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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, 13 Aug 2020

This DRDO-supported MSME's microwave-shaped box can sanitize your fruits, vegetables, phone, keys, more

Technology for MSMEs: Maser Technology, which claimed to be the only medical MSME working on microwave technology to disinfect surfaces and objects to help control the spread of Covid, had partnered with Defence Institute of Advanced Technology (DIAT), Pune – a deemed university of DRDO for transfer of technology
By Sandeep Soni

Technology for MSMEs: Defence Research and Development Organisation (DRDO) supported MSME Maser Technology working on microwave technology-based sterilisation solution amid Covid spread has launched microwave-shaped 'Atulya' sterilizer for retail. The company, which claimed to be the only medical MSME working on microwave technology to disinfect surfaces and objects to help control the spread of Covid, had partnered with Defence Institute of Advanced Technology (DIAT), Pune – a deemed university of DRDO for transfer of technology (ToT). "Essentially we have the ToT which means that DIAT/DRDO shares all intellectual property with us for manufacturing and commercialisation of Atulya. As ToT partners we further research and develop the product for market acceptance, and then all collective research developments will be the intellectual property of DIAT/DRDO & MaserTech together," Monish Bhandari, Founder and MD, Maser Technology told Financial Express Online.

Launched by MSME Minister Nitin Gadkari on Tuesday, Atulya is a handheld device to sterilize objects, surfaces, surroundings, and aerosols within 30 seconds to 1 minute with a "patented smart technology which enables cold sterilization in the range of 56-60 Celsius temperature," the company said. Maser Technology is also working on creating a portable battery version of the sterilizer.

Atulya can scan objects and surfaces up to five meters depth "thus eliminating any trace of Covid or similar viruses and bacteria. Prof. K.P. Ray, Dean DIAT (DRDO), is the co-innovator of Atulya and is a world authority on microwave technology," said Bhandari. The product has an introductory price of Rs 12,700 and is available on GeM and Amazon.

"This highlights how our Indian MSMEs are taking the vision of 'Vocal for Local' a step ahead with every innovation," said Gadkari. In contrast to UV and chemical-based products, Atulya, according to the company is proven to be safe against cancer, retina damage, and skin diseases. The product is tested for Covid and other virus sterilization by DIAT using the Nuclear Magnetic Resonance (NMR) a medical imaging technique for imaging the anatomy and the physiological processes of the human body.



The product has an introductory price of Rs 12,700 and is available on GeM and Amazon.

“Maser as a major stakeholder in Research & Development of Medical Microwave Technology, probably made sense as ToT partners for Atulya given that the technology is microwave based, in which we have over 400 years of collective team experience. Also, our 90 per cent share of India’s medical microwave market sealed the deal as the ToT partners for manufacturing & commercialisation,” Bhandari added.

<https://www.financialexpress.com/industry/sme/msme-tech-this-drdo-supported-msmes-microwave-shaped-box-can-sanitize-your-fruits-vegetables-phone-keys-more/2053139/>



Thu, 13 Aug 2020

Fighting Coronavirus: Nitin Gadkari unveils ‘Atulya’, a device which can disinfect premises in 30 seconds

What makes the launch of the device more heartening is the fact that the microwave device has been 100 per cent indigenously manufactured

Union Minister for Road Transport and Highways and Micro, Small and Medium Enterprises Nitin Gadkari has unveiled a microwave device that can disinfect premises in just 30 seconds. Named ‘Atulya’, the device can incredibly disinfect any premises with the help of differential heating leading to the disintegration of coronavirus from the surroundings, according to a news report by the All India Radio. What makes the launch of the device more heartening is the fact that the microwave device has been 100 per cent indigenously manufactured. India’s premier research organisation Defence Research and Development Organisation (DRDO) has certified its design. The machine has been developed under the overall supervision of the Ministry of Micro, Small and Medium Enterprises.

As per the All India Radio report, the device can be used to disinfect any premise up to an area of 5 metre at a time. In addition to the premises, virus particles lingering on the surfaces of furniture, beds, office tables and even inside the boxes could be disintegrated with the new device. The device has also been designed in such a way that it remains portable and lightweight and could be used by anybody without much effort.

The device weighs only 3 kg and has been certified by the DRDO to be completely safe for human use as it does not emit any ultraviolet rays which could prove harmful to humans. The device instead relies on the differential heating technology under which it used the temperature between 56 to 60 degree Celsius to disinfect different and varied objects. The total time taken by the machine also depends upon the size and the nature of the objects which are to be disinfected. From a minimum of 30 seconds, the device could take up to a minute to disinfect all types of objects.

<https://www.financialexpress.com/lifestyle/science/fighting-coronavirus-nitin-gadkari-unveils-atulya-a-device-which-can-disinfect-premises-in-30-seconds/2053078/lite/>



Fighting Coronavirus: Nitin Gadkari unveils ‘Atulya’, a device which can disinfect premises in 30 seconds

ATULYA Sterilizer to combat Covid-19 unveiled by Union Cabinet Minister Shri Nitin Gadkari

ATULYA - a DRDO technology, enables for the first time in the world, sterilization of surface and aerosol up to a depth of 5 meters within 30 seconds

Union Cabinet Minister Shri Nitin Gadkari, Minister for MSME and Road Transport & Highways, launched ATULYA. The product enables sterilization of surfaces, surroundings and aerosols during COVID 19 spread. Maser- the Indian medical MSME working on microwave technology for disinfection solution has announced the launch.

Union Cabinet Minister in the presence of Dr. Vikas Mahatme, Member of Parliament and Padma Shri Awarded Indian ophthalmologist, Ms. Shivani Dani Wakhre, President – BJYM Nagpur and others at an event in Nagpur with an aim to introduce the technology to masses while people together fight the battle against Coronavirus.

Speaking of ATULYA, Shri Nitin Gadkari, said: “It is delightful to see our intelligent Indian minds working on technology backbone and come up with solutions like ATULYA, while we combat COVID 19. This highlights how our Indian MSME’s are taking the vision of ‘Vocal for Local’ a step ahead with every innovation.”

ATULYA works on microwave technology to disintegrate virus and bacteria. It runs on the technology developed by Defence Institute of Advanced Technology, Pune, deemed university of DRDO.

The sterilizer is operated as a handheld device and depending on the shape and size it has the capability to sterilize objects, surfaces, surroundings and aerosols within 30 seconds to 1 minute with a patented smart technology which enables cold sterilization in the range of 56-60 Celsius temperature (MACSR). The 4.5kg model of the product runs on connected power supply of 5 amp. The company is also working on developing a portable battery version of the same.

Monish Bhandari, Founder and Managing Director, Maser Technology, added: “At Maser we are always working on solutions that ensure safety of people through disinfection and sterilization. This ambition led us to associate with DIAT (DRDO) and introduce ATULYA sterilizer that would enable a safe surrounding for people.

“The microwave technology of the product can disintegrate viruses and safeguard users during this pandemic. A 30 second simple scan by ATULYA sterilizes any surface upto 5 metres depth, thus eliminating any trace of COVID or similar viruses and bacteria. Prof. K.P. Ray, Dean DIAT (DRDO), is the co-innovator of ‘ATULYA’ and is a world authority on microwave technology. We consider this our responsibility in the current unprecedented times to bring this solution to the masses. “

<https://www.dqindia.com/atulya-sterilizer-to-combat-covid-19-unveiled-by-union-cabinet-minister-shri-nitin-gadkari/>



ATULYA Sterilizer

Thu, 13 Aug 2020

PM Modi pushed for early release of Defence Ministry's negative import list

A few weeks ago, PM Modi had asked for detailed presentations from the DRDO and Department of Defence Production to know about indigenous capabilities to produce military hardware, after which the government issued a negative arms import list

By Manjeet Singh Negi

New Delhi: The Centre's embargo on imports in defence sector came after Prime Minister Narendra Modi pushed for an early release of Defence Ministry's negative import list, sources have said.

In the last part of July and the first week of August, PM Modi had asked for detailed presentations from the Defence Research and Development Organization (DRDO) and Department of Defence Production (DDP) to know about indigenous capabilities to produce military hardware, after which the government issued a negative arms import list.



File photo of PM Narendra Modi

"Detailed briefings and product presentations were given by the DRDO and DDP to the prime minister detailing the indigenous capability to produce weapon systems and platforms within the country," top government sources told Aajtak and India Today TV.

The crucial meetings, called by the prime minister, were attended by several important dignitaries, including some of his cabinet colleagues and senior bureaucrats from the Prime Minister's Office, the sources said.

It has been one of the topmost priorities of Prime Minister Narendra Modi to increase indigenous defence production and create a robust military industry within the country to boost economic growth and create jobs which are generally taken by foreigners due to placement of orders to foreign vendors, the sources said.

A number of indigenous defence producers have also been asking the government at the topmost levels to take measures to improve the defence production ecosystem within the country and provide more business opportunities to them as well, they said.

After the prime minister was briefed about the negative arms import list by the concerned officials, the defence ministry introduced an import embargo on 101 items beyond a given timeline to boost indigenisation of defence production. It is estimated that contracts worth almost Rs 4 lakh crore will be placed upon the domestic industry within the next six to seven years after this step. The list also includes wheeled Armoured Fighting Vehicles (AFVs) with indicative import embargo date of December 2021. The Indian Army is expected to contract almost 200 AFVs at an approximate cost of over Rs 5,000 crore.

<https://www.indiatoday.in/india/story/pm-modi-pushed-for-early-release-of-defence-ministry-s-negative-import-list-1710514-2020-08-12>

हथियारों के आयात पर रोक से पहले PM मोदी ने जानी देसी कंपनियों की तैयारी

सरकार के टॉप सूत्रों ने आजतक को बताया कि देश की रक्षा कंपनियों की उत्पादन क्षमता और उनके तकनीकी कौशल की जानकारी डीआरडीओ और रक्षा उत्पादन विभाग ने पीएम मोदी को दी

- DRDO के साथ पीएम मोदी की बैठक
- विस्तृत प्रजेंटेशन देकर बताया उत्पादन प्लान

विदेशों से 101 हथियारों के आयात पर चरणबद्ध रोक लगाने से पहले प्रधानमंत्री नरेंद्र मोदी ने डीआरडीओ और रक्षा उत्पादन विभाग को एक विस्तृत प्रजेंटेशन देकर ये बताने को कहा कि देश की रक्षा कंपनियों के पास हथियारों और उपकरणों की उत्पादन क्षमता क्या है। इस प्रजेंटेशन से संतुष्ट होने के बाद ही रक्षा मंत्रालय ने लिस्ट जारी की।

सरकार के टॉप सूत्रों ने आजतक को बताया कि देश की रक्षा कंपनियों की उत्पादन क्षमता और उनके तकनीकी कौशल की जानकारी डीआरडीओ और रक्षा उत्पादन विभाग ने पीएम मोदी को दी। सूत्रों ने कहा कि इस बारे में पीएम की बुलाई गई मीटिंग में कुछ कैबिनेट मंत्री, वरिष्ठ नौकरशाह और पीएमओ के टॉप अधिकारी मौजूद थे। 101 उत्पादों की लिस्ट को अंतिम रूप देने के लिए कई राउंड की मीटिंग की गई और इसमें रक्षा विभाग के अधिकारी शामिल रहे।

बता दें कि देश की रक्षा उत्पादन क्षमता बढ़ाना नरेंद्र मोदी सरकार की सर्वोच्च प्राथमिकताओं में शामिल है। सरकार देश में सैन्य उद्योग को बढ़ावा देना चाहती है ताकि रोजगार में बढ़ोतरी और हथियार खरीदने में देश का जो पैसा बाहर चला जाता है उसका फायदा देश की कंपनियों और युवाओं को ही मिले।

