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समाचार पत्रों से चयित अंश
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THE HINDU

Tue, 20 Oct 2020

COVID drug trial completed at KGH

2-Deoxy-D-Glucose administered to nine volunteers; 'no side effects reported till date'

By Sumit Bhattacharjee

Visakhapatnam: The King George Hospital (KGH) and Andhra Medical College (AMC) have successfully completed the trial of 2-Deoxy-D-Glucose, a drug developed by the Defence Research and Development Organisation (DRDO) to treat coronavirus patients with moderate to severe symptoms as an adjunct therapy.

The drug has been administered to nine volunteers, in compliance with the protocols set up by the DRDO and the report has been sent to it for further evaluation.

The King George Hospital (KGH) in Visakhapatnam will send the drug trial report to teh DRDO, says official.

"The drug was developed as an adjunct therapy to reduce the impact of coronavirus and to hasten the recovery process. As per the DRDO's specifications, the drug was sucessfully administered to the volunteers. There have been no reactions or side effects till date. The report have been sent to the DRDO," P.V. Sudhakar, principal of Andhra Medical College and the District COVID Special Officer told *The Hindu*.

Vaccine trial

Meanwhile, the trials for the COVISHIELD vaccine is on and it has been administered to 40 volunteers so far. COVISHIELD has been developed by the Oxford University, with Serum India Limited and Indian Council of Medical Research (ICMR) as partners.

This vaccine will be administered to 100 volunteers. The KGH and the AMC intend to complete the trials in a week's time. "The vaccine has been administered to 40 volunteers in the last 10 days. We intend to speed and complete the process by the next week," said Dr. Sudhakar, adding that there has been no reports of reactions or side effects.

Protocols

Prior to administering the vaccine, the volunteers need go through a detail physical and medical examination. They undergo the RTPCR and antibodies tests to check if they are COVID-19 positive or have contracted the infection in the past.

The volunteers undergo a series of tests up to six months, starting from the third week after they are administered the vaccine. Tests are done to check the level of development of antibodies in the volunteers and to find out if the vaccine has the stimulating properties to develop antibodies that is required to fight the virus, explained Dr. Sudhakar.

https://www.thehindu.com/news/national/andhra-pradesh/covid-drug-trial-completed-at-kgh/article32896440.ece

THE NEW INDIAN EXPRESS

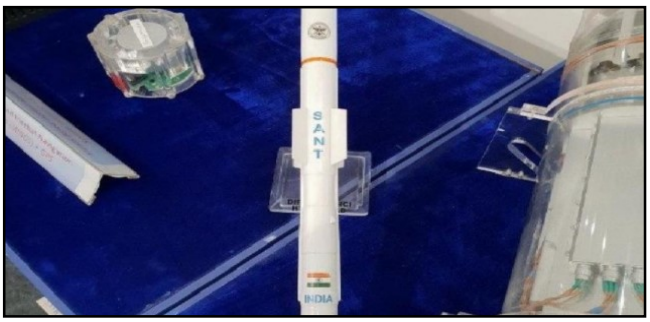
Tue, 20 Oct 2020

SANT missile clears crucial developmental trial off Odisha coast

The air-to-surface missile developed by DRDO for the Indian Air Force was test fired from a roof-top launcher at the Integrated Test Range (ITR) against a static target. The air-to-surface missile developed by DRDO for the Indian Air Force was test fired from a roof-top launcher at the Integrated Test Range (ITR) against a static target

By Hemant Kumar Rout

Bhubaneswar: In a bid to fast track its major strategic defence projects in the backdrop of Chinese aggression along the line of actual control, India on Monday successfully flight tested indigenously developed Stand-off Anti-tank (SANT) missile from a ground-based platform off Odisha coast.



A model of SANT missile on display by DRDO.

The air-to-surface missile developed by DRDO for the Indian Air Force was test fired from a roof-top launcher at the Integrated Test Range (ITR) against a static target. The crucial developmental trial conducted in association with Indian Air Force met all mission parameters as the missile hit the target with high accuracy.

An upgraded version of anti-tank missile - Helicopter Launched Nag (HeliNa), the SANT missile has both lock-on before launch and lock-on after launch capability. Equipped with an advanced nose-mounted seeker the missile can destroy targets 15 km to 20 km away.

"While the earlier version of the missile has a strike range of about eight km, the upgraded variant with infrared imaging seeker can cover at least double he distance. One more trial of the missile has been planned on Tuesday. A series of successful tests would pave the way for its induction and serial production," a defence official told The Express.

The trials of the fourth generation 'fire and forget' missile are being conducted after the weapon system underwent a couple of tests in desert conditions in Pokhran firing range. The missile will be inducted after a series of tests from the actual launch platform on-board light combat helicopters and advanced light helicopters.

"The nose mounted advanced seeker helps the missile evade enemy attack as it can be fired from a safe distance. Unlike other missiles in its class, it can neutralise targets at a long range. SANT missile is one of the best airborne anti-armour guided missiles in the world," the official added.

This was 11th missile test fired by India within one and a half month. This test came in the wake of twin successes of Laser Guided Anti Tank Guided Missile (ATGM) from KK ranges at Ahmednagar in Maharashtra on September 22 and October 1.

The ATGM fired from MBT Arjun destroyed target located at a longer range. The missile locks and tracks the targets with the help of laser designation to ensure precision hit accuracy.

https://www.newindianexpress.com/nation/2020/oct/19/sant-missile-clears-crucial-developmental-trial-off-odisha-coast-2212400.html

TIMESNOWNEWS.COM

Tue, 20 Oct 2020

India successfully test-fires SANT missile with 'Lock-on After Launch' & 'Lock-on Before Launch' capabilities

The Defence Research and Development Organisation is developing the missile for the Indian Air Force and it will have both Lock-on After Launch and Lock-on Before Launch capabilities

New Delhi: India on Monday test-fired the Stand-off Anti-tank (SANT) missile off the coast of Odisha. The test was successful.

The Defence Research and Development Organisation is developing the missile for the Indian Air Force and it will have both Lock-on After Launch and Lock-on Before Launch capabilities, sources said.

The test came a day after a successful test of the naval version of BrahMos supersonic cruise missile was conducted. The missile was test-fired from an indigenously-developed stealth destroyer, INS Chennai of the Indian Navy in the Arabian Sea on Sunday.

The missile hit the target with pin-point accuracy and also performed "extremely complex" manoeuvres before taking out the target, officials were reported as saying.

"BrahMos as 'prime strike weapon' will ensure the warship's invincibility by engaging naval surface targets at long ranges, thus making the destroyer another lethal platform of Indian Navy," the Ministry of Defence said in a statement.

The missile has been developed by BrahMos Aerospace, which is a joint venture between India and Russia. The JV has developed / is developing the supersonic cruise missile which can be launched from submarines, ships, aircraft, or from land platforms.

In the last few weeks, India has test-fired several missiles, including a new version of the surface-to-surface supersonic cruise missile BrahMos and anti-radiation missile Rudram-1. Laser-guided anti-tank guided missile and nuclear-capable hypersonic missile 'Shaurya' were also test-fired.

