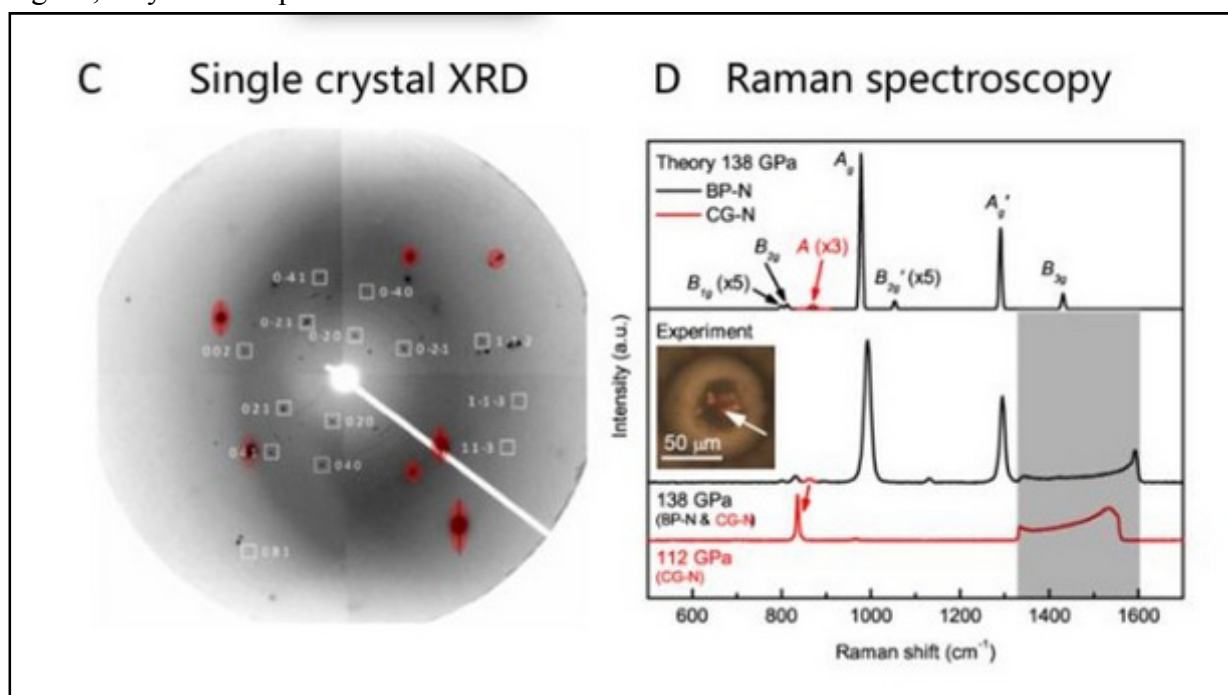
ज्ञान प्रसार एवम् विर Thu, 18 June 2020

# Long-sought-after nitrogen found in black phosphorus structure

An international team co-led by Ho-Kwang Mao and Huiyang Gou from Center for High Pressure Science and Technology Advanced Research (HPSTAR) and Yansun Yao from University of Saskatchewan discovered that nitrogen, usually consisting of diatomic molecules, can form an extended structure under the conditions of 1.5 million atm pressure and 1,900 °C. In the new structure, all nitrogen atoms are connected with single bonds, similar to phosphorus atoms in black phosphorus (BP). This finding provides prospects for nitrogen-based two-dimensional (2D) materials. The results were recently published in Science Advances.

Graphene, or single layer of graphite, has a set of novel properties which has drawn tremendous attentions since its discovery. Nitrogen is the next neighbor to carbon in the periodic table of elements. Naturally, a question to ask is whether nitrogen can form a 2D material similar to graphene. On the face of it, it is difficult to imagine such a nitrogen layer since nitrogen has one more electron than carbon, overwhelming the bonding requirement of graphene. However, all elements in the VA group but nitrogen do possess allotropes with layered structures. The difference is that these VA elements have buckled layers (Figure 1A), where the surplus electrons are stored in non-bonding pairs (lone pairs). The covalent bonds connecting all VA atoms and the repulsion

among lone pairs on each atom have a delicate competition and this determines how atoms are arranged in crystal structure. Phosphorene is a typical 2D material derived from the buckled honeycomb layers of black phosphorus. It exhibits a number of unusual electronic, mechanical, optical, and transport properties with great potential as a prototypical next-generation 2D material. If the BP-structured nitrogen can be found, the synthesis of a nitrogen-based 2D material, or nitrogene, may become possible.