कई देसी कंपनियां प्रधानमंत्री से आग्रह कर रही थी कि देश में डिफेंस प्रोडक्शन का इको सिस्टम ठीक किया जाए। प्रधानमंत्री के साथ हुई मीटिंग में इन तमाम मुद्दों पर चर्चा हुई। अधिकारियों ने प्रधानमंत्री देसी रक्षा उद्योगों का स्टेटस बताया। प्रधानमंत्री की ओर से ग्रीन सिग्नल मिलने के बाद ही रक्षा मंत्रालय ने 101 हथियारों और रक्षा उपकरणों की सूची तैयार की। रक्षा मंत्रालय दिसंबर 2025 तक चरणबद्ध तरीके से इन सामानों के आयात पर प्रतिबंध लगाएगा।

बताया जा रहा है कि इन सामानों का देश में उत्पादन शुरू होने के बाद 6 से 7 सालों में देसी रक्षा कंपनियों को 4 लाख करोड़ का ऑर्डर मिलेगा।

<https://aajtak.intoday.in/story/pm-narendra-modi-push-for-early-release-of-defence-ministry-negative-import-list-drdo-1-1219155.html>

सेना को फायरिंग रेंज की बजाय लैब में ही मिल जायेगा हथियारों का प्रशिक्षण

गजेन्द्र सिंह दहिया

- कंप्यूटर विज्ञान हब आई आई टी जोधपुर में 115 करोड़ रुपए से बना टेक्नोलॉजी इनोवेशन हब
- रक्षा क्षेत्र में काम करने के लिए डीआरडीओ की 6 रक्षा प्रयोगशाला के साथ चल रही है वार्ता गजेन्द्र सिंह दहिया/जोधपुर. केंद्रीय विज्ञान एवं प्रौद्योगिकी विभाग के नेशनल मिशन ऑन इंटरडिसिप्लिनरी साइबर फिजिकल सिस्टम के अंतर्गत भारतीय प्रौद्योगिकी संस्थान (आइआइटी) जोधपुर का चयन टेक्नोलॉजी इनोवेशन हब (टीआईबी) के रूप में किया गया है। यहां कम्प्यूटर विज्ञान व वर्चुअल वल्ड का हब बनेगा, जिसके लिए 115 करोड़ रुपए दिए गए हैं। आर्टिफिशियल इंटेलिजेंस (एआई) की मदद से आइआइटी जोधपुर देश के विभिन्न तकनीकी, वैज्ञानिक व औद्योगिकी संस्थानों के साथ एमओयू करके नई तकनीक विकसित करेगा। देश में 18 टेक्नोलॉजी इनोवेशन हब और 7 सेक्टरल एप्लीकेशन हब खोले जाने हैं ताकि साइबर क्षेत्र में देश में नई तकनीक व एप्लीकेशन विकसित की जा सके।

रक्षा क्षेत्र में पहल करेगा जोधपुर

आइआइटी जोधपुर रक्षा क्षेत्र में काम करने के लिए देश के रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) की देशभर में फैली 6 रक्षा प्रयोगशाला के साथ वार्ता कर रहा है। एमओयू होने पर आइआइटी जोधपुर में डीआरडीओ का एक्सीलेंस सेंटर बनेगा। भविष्य में यहां आर्मी, एयरफोर्स व नेवी के लिए एआई आधारित तकनीक विकसित की जाएगी। आने वाले समय में रक्षा क्षेत्र में एआई की भूमिका महत्वपूर्ण रहेगी। लड़ाकू विमान, हेलीकॉप्टर, ड्रोन व बड़े हथियारों को बगैर मानव के ऑपरेट किए जाने पर रिसर्च की संभावना है।

फायरिंग रेंज में नहीं जाना पड़ेगा

सूत्रों के मुताबिक वर्चुअल तकनीक की सहायता से सेना को प्रशिक्षण भी बगैर रियल फील्ड में भेजे दिया जा सकेगा। इसके बाद सभी सैनिकों को फायरिंग रेंज में जाने की जरूरत नहीं पड़ेगी। वर्तमान में जैसलमेर पोकरण फील्ड फायरिंग रेंज और बीकानेर स्थित महाजन फील्ड फायरिंग रेंज में प्रशिक्षण के लिए हर साल बड़ी संख्या में सैनिकों का मूवमेंट होता है। स्क्रैप्स के कारण कुछ स्थानीय लोग भी कई बार मारे जाते हैं। साथ ही आसपास के गांव के निवासियों को भी परेशानी होती है।

लड़ाकू विमान का सिम्यूलेशन भी

लड़ाकू विमान के पायलट्स को भी प्राथमिक प्रशिक्षण प्रयोगशाला में ही मिलने की उम्मीद है। इसके लिए मिग-21, मिग-27, सुखोई-30 और हाल ही में आए रफाल लड़ाकू विमान के सिम्यूलेशन बनाए जाएंगे। इससे ईंधन व मानव जान दोनों को फायदा मिलेगा। अपाचे, चिनूक, रुद्र जैसे हेलीकॉप्टर का प्रशिक्षण भी वर्चुअल वल्ड में दिया जा सकेगा।

<https://www.patrika.com/jodhpur-news/iit-jodhpur-will-join-hand-with-drdo-6335298/>

DRDO develops 6 more location radar weapons SWATHI, to be procured by Indian Army soon

The Defence Research and Development Organisation (DRDO) developed six more locating radars Swathi weapons. Meanwhile, these powerful weapons will be procured by the Indian Army soon. This is a powerful weapon that can easily distinguish between friends and foes

By Manish Prasad

New Delhi: The Defence Research and Development Organisation (DRDO) developed six more locating radars Swathi weapons. Meanwhile, these powerful weapons will be procured by the Indian Army soon. This is a powerful weapon that can easily distinguish between friends and foes. It's 400 crore projects taken up by the Ministry of Defence and it will enhance the capability of the Indian Army.

Here are some features of Weapon Location Radar (WLR) – SWATHI

1. Detection of launch point of enemy Shells, Mortars and Rockets
2. Guide own artillery fire at enemy targets to achieve fire supremacy in the battlefield
3. Tracks from launch to impact point of all types of targets
4. Self-sufficient with own north finding system and GPS to find own location
5. Slewable Phased Array Antenna
6. Communication with higher echelons
7. Low encamp and decamp time
8. Weapon locating in high density fire environment
9. Programmable state-of-the-art hardware based processing



DRDO develops 6 more location radar weapons
SWATHI, to be procured by Indian Army soon

This weapon is designed and developed by Electronics and Radar Development Establishment (LRDE), Bengaluru. SWATHI-Weapon Location Radar was handed over to Indian Army in March 2017. Swathi Weapon Location Radar (WLR) is indigenously developed, coherent, electronically scanned phased array radar. The radar automatically locates hostile artillery, mortars and rocket launchers and tracks friendly fire to locate the impact point to issue necessary corrections.

The radar is designed to detect projectiles with small cross section across the battle space horizon, and has the capability to handle simultaneous fire from weapons deployed at multiple locations. WLR has two roles to perform: Weapon Location Mode for Enemy Artillery and Direction of Own Artillery Fire (DOOAF) Mode. The key technologies include Gun Launch Point Computation, Digital Pulse Compression, Digital Receiver with Waveform Programming, UML based Software Development and efficient thermal management using Compact Light Weight Intelligent Cooling Systems.

<https://www.indiatvnews.com/news/india/drdo-develops-location-radar-weapons-swathi-indian-army-641443>

hindustantimes

Thu, 13 Aug 2020

The quest for self-reliance in defence | Opinion

The intent is noble. But India's techno-industrial complex has not shown the required competence

By C Uday Bhaskar

In the run-up to August 15, the challenge to India's territorial integrity and sovereignty has been foregrounded in a startling, but perhaps unsurprising, manner by the June 15 Galwan setback. Chinese troops intruded into areas along the Line of Actual Control (LAC) in the Ladakh region where the Indian tactical presence was thin and there is an October 1962 sense of *déjà vu*.

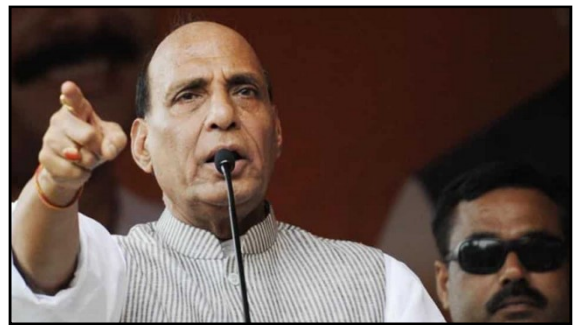
In a puzzling development, the ministry of defence (MoD) uploaded some details of the transgression by China's People's Liberation Army (PLA) troops in the Ladakh region on its website on August 4. Within two days, this was removed without ascribing any reason. This lack of consistency on a grave national security matter was avoidable.

But as per media reports, the gravity of the challenge posed by PLA and its transgression in Ladakh was formally conveyed to a committee of lawmakers by the Chief of Defence Staff General, Bipin Rawat, on August 10. Currently, there is a stalemate in the de-escalation process which has compelled the Indian Army to deploy heavily along LAC and the committee was informed that this may be a "long-drawn process".

The Indian military will have to prepare for a long haul in manning LAC so that there are no more "surprises" in other sectors. The Pakistan factor remains a perennial operational concern. Thus, the robustness of the inventory and logistics-maintenance depth of the three armed forces will be a critical factor in the short-term, as India prepares to manage a post-Galwan bilateral relationship with China.

In this context, defence minister Rajnath Singh put out a series of tweets on August 9 that underlined the resolve of the Narendra Modi government to redress long-festering structural issues pertaining to defence imports. Over the last decade, India has been in the very top-tier of global arms importers and this blunts the claim to "strategic autonomy" and major power status that Delhi aspires for. The flip side is that, during this period, Beijing has emerged as a major arms exporter and a Stockholm International Peace Research Institute (SIPRI) study of January indicated that currently "China is the second-largest arms producer in the world, behind the United States but ahead of Russia."

In the latest defence imports iteration, MoD listed 101 items as part of military platforms and equipment whose import would be embargoed progressively from now till 2025. This is a reiteration of a 2016 policy that the objective would be to encourage/compel the Indian armed



The big constraint in the government's Make-in-India push is that no additional funds have been earmarked (File photo)

forces to source these products from an indigenous manufacturer and thereby reduce import dependency. The list is large and varies from sniper rifles and self-propelled /towed artillery guns to different types of warships, combat aircraft and missiles.

This resolve to buy Indian-made military products is desirable and unexceptionable. A nation that imports a high percentage of its critical military remains vulnerable to the reliability of the supplier even while imposing high fiscal costs. However, the realisation of this objective — buy only make-in-India products — is predicated on a central assumption: That the domestic techno-industrial ecosystem has acquired the necessary competence to produce in a timely and cost-effective manner what the military needs, to acquire and sustain the optimum operational profile necessary to deal with the complex security challenges that are now more visible.

This proven competence level is yet to be arrived at. Consequently, while the intent is laudable, the wherewithal across the Indian military design, research and development (R&D) and manufacturing landscape need much greater infusion of resources — both material and human than what obtains now.

Successive governments have sought to prioritise the “make-in-India” objective but with limited success.

There is a paradox here, for India has attained a commendable degree of design-cum-manufacturing sufficiency based on the indigenous effort in certain strategic capabilities — viz nuclear weapons, satellites, missiles and nuclear propulsion (albeit with Russian assistance) but not in the conventional arms domain.