All these tests have been conducted at a time when India has been involved in a bitter border dispute with China in eastern Ladakh.

https://www.timesnownews.com/india/article/india-successfully-test-fires-sant-missile-with-lock-on-after-launch-lock-on-before-launch-capabilities/669661

दैनिक भास्कर

Tue, 20 Oct 2020

SANT Missile: भारत ने सैंट मिसाइल का किया सफल परीक्षण

Anti tank SANT Missile भारत ने ओडिशा के तट से दूर एंटी-टैंक सैंट मिसाइल का सफल परीक्षण किया। डीआरडीओ द्वारा भारतीय वायु सेना के लिए मिसाइल विकसित की जा रही है और लॉन्च के बाद लॉक-ऑन और लॉन्च क्षमता से पहले लॉक-ऑन दोनों होंगे।

भुवनेश्वर, एएनआइ। SANT Missile : भारत ने सोमवार को ओडिशा के तट से दूर एंटी-टैंक (सैंट) मिसाइल का सफल परीक्षण किया है। डीआरडीओ द्वारा भारतीय वायु सेना के लिए मिसाइल विकसित की जा रही है और लॉन्च के बाद लॉक-ऑन और लॉन्च क्षमता से पहले लॉक-ऑन दोनों होंगे। इससे पहले भारत ने ओडिशा के बालासोर जिले के चांदीपुर अंतरिम परीक्षण परिसर आइटीआर से पृथ्वी-2 बैलिस्टिक मिसाइल का शुक्रवार शाम 7:30 बजे सफल परीक्षण किया गया। डीआरडीओ रक्षा अनुसंधान व विकास संगठन की ओर से विकसित पृथ्वी-2 मिसाइल का परीक्षण चांदीपुर आइटीआर के लॉचिंग कॉम्प्लेक्स 3 से सफलतापूर्वक किया गया। यह पहली मिसाइल है, जिसे डीआरडीओ ने इंटीग्रेटेड गाइडेड मिसाइल डेवलपमेंट प्रोग्राम के तहत तैयार किया है।

यह मिसाइल 1000 किलोग्राम तक अस्त्र धोने की ताकत रखती है। देश में बनाई गई यह मिसाइल सतह से सतह पर 500 किलोमीटर की दूरी तक मार करने की ताकत रखती है। इस मिसाइल को तरल ईंधन वाले दो इंजन लगाए गए हैं। इसे तरल और ठोस दोनों तरह के ईंधन से संचालित किया जा सकता है। यह मिसाइल परंपरागत और परमाणु दोनों तरह के हथियार ले जाने में सक्षम है। 8.56 मीटर लंबी 1.1 मीटर चौड़ी और 4600 किलोग्राम वजन वाली यह मिसाइल 483 सेकेंड तक और 43.5 किलोमीटर की ऊंचाई तक उड़ान भर सकती है। इसके परीक्षण के मौके पर डीआरडीओ और आइटीआर से जुड़े वरिष्ठ वैज्ञानिकों और अधिकारियों का दल मौके पर मौजूद था। यह पहला मौका नहीं है, जब पृथ्वी मिसाइल को रात्रि कालीन परीक्षण किया गया है। इसके पहले कई कई बार पृथ्वी मिसाइल का रात्रि कालीन सफलतापूर्वक प्रायोगिक परीक्षण किया जा चुका है। मात्र 30 दिनों के भीतर ही भारत ने आठ नए और पुराने किस्म की मिसाइलों का सुबह और रात को सफलतापूर्वक परीक्षण किया है। सूत्रों की मानें तो आने वाले और चंद दिनों में और कई नई किस्म के मिसाइलों और पुराने किस्म के मिसाइलों का प्रायोगिक परीक्षण भारत करेगा।

डीआरडीओ (रक्षा अनुसंधान व विकास संगठन) ने इन परीक्षणों से दुश्मन देश को कड़ा संदेश देने का काम किया है। जिन मिसाइलों का परीक्षण हुआ है उसकी खासियत है कि वह स्वदेशी तकनीक से बनाए गए हैं, साथ ही इनमें नई तकनीक का भी इस्तेमाल हुआ है। यह एक तरह से ये आत्मनिर्भर भारत को भी रेखांकित करता है।मिसाइलों का परीक्षण ओडिशा के दो तटवर्ती इलाकों से किया गया। पहला बालेश्वर के चांदीपुर से, जहां एक नंबर, दो नंबर व तीन नंबर लांचिंग कांपलेक्स है। दूसरा, अब्दुल कलाम द्वीप, जहां पर चार नंबर लां¨चग कांपलेक्स है। मिसाइलों के परीक्षण का सिलसिला सात सितंबर, 2020 से शुरू हुआ था। इस दिन एचएसटीवीडी मिसाइल का दूसरी बार सफलतापूर्वक परीक्षण किया गया था। इसका पहला परीक्षण पिछले वर्ष किया गया था। दूसरी मिसाइल लेजर गाइडेड एंटी टैंक मिसाइल का परीक्षण 22 सितंबर को किया गया। इसके बाद 23 सितंबर को रात में पृथ्वी मिसाइल का परीक्षण किया गया।

चौथा परीक्षण 30 सितंबर को ब्रह्माोस सुपरसोनिक क्रूज मिसाइल का किया गया। पांचवां परीक्षण एक अक्टूबर, 2020 को लेजर गाइडेड एंटी टैंक मिसाइल का किया गया। छठा परीक्षण तीन अक्टूबर को शौर्य मिसाइल का किया गया। सातवां परीक्षण पांच अक्टूबर को स्मार्ट वेपन सिस्टम यानी सुपर सोनिक मिसाइल असिस्टेंट रिलीज आफ टॉरपीडो का किया गया। आठवां परीक्षण नौ अक्टूबर, 2020 को रूद्रम मिसाइल का किया गया। सभी परीक्षण सफल रहे। ये सभी मिसाइल जल, थल और वायु सेनाओं को ताकतवर बनाने वाले हैं।

https://www.jagran.com/odisha/bhubaneshwar-india-successfully-testfired-stand-off-anti-tank-sant-missile-off-coast-of-odisha-20909660.html

दैनिक भास्कर

Tue, 20 Oct 2020

एयर फोर्स की बढ़ेगी ताकत:एंटी टैंक मिसाइल SANT का टेस्ट सफल, एक दिन पहले ही INS चेन्नई से ब्रह्मोस मिसाइल फायर की गई थी

- ***स्टैंड ऑफ एंटी टैंक मिसाइल लॉन्च के बाद लॉक-ऑन और और लॉन्च से पहले लॉक-ऑन क्षमताओं से लैस है***
- ***ब्रह्मोस ध्वनि की रफ्तार से तीन गुना तेजी से वार कर सकती है, इसकी रफ्तार करीब 3457 किमी प्रति घंटे है***

भारत ने सोमवार को ओडिशा तट से एंटी टैंक मिसाइल (SANT) का टेस्ट किया, जो सफल रहा। इसे डिफेंस रिसर्च एंड डेवलपमेंट ऑर्गेनाइजेशन (डीआरडीओ) ने एयर फोर्स के लिए विकसित किया है। मिसाइल लॉन्च के बाद लॉक-ऑन और और लॉन्च से पहले लॉक-ऑन क्षमताओं से लैस है।

एक दिन पहले रविवार को इंडियन एयरफोर्स ने ब्रह्मोस सुपरसोनिक क्रूज मिसाइल के सफल टेस्टिंग पर डीआरडीओ को शुभकामनाएं दी थीं। डीआरडीओ ने बताया था कि रविवार सुबह चेन्नई में इसे नेवी के स्टील्थ डेस्ट्रॉयर जहाज (इसे दुश्मन का रडार नहीं पकड़ सकता) INS चेन्नई से फायर किया गया। इसने इस टेस्ट फायर में अरब महासागर में एक टारगेट पर सटीक निशाना लगाया।

ब्रह्मोस को जमीन, जहाज और फाइटर जेट से दागा जा सकता है

यह मिसाइल ध्वनि की रफ्तार से तीन गुना तेजी से वार कर सकती है। इसकी रफ्तार करीब 3457 किमी प्रति घंटे है। यह 400 किमी की रेंज तक निशाना लगा सकती है। सुपरसोनिक क्रूज ब्रह्मोस मिसाइल को जमीन, जहाज और फाइटर जेट से दागा जा सकता है। मिसाइल के पहले एक्सटेंडेड वर्जन का परीक्षण 11 मार्च 2017 को किया गया था। ब्रह्मोस का नाम दो नदियों के नाम से लिया गया है, इसमें भारत की ब्रह्मपुत्र नदी का 'ब्रह्म' और रूस की मोस्क्वा नदी से 'मोस' लिया गया है।