Subfigures A, C, and D are from this work [C. Ji, et al., *Science Advances*, 6, eaba9206. Credit: Cheng Ji.

There is a rule of thumb for structural changes at high pressure, “elements at high pressure behave like the elements below them in the periodic table at lower pressures.” As the first element of VA group, nitrogen is right above phosphorus. Theoretical calculations have predicted the formation of BP-structured nitrogen at high pressure. However, nitrogen is much more difficult to be transformed into the BP structure compared to the other VA elements, since nitrogen forms N<sub>2</sub> molecules with extremely strong triple chemical bonds. Even though nitrogen has been studied at pressures exceeding one million atmosphere (100 GPa), BP-structured nitrogen has never been reported.

“Analogous to the black, white, and red phosphorus allotropes which have similar energies and can be mutually transformed, single-bonded nitrogen at high pressure may also have multiple polymorphs that are very close in energy. Although BP-structured nitrogen is calculated not to be the allotrope with the lowest energy, we think it may be synthesized as a metastable phase at some particular pressure-temperature conditions,” said Huiyang Gou, a co-team leader at the Center for High Pressure Science and Technology Advanced Research (HPSTAR) in Beijing.

“Our molecular dynamic simulation indicates that BP-structured nitrogen becomes energetically more favorable when the temperature is raised, implying the possibility of synthesizing BP-structured nitrogen at high pressure and high temperature conditions.” said Yansun Yao, a professor of University of Saskatchewan.

The team used an apparatus called “diamond anvil cell”, to exert formidable pressure on to molecular nitrogen. A tiny nitrogen sample is squeezed between two opposite sharp diamond tips (Figure 1B), and meanwhile it is subjected to very high temperature through heating by high-power laser. They explored a large pressure range from 1.2 to 1.9 million times normal atmospheric pressure, and saw the formation of a new nitrogen phase at approximately 1.5 million times normal atmospheric pressure and 1,900 degrees Celsius. The BP structure was identified by using synchrotron based single crystal X-ray diffraction (XRD) techniques (Figure 1C), Raman spectroscopy (Figure 1D), and theoretical calculation. The new material exhibits a very special set



of optical properties associated to the anisotropy of the buckled layers, in particular, colossal Raman intensity compared to other nitrogen phases. The reason for the long time absence of BP-structured nitrogen in high pressure experiment was also explained through theoretical calculations. The BP-structured nitrogen transforms back to N<sub>2</sub> gas when the pressure is lowered. Future studies are desirable for obtaining metastable BP-structured nitrogen at ambient conditions.

“The discovery of BP-structured nitrogen is a typical showcase demonstrating the importance of fundamental scientific research at extreme conditions,” added Ho-kwang Mao, director of HPSTAR, ‘Proving the existence of a material is the very first and essential step towards applications, which may demand years or even decades of continued research efforts.’”

#### Reference

Nitrogen in black phosphorus structure. Cheng Ji et al. Science Advances 03 Jun 2020: Vol. 6, no. 23, eaba9206, DOI: [10.1126/sciadv.aba9206](https://doi.org/10.1126/sciadv.aba9206).

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<https://www.technologynetworks.com/analysis/news/long-sought-after-nitrogen-found-in-black-phosphorus-structure-336210>

## COVID-19 Research News

THE ECONOMIC TIMES

Thu, 18 June 2020

### IIT Hyderabad researcher develops AI-powered low-cost, point of care Covid-19 testing kit

*The test kit can produce results in around 20 minutes for symptomatic and asymptomatic patients*

Hyderabad: Indian Institute of Technology Hyderabad researcher has developed an Artificial Intelligence-powered COVID-19 test, which can be performed at an affordable cost.

The test kit can produce results in around 20 minutes for symptomatic and asymptomatic patients.

The test kit has already been field-tested at ESIC Medical College and Hospital in Hyderabad to ascertain its efficiency. It can be transported quickly, enabling the test to be conducted at the point-of-care. A major benefit of this testing kit is that it does not require RT-PCR (Reverse Transcription Polymerase Chain Reaction).

Each test costs around Rs. 600 device now. However, mass production of the testing kit will help reduce the cost to around Rs. 350 per test.