Yes, some major platforms are assembled or made in India such as fighter aircraft or tanks (MIG and T-72) but according to an imported design. The one area where there has been a commendable success is in warship design and building but even here, the equipment that accords the naval ship its war-fighting capability, the ordnance (guns-missiles) and the advanced surveillance are mostly imported.

Regrettably, there were a few design successes in the military domain. Though encouraging when they blossomed, they died a nascent death due to lack of strategic vision, political vacillation and institutional turf battles that turned venal. The story of the HF 24 fighter aircraft and the navy’s Advanced Panoramic Sonar Hull Mounted (APSOH) sonar is a case in point.

The bigger constraint in the Rajnath Singh announcement is that no additional funds are being earmarked to give a fillip to the new Make in India policy. Further, a pandemic-afflicted economy will have little to spare for the military-defence complex to nurture R&D and design skills across the board.

The R&D-cum-design shortcomings in India are endemic and best illustrated by the saga of the combat boots. As a former army commander lamented, “India manufactures some of the best shoes in the world but the Indian army wears the worst combat boots in the world which has remained unchanged in design for 130 years.”

(C Uday Bhaskar is director, Society for Policy Studies, New Delhi. The views expressed are personal)

<https://www.hindustantimes.com/analysis/the-quest-for-self-reliance-in-defence/story-GizPLPQRc1kJDphuzJTyeN.html>

Thu, 13 Aug 2020

Army refutes CAG findings on shortage of winter clothing and equipment

The Army said deficiency in reserves at the Army headquarters does not impact availability to troops

By Abhishek Bhalla

New Delhi: Shortage in reserves at the Army headquarters does not impact availability to troops, the Army told a parliamentary panel responding to the findings of the Comptroller and Auditor General (CAG) pointing out deficiencies of winter clothing and equipment for high altitude areas.

The Indian Army stated that the shortages in the stocks, that existed for special clothing and mountaineering meant for areas where temperatures dip below minus 20 degrees Celsius, is being built up now.

The Army's assertion that there is no shortage of equipment and clothing for troops on the ground is significant as it comes amid the India-China standoff in eastern Ladakh. With the deadlock continuing, the Indian Army is stocking up and preparing for a "long winter deployment" when the temperatures in some of the areas fall to minus 30 to minus 45 degrees Celsius.



Indian soldiers patrol the Siachen Glacier. (Photo: PTI)

Clarifying about the shortages flagged in the CAG report tabled in Parliament earlier this year - which talked only about shortages in reserves at the headquarters and had no bearing on troops deployed in areas at more than 10,000 feet - the Army informed the Public Accounts Committee (PAC) that local purchases are available to meet any eventuality, if required.

"Discounting reserves, availability of stocks with troops was adequate. Local purchases for urgent requirements are undertaken," the Army told the PAC on Monday. Due to shortages, the troops had to "recycle" snow boots, the CAG had observed in its report between 2015-16 and 2017-18.

The Army has faced critical shortages in its reserves of special clothing and equipment - like snow goggles, boots, jackets and sleeping bags - meant for high altitude areas, the report had said. The audit performed by the CAG was based on clothing, equipment, ration and housing in high altitude areas.

Explaining the procurement process, the Army stated in its response to the PAC, that only items approved by soldiers are included in the tendering. The panel was informed that high altitude areas are divided into two categories. Heights up to 12,000 feet is in the category of 'Extreme Cold' clothing, and for heights beyond that special clothing and mountaineering equipment is required.

More than 3,54,000 troops are deployed up to 12,000 feet, and 38,000 troops at heights above that. Responding to the CAG findings on irregularities in the selection of "inferior" rucksacks that did not meet specifications listed in the contract, the Army said that inconsistencies in lab testing led to a dispute between the Directorate General Quality Assurance and the supplier.

"No compromise on quality of stores, and no defect report has been received from the troops till date," it said. The Army also said that there has been no quality complaints or loss to state due to Shelf Life Management of any of the items.

The auditor had found that three items of the special clothing and mountaineering equipment were issued to units after the expiry of shelf life. The Army, however, said that the shelf life extension of stores is a regular process and all the items were gainfully utilised.

<https://www.indiatoday.in/india/story/army-refutes-cag-findings-on-shortage-of-winter-clothing-and-equipment-1710580-2020-08-13>

THE ECONOMIC TIMES

Thu, 13 Aug 2020

Indian envoy to China Vikram Misri meets top party functionary to discuss LAC tensions

By Dipanjan Roy Chaudhury

Synopsis

During the meeting, Misri referred to India's position on the situation on the borders on eastern Ladakh and the overall bilateral relations, sources said. This comes within three days of last military talks.

New Delhi: Indian Ambassador to China Vikram Misri on Wednesday met Liu Jianchao, the deputy director office of the CPC Central Committee Foreign Affairs Commission to discuss current tensions along LAC.

“Ambassador @VikramMisri today met H.E. Liu Jianchao, Deputy Director of the Office of the CPC Central Committee Foreign Affairs Commission and briefed him on India’s stance vis-à-vis the situation on the borders in eastern Ladakh UT and overall bilateral relations,” Indian Embassy in China tweeted after the meeting.

During the meeting, Misri referred to India's position on the situation on the borders on eastern Ladakh and the overall bilateral relations, sources said. This comes within three days of last military talks.

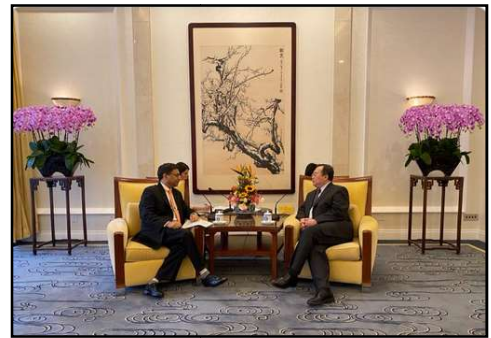
Major general-level talks held between India and China Sunday over the tensions in the Depsang Plains region along the Line of Actual Control (LAC) achieved no progress.

There has not been any significant change in the ground situation in Ladakh, where the Chinese continue to occupy areas near Pangong Tso, and block Indian patrols in the Depsang Plains.

Then ongoing talks between India and China have hit a roadblock, with the Chinese standing firm on their positions.

India has told China to stop further construction and pull back troops from the Depsang-Daulat Beg Oldie sector of eastern Ladakh. During the talks between the two sides, India also told China to stop further construction activities in the area.

<https://economictimes.indiatimes.com/news/defence/indian-envoy-to-china-vikram-misri-meets-top-party-functionary-to-discuss-lac-tensions/articleshow/77511524.cms?from=mdr>



Satellite images show Pakistan's military build-up at sea, Chinese Navy seen near Agosta-90B submarine: Report

Pakistani Navy submarines were seen parked right in the middle of Chinese Navy warships near Karachi in January

Key Highlights

- *Satellite imageries picked up by private intelligence consultancy named ShadowBreak Intl confirmed that Pakistan Navy's Agosta-90B type submarine – Hashmat-class – was indeed docked next to Chinese ships near Karachi*
- *The Chinese naval ships were reportedly on a joint exercise with the Pakistani fleet in January, called 'Sea Guardian-2020'*

Islamabad: Pakistan's camaraderie with China is not hidden from the world. Not that it affects the Islamic nation much, but this friendship has cost them many others, including the United States.

Even after repeated warnings over the country's nefarious tactics with India along the Line of Control, as well as the Financial Action Task Force dumping it in the 'Grey List' following terror financing charges, Pakistan continues to engage with China and conduct military exercises not far away from India's coastal borders.

In a recent report by *Forbes*, Pakistani Navy submarines were seen parked right in the middle of Chinese Navy warships near Karachi, a clear indication that Pakistan is ramping up its naval fleet with assistance from 'all weather partner' China.

At present, Pakistan is reportedly adding eight Chinese-made Type-039B Yuan Class warships to its fleet, and the submarines spotted now are clear indicators of collaboration between Islamabad and Beijing to share military knowledge and hardware.

Satellite imageries picked up by private intelligence consultancy named ShadowBreak Intl confirmed that Pakistan Navy's Agosta-90B type submarine – Hashmat-class – was indeed docked next to Chinese ships near Karachi.

According to the publication, the Chinese naval ships were on a joint exercise with the Pakistani fleet in January, called 'Sea Guardian-2020'.

Interestingly, back then Pakistan's *The Nation* had reported that Pakistani warships were involved in the exercise along with other military equipment such as missile boats, helicopters, anti-submarine aircraft, frigates, etc., but the fact that submarines were also part of the exercise was hidden.

Likewise, the *South China Morning Post* too did not furnish concrete information about the grade of submarines, barring a mention that submarines were involved.

To add to Pakistan's hideous acts, the submarine exercise was conducted in one of Karachi's cordoned-off commercial docks, not their usual ones.

Islamabad operates five French-designed Agosta-class submarines, of which three are improved versions with the Air independent Power (AIP) technology, the kind seen near the Chinese vessels.

According to the report, these class of submarines are potent and one of the more modern machines in the Pakistani arsenal. Besides the AIP, the subs have AS-39 Exocet anti-ship missiles



Chinese submarines. | Representational image | Photo Credit: ANI

and state-of-the-art combat systems. It's also expected to be the launchpad for the country's homegrown Babur-3 nuclear-capable cruise missile.

<https://www.timesnownews.com/international/article/satellite-images-show-pakistan-navy-military-build-up-karachi-chinese-navy-seen-near-agosta-90b-submarine-report/636104>

The Tribune

Thu, 13 Aug 2020

BSF gets first lot of fully indigenised rifle grenades

Its range is 400 metre as compared to 30 metre of hand lobbed one

By Vijay Mohan

Chandigarh: Border Security Force received the first consignment of fully indigenised 40 mm under-barrel grenade launcher (UBGL) ammunition produced by Ammunition Factory, Khadki in Pune, on Wednesday. The grenade is fired from a launcher fitted under the barrel of the 5.56 mm INSAS rifle.

The advantages of 40 mm UBGL ammunition vis-a-vis traditional hand grenade are as that it is lightweight and is also very safe while carrying by troops. Its range is 400 metre as compared to 30 metre of the hand lobbed one.

The UBGL ammunition has four variants for different purposes, including a rocket propelled one and one for practice.

The UBGL, which has a separate trigger, can also be mounted on the AK-47. A standalone version also exists. Some modifications are required to the front part of the weapon to mount the UBGL.

The 40 mm UBGL ammunition is designed and manufactured by the Ammunition Factory, an establishment of state run Ordnance Factory Board, with the components sourced from the Indian Industry.

This ammunition was being imported by the Army as well as the Ministry of Home Affairs (MHA) for use by the Central Armed Police Forces. Thus, there was a perceived need to indigenise the design and manufacture the said ammunition.

Earlier, MK Mohapatra, Senior General Manager, Ammunition Factory, had handed over the Inspection Note of the 40 mm UBGL (Practice) manufactured at the factory, to Ashok Kumar Jha, Deputy Inspector General, BSF, on August 4.

<https://www.tribuneindia.com/news/nation/bsf-gets-first-lot-of-fully-indigenised-rifle-grenades-125624>



A grenade launcher fitted under the barrel of a rifle.



Thu, 13 Aug 2020

India's Heron drones to be armed with missiles for precision strike missions

In a major move by the Indian Air Force, Heron drones which so far are being used for reconnaissance will now be equipped with missiles to attack enemies. The Indian armed forces operate nearly a hundred of these unmanned reconnaissance planes.