दो हफ्ते में दूसरी बार हुआ मिसाइल का टेस्ट

डीआरडीओ ने टेस्ट सफल रहने पर कहा- ब्रह्मोस एक प्राइम स्ट्राइक वेपन है। इससे हमारे जंगी जहाजों को लंबी दूरी तक सतह से सतह पर वार करने में मदद मिलेगी। दो हफ्ते पहले भी ओडिशा के चांदीपुरा

स्थित इंटिग्रेटेड टेस्ट रेंज में इसे टेस्ट किया गया था। उस समय भी इसने परीक्षण के सभी मापदंडों को सफलतापूर्वक पूरा किया था।

भारतीय सेना के बेड़े में शामिल है ब्रह्मोस

इसे भारत के डीआरडीओ ने रूस के एनपीओ मैशिनोस्ट्रोनिया (एनपीओएम) के साथ मिलकर तैयार किया है। ब्रह्मोस उन चुनिंदा सुपरसोनिक क्रूज मिसाइलों में शामिल हैं जो भारतीय वायुसेना और नौसेना के बेड़े में शामिल है। नए संस्करण का प्रपुल्शन सिस्टम, एयरफ्रेम, पावर सप्लाई समेत कई अहम उपकरण देश में ही विकसित किए गए हैं। यह मुख्य तौर पर पनडुब्बियों, जहाजों और नौकाओं को निशाना बनाने में मददगार साबित होगी।

https://www.bhaskar.com/national/news/india-today-successfully-testfired-the-stand-off-anti-tank-missile-off-the-coast-of-odisha-127828930.html

NDTV

Tue, 20 Oct 2020

IAF Congratulates Defence Research Body on successful BrahMos missile test firing

BrahMos supersonic cruise missile was successfully test-fired on Sunday from the Indian Navy's indigenously-built stealth destroyer INS Chennai, hitting a target in the Arabian Sea

New Delhi: The Indian Air Force (IAF) on Sunday congratulated the Defence Research and Development Organisation (DRDO) on the successful test-firing of BrahMos supersonic cruise missile.

The missile hit the target successfully with pinpoint accuracy

"Indian Air Force congratulates @DRDO_India on successful test-firing of BrahMos supersonic cruise missile from Indian Navy's indigenously-built stealth destroyer INS Chennai today," IAF tweeted.

BrahMos supersonic cruise missile was successfully test-fired on Sunday from the Indian Navy's indigenously-built stealth destroyer INS Chennai, hitting a target in the Arabian Sea, the Defence Research and Development Organisation (DRDO) said on Sunday.

The missile hit the target successfully with pinpoint accuracy after performing high-level and extremely complex manoeuvres.

BrahMos as "prime strike weapon" will ensure the warship's invincibility by engaging naval surface targets at long ranges, thus making the destroyer another lethal platform of Indian Navy.

"BrahMos, the supersonic cruise missile was successfully test-fired today on 18th October 2020 from Indian Navy"s indigenously-built stealth destroyer INS Chennai, hitting a target in the Arabian Sea. The missile hit the target successfully with pin-point accuracy," the DRDO said in a tweet.

(Except for the headline, this story has not been edited by NDTV staff and is published from a syndicated feed.)

https://www.ndtv.com/india-news/iaf-congratulates-defence-research-body-on-successful-brahmos-missile-test-firing-2312153

The Indian EXPRESS

Tue, 20 Oct 2020

Explained: What are Anti-Tank Guided Missiles and why are they important?

The indigenously developed low weight, fire and forget Man Portable Anti Tank Guided Missile (MPATGM) was successfully in September last year

By Sushant Kulkarni

Pune: The indigenously developed laser-guided version of the Anti-Tank Guided Missile (ATGM) was successfully test fired by the Defence Research and Development Organisation (DRDO) on two separate occasions recently and will undergo more validation tests in coming days before it is ready for the user trials. We look at the importance of the weapons system while countering armoured vehicles.

When did ATGMs first come into use?

The development of ammunition that can pierce the armours of tanks and the material that can withstand such ammo has been an ongoing race since World War I. But it wasn't until the next World War that armies across the world began to use the ATGMs, missile systems that can strike and neutralise armoured vehicles such as tanks.

The indigenously developed laser-guided version of the Anti-Tank Guided Missile (ATGM) was successfully test fired by the Defence Research and Development Organisation on two separate occasions recently.

While Indian Army mainly uses various imported anti-tank guided missiles, the DRDO has been working on ATGMs that can be launched from different platforms as part of the Integrated Guided Missile Development Programme.

The indigenously developed low weight, fire and forget Man Portable Anti Tank Guided Missile (MPATGM) was successfully in September last year. In February 2018, ATGM Nag was successfully tested in desert conditions. All these systems, which are mainly used by infantry units of the Army, are in their various stages of development. In the meantime, the government said in December 2019 that it has procured Anti-Tank Spike Missiles from Israel along with the allied systems to meet operational requirements of the Indian Army.

How are laser-guided ATGMs different?

The laser-guided ATGM, which was successfully tested recently on September 22 and later on October 1, mainly differs in one aspect from other ATGMS developed till date. This ATGM — which is yet to receive an operational name — is designed to be fired from tanks. With its range limited to 1.5 to 5 kilometers, it locks and tracks the targets with the help of laser designation to ensure precision in striking the target. The missile uses a 'tandem' High Explosive Anti Tank (HEAT) warhead. The term tandem refers to the missiles using more than one detonation in order to effectively penetrate the protective armours. This missile has the capacity of piercing armoured vehicles which use specially designed armour plates to counter the impact of such projectiles.

This Laser Guided ATGM has been developed by two Pune based facilities of the DRDO's Armament and Combat Engineering Cluster — the Armament Research and Development Establishment (ARDE) and High Energy Materials Research Laboratory (HEMRL) — in association with Instruments Research & Development Establishment (IRDE), Dehradun.

It is currently undergoing tests to be integrated with India's Main Battle Tank (MBT), Arjun. DRDO scientists said more tests for hitting targets at different ranges and for testing other flight parameters are planned in coming days. After these series of validation tests, the system will be

ready for the user trial by the Army, when it will be tested for various weather conditions, among other things.

These tests were conducted from MBT Arjun at the field ranges of the Armoured Corps Centre and School (ACC&S) of the Indian Army, located on the outskirts of Ahmednagar in Maharashtra. In the September 22 test, the missile was tested for a target placed at 3 kilometer range. On October 1, it was successfully test fired for a slightly longer range.

Importance in armoured warfare

The role of armoured and mechanised vehicles has remained decisive even in modern day warfare because of their ability to go past conventional defenses. Tank battles are generally fought in a close range of under five kilometers. The objective is to hit the enemy tank before they can take a clear shot. Development of missile systems that can defeat tanks built using modern armour act as a deterrent against enemy tanks from advancing.

DRDO Scientists say the operability of the missile from a tank is a key feature in armoured warfare. The missile has the capability of engaging with the target even if it is not in the line of sight, thus further enhancing its capability.

https://indianexpress.com/article/explained/explained-what-are-anti-tank-guided-missiles-and-why-are-they-important-6771422/

Hindustan Times

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SANT Missile successfully testfired from Odisha coast

The Missile is being developed by the Defence Research and Development Organisation (DRDO) for the Indian Air Force (IAF) and will have both Lock-on After Launch and Lock-on Before Launch capability, the sources informed

New Delhi: India today successfully test fired the Stand-off Anti-tank (SANT) Missile off the coast of Odisha, sources said on Monday.