The testing kit was developed by a team led by Prof. Shiv Govind Singh, Department of Electrical Engineering, IIT Hyderabad. Dr. Suryasnata Tripathy, a postdoctoral fellow, Patta Supraja, a fourth-year doctoral student and other students from Prof. Shiv Govind Singh's Research Team, institute faculty and funding agencies supported this project.

Singh said, "The Research Team has the manpower and the capability required for mass production of this testing kit. We are now planning to raise funds from various Government and Private sources towards this end. This device is IIT Hyderabad's small contribution to the Nation at the time of this crisis."



Singh and his team have also developed AI (Artificial Intelligence) tools to capture extensive data points to minimize the errors in decision making. He is now seeking the approval for mass production of the test kit from ICMR and said he will also be filing for a patent for the device.

<https://health.economictimes.indiatimes.com/news/medical-devices/iit-hyderabad-researcher-develops-ai-powered-low-cost-point-of-care-covid-19-testing-kit/76418478>



Thu, 18 June 2020

## NTU researchers develop a sustainable way to extract high-quality antimicrobial compounds

By James Ives

Berlin: The Modi government is reportedly planning to launch a board to promote private engagement in space activities. The proposal is a promising move towards addressing some of the biggest problems that are keeping the local space industry from achieving its potential.

Scientists from Nanyang Technological University, Singapore (NTU Singapore) have developed a sustainable and green way to extract high-quality antimicrobial compounds from seeds.

This new antimicrobial compound is used by global apparel and textiles manufacturer Ghim Li Group (GLG) as a fabric finishing in their reusable masks sold locally and overseas.

The masks were distributed to Singaporeans and permanent residents last month as part of the Government's strategy to fight the COVID-19 pandemic.

The natural antimicrobial compound developed by NTU scientists contains powerful antioxidants found in seeds. In lab tests done at NTU, the compound killed 99 per cent of harmful bacteria by disrupting their cell walls.

Obtaining high-value ingredients from organic parts discarded during food processing, such as stems, seeds and husks, is an innovative way that can contribute towards a sustainable circular food economy and a key research focus of NTU's Food Science and Technology Programme.

Using green processes to obtain these ingredients will also be more sustainable, as typical antimicrobial solutions require the use of harsh chemicals such as solvents or use ions obtained from various metals such as silver.

In contrast, Professor William Chen, Director of NTU's Food Science and Technology Programme, and his team used ball-milling, known as solid-state synthesis, with clean water processes to extract the antimicrobial compounds from the discarded husks of seeds without the need for harsh chemicals.

As the natural compound is considered non-toxic for humans, it has huge potential to be applied in other types of products, such as personal protective equipment, sports apparel, paints, and disinfectants.

With the new technology, GLG has plans to capture new business opportunities, expanding their product offerings to masks and even medical uniforms, beyond the traditional apparel products.

Products from GLG are distributed worldwide, to a range of USA and Europe specialty store retailers, major department stores and supermarket chains.

### Antimicrobial finish by NTU scientists

Research fellow Dr Jaslyn Lee and other researchers from Prof Chen's team conducted lab experiments using the extracted antimicrobial liquid compound, testing it on common food pathogens *Escherichia coli* and *Staphylococcus aureus*, which typically cause food poisoning when consumed.

When in contact with bacteria, the compound binds to the bacteria wall, inactivating the protein and enzymes on the wall, thus inhibiting bacterial growth.

In the tests, the compound was shown to be able to create a "zone of inhibition", where both *S. Aureus* and *E. Coli* bacteria growth were not able to penetrate this zone.

The NTU research team was initially targeting to create a new generation of sustainable anti-microbial food packaging. But following discussions with GLG, the newly discovered compound found another important application in reusable masks in this COVID-19 pandemic.

"This is a great example of how academia and industry can work together to create value for Singapore's economy and help Singapore companies become more competitive."

#### **Applications beyond masks by Ghim Li**

Ms Estina Ang, Founder, Chairman & CEO, Ghim Li Group, said: "Ghim Li Group is thrilled to embark on our new journey with NTU on our R&D collaboration as we continue to reinvent our business model to develop new products and explore new business markets.

"With this know-how using organic sustainable argri-waste, we are able to apply this on new sustainable products using natural cotton fibres and sustainable chemicals which is in line with Ghim Li Group's sustainable initiatives to protect the environment by reducing global waste and carbon footprint."