The Heron unmanned aerial vehicles are already in the Air Force, Navy, and the Army and are being used extensively at the moment by both Army surveillance and Target acquisition batteries and Air Force in the Ladakh sector.

But now, after over a decade of service, the Indian government wants these Heron drone to go to the next level. On Tuesday, the Ministry of Defence cleared a long-pending programme to upgrade these unarmed Heron drones.

India Today has learnt that these drones will be fitted with laser guided bombs, stand-off air to ground missiles and anti-tank guided missiles — capable of remote precision strike missions.

<https://www.defenceaviationpost.com/2020/08/indias-heron-drones-to-be-armed-with-missiles-for-precision-strike-missions/>



THE TIMES OF INDIA

Thu, 13 Aug 2020

HALs Light Combat Helicopters deployed for operations at Leh

Bengaluru: The Hindustan Aeronautics Limited said on Wednesday two Light Combat Helicopters (LCH) produced by it have been deployed for operations at high altitude (Leh sector) at short notice to support IAF missions, "in the light of the prevailing situation on the border."

"It is the lightest attack helicopter in the world designed and developed by HAL to meet the specific and unique requirements of Indian Armed Forces reflecting the crucial role of HAL in 'Atma Nirbhar Bharat'," HAL's CMD, R Madhavan, said.

The Vice Chief of Air Staff, Air Marshal Harjit Singh Arora took part in one such operation along with HAL test pilot, Wg Cdr (Retd), Subash P John recently by taking-off from high altitude location to a forward area for a simulated attack on a high altitude target, the Bengaluru-headquartered company said in a statement.

"This was followed by a landing at one of the most treacherous helipads in the region.

The LCH successfully demonstrated its quick deployment prowess to forward locations in extreme temperatures," it said.

LCH is a potent weapon platform because of its state-of-the-art systems and highly accurate weapons that are capable of hitting any type of target by day or night, according to HAL.

The other features of LCH include its ability to operate in the complete Area of Responsibility (AOR) and altitudes.

It has capability to carry adequate weapon load at high altitudes under varied conditions.

All these characteristics make it most suitable for hot and high altitude operations, the statement added.

The IAF and the Indian Army together need around 160 LCHs, HAL said.

The Defence Acquisition Council (DAC) had approved the proposal for initial batch of 15 LCHs, the statement said.

The IAF issued Request for Proposal (RFP) for 15 Limited Series Production (LSP) helicopter (10 for IAF and 5 for Army) and HAL had submitted its response, it said, adding, technical evaluation and the price negotiations have been concluded and the order is expected shortly.

"However, as a proactive measure, HAL has launched production of LSPs in anticipation of orders at its Bengaluru facility," the statement said.

<https://timesofindia.indiatimes.com/india/hals-light-combat-helicopters-deployed-for-operations-at-leh/articleshow/77504488.cms>



Thu, 13 Aug 2020

India China Border: लद्दाख में वायुसेना की मारक क्षमता बढ़ाने को 2 एडवांस लाइट हेलीकाप्टर तैनात

भारतीय वायुसेना व सेना को ऐसे 160 एडवांस लाइट हेलीकाप्टरों की जरूरत है। पहले चरण में 15 एडवांस लाइट हेलीकाप्टर बनाए जा रहे हैं। इनमें से 10 भारतीय वायुसेना व 5 सेना के लिए होंगे।

जम्मू: पूर्वी लद्दाख में वास्तविक नियंत्रण रेखा पर चीन से तनाव के बीच ऑपरेशन के लिए भारतीय वायु सेना के बेड़े में दो एडवांस लाइट हेलीकाप्टर तैनात कर दिए गए हैं। दुश्मन के मंसूबाओं को नाकाम बनाने के लिए ये हेलीकाप्टर आधुनिक हथियारों से लैस हैं। हिन्दोस्तान एयरनोटिकल लिमिटेड द्वारा विश्व के सबसे हलके हेलीकाप्टर मौजूदा सुरक्षा परिदृश्य को देखते हुए अतिशीघ्र तैयार किए गए हैं। लद्दाख में इनकी तैनाती से भारतीय वायुसेना की मारक क्षमता में वृद्धि हुई है। इसे सशस्त्र सेना की जरूरतों व लद्दाख जैसे दुर्गम इलाकों के हालात को ध्यान में रखते हुए मोदी सरकार के आत्म निर्भर भारत मुहिम के तहत तैयार किया गया है।

सैन्य सूत्रों के अनुसार लद्दाख में इस एडवांस लाइट हेलीकाप्टर के आपरेशन में भारतीय वायुसेना के वाइस चीफ आफ एयर स्टाफ एयर मार्शल हरजीत सिंह अरोड़ा ने हिस्सा लिया। हिन्दोस्तान एयरनोटिकल लिमिटेड के टेस्ट पायलेट विंग कमांडर सुभाष पी जान ने उंचाई पर कड़ी ठंड में इस हेलीकाप्टर की मारक क्षमता का परिचय देने के लिए अग्रिम इलाके में उड़ान भी भरी है। इसके बाद इस हेलीकाप्टर ने चुनौतीपूर्ण हालात में लैंड करने का प्रदर्शन भी किया। प्रदर्शन के दौरान इन हेलीकाप्टरों ने अपनी ताकत दिखाई।

ये एडवांस लाइट हेलीकाप्टर लद्दाख में किसी भी प्रकार के हालात में दुश्मन पर सटीक वार करने में सक्षम हैं। ये हेलीकाप्टर दिन के साथ रात के समय भी पर्याप्त मात्रा में गोली बारूद लेकर उंचाई वाले इलाकों में उड़ान भर सकते हैं। इस हेलीकाप्टर में वे सभी खूबियां हैं तो इसे ठंड व गर्मी में हमला करने में कामयाब बनाएंगी। इन हेलीकाप्टरों से पहले लद्दाख में चिन्क हेलीकाप्टरों ने अपनी क्षमता का प्रदर्शन किया था।

भारतीय वायुसेना व सेना को ऐसे 160 एडवांस लाइट हेलीकाप्टरों की जरूरत है। पहले चरण में ऐसे 15 एडवांस लाइट हेलीकाप्टर बनाए जा रहे हैं। इनमें से 10 भारतीय वायुसेना व 5 सेना के लिए होंगे।

https://www.jagran.com/jammu-and-kashmir/jammu-indian-air-force-deploy-2-advanced-light-helicopter-in-ladakh-on-india-china-border-jagran-special-20619707.html?utm_expid=.W6HdjhiBO-ml0nTAajwl9g.0&utm_referrer=https%3A%2F%2Fwww.google.com%2F

HAL's share price jumps 4% after India approves defence projects worth \$1.2 billion

By Prabhjote Gill

- *The Indian government has pushed through a stack of defence projects to the tune of \$1.2 billion on August*
- *This comes after the Defence Acquisition Council (DAC) had already approved arms projects worth \$5.5 billion last month.*
- *The biggest beneficiary, Hindustan Aeronautics Limited (HAL), saw its share price jump by over 4% as markets opening today morning.*
- *The entire \$1.2 billion will be spent on the domestic industry with companies like Hindustan Aeronautics Limited (HAL) and Bharat Heavy Electricals Limited (BHEL) reaping the benefits.*

India is spending another ₹8.7 lakh crore (\$1.2 billion) on defence projects after having already having approved ₹38.9 lakh crore (\$5.5 billion) for arms projects last month.

Last time around the lion's share of the capital— around ₹31.1 lakh crore (\$4.44 billion) — was directed towards the domestic industry. This time the entire amount is going to local manufacturers like Hindustan Aeronautics Limited (HAL) and Bharat Heavy Electricals Limited (BHEL). HAL's share price saw a jump over 4% as markets opened today morning.

BHEL's share price on the other hand remained muted showing a marginal uptake of over 1%.

The projects approved by the Defence Acquisition Council (DAC) in its meeting today headed by India's Defence Minister Rajnath Singh include new aircraft, more firepower for the Indian Navy, as well as approvals that will speed the procurement and upgrades of unmanned aerial vehicles (UAVs).

The Indian Air Force (IAF) needs more eyes in the sky

In July, the DAC approved the proposal to procure 21 new MiG-29 aircraft along with upgrading the existing 59 already enlisted with the Air Force. It also sanctioned buying 12 new Sukhoi-20 MK I aircraft.

Pushing on the narrative of *Athmanibhar Bharat*, self-reliant India, the government has put an order for 106 of the newly developed Basic Trainer Aircraft from HAL.

Initially, 70 of these jets will be inducted to meet the IAF's training requirements once they receive the required certification. The remaining 36 will be picked up once the HTT-40 fleet — another trainer aircraft that HAL invested ₹550 crore to develop — is operational.

Increasing the Indian Navy's firepower

Other than, the primary beneficiary of the DAC's project approval is BHEL. The government has approved the procurement of an upgraded version of the Super Rapid Gun Mount (SRGM). It is the main fun onboard Navy and Indian Coast Guard warships.

According to the government, the upgraded version of the SRGM will increase the capabilities of the warships to manoeuvre against fast-moving targets like missiles. It will also enhance the engagement range of the guns.

The Indian Army won't be left out of the fray. It will be getting new 125 mm Armour Piercing Fin Stabilised Discarding Sabot (APFSDS) ammunition. 70% of the product will be made in India and the ammunition will be brought in under a 'design and development case'.

Other approvals are aimed at speeding up the procurement of Indo-Russian AK 203 guns and push through faster upgrades for UAVs.

<https://www.businessinsider.in/defense/news/india-approves-another-1-2-billion-for-defence-over-and-above-the-5-5-billion-last-month/articleshow/77487432.cms>



Thu, 13 Aug 2020

India-Russia to scale up military cooperation; To ink IGA later this week

Both sides are keen on developing military cooperation, as well as fighting counter terrorism bilaterally

By Huma Siddiqui

Ahead of the annual India-Russia summit later this year, several high level exchanges are scheduled between the officials of both sides. This year the annual summit scheduled for October will take place in India when Russian President Vladimir Putin will come accompanied by a high-level delegation. The focus of talks have been on the regional and international issues; also on enhancing the military cooperation as well as expediting the delivery of some platforms India has ordered.

According to the official spokesperson of the Ministry of External Affairs (MEA), Anurag Srivastava, “The foreign secretary Harsh Vardhan Shringla and the Deputy Russian foreign minister had a talk recently. The talks were related to the recent exchanges between the top leaders of the two countries.”

Prime Minister Narendra Modi and President Putin both had spoken on July 12. Modi had congratulated the Russian leader on his successful national vote on constitutional amendments in Russia.

As has been reported earlier, an Indian Military Contingent had gone to Moscow to participate in the 75th anniversary of the victory in the 2nd world war and the defence minister Rajnath Singh had also gone there in the last week of June.

“Yesterday when foreign secretary (Harsh Vardhan Shringla) and the (Russian) deputy foreign minister spoke, they took stock of all these recent exchanges and the idea is to keep the momentum of these regular exchanges going on because due to the COVID situation, we have not been able to have visits,” he said.

More meetings coming up

Besides the India-Russia Annual Summit later this year, there will be other two major meetings including the SCO and the BRICS and the NSAs’ meetings. Also, the defence ministers of the two countries are expected to meet soon. The dates have not been firmed up.

Due to the global lockdown because of COVID-19 pandemic, both the SCO and BRICS Foreign Ministers meetings had to be postponed. No date has been decided for the meetings to happen.

India-Russia Military Co-operation

Both India and Russia are keen to further intensify their military relations by implementing contracts worth almost \$ 15 billion, and also ink an Inter-Governmental Agreement under which the two sides are expected to go in for development and production of military platforms, spare parts as well, jointly.