The Missile is being developed by the Defence Research and Development Organisation (DRDO) for the Indian Air Force (IAF) and will have both Lock-on After Launch and Lock-on Before Launch capability, the sources informed.

The Indian Air Force (IAF) on Sunday congratulated the DRDO on the successful test-firing of BrahMos supersonic cruise missile.(ANI file photo)

On the other hand, the IAF on Sunday congratulated the DRDO on the successful test-firing of BrahMos supersonic cruise missile.

BrahMos supersonic cruise missile was successfully test-fired from the Indian Navy's indigenously-built stealth destroyer INS Chennai, hitting a target in the Arabian Sea, the DRDO said.

https://www.hindustantimes.com/india-news/sant-missile-successfully-testfired-from-odisha-coast/story-hEObviVjNXojxIW2ETupjM.html

moneycontrol

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INS Vagir: Indian Navy to get fifth Scorpene-class submarine from Mazagon Dock in six months

The PSU believes it can complete deliveries of all the contracted submarines by 2022, with the last of the six, INS Vagsheer, expected to be launched by then

By Swaraj Baggonkar

Defence public sector undertaking (PSU) Mazagon Dock Shipbuilders (MDSL) will hand over its fifth Scorpene-class submarine to the Indian Navy by the end of this year or early next year, a top company official said.

INS Khanderi (Image: Indian Navy)

The defence PSU has stepped up the pace of construction and deliveries of submarines and ships over the last couple of years to ensure adherence to the agreed timelines. The first of the six Scorpene-class submarines, INS Kalvari, was launched in 2015 and commissioned into service in late 2017.

MDSL is working with French collaborator Naval Group (earlier known as DCNS) on transfer of technology for the submarines under Project 75 (P75) with the deal valued at over Rs 23,000 crore. (This project should not be confused with P75I (Project 75 India), which envisages construction of the long-pending Rs 42,000 crore, six stealth submarines, which will be built by MDSL and L&T.)

Sanjeev Singhal, Director (Finance), Mazagon Dock Shipbuilders, said: “In spite of the Covid-19 challenges, we are trying to keep the timelines of whatever we had planned earlier, including the delivery of the fifth submarine sometime by end of this year or early next year. In addition, basin trials of one of the ships are also scheduled before early November.”

Since 2017 MDSL has delivered one submarine every year to the Indian Navy. INS Khanderi was launched in 2017 followed by INS Karanj in 2018 and INS Vela in 2019. Due to the Covid-19 disruption, the company suffered a setback of about three months in the development of the fifth submarine, known as INS Vagir.

The PSU believes it can complete deliveries of all the contracted submarines by 2022, wLast delivery by 2022ith the last of the six, INS Vagsheer, expected to be launched by then.

“In 2021-22 and 2022-23, we should be able to make up for the impact which has been there for FY21,” added Singhal, speaking at an analyst event for the PSU’s initial public offering (IPO). Mazagon Dock Shipbuilders raised Rs 443 crore through a public issue between September 29 and October 1. The company has an order book of Rs 54,500 crore.

Scorpene submarines are a class of diesel-electric attack submarines that claim to have stealth features. This class of submarines is designed to remain submerged for longer durations and

undertake operations such as intelligence gathering as well as participate in special operations during hostilities. Chile, Malaysia and Brazil are the other countries that possess these submarines.

India currently has 17 submarines, including two ballistic missile submarines and one nuclear-powered attack submarine. The Indian Navy also has 14 conventionally-powered submarines, developed in collaboration with French, Russian and German companies.

Eye on Exports

Following the increased focus on 'Make in India' and simultaneous surge in demand from the Ministry of Defence, MDSL was forced to overlook demand emerging from outside India. The last vessel it delivered to an overseas client was in 2014.

Rear Admiral Anil Kumar Saxena, NM (Retd), Director (Shipbuilding), Mazagon Docks Shipbuilders said: "We have exported 243 ships till date. The last ships we delivered were in 2012 and 2014 to the Bahamas and Mexico, which were multi-support vessels of about 7,000 tonnes.

Thereafter we stopped our exports because our hands were full with the naval (Indian Navy) orders."

Saxena added: "But after that we augmented our capacity and increased it to 11 submarines and ten ships at a time. We have started to diversify into refit, exports and commercial vessels also."

The company has held discussions with some potential foreign customers. "We have had dialogues with some countries from Africa and Latin America, Middle East and South East Asia. We got some leads from there and we have given our bits to them, but because of Covid-19, things are not moving as earlier and it may take some time," added Saxena.

Covid-19 has affected the PSU's operations since it is headquartered in Mumbai, one of the worst hit cities in India.

"The trains and buses in Mumbai were under total lockdown for three months. We have started to get 50-60 percent of people back since trains have partially resumed. We were also impacted by the sub-contracted manpower. Because they had people coming from States like UP, Bihar and Orissa, who went back. They are coming back but not at the same speed we were hoping," added Saxena.

https://www.moneycontrol.com/news/business/companies/ins-vagir-indian-navy-to-get-fifth-scorpene-class-submarine-from-mazagon-dock-in-six-months-5979381.html

TIMESNOWNEWS.COM

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Army Chief MM Naravane visits Ambala-based Kharga Corps

The II Corps, popularly known as Kharga Corps, is one of the most potent formations of the Indian Army

New Delhi: Chief of Army Staff Gen MM Naravane on Monday visited the Ambala-based Kharga Corps and reviewed its security and operational preparedness, officials said. The II Corps, popularly known as Kharga Corps, is one of the most potent formations of the Indian Army with significant offensive capabilities as it is mandated to deal with any eventuality in case of any military conflict with Pakistan.

The Chief of Army Staff also visited the Ambala Air Force base and lauded the synergy amongst the two forces. The Army said Gen Naravane visited Ambala Cantonment to review the security and operational preparedness of Kharga Corps.

It said the Chief of Army Staff was briefed by the General Officer Commanding Lt Gen SS Mahal and later he interacted with formation Commanders.

"He commended the formation for high level of operational preparedness and appreciated the protection measures taken by the formation and units in the fight against COVID-19," the Army said in a statement.

It said Gen Naravane exhorted all ranks to continue working with "zeal" and be prepared for any future operational challenges.

https://www.timesnownews.com/india/article/army-chief-mm-naravane-visits-ambala-based-kharga-corps/669785

The Tribune

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Why Army shuns local high-altitude clothing

Desultory endeavours to locally source special clothing and mountaineering equipment were repeatedly rejected by the Army, which is somewhat incredulous as manufacturing winter clothing involves no advanced technology. Such tactics only ensure the continuation of overseas visits for costly SCME purchases

By Rahul Bedi

The Indian Army's near complete dependence on imported high-altitude clothing and associated mountaineering equipment for nearly four decades will be highlighted yet again when its troops deploy against the irredentist People's Liberation Army (PLA) in eastern Ladakh during winter.

Lamentable: 80 per cent of special clothing for soldiers at heights is imported.

After mid-August, when the PLA's pullback from the occupied Indian territory along the Line of Actual Control (LAC) appeared doubtful, the frantic and costly procurement of special clothing and mountaineering equipment (SCME) began. It was done to equip the over 40,000 troops positioned at heights between 12,000 and 18,000 feet to prevent further PLA ingress. Ministry of Defence (MoD) and Army officials fanned out across Europe, Australia, Canada and the US to procure assorted high-altitude gear under 'emergency purchase' procedures in times of massive financial indigence of kit that can easily be sourced locally.