"We will continue to enhance our R&D efforts on sustainability to achieve our Ghim Li Group's motto "锦質吡瀑" to do our part using our products to benefit mankind by saving the environment."

The discussion to use NTU's antimicrobial technology started when Ms Ang heard about the sustainable waste-to-resource food research done by Prof Chen's team.

Ms Ang, an NTU alumnus and a 2019 recipient of the Nanyang Alumni Achievement Award recognized for her outstanding contribution to her field, then contacted NTUitive, NTU's enterprise and innovation company, to acquire the antimicrobial technology and its knowhow.

GLG is now looking to embark on a future research partnership with NTU to further research and develop innovative antimicrobial compounds and to identify future applications.

Prof Chen, who is also the Michael Fam Chair Professor in Food Science and Technology, said: "Our new antimicrobial compound assigned to Ghim Li Group was been tested in our labs to be safe for humans and can be sustainably produced in large quantities using green processes."

"We hope to continue this productive partnership where we can develop sustainable innovations that will keep Singapore at the forefront of a circular economy."

One potential area of research in future, could be to further study the properties of the antimicrobial compound and its effects on different bacteria and viruses. This follows the findings of a peer-reviewed paper in 2005 by Taipei's National Health Research Institutes.

The Taiwanese study reported that similar compounds found in black and green teas (also found commonly in seeds) demonstrated inhibitory activity against a protease that was deemed critical to the viral replication of the severe acute respiratory syndrome coronavirus (SARS-CoV).

*"As a leading research-intensive university, NTU is proud that our research efforts have yielded a valuable resource for Singapore in the fight against infectious diseases. This innovation was an unexpected result of research in food science being applied in reusable masks used in the fight against COVID-19."*

*Lam Khin Yong, Senior Vice President, Professor, Nanyang Technological University*

<https://www.news-medical.net/news/20200617/e2808bNTU-researchers-develop-a-sustainable-way-to-extract-high-quality-antimicrobial-compounds.aspx>



## Russia starts clinical trials of COVID-19 vaccine

By Daria Litvinova

Moscow (AP) — Clinical trials of a Russian coronavirus vaccine have started Wednesday, the Health Ministry said in a statement.

Two forms of the vaccine developed by the Moscow-based Gamaleya research institute — liquid and powder for injections — will be tested on two groups of volunteers, 38 people each, the statement said. The participants will be isolated in two Moscow hospitals.

“Running clinical trials in the midst of a pandemic is a unique situation. So unprecedented measures have been taken — all potential participants of the trial ... spent two weeks (quarantined) in a sanatorium for observation,” the ministry said, adding that the first injections are scheduled for Thursday and Friday.

The Gamaleya institute made headlines last month when its director, professor Alexander Gintsburg, made a statement that he and other researchers had tried the vaccine on themselves before the start of human studies.

He didn't clarify how many people injected themselves with the substance, but told the Interfax news agency that no one experienced any side effects: “Everyone is alive and well and cheerful.”

In comments to RIA Novosti, Gintsburg insisted that he and others hadn't intended to test the vaccine — they were merely looking to “protect themselves (from the virus) with the vaccine.”

“It's not a trial. It's self-defense in order for us to continue working (on the vaccine). Losing a staffer (to the virus) would delay the work. Knowing what they're developing, they consciously took this step. And so did I,” Gintsburg said.

Gintsburg's comments sparked criticism in the Russian medical community. The country's Association of Clinical Research Organizations issued a statement condemning the actions of the researchers as a “crude violation of the very foundations of clinical research, Russian law and universally accepted international regulations.”

The association accused Russian authorities of rushing researchers to finish clinical trials of COVID-19 vaccines, saying “an unattainable bar has been set. Many scientists understand that, yet they got involved in the crazy race, hoping to please those in power.”

Days before Gintsburg revealed trying the vaccine, Kremlin spokesman Dmitry Peskov extended “words of admiration” to scientists testing the vaccine on themselves.

“Let's not name the facility, the people. But these are people that are fanatics in what they do in the best sense of the word,” Peskov told the Kommersant newspaper in an interview in mid-May.

According to Russian media, at least seven research facilities are currently working on coronavirus vaccines.

<https://www.seattlepi.com/news/article/Russia-starts-clinical-trials-of-COVID-19-vaccine-15346564.php>