Prime Minister Narendra Modi and President Putin both had spoken on July 12.

Both sides are keen on developing military cooperation, as well as fighting counter terrorism bilaterally.

As has announced last year after the annual summit, both countries have extended the agreement for mutual military and technical cooperation. This has been extended by almost 10 years and will now expire in 2030.

Almost 60 per cent of the platforms and weapons the Indian armed forces is using is from Russia. And the two countries decided to ensure there is no delay in the spare parts and there are plans to make them in India with the help of Russia.

What is India getting from Russia?

The two sides have a contract in place for the S-400 Triumf 'SA-21 Growler' long-range surface-to-air missile (SAM) systems. Under the deal which is worth approximately \$5.43 billion, Russia will supply five Triumf regimental kits to India for the Indian Air Force (IAF).

Also, there is the upgraded Mikoyan-Gurevich MiG-29UPG 'Fulcrum-E' fighter aircraft for various programmes.

There is joint venture between the two sides to manufacture Kamov Ka-226T 'Hoodlum' light utility helicopters. And once it takes off around 140 helicopters are expected to be produced locally. And they will be the main light utility helicopters for the Indian Armed Forces.

Also, the Indian Navy will be receiving four Project 11356 Grigorovich-class frigates. Two out of the four are under construction at the Yantar Shipyard (a subsidiary of the United Shipbuilding Corporation). And as per the contract two will be constructed at the Goa Shipyard Limited, India.

BrahMos Aerospace is already delivering ground- and sea-launched cruise missiles to both the Indian Army and the Navy. The joint venture with has already successfully developed and tested the air-launched variant of the weapon.

Almost 1,000 of T-90S Bhishma Main Battle Tanks, which have been made in India with the Russian Transfer of Technology are being used by the Indian Army. The production of the 3VBM42 Mango 125 mm armour-piercing fin-stabilized discarding sabot (APFSDS) rounds to be used is going on under license.

Both countries are in talks for the anti-tank capabilities to protect the troops.

The Konkurs-M 'AT-5b Spandrel' anti-tank guided missiles (ATGMs), is being produced under license by Bharat Dynamics Limited (BDL).

Joint Venture to manufacture AK-203 7.62 mm Assault Rifles for the Indian Armed Forces.

Under this venture Kalashnikov AK-203 7.62 mm Assault Rifles 200 series will be manufactured which will fulfil Indian security agencies' requirement for small arms.

Highly placed sources have confirmed to Financial Express Online "Later this week, there is an Inter Governmental agreement between the two countries related to the manufacturing of the world famous Kalashnikov assault rifles of the newest 200 series. There were issues related to the pricing of these rifles and the full local production. Those issues have been resolved and most liked there is a certain number of assault rifles which will come from Russia. And the balance will be produced here."

"There is an IGA in place already, but there were some issues, that have now been sorted out," said the source quoted above.

<https://www.financialexpress.com/defence/india-russia-to-scale-up-military-cooperation-to-ink-iga-later-this-week/2053043/>

Business Standard

Thu, 13 Aug 2020

Skyroot Aerospace first private company to test upper stage rocket engine

*The company till now has raised Rs 31.5 crore and is
in process of raising another Rs 90 crore this year*

By TE Narasimhan

Chennai: Spacetechnology startup Skyroot Aerospace has successfully test fired an upper stage rocket engine, becoming the first Indian private company to demonstrate the capability to build a homegrown rocket engine.

Meanwhile, the company is planning to raise around Rs 90 crore.

Founded by Pawan Kumar Chandana and Naga Bharath Daka, both former scientists at the Indian Space Research Organisation (Isro), Skyroot plans to build a family of rockets.

The first rocket, which can hurl satellites of 250-700 kgs into a lower earth orbit, is expected to be launched by end-2021. This is a major milestone for us in a path towards our first launch targeted for December 2021, said Daka, Co-Founder & COO, Skyroot Aerospace.

Chandana added two of the company's rocket stages are getting ready for test firing in the six months. The company manufactured India's first 3D printed Cryogenic rocket engine which will run on high performance Cryogenic propellants Liquid Natural Gas (LNG) & Liquid Oxygen.

The company demonstrated India's first 100 per cent 3D-printed Bi-Propellant Liquid Rocket Engine injector. Compared to traditional manufacturing this reduced the overall mass by 50 per cent, reduced total number of components and lead time by 80 per cent. The engine is capable of multiple restarts enabling them to insert various satellites into multiple orbits in a single mission.

"We have completed multiple test firings to qualify our solid propellant formulation. We have developed in house software for launch vehicle guidance, navigation and control functions and testing for onboard avionics modules is in progress. We are targeting our first launch in December 2021," said Daka.

The first launch vehicle 'Vikram-I' which is under manufacturing and targeting launch in December 2021, hosts an Orbit Adjustment Module (OAM) at the top which gives the final burn and inserts multiple satellites into space.

The union cabinet recently approved private player participation in space in June 2020 to transform the sector.

"We will highly benefit from it and we now get access to ISRO's testing and launch range facilities. We are already in active discussions with ISRO for testing activities," says Chandana. He and his team has rocket engineers with a cumulative experience of 300 plus years in the rocket industry and the company has been actively developing its Vikram series of launch vehicles for the past two years.



Founded by Pawan Kumar Chandana and Naga Bharath Daka, both former scientists at Isro, Skyroot plans to build a family of rockets.

The company till now has raised Rs 31.5 crore and is in process of raising another Rs 90 crore in the year.

The existing investors include Mukesh Bansal (Founder Myntra, CureFit), Solar Industries (India's leading explosives manufacturer and renowned Space & Defence Contactor), Vedanshu investments and a few other Angel investors.

https://www.business-standard.com/article/companies/skyroot-aerospace-first-private-company-to-test-upper-stage-rocket-engine-120081200445_1.html



Thu, 13 Aug 2020

Efficient valves for electron spins

Researchers at the University of Basel in collaboration with colleagues from Pisa have developed a new concept that uses electron spin to switch an electrical current. In addition to fundamental research, such spin valves are also the key elements in spintronics—a type of electronics that exploits the spin instead of the charge of electrons. The results were published in the scientific journal *Communications Physics*.

At some point, spintronics might become a buzzword that is as much a part of our vocabulary as electronics. The idea behind it is to use the angular momentum (spin) of an electron instead of the electrical charge. Researchers around the world have been pursuing this goal for many years. Spintronics promises numerous applications in information storage and processing, and could improve the energy efficiency of electronic devices. An important prerequisite is the efficient control and detection of electron spins.

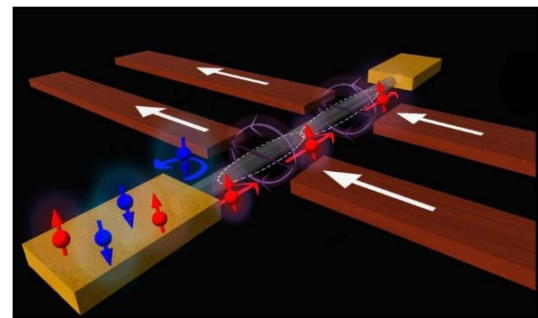
A team of physicists around Professor Christian Schönenberger and Dr. Andreas Baumgartner from the Swiss Nanoscience Institute and the Department of Physics at the University of Basel has now developed a new technique for spintronics in semiconductor devices. Researchers from the Istituto Nanoscienze-CNR in Pisa were also involved.

Nanomagnets are the key

For this purpose, the scientists form two small semiconductor islands (quantum dots) behind each other on a nanowire and generate magnetic fields in the quantum dots using nanomagnets. Using an external field, they are able to control these magnets individually and thus can determine whether a quantum dot allows electrons to pass with a spin directed upward (up) or downward (down). When two quantum dots are connected in series, a current only flows if both are set to 'up' or both to 'down.' Ideally, no current flows if they are oriented in opposite directions.

Arunav Bordoloi, first author of the publication and Ph.D. student in the Schönenberger team, found that this method produced a spin polarization close to the theoretical maximum. "With this technique, we can choose whether a single electron in a given spin state is allowed to enter or leave a quantum system with an efficiency far greater than in conventional spin valves," he says.

"In recent years, researchers around the world found it a hard nut to crack to fabricate spin valves useful for nano- and quantum-electronic devices," says Dr. Andreas Baumgartner, who is supervising the project. "We have now succeeded in producing one."



Both quantum dots (dashed ellipses) on the nanowire are tuned by nanomagnets (brown bars) such that they only allow electrons with an 'up' spin to pass. If the orientation of one of the magnets is changed, the current flow is suppressed. Credit: University of Basel, Department of Physics

Exploring new phenomena

The physicists were also able to show that the magnetic fields are localized to specific locations on the nanowire. "This technique should therefore allow us to study the spin properties of new phenomena typically too sensitive to magnetic fields, such as novel states at the ends of special superconductors," comments Dr. Baumgartner.

This new approach to spintronics should now enable direct measurements of spin correlations and spin entanglement and shed new light on many old and new physical phenomena. In the future, the concept could even prove useful in the quest to use electron spins as the smallest information unit (quantum bit) in a quantum computer.

More information: Arunav Bordoloi et al, A double quantum dot spin valve, *Communications Physics* (2020). DOI: [10.1038/s42005-020-00405-2](https://doi.org/10.1038/s42005-020-00405-2)

Journal information: [Communications Physics](https://phys.org/news/2020-08-efficient-valves-electron.html)
<https://phys.org/news/2020-08-efficient-valves-electron.html>



Thu, 13 Aug 2020

New advance in superconductors with 'twist' in rhombohedral graphite

An international research team led by The University of Manchester has revealed a nanomaterial that mirrors the "magic angle" effect originally found in a complex man-made structure known as twisted bilayer graphene—a key area of study in physics in recent years.

The new research shows that the special topology of rhombohedral graphite effectively provides an inbuilt "twist" and therefore offers an alternative medium to study potentially game-changing effects like superconductivity. "It is an interesting alternative to highly popular studies of magic-angle graphene" said graphene pioneer Professor Sir Andre Geim, a co-author of the study.

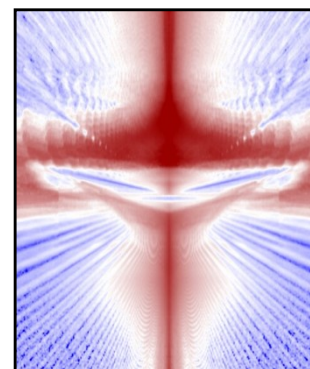
The team, led by Artem Mishchenko, Professor of Condensed Matter Physics at The University of Manchester published its findings in the journal *Nature* on 12 August 2020.

"Rhombohedral graphite can help to better understand materials in which strong electronic correlations are important—such as heavy-fermion compounds and high-temperature superconductors", said Professor Mishchenko.

A previous step-forward in two-dimensional materials research was the curious behavior that stacking one sheet of graphene atop one another and twisting it to a 'magic angle' changed the bilayer's properties, turning it into a superconductor.

Professor Mishchenko and his colleagues have now observed the emergence of strong electron-electron interactions in a weakly stable rhombohedral form of graphite—the form in which graphene layers stack slightly differently compared to stable hexagonal form.

Interactions in twisted bilayer graphene are exceptionally sensitive to the twist angle. Tiny deviations of about 0.1 degree from the exact magic angle strongly suppress interactions. It is extremely difficult to make devices with the required accuracy and, especially, find sufficiently uniform ones to study the exciting physics involved. The newly published findings on rhombohedral graphite has now opened an alternative route to accurately making superconductor devices.