The Army's Vice-Chief of Staff, Lieutenant General SK Saini, stressed as much recently when he lamented the fact that the force continued importing SCME due to lack of 'viable indigenous solutions'. Speaking at a webinar earlier this month, Lieutenant-General Saini reiterated the need for collaborative efforts under the Atmanirbhar Bharat or self-reliant India initiative to meet critical SCME requirements, which have astonishingly endured since 1984, after the Army took control of the 17,000-foot high Siachen glacier.

Despite India being one of the world's largest garment and footwear producers, it had failed miserably in making clothing items like Down jackets, insulated trousers, gloves, socks, mittens, caps or even triple-lined snow boots for its soldiers to combat temperatures averaging minus 20 degree Celsius. These drop precipitously further to minus 40 degree in the upper Himalayan reaches, accentuated brutally by the merciless wind chill factor.

The Army was also wholly dependent on imported Arctic tents, sleeping bags, backpacks, ice-picks and associated rudimentary mountaineering survival equipment, essential for survival at those vertiginous heights. The limited Ordnance Factory Board (OFB)-made extreme cold climate clothing and equipment (ECCCE) supplied to the Army, like jackets, trousers and boots, were not only ill-fitting and operationally restrictive, but also inadequate against the cold even at heights far less than that of Siachen or the LAC.

Sporadic attempts over the decades to indigenously source SCME through a handful of collaborative ventures had come to nought. Deposing before the parliamentary standing committee on Defence in late 2019, an Army representative declared that some 80 per cent of the essential three-layered special clothing with thermal insulation and other items essential for soldiers at climatically murderous heights continue to be imported. Attempts to domestically acquire such kit, he regretted, had not met with the Army's 'acceptable standards'.

The officer was merely echoing what the MoD and the state-owned OFB responsible for equipping the Indian military with weapons and materials, too, told the committee of their inability to kit out the Army in such a testing environment. Thirty-six years after the Army had installed itself permanently at Siachen, the MoD and OFB said technical collaborative efforts with technical institutions were still under way to develop electrically heated vests, but little had emerged.

The experience of a senior MoD official, who travelled to some European countries a decade ago to inspect the manufacturing and testing facilities for SCME, ahead of finalising contracts for these items for the Army, are instructive. He said a Swiss vendor, who was a regular SCME supplier to the Indian Army, told him that he had advised the MoD that most of the high-altitude gear it imported recurrently could easily be made indigenously. He indicated his willingness to collaborate in a venture to domestically kickstart winter clothing units after visiting a potentially capable manufacturing unit near Agra during one of his India trips.

Thereafter, he said that the MoD continually prevaricated on the project, before eventually letting the proposal lapse. But in a telling and somewhat embarrassing comment, the Swiss dealer candidly told the visiting MoD official that the putative collaborative project had not evoked interest as its success would have obviated the need for visits by Indian officials to European countries to source SCME. He was dead right as several years later, high-altitude clothing procurement missions continue their overseas travel uninterruptedly, even more assiduously in recent months to meet the Army's requirements for its pan-winter deployment along the LAC till April 2021.

Desultory endeavours to locally source SCME were repeatedly rejected by the Army, which sounds somewhat incredulous as manufacturing winter clothing involves no advanced technology or knowhow. Besides, it's a goal not impossible to achieve for the Army's much-feted Directorate of Indigenisation, mandated over a decade ago to propagate product import substitution. Moreover, it further stretches disbelief that India, which designs and manufactures long-range nuclear and other missiles, nuclear submarines, fighter aircraft, helicopters and tanks, simply cannot make SCME.

Around 2006-07, the Army instituted buffer stocks of certain SCME items, but puzzlingly, a suggestion to recycle hugely expensive down feathers from discarded clothing into locally manufactured high-altitude clothing was rejected on specious grounds. In short, such tactics only ensured the continuation of overseas visits by the MoD and Army personnel for expensive SCME purchases which, surprisingly, were also recently revealed to be in short supply.

In February this year, the Comptroller and Auditor-General (CAG) censured the Army for enduring shortages of essential SCME that had persisted for four years till 2018 and included snow goggles and multi-purpose boots. The national auditor disclosed that the paucity of snow goggles ranged from 62-98 per cent, whilst those of multi-use snow boots had compelled soldiers on Siachen to use 'recycled' footwear.

The CAG further castigated the Army for purchasing 31,779 'substandard' sleeping bags at inflated rates, in addition to acquiring 'inferior' backpacks that had failed to meet stipulated specifications. Army personnel, the CAG added, had to make do with 'older versions' of essential items like face masks and jackets, instead of the better and more modern varieties at high altitudes.

Let's hope that with a bit of luck, perspicacity, and possibly hindsight, such circumstances will not be perpetuated in the ongoing LAC deployment.

https://www.tribuneindia.com/news/comment/why-army-shuns-local-high-altitude-clothing-158278

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Read to Lead

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India-Chile to have BIPT soon; Deeper cooperation in defence, space and other sectors, says MEA

In addition to the ongoing negotiations for the second round of expansion of Preferential Trade Agreement (PTA), India and Chile are soon going to ink a Bilateral Investment Protection Treaty

By Huma Siddiqui

In addition to the ongoing negotiations for the second round of expansion of Preferential Trade Agreement (PTA), India and Chile are soon going to ink a Bilateral Investment Protection Treaty. India and the South American nation Chile already has a Double Taxation Avoidance Agreement which was signed earlier this year in March and the two sides are already in the process of finalizing a date for the next round of talks for the expansion of the PTA, which was delayed due to global pandemic.

India has welcomed Chile's decision to designate India as a priority country in its foreign policy, and its decision to opening Consulate General in Mumbai.

Post-COVID, in an effort to promote cooperation in trade, investment, services and all industrial sectors between the two countries, the two countries are also in the midst of setting up an India-Chile Joint Business Council. Another big step the two sides are working on an MoU for cooperation in the health sector and export of generic medicines from India.

India has welcomed Chile's decision to designate India as a priority country in its foreign policy, and its decision to opening Consulate General in Mumbai.

These are some of the highlights of the recently held first Joint Commission meeting between the two countries, external affairs minister S Jaishankar and Chile's Allamand Zavala co-chaired the virtual meeting and reviewed the bilateral cooperation. This is the first institutionalized dialogue between the two countries at the level of Foreign Ministers and this consequent to the visit of President Ram Nath Kovind's visit to Santiago last April.

The two leaders agreed to `add momentum' in their cooperation various sectors including space cooperation, defence, energy, agriculture, mining and science and technology and trade.

Sources confirmed to Financial Express Online that the two countries are keen on expanding Agricultural cooperation, and this includes an agreement on Agriculture and also to address market access issues for products of mutual interest.

Renewable energy was also on the agenda of talks between the two countries, with a focus on Renewable Energy. The South American country which is a member of the International Solar Alliance, is in the process of ratifying the agreement.

Multiple and long term visa as well as liberalization of visa for Indian businessman was also part of the talks.

At the virtual meeting which concluded on October 16, 2020, the two talked about the expansion of the UN Security Council, COVID-19 pandemic as well as issues of mutual interest.

India – Chile Relations

The two countries have recently completed 70 years of diplomatic relations. In April 2019, during the visit of President Kovind, to Santiago, MoUs for cooperation in the field of Mining and Culture and a Letter of Intent for cooperation in the disability sector were signed.

The South American has the distinction of being the longest country in the world, has a very large maritime boundary and control a large part of Antarctica. It also has a huge base of natural resources which includes copper, tin, forest resources.

India already has a PTA with Chile which was expanded in 2017, which has helped in boosting bilateral trade. Today Chile is India's fifth-largest trading partner in the LAC region. It is extensively engaged with the outside world and has free trade agreements with a large number of countries and regions.

Prime minister Narendra Modi has had three interactions with the Chilean President Sebastian Pinera — on the sidelines of G20 meetings in Buenos Aires (2018), Osaka (2019) and G7 in Biarritz (2019).

Defence Cooperation

As has been reported by Financial Express Online, the Chilean Navy has extended an invitation to the Indian navy to participate in the EXPONAVAL 2020 which is expected to take place end of this year at a naval base in that country. Also, the BrahMos Aerospace Company has been invited to participate in the expo.

An invite has been received for one of the Indian warships to attend an event at Valparaiso during their expo; a decision has not yet been taken. For supply of defence and industrial platforms, since the laws of that country require companies from all over the world to register themselves with the Chilean Armed Forces and the Joint Staff, several Indian companies are getting themselves with the armed forces in that country. These include Hindustan Aeronautics Limited; Ordnance Factory Board; BEML; New Space India Limited; and Neo Power.

https://www.financialexpress.com/defence/india-chile-to-have-bipt-soon-deeper-cooperation-in-defence-space-and-other-sectors-says-mea/2109073/

Business Standard

Tue, 20 Oct 2020

Amid Ladakh row, Australia to be part of Indian Navy's Malabar exercise

The US and Japan are the other countries that participate in the annual exercise, which is likely to take place next month in the Bay of Bengal and the Arabian Sea

New Delhi: India on Monday announced that Australia will join the upcoming Malabar exercise which effectively means that all the four member countries of the 'Quad' or Quadrilateral coalition will be participating in the mega drill.

India's decision to heed to Australia's request to be part of the mega naval drill comes in the midst of growing strain in ties with China over the border row in eastern Ladakh.

The US and Japan are the other countries that participate in the annual exercise, which is likely to take place next month in the Bay of Bengal and the Arabian Sea.

India's decision to heed to Australia's request to be part of the mega naval drill comes in the midst of growing strain in ties with China over the border row in eastern Ladakh.

"As India seeks to increase cooperation with other countries in the maritime security domain and

in the light of increased defence cooperation with Australia, Malabar 2020 will see the participation of the Australian Navy," the defence ministry said in a statement.

It said the exercise has been planned on a non-contact - at sea' format.

"The exercise will strengthen the coordination between the navies of the participating countries," the ministry said.

China has been suspicious about the purpose of the Malabar exercise as it feels that the annual war game is an effort to contain its influence in the Indo-Pacific region.

The Malabar exercise started in 1992 as a bilateral drill between the Indian Navy and the US Navy in the Indian Ocean. Japan became a permanent participant in the exercise in 2015.

For the last few years, Australia has been showing keen interest in joining the exercise.

(Only the headline and picture of this report may have been reworked by the Business Standard staff; the rest of the content is auto-generated from a syndicated feed.)

https://www.business-standard.com/article/current-affairs/amid-ladakh-row-australia-to-be-part-of-indian-navy-s-malabar-exercise-120101900938_1.html

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Tue, 20 Oct 2020

LAC पर कम होगी तल्खी? चीन से 8वें दौर की बातचीत के लिए सेना कर रही तैयारी

नई दिल्ली: वास्तविक नियंत्रण रेखा (एलएसी) पर कायम गतिरोध को दूर करने के लिए सेना चीन से आठवें दौर की बातचीत को लेकर अपनी तैयारियां कर रही हैं। सेना प्रमुख शीर्ष सैन्य अधिकारियों के साथ इस मुद्दे पर विमर्श कर रहे हैं। सेना चाहती है कि इस बार बातचीत निर्णायक हो और तनाव वाले क्षेत्रों से पीछे हटने का रास्ता निकले। बैठक इसी सप्ताह होने की संभावना है।

सेना के सूत्रों ने कहा कि अभी तिथि तय नहीं हुई है, लेकिन इसी सप्ताह बातचीत होगी। पिछले दो बैठकों में सकारात्मक प्रगति हुई है, लेकिन हम चाहते हैं कि इसका असर जमीन पर भी दिखना चाहिए। चीनी सेना को विवाद वाले स्थानों से पीछे हटकर पूर्व की स्थिति बहाल करनी चाहिए।

सैन्य कमांडरों की आठवें दौर की बैठक में उन प्रक्रियाओं को अंतिम रुप दिए जाने की संभावना है जिससे सेनाएं पीछे हटें एवं मई से पूर्व की स्थिति बहाल हो। हालांकि इस मामले में चीन का अडियल रुख चिंता पैदा करने वाला है, लेकिन लंबे समय तक गतिरोध को भारत कायम नहीं रहने देना चाहता है। क्योंकि इसका संदेश भी गलत जा रहा है। इसलिए भारत की कोशिश है कि इस बैठक में पीछे हटने का फॉर्मूला अमल में आ जाए।

ITBP के डीजी भारत-चीन सीमा की अंतिम चौकी मिलम पैदल चलकर पहुंचे

आईटीबीपी के डीजी जवानों में नया जोश भरने चीन सीमा पर स्थित अंतिम चौकी मिलम 13 किमी पैदल चलकर पहुंचे। उन्होंने वहां पहुंचकर सुरक्षा व्यवस्था का जायजा लिया।सोमवार को आईटीबीपी के डीजी एसएस देशवाल जवानों के साथ बुगड़ियार चौकी से सुबह 7 बजे मिलम रवाना हुए। 13 किमी का पैदल सफर करने के बाद चीन सीमा पर स्थित अंतिम चौकी पहुंचकर उन्होंने जवानों में नया जोश भरा।

https://www.livehindustan.com/national/story-indian-army-is-preparing-for-the-8th-round-of-talks-with-china-3574547.html

Business Standard

Tue, 20 Oct 2020

A Cool Bomb: How an Indian mathematician aims to limit nuclear blast impact

Dr Meera Chadha's groundbreaking research with dust particles could pave the way for reducing the impact of nuclear blasts

New Delhi: Former president Dr A P J Abdul Kalam was once asked: "Can science create a 'Cool Bomb' to defuse or deactivate the deadly atom bomb?" Years later, India now seems to be taking the first steps in that direction, with a new research indicating that dust particles could help minimise the damage caused by a nuclear blast.

A 'cool bomb' can act as a deterrent to nuclear warfare as it can be concurrently used. (Shutterstock)

Ever since the US dropped atom bombs on Japan's Hiroshima and Nagasaki, killing hundreds of thousands to end the World War-II, physicists the world over have been exploring ways to reduce the impact of nuclear bombs. An Indian mathematician seems to have taken a leap in this direction.

Dr Meera Chadha of the Netaji Subhas Institute of Technology in New Delhi has found that the deadly effects of a nuclear blast can be partially mitigated or reduced with the help of dust particles. This mathematical model, first published in The Royal Society Publishing in June and in the Journal of the Physical Society of Japan in August this year, has deduced that the energy released and the damage radius of a nuclear blast decreases with time as dust parameters in the system increase.

Dr Meera Chadha is part of the team studying ways to reduce nuclear blast range.

The research was an attempt to approximate the reduction in the damage radius and the peak pressure in the nuclear blast waves with the addition of dust particles. Researchers found that high temperatures in the vicinity of the blast heat up dust particles, and a part of the energy of the gas is consumed in the process, resulting in a lowering of temperature and pressure of the gas. So, "the addition of dust results in decreasing the mixture's compressibility and increases the mixture's inertia which ultimately causes the reduction in the blast radius and peak pressures," the paper published in the Journal of The Physical Society of Japan stated.

Speaking to Business Standard, Dr Meera Chadha said: "Although small, mitigation of nuclear explosion is possible with dust particles. However, a detailed laboratory experiment conducted in a controlled environment can help validate our claims." The research, funded by the Ministry of Science and Technology, is being viewed as groundbreaking, as these are the first step towards mitigating the colossal disaster a nuclear blast might cause. "Estimation of the reduction of damage

radius is the first step in that direction. The second step would be a physical lab test to validate and finetune the results of this mathematical model," she added.