Electronic phase separation in multilayer rhombohedral graphite. Credit: The University of Manchester

Graphite, a carbon material made up of stacked graphene layers, has two stable forms: hexagonal and rhombohedral. The former is more stable, and has thus been extensively studied, while the latter is less so.

To better understand the new result, it is important to remember that the graphene layers are stacked in different ways in these two forms of graphite. Hexagonal graphite (the form of carbon found in pencil lead) is composed of graphene layers orderly stacked on top of each other. The metastable rhombohedral form has a slightly different stacking order, and this slight difference leads to a drastic change in its electronic spectrum.

Previous theoretical studies have pointed to the existence of all kinds of many-body physics in the surface states of rhombohedral graphite—including high-temperature magnetic ordering and superconductivity. These predictions could not be verified, however, since electron transport measurements on the material were completely lacking until now.

The Manchester team has been studying hexagonal graphite films for several years and have developed advanced technologies to produce high-quality samples. One of their techniques involves encapsulating the films with an atomically-flat insulator, hexagonal boron nitride (hBN), which serves to preserve the high electronic quality in the resulting hBN/hexagonal graphite/hBN heterostructures. In their new experiments on rhombohedral graphite, the researchers modified their technology to preserve the fragile stacking order of this less stable form of graphite.

The researchers imaged their samples, which contained up to 50 layers of graphene, using Raman spectroscopy to confirm that the stacking order in the material remained intact and that it was of high quality. They then measured electronic transport properties of their samples in the traditional way—by recording the resistance of the material as they changed the temperature and the strength of a magnetic field applied to it.

The energy gap can also be opened in the surface states of rhombohedral graphite by applying an electric field explains Professor Mishchenko: "The surface-state gap opening, which was predicted theoretically, is also an independent confirmation of the rhombohedral nature of the samples, since such a phenomenon is forbidden in hexagonal graphite."

In rhombohedral graphite thinner than 4nm, a band gap is present even without applying an external electric field. The researchers say they are as yet unsure of the exact nature of this spontaneous gap opening (which occurs at the "charge neutrality"- the point at which densities of electrons and holes are balanced), but they are busy working on answering this question.

"From our experiments in the quantum Hall regime, we see that the gap is of a quantum spin Hall nature, but we do not know whether the spontaneous gap opening at the charge neutrality is of the same origin," adds Professor Mishchenko. "In our case, this gap opening was accompanied by hysteretic behavior of the material's resistance as a function of applied electric or magnetic fields. This hysteresis (in which the resistance change lags behind the applied fields) implies that there are different electronic gapped phases separated into domains—and these are typical of strongly correlated materials."

Further investigation of rhombohedral graphite could shed more light on the origin of many-body phenomena in strongly correlated materials such as heavy-fermion compounds and high-temperature superconductors, to name but two examples.

More information: Yanmeng Shi et al. Electronic phase separation in multilayer rhombohedral graphite, *Nature* (2020). DOI: [10.1038/s41586-020-2568-2](https://doi.org/10.1038/s41586-020-2568-2)

Journal information: *Nature*
<https://phys.org/news/2020-08-advance-superconductors-rhombohedral-graphite.html>

Glass blowing inspires new class of quantum sensors

When Adelaide glass blower Karen Cunningham made art using diamond and glass she had no idea it would inspire a new kind of hybrid material. Now a consortium of scientists, including from RMIT University and University of Adelaide, is using the technology to make a new class of quantum sensors.

The study published in *APL Materials* reveals how high-performance diamond sensors can be made using conventional glass fibers.

By embedding micron-scale diamond particles within the cross section of a silicate glass fiber, the team has demonstrated the use of a robust fiber material capable of sensing magnetic fields.

Study lead author and RMIT School of Science's Dr. Dongbi Bai said it was an exciting achievement that opened the door to many applications in underwater monitoring, mining and beyond.

"This allows us to make cheap quantum sensor networks that are able to monitor changes in magnetic field, with many useful applications and the answers to questions we haven't thought of yet," she said.

Diamond is one of the front runner technologies for quantum magnetic field sensing, with applications as diverse as brain scanning, navigation and mineral exploration.

But, diamond particles need to be viewed through high-end microscopes that aren't suited for use over an extended period or in the field.

University of Adelaide Deputy Director of the Institute for Photonics and Advanced Sensing, Heike Ebendorff-Heidepriem, said the team had been working to get around this issue for a decade.

"But because diamond burns at high temperatures, we've been limited in the glasses that we can use," she added.

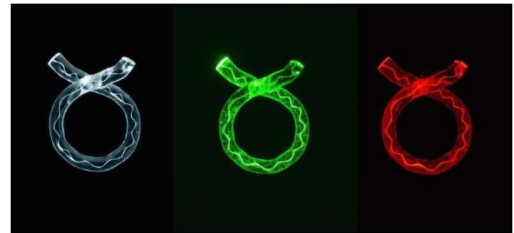
The team has learnt a lot from these so-called 'soft glasses,' but these glasses are non-standard and not as good at guiding light as conventional silica fibers, such as those used in the National Broadband Network.

From art to science

This is where glass artist Karen Cunningham comes into the picture. She was making art using nanoparticles to show how light moves through glass and was fascinated by the diamonds that were used by Heike and her colleagues in her research.

"We gave Karen some of our larger diamonds to see how they worked," RMIT School of Science's Professor Brant Gibson, explained.

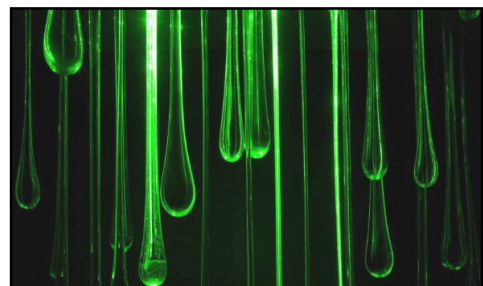
The diamonds he gave Karen were around one micron in diameter, which is 50 times smaller than the width of a human hair.



Three glass rings by artist Karen Cunningham. The colored light reveals the internal line of the diamond used in the artwork. Credit: Michael Haines Photography



Optic vessels made of glass and diamond by artist Karen Cunningham. Credit: Michael Haines Photography



Green drips made of glass and diamond by artist Karen Cunningham. Credit: Michael Haines Photography

"For most of our work, these diamonds are just too big, so we use them mainly for testing," he said.

Incredibly, the diamonds survived Karen's glass blowing, and were part of her exhibition at JamFactory in Adelaide, in 2017.

"For us, it was the lightbulb moment and we knew we could make diamond sensors in more conventional glass fibers," Heike said.

To go from Karen's art to prototype sensors took another three years of testing and fabrication, explained Dr. Dongbi Bai.

"It always takes hard work to go from the idea to the product, but I'm so excited by what we've achieved, and even more excited by where this new quantum sensor can take us," she said.

More information: D. Bai et al, Fluorescent diamond microparticle doped glass fiber for magnetic field sensing, *APL Materials* (2020). DOI: [10.1063/5.0013473](https://doi.org/10.1063/5.0013473)
<https://phys.org/news/2020-08-glass-class-quantum-sensors.html>



Thu, 13 Aug 2020

Quantum materials quest could benefit from graphene that buckles

By Todd Bates

Graphene, an extremely thin two-dimensional layer of the graphite used in pencils, buckles when cooled while attached to a flat surface, resulting in beautiful pucker patterns that could benefit the search for novel quantum materials and superconductors, according to Rutgers-led research in the journal *Nature*.

Quantum materials host strongly interacting electrons with special properties, such as entangled trajectories, that could provide building blocks for super-fast quantum computers. They also can become superconductors that could slash energy consumption by making power transmission and electronic devices more efficient.



Simulated mountain and valley landscape created by buckling in graphene. The bright linked dots are electrons that have slowed down and interact strongly. Credit: Yuhang Jiang

"The buckling we discovered in graphene mimics the effect of colossally large magnetic fields that are unattainable with today's magnet technologies, leading to dramatic changes in the material's electronic properties," said lead author Eva Y. Andrei, Board of Governors professor in the Department of Physics and Astronomy in the School of Arts and Sciences at Rutgers University-New Brunswick. "Buckling of stiff thin films like graphene laminated on flexible materials is gaining ground as a platform for stretchable electronics with many important applications, including eye-like digital cameras, energy harvesting, skin sensors, health monitoring devices like tiny robots and intelligent surgical gloves. Our discovery opens the way to the development of devices for controlling nano-robots that may one day play a role in biological diagnostics and tissue repair."

The scientists studied buckled graphene crystals whose properties change radically when they're cooled, creating essentially new materials with electrons that slow down, become aware of each other and interact strongly, enabling the emergence of fascinating phenomena such as superconductivity and magnetism, according to Andrei.

Using high-tech imaging and computer simulations, the scientists showed that graphene placed on a flat surface made of niobium diselenide, buckles when cooled to 4 degrees above absolute zero. To the electrons in graphene, the mountain and valley landscape created by the buckling

appears as gigantic magnetic fields. These pseudo-magnetic fields are an electronic illusion, but they act as real magnetic fields, according to Andrei.

"Our research demonstrates that buckling in 2-D materials can dramatically alter their electronic properties," she said.

The next steps include developing ways to engineer buckled 2-D materials with novel electronic and mechanical properties that could be beneficial in nano-robotics and quantum computing, according to Andrei.

The first author is Jinhai Mao, formerly a research associate in the Department of Physics and Astronomy and now a researcher at the University of Chinese Academy of Sciences.

More information: Evidence of flat bands and correlated states in buckled graphene superlattices, *Nature* (2020). DOI: [10.1038/s41586-020-2567-3](https://doi.org/10.1038/s41586-020-2567-3) , www.nature.com/articles/s41586-020-2567-3

Journal information: *Nature*
<https://phys.org/news/2020-08-quantum-materials-quest-benefit-graphene.html>



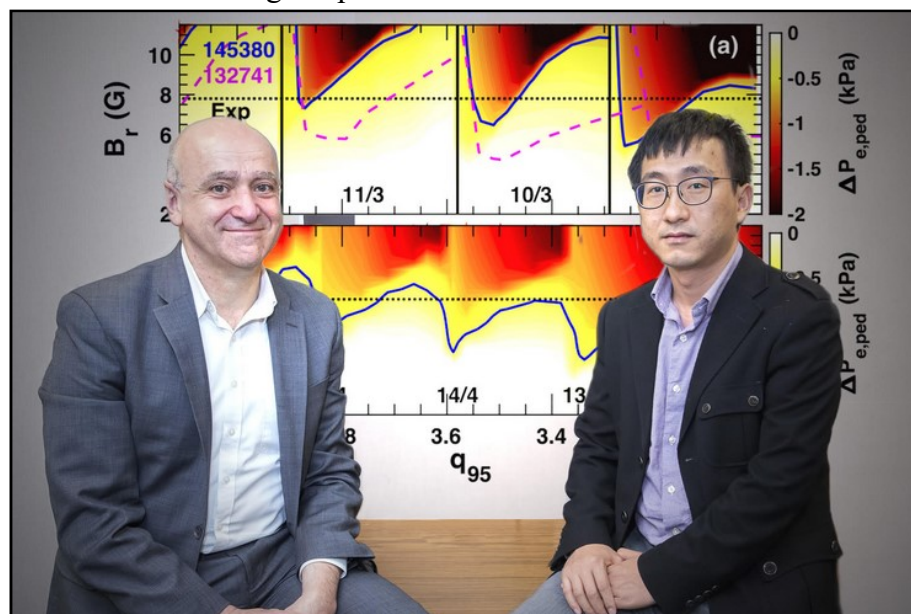
Thu, 13 Aug 2020

Scientists propose method for eliminating damaging heat bursts in fusion device

By John Greenwald

Picture an airplane that can only climb to one or two altitudes after taking off. That limitation would be similar to the plight facing scientists who seek to avoid instabilities that restrict the path to clean, safe and abundant fusion energy in doughnut-shaped tokamak facilities. Researchers at the U.S. Department of Energy's (DOE) Princeton Plasma Physics Laboratory (PPPL) and General Atomics (GA) have now published a breakthrough explanation of this tokamak restriction and how it may be overcome.