The mathematical model, developed in a lab, is yet to be fully tested experimentally. The team is in the process of preparing a proposal to test it on a larger scale. "Lab test is the next step. In the short term, these tests could be performed in any institution where such a facility is available. However, in the medium and long terms, a mathematical research centre needs to come up for both theoretical modelling and its experimental validation. For this, a formal proposal is being prepared," Dr Chadha said.

With the nuclear weaponry proliferating across the world, several countries are now flexing their geostrategy. India and Pakistan, both nuclear powers, had come on the brink of an all-out war following the deadly Pulwama attack in February 2019. A development in ways to reduce the impact of an atom bomb could prove game-changing in shaping the country's geopolitical strategy. "This is only a first step in that direction. An enormous amount of work needs to be done to actually reach the stage of a full-fledged 'Cool Bomb' which will definitely have many more material and substances in addition to dust," the mathematician said.

With the research still in its nascent stage, a lot needs to be done before it can be practically tested. One of the major requirements is the creation of a mathematical research center-cum-testing lab, where the model can be tested in a real environment. Apart from it, a major hurdle is the development's inclusion in the "policy for strategic planning for the defence of the country".

'cool bomb' can act as a deterrent to nuclear warfare as it can be concurrently used in two forms. Dr Chadha elaborated that such material could first be placed around high value and strategic targets. And then these cool bombs could be launched at anticipated points of impact of incoming attacks to minimise the blast range.

The team is now pushing for advanced research in this area.

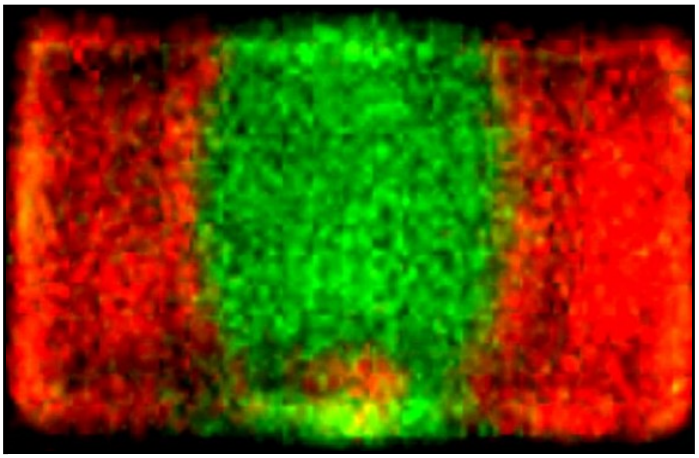
https://www.business-standard.com/article/current-affairs/a-cool-bomb-how-an-indian-mathematician-dr-meera-chadha-aims-to-limit-nuclear-blast-impact-120101900345_1.html

PHYS.ORG

Tue, 20 Oct 2020

Tough love: Intense glare helps next-gen solar tech through awkward phase

Researchers in Australia have resolved a fundamental challenge preventing the wide uptake of next-generation perovskite solar cells.



Scanning confocal microscope image of a single mixed-halide perovskite crystal showing emission from mixed (green) and segregated (red) regions. The central region is exposed region is exposed to intense light, which causes the halide-ions in this region to mix, generating green (540-570 nm) fluorescence. The red emission (>660 nm) is from phase-segregated perovskite driven by the low-intensity confocal microscope scanning laser. Credit: ARC Centre of Excellence in Exciton Science

Metal-halide perovskites, a class of hybrid organic-inorganic materials, provide a cheap, flexible and highly promising pathway for efficient solar photovoltaics, as well as light emissive devices and fast X-ray detectors.

However, since gaining prominence over the last decade, perovskite materials have presented scientists and engineers with several problems precluding their widespread use in commercial applications.

Among these is light-induced phase segregation, in which illumination, such as sunlight, disrupts the carefully arranged composition of elements within mixed-halide perovskites.

This in turn leads to instability in the material's bandgap, interfering with the wavelengths of light absorbed, while reducing charge-carrier conduction and the efficiency of devices.

Now, though, an unlikely solution has been identified.

Members of the ARC Centre of Excellence in Exciton Science have shown that high-intensity light will undo the disruption caused by light at lower intensities, and that this approach can be used to actively control the material's bandgap.

The results have been published in the journal *Nature Materials*.

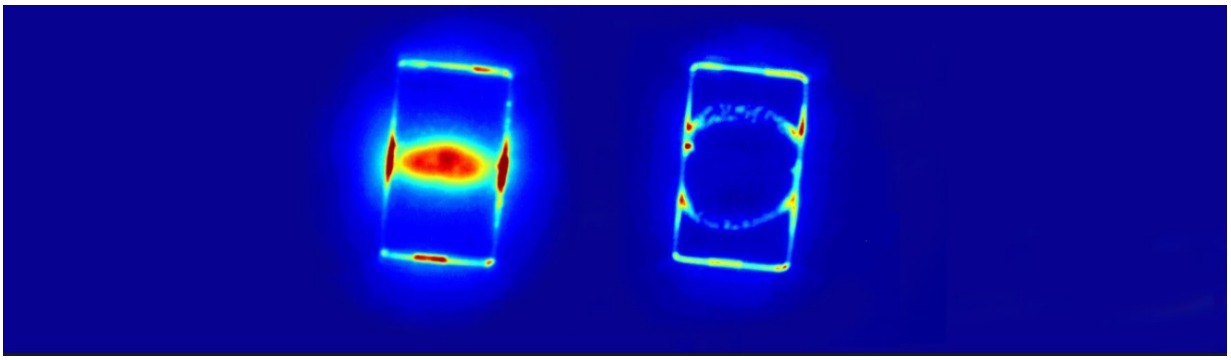
Dr. Chris Hall, a member of Professor Trevor Smith's team at The University of Melbourne, and Dr. Wenxin Mao of Professor Udo Bach's group at Monash University, first noticed the potential to explore this avenue of investigation during a separate experiment.

"It was one of those unusual discoveries that you sometimes hear about in science," Chris said.

"We were performing a measurement, looking for something else, and then we came across this process that at the time seemed quite strange. However, we quickly realised it was an important observation."

They enlisted the help of Dr. Stefano Bernardi, a member of Dr. Asaph Widmer-Cooper's group at the University of Sydney, who led the computational modelling work to better understand their surprising solution to the issue.

Stefano said: "What we found is that as you increase the excitation intensity, the local strains in the ionic lattice, which were the original cause of segregation, start to merge together. When this happens, the local deformations that drove segregation disappear.



Spatially-resolved steady state widefield microscopic PL image response to a carrier density gradient. The fluorescent images were simultaneously recorded at two separate wavelength regions. The image on the left presents the fluorescence at 540-570nm and the right one shows the fluorescence at 660-690nm, which perfectly respond to the remixing phase emission at the centre while the segregated phase forming a ring-like emission. Credit: ARC Centre of Excellence in Exciton Science

"On a normal sunny day, the intensity is so low that these deformations are still localised. But if you find a way to increase the excitation above a certain threshold, for example by using a solar concentrator, then segregation disappears."

The implications of the findings are significant, with researchers now able to retain the optimal composition of elements within mixed-halide perovskites when they are exposed to light, necessary for its use in solar cells.

"A lot of people have approached this problem by investigating ways of suppressing light-induced disorder, such as looking at different compositions of the material or changing the dimensions of the material," Chris said.

"What we've shown is that you can actually use the material in the state that you want to use it, for a solar cell—all you need to do is focus more light onto it.

"An exciting extension of this work is that the ability to rapidly switch the bandgap with light opens an interesting opportunity to use perovskites in data storage," Wenxin said.

Chris added: "We've done the fundamental work and the next step is to put it into a device."