Toroidal, or doughnut-shaped, tokamaks are prone to intense bursts of heat and particles, called edge localized modes (ELMs). These ELMs can damage the reactor walls and must be controlled to develop reliable fusion power. Fortunately, scientists have learned to tame these ELMs by applying spiraling rippled magnetic fields to the surface of the plasma that fuels fusion reactions. However, the taming of ELMs requires very specific conditions that limit the operational flexibility of tokamak reactors.



Physicists Raffi Nazikian and Qiming Hu with figure from research behind them. Credit: Elle Starkman/PPPL Office of Communications

ELM suppression

Now, researchers at PPPL and GA have developed a model that, for the first time, accurately reproduces the conditions for ELM suppression in the DIII-D National Fusion Facility that GA operates for DOE. The model predicts the conditions under which ELM suppression should extend over a wider range of operating conditions in the tokamak than previously thought possible. The work presents important predictions for how to optimize the effectiveness of ELM suppression in ITER, the massive international fusion device under construction in the south of France to demonstrate the feasibility of fusion power.

Fusion, the power that drives the sun and stars, combines light elements in the form of plasma—the hot, charged state of matter composed of free electrons and atomic nuclei that makes up 99 percent of the visible universe—to generate massive amounts of energy. Tokamaks are the most widely used devices by scientists seeking to replicate fusion as a renewable, carbon-free source of virtually limitless energy for generating electricity.

PPPL physicists Qiming Hu and Raffi Nazikian are the lead authors of a paper describing the model in *Physical Review Letters*. They note that under normal conditions the rippled magnetic field can only suppress ELMs for very precise values of the plasma current that produces the magnetic fields that confine the plasma. This creates a problem because tokamak reactors must operate over a wide range of plasma current to explore and optimize the conditions required to generate fusion power.

Modifying magnetic ripples

The authors show how, by modifying the structure of the helical magnetic ripples applied to the plasma, ELMs should be eliminated over a wider range of plasma current with improved generation of fusion power. Hu said he believes the findings could provide ITER with the wide operational flexibility it will need to demonstrate the practicality of fusion energy. "This model could have significant implications for suppressing ELMs in ITER," he said.

Indeed, "What we have done is to accurately predict when we can achieve ELM suppression over wider ranges of the plasma current," said Nazikian, who oversees PPPL research on tokamaks. "By trying to understand some strange results we saw on DIII-D, we figured out the key physics that controls the range of ELM suppression that can be achieved using these helically rippled magnetic fields. We then went back and figured out a method that could produce wider operational windows of ELM suppression more routinely in DIII-D and ITER."

Enhanced tokamak operation

The findings open the door to enhanced tokamak operation. "This work describes a path to expand the operational space for controlling edge instability in tokamaks by modifying the structure of the ripples," said Carlos Paz-Soldan, a GA scientist and a co-author of the paper. "We look forward to testing these predictions with our upgraded field coils that are planned for DIII-D in a few years' time."

Returning to the aircraft analogy, "If you could fly at only one or two different altitudes, travel would be very limited," said PPPL physicist Brian Grierson, a co-author of the paper. "Fixing the restriction would enable the plane to fly over a wide range of altitudes in order to optimize its flight path and fulfill its mission." In the same way, the present paper lays out an approach that is predicted to expand the capabilities of fusion reactors to operate free from ELMs that can damage the facilities and hinder the development of tokamaks for fusion energy.

More information: Q. M. Hu et al, Wide Operational Windows of Edge-Localized Mode Suppression by Resonant Magnetic Perturbations in the DIII-D Tokamak, *Physical Review Letters* (2020). DOI: [10.1103/PhysRevLett.125.045001](https://doi.org/10.1103/PhysRevLett.125.045001)

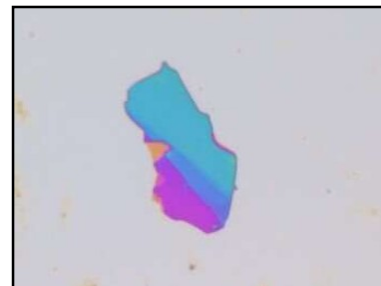
Journal information: *Physical Review Letters*
<https://phys.org/news/2020-08-scientists-method-fusion-device.html>

Why nanomaterial quality matters, and the smart new way to check it

By Anna Ford

A new way to check the quality of nanomaterials like graphene has emerged from a team at the University of Sussex.

Graphene and nanomaterials have been touted as wonder materials, and they are proving invaluable in all sorts of applications, such as in the automotive and aerospace industries, where heavy metals are replaced with lighter but equally strong composite materials. Nanomaterial quality therefore matters a great deal, but standardization and quality checking have eluded the industry.



Optical microscope image of stacked graphene layers. Credit: Dr Matt Large

The Sussex team have developed a technique that gives detailed information about the size and thickness of graphene particles. It uses a non-destructive, laser-based method for looking at the particles as a whole, and lets them quickly build a detailed picture of the distribution of particles in a given material. Their paper, "Raman Metrics for Molybdenum Disulfide and Graphene Enable Statistical Mapping of Nanosheet Populations," is published in the journal *Chemistry of Materials*.

Dr. Matt Large, who led the discovery in the School of Mathematical and Physical Sciences at the University of Sussex, said:

"Standards for measurement are a really critical underpinning of modern economies. It really comes down to one simple question; how do you know you got what you paid for? At the moment the graphene industry is a bit of a wild frontier; it's very difficult to compare different products because there is no agreed way of measuring them. That's where studies like ours come in. It's really an important issue for any business looking to reap the benefits of graphene (or any other nanomaterial, for that matter) in their products. Often using the wrong material can either have no benefit at all, or even make product performance worse. A particular example would be composite materials like graphene-reinforced plastics; if a poor-quality graphene material is used it can cause parts to fail instead of providing the improved strength expected. This can be a big issue for industries such as automotive and aerospace, where there is enormous effort behind replacing heavier metal parts with lighter composite materials (like carbon fiber) that are just as strong. If graphene and other nanomaterials are to play a role in reducing weight and cost then agreed standards are really important."

Aline Amorim Graf is a co-author of the paper in the team at the School of Mathematical and Physical Sciences at the University of Sussex. She said:

"Some manufacturers say they produce graphene but actually—no doubt inadvertently—produce a form of graphite. Some will charge up to £500 per gram. The trouble is there's no standardization. What we've done is to create a new way to measure the quality of nanomaterials like graphene. We use a Raman spectrometer to do this, and have created an algorithm to automate the process. In this way, we can determine the quality, size and thickness of the sample. Clearly the quality of graphene really matters. If you're using graphene to strengthen structures, to use in health monitors, to use in supermarket tags, you want to know you're getting the real stuff. But actually purchasers of graphene have no clue as to the quality of what they're buying online. If you're using graphene to strengthen cement, and it turns out it's actually not graphene or is low quality graphene, then that's going to matter."

Professor Alan Dalton, co-Director of the Sussex Program for Quantum Research and co-author of the paper, said:

"This is truly an important area of research for our team. We believe that our new metric will be of great help to industry, researchers and standards bodies alike who are key-stakeholders in the development of 2-D materials towards commercialisation."

The Graphene Council has long called for better standardization. Terrance Barkan of the Graphene Council has written:

"The lack of an agreed global standard for graphene and closely related materials creates a vacuum and lack of trust in the marketplace for industrial scale adoption of graphene materials."

The Sussex team continue their research and are open to checking the quality of graphene on a consultative basis.

More information: Aline Amorim Graf et al. Raman Metrics for Molybdenum Disulfide and Graphene Enable Statistical Mapping of Nanosheet Populations, *Chemistry of Materials* (2020). DOI: [10.1021/acs.chemmater.0c02109](https://doi.org/10.1021/acs.chemmater.0c02109)

Journal information: [Chemistry of Materials](https://chemrxiv.org/chemrxiv/2020-08-nanomaterial-quality-smart.html)
<https://phys.org/news/2020-08-nanomaterial-quality-smart.html>

COVID-19 Research News

SingularityHub

Thu, 13 Aug 2020

An Indian company is gearing up to make millions of doses of a \$3 covid-19 vaccine

By Vanessa Ramirez

As the Covid-19 pandemic drags on, there's one thing we're all counting on to rescue us from the drudgery of socially-distanced life: a vaccine.

How many times have you heard "X won't happen again until there's a vaccine"? Concerts, conferences, festivals, sporting events, weddings, and anything else that entails a lot of people being in one place has been put on hold indefinitely—and we miss it. All of it.

But as much as we're counting on a vaccine to put an end to this nightmare, the reality is that even once a fateful scientist, company, or lab does find a vaccine, the story doesn't end there; the next steps are manufacturing the vaccine at scale, ensuring equitable distribution both between and within countries, and making sure everyone who needs vaccination—billions of people around the world—can access and afford it. We've never been faced with a challenge like this, and the way it plays out will speak to our collective compassion and humanity.

An Indian company is getting a jump-start on manufacturing low-cost vaccines. With funding from the Bill & Melinda Gates Foundation, the Serum Institute of India plans to crank out 100 million doses of Oxford University's coronavirus vaccine for poor countries at a cost of \$3 or less per dose. In a separate deal with multinational pharma giant AstraZeneca, which licensed Oxford's vaccine in late April, the Serum Institute also agreed to produce a billion doses for low- and middle-income countries.

The Serum Institute

The Serum Institute of India isn't widely known, but as Bill Gates points out in this video from 2012, the company plays a crucial role in global health. As the world's biggest manufacturer of

vaccines by volume (not by revenue—that title goes to British GlaxoSmithKline), Serum makes vaccines for dozens of diseases, including measles, mumps, diphtheria, tetanus, and hepatitis-b, among others. According to the company’s website, 65 percent of children in the world receive at least one of its vaccines, and they’re used in over 170 different countries.

Serum was founded in 1966 and is privately owned, which gives it the freedom to make quick, risky decisions that publicly-traded pharma companies can’t; *Bloomberg* says the company “may be the world’s best hope for producing enough vaccine to end the pandemic.”

The Oxford Vaccine

As detailed in a paper published in *The Lancet* on July 20, a vaccine developed by researchers at Oxford University showed highly encouraging results in phase 1 and 2 clinical trials. Of 1,077 people that took part in the trials, 90 percent developed antibodies that neutralized Covid-19 after just one vaccine dose.

Its unwieldy name, “ChAdOx1 nCoV-19,” is a mashup of its various attributes: it’s a *chimpanzee* (Ch) *adenovirus-vectored vaccine* (Ad) developed at *Oxford* (Ox). Unlike American company Moderna’s vaccine, which prompts an immune response using Covid-19 messenger RNA, the Oxford vaccine is made from a virus genetically engineered to resemble coronavirus. Scientists used a virus that causes the common cold in chimpanzees, and added the spike protein that Covid-19 uses to break into human cells. The resulting virus doesn’t actually cause people to get infected, but it prompts the immune system to launch a defense against it and block it from continuing to invade cells.

The vaccine’s only side effects were headaches and a mild fever. More extensive trials are now being launched in the US (this will be the biggest with 30,000 people), UK, South Africa, and Brazil. The vaccine may be used in controversial human challenge trials as well—this is when vaccinated people are infected with the virus to see whether the vaccine can effectively neutralize it.

Risky Business, Onward

The Serum Institute is taking a pretty big risk by forging ahead with these plans, even outside of the fact that the Oxford vaccine hasn’t yet passed Phase 3 clinical trials. If the vaccine falls through for any reason, Serum stands to lose up to \$200 million.

Even once a vaccine (this one or any other) is determined safe, cranked out at lightning speed, and distributed, there’s no guarantee it will eradicate Covid-19. The virus could mutate and develop a new strain. The ultra-accelerated timeline under which vaccines are being developed could leave us with one that’s not truly safe and time-tested. Production constraints and supply hoarding could complicate manufacturing. And according to one study, 50 percent of Americans and more than a quarter of people in France say they don’t even want to be vaccinated.

As Carolyn Johnson wrote in the *Washington Post*, “The declaration that a vaccine has been shown safe and effective will be a beginning, not the end. Deploying the vaccine to people in the United States and around the world will test and strain distribution networks, the supply chain, public trust and global cooperation. It will take months or, more likely, years to reach enough people to make the world safe.”

Despite these caveats, though, a vaccine is still a finish line we must race towards, and the only logical next step short of letting the virus rage in an attempt to achieve herd immunity. So, fraught as it may be when (or if) it arrives, we’ll keep waiting, hoping, and looking forward to all the things we’re going to do again once there’s a vaccine.

<https://singularityhub.com/2020/08/12/an-indian-company-is-gearing-up-to-make-millions-of-doses-of-a-3-covid-19-vaccine/>

Amid arrival of Sputnik V, expert panel asks states not to procure COVID-19 vaccine separately

The message from the panel comes as some states have shown enthusiasm, said sources, in tying up with Russia which on Tuesday registered the world's first vaccine against the infectious disease

By Sumi Sukanya Dutta

New Delhi: An expert group on COVID-19 vaccine administration, which formally met for the first time on Wednesday, has asked states not to separately procure vaccines, clarifying that all such procurement will only be done centrally.

The message from the panel comes as some states have shown enthusiasm, said sources, in tying up with Russia which on Tuesday registered the world's first vaccine against the infectious disease, even as there is scanty data on its quality, safety and efficacy.

The Centre has formed the vaccine committee under Dr V K Paul, member (health) Niti Aayog and Union health secretary Rajesh Bhushan.

A senior member of the committee, who did not wish to be named, told *The New Indian Express* that there was no question of procuring Sputnik V for India as it has not even completed phase 3 clinical trials and has not released full details of its early human trials.

The official also said that there must be some amount of "realism" while addressing the issue of a COVID-19 vaccine.

"Even the WHO points out that the earliest time horizon we're looking at is January next year for any vaccine to pass our safety and efficacy parameters," he said.

The expert group, meanwhile, deliberated on conceptualization and implementation mechanisms for creation of a digital infrastructure for inventory management and delivery mechanism of the vaccine including tracking of vaccination process with particular focus on last mile delivery.

The panel also discussed the broad parameters guiding the selection of COVID-19 vaccine candidates for the country and sought inputs from the standing technical sub-committee of the National Technical Advisory Group on Immunization.

The issues related to procurement mechanisms for the vaccine, including both indigenous and international manufacturing along with guiding principles for prioritization of population groups for vaccination, were also discussed in the meeting.

"The expert group discussed the financial resources required for procurement of a COVID-19 vaccine and various options of financing the same," said the government in a statement.

"Available options in terms of delivery platforms, cold chain and associated infrastructure for rollout of COVID-19 vaccination were also taken up."

Further, strategy and follow-up action on all possible scenarios to ensure equitable and transparent delivery of vaccine was deliberated upon, Issues related to vaccine safety and surveillance were taken up and strategies for community involvement through transparent information and awareness creation were discussed.

India is also looking to support its key neighbours and development partner countries for COVID-19 vaccines and has made it clear that it will leverage domestic vaccine manufacturing



Vaccine against the coronavirus disease, developed by Russia's Gamaleya Research Institute of Epidemiology and Microbiology. (Photo | AFP)

capacity and will also engage with all international players for early delivery of vaccines also in other low- and middle-income countries.

As of now there are three vaccines—two of them homegrown—in different stages of human trials in the country.

<https://www.newindianexpress.com/nation/2020/aug/12/amid-arrival-of-sputnik-v-expert-panel-asks-states-not-to-procure-covid-19-vaccine-separately-2182539.html>



Thu, 13 Aug 2020

Who will get covid-19 vaccine in India first? Committee meets today

Edited By Surajit Dasgupta

- ***The group delved on the procurement mechanisms for COVID-19 vaccine, including both indigenous and international manufacturing***

The national expert group on covid vaccine administration met for the first time today. From selection to procurement of covid vaccine, the committee deliberated on principles for prioritisation of population groups for vaccination. The meeting was chaired by Dr V K Paul, Member Niti Aayog, along with Secretary (Ministry of Health and Family Welfare) as co-Chair.

Three vaccine candidates are in different stages of human clinical trials in India. Pune-based Serum Institute of India has also partnered with AstraZeneca for manufacturing Oxford vaccine in India.

The Serum Institute of India has been permitted for conducting Phase 2 and 3 human clinical trials of the third vaccine candidate developed by the Oxford University.

The phase-1 and 2 human clinical trials of two other vaccines, developed indigenously by Bharat Biotech, in collaboration with the Indian Council of Medical Research, and Zydus Cadila Ltd, are going on.

The expert group on covid vaccine administration also deliberated on creation of a digital infrastructure for inventory management and delivery mechanism of the vaccine, including tracking of vaccination process with particular focus on last mile delivery.

"They discussed on broad parameters guiding the selection of COVID-19 vaccine candidates for the country and sought inputs from Standing Technical Sub-Committee of National Technical Advisory Group on Immunization (NTAGI)," the government said in a statement.

"The group delved on the procurement mechanisms for COVID-19 vaccine, including both indigenous and international manufacturing along with guiding principles for prioritization of population groups for vaccination."

Issues related to financial resources required for procurement of COVID-19 vaccine, safety and surveillance were taken up.

The committee advised states not to chart separate pathways of procurement.

The expert group discussed that India will leverage domestic vaccine manufacturing capacity and will also engage with all international players for early delivery of vaccines not only in India but also in low and middle income countries.

The meeting comes in the backdrop of Russia on Tuesday claiming development of the world's first coronavirus vaccine. Moscow said Tuesday its vaccine offered "sustainable immunity" against the virus, but many scientists have questioned the approval of the vaccine even before Phase 3 trial.

<https://www.livemint.com/science/health/who-will-get-covid-19-vaccine-in-india-first-committee-meets-today-11597234515887.html>

Russia COVID-19 vaccine: Who will buy it? Read world leader's reaction

- *Israel will examine Russia's COVID-19 vaccine and enter negotiations to buy it*
- *Brazil's Parana state governor Ratinho Junior was expected to meet the Russian ambassador to Brazil on Wednesday*

Russia on Tuesday declared that it had become the first country to approve a vaccine against novel coronavirus. Dubbed as Sputnik V, the vaccine was developed by Gamaleya Research Institute and the Russian defence ministry. Russia registered the vaccine after less than two months of human testing. Russian President Vladimir Putin claimed that one of his daughters had been inoculated with the vaccine. "I know it has proven efficient and forms a stable immunity, and I would like to repeat that it has passed all the necessary tests," Putin said.

Based on a Chinese prototype, Sputnik V is a vector vaccine employs another virus to carry the immune response into human cells. Russia health ministry said that the COVID-19 vaccine offers lasting immunity from the virus. The vaccine is expected to provide immunity from the coronavirus for up to two years, according to health ministry.

What world leaders are saying:

German Health Minister Jens Spahn said the vaccine had not been sufficiently tested, adding the aim was to have a safe product rather than just being first to start vaccinating people.

Israel will examine Russia's COVID-19 vaccine and enter negotiations to buy it if it is found to be a "serious product", Israel's health minister said.

Philippine scientists were set to meet representatives of the Russian research facility that developed the vaccine on Wednesday, to discuss possible participation in clinical trials and access to its research data.

Brazil's Parana state governor Ratinho Junior was expected to meet the Russian ambassador to Brazil on Wednesday to discuss the terms of an agreement to produce the vaccine. But it was unclear if the state's research institute would get regulatory approval in Brazil.

Kazakhstan plans to send government officials to Moscow later this month to discuss possible deliveries.

Mexico's coronavirus czar, Deputy Health Minister Hugo Lopez-Gatell, said he was surprised by the Russian announcement and the government would wait for more information.

WHO's reaction

The World Health Organization and Russian health authorities are discussing the process for possible WHO prequalification, a WHO spokesman said on Tuesday.

"Prequalification of any vaccine includes the rigorous review and assessment of all required safety and efficacy data," WHO spokesman Tarik Jasarevic told a UN briefing in Geneva, referring to clinical trials.

Jarbas Barbosa, assistant director of the WHO's regional branch, the Pan American Health Organization, was asked on Tuesday about potential production of the vaccine in Brazil. He said that should not be done until Phase 2 and 3 trials are completed to guarantee its safety and effectiveness.

<https://www.livemint.com/news/india/russia-covid-19-vaccine-who-will-buy-it-read-world-leader-s-reaction-11597241906601.html>

U.S. inks \$1.5 billion deal with Moderna for 100 million doses of COVID-19 vaccine

Synopsis

The United States in recent weeks has made deals to acquire hundreds of millions of doses of potential COVID-19 vaccines from several companies as part of its Operation Warp Speed program, which aims to deliver a vaccine in the country by the end of the year.

The United States has entered an agreement with drugmaker Moderna Inc to acquire 100 million doses of its potential COVID-19 vaccine for around \$1.5 billion (£1.15 billion), the company and White House said on Tuesday.

The United States in recent weeks has made deals to acquire hundreds of millions of doses of potential COVID-19 vaccines from several companies as part of its Operation Warp Speed program, which aims to deliver a vaccine in the country by the end of the year. Moderna's price per dose comes to around \$30.50 per person for a two dose regimen.

With the exception of its deal with AstraZeneca which offered a lower price per drug in exchange for upfront research and development costs, all the deals price COVID-19 vaccines between \$20 to \$42 for a two dose course of treatment. Moderna's vaccine candidate, mRNA-1273, is one of the few that have already advanced to the final stage of testing and is on track to be completed in September, the company said this month.

Moderna's deal with the U.S. only pays out in full if the drug maker hits certain unspecific timing benchmarks for vaccine delivery. The United States has advanced purchase agreements with Johnson & Johnson, AstraZeneca Plc, Pfizer Inc and BioNTech SE, and Sanofi SA and GlaxoSmithKline Plc for their respective vaccine candidates.

The agreements would lock in more than 500 million doses of COVID-19 vaccine for the U.S., assuming that the companies involved receive regulatory approval. Some deals also give the United States an option to purchase additional doses.

The U.S. government previously gave Moderna around \$1 billion to fund its research efforts, bringing total U.S. funding to around \$2.5 billion. Other countries, including Japan, the United Kingdom and Canada, have forged similar deals with drug makers.

<https://economictimes.indiatimes.com/news/international/business/u-s-inks-1-5-billion-deal-with-moderna-for-100-million-doses-of-covid-19-vaccine/articleshow/77498370.cms>