More information: Light-induced reversal of ion segregation in mixed-halide perovskites, *Nature Materials* (2020).

DOI: 10.1038/s41563-020-00826-y , www.nature.com/articles/s41563-020-00826-y

Journal information: Nature Materials

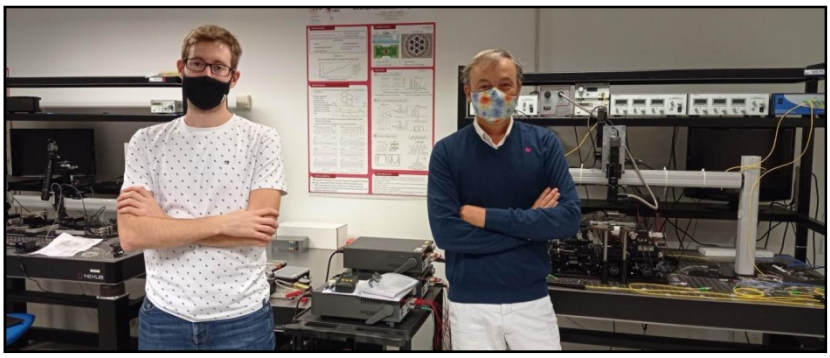
https://phys.org/news/2020-10-tough-intense-glare-next-gen-solar.html

PHYS.ORG

Tue, 20 Oct 2020

Researching the chips of the future

The chips of the future will include photonics and electronics; they will have bandwidth, speed and processing and computing abilities that are currently unthinkable; they will make it possible to integrate many other components, and their capabilities will increase exponentially compared to electronic chips. In all, they will be essential in many fields; they will bring us a little closer, for example, to quantum computing or to the autonomous car.



Daniel Pérez and José Capmany Credit: UPV

The key resides in programmable photonics, a technology in which the Polytechnic University of Valencia (UPV), through the Photonics Research Labs of the iTEAM institute and its spin-off iPronics, programmable photonics SL, is today an international benchmark. This much is confirmed by *Nature*, which in its latest issue has published an article that analyzes the present and future of this discipline—programmable photonics—written, among others, by Photonics Research Labs researchers Daniel Pérez and José Capmany.

"Programmable photonics marks a before and an after in the field of telecommunications. It is a field with great potential and value, due to the complementarity it has with electronics. Our article includes all the progress that has been achieved heretofore around the world in this field, which is garnering increased levels of interest," highlights José Capmany.

Democratizing photonics

As part of this progress, special mention must go to the generic purpose programmable chips that the UPV research team is working on. These circuits are capable of providing numerous functionalities by using a single structure, in an analogous way to how microprocessors work in electronics. The article also includes the most recent landmarks in the development of chips for specific purposes—designed for a specific task—and mentions the research of European centers such as the University of Ghent and the Polytechnic University of Milan, or American centers such as the MIT, the University of Stanford and the University of Toronto.

"From a fundamental point of view, the article describes and presents the technology of integrated photonics and the different levels required—photonic hardware, control electronics and software—to make the most of the potential of this type of systems," adds Daniel Pérez.

For the UPV researchers, these technologies will make it possible to democratize photonics, which would entail a true revolution in the field of telecommunications.

"As well as for the autonomous car or quantic computing, integrated photonics will also help improve automated learning systems, 5G communications or the development of neuromorphic computing, with chips that will imitate the network of neurons of our brain and their connections. All these uses require great flexibility and the processing of large amounts of data at high speeds. And this is what programmable photonics offers, and it is what the article published in *Nature* addresses," highlights Daniel Pérez.

More information: Wim Bogaerts et al, Programmable photonic circuits, *Nature* (2020). DOI: 10.1038/s41586-020-2764-0

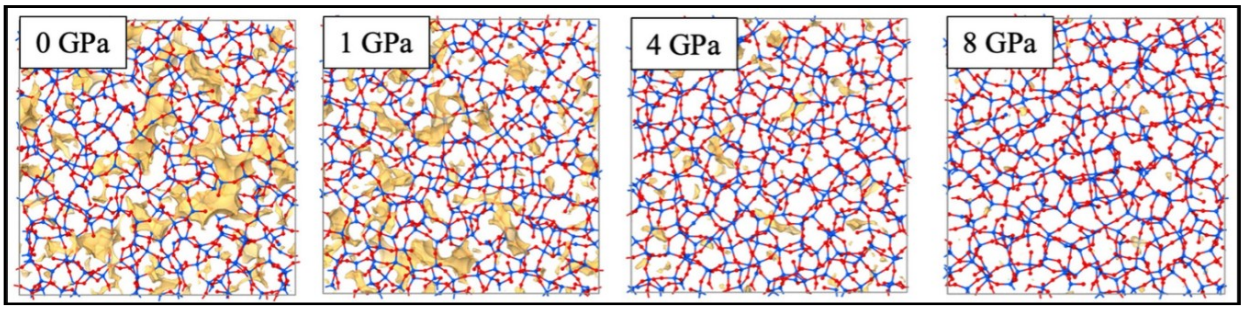
Journal information: Nature

https://phys.org/news/2020-10-chips-future.html

Tue, 20 Oct 2020

High pressure is key for better optical fibers

Optical fiber data transmission can be significantly improved by producing the fibers, made of silica glass, under high pressure, researchers from Japan and the US report in the journal *npj Computational Materials*.



The voids in silica glass (yellow), which are responsibl e for scattering of light and degradation of signals, become much smaller when the glass is quenched at higher pressures (Yongjian Yang, et al., npj Computational Materials, September 17, 2020). Credit: Yongjian Yang, et al., npj Computational Materials, September 17, 2020

Using computer simulations, researchers at Hokkaido University, The Pennsylvania State University and their industry collaborators theoretically show that signal loss from silica glass fibers can be reduced by more than 50 percent, which could dramatically extend the distance data can be transmitted without the need for amplification.

"Improvements in silica glass, the most important material for optical communication, have stalled in recent years due to lack of understanding of the material on the atomic level," says Associate Professor Madoka Ono of Hokkaido University's Research Institute of Electronic Science (RIES). "Our findings can now help guide future physical experiments and production processes, though it will be technically challenging."

Optical fibers have revolutionized high-bandwidth, long-distance communication all over the world. The cables carrying all that information are mainly made of fine threads of silica glass, slightly thicker than a human hair. The material is strong, flexible and very good at transmitting information, in the form of light, at low cost. But the data signal peters out before reaching its final destination due to light being scattered. Amplifiers and other tools are used to contain and relay the information before it scatters, ensuring it is delivered successfully. Scientists are seeking to reduce light scatter, called Rayleigh scattering, to help accelerate data transmission and move closer towards quantum communication.

Ono and her collaborators used multiple computational methods to predict what happens to the atomic structure of silica glass under high temperature and high pressure. They found large voids between silica atoms form when the glass is heated up and then cooled down, which is called quenching, under low pressure. But when this process occurs under 4 gigapascals (GPa), most of the large voids disappear and the glass takes on a much more uniform lattice structure.

Specifically, the models show that the glass goes under a physical transformation, and smaller rings of atoms are eliminated or "pruned" allowing larger rings to join more closely together. This helps to reduce the number of large voids and the average size of voids, which cause light scattering, and decrease signal loss by more than 50 percent.

The researchers suspect even greater improvements can be achieved using a slower cooling rate at higher pressure. The process could also be explored for other types of inorganic glass with similar structures. However, actually making glass fibers under such high pressures at an industrial scale is very difficult.

"Now that we know the ideal pressure, we hope this research will help spur the development of high-pressure manufacturing devices that can produce this ultra-transparent silica glass," Ono says.

More information: Yongjian Yang et al. Topological pruning enables ultra-low Rayleigh scattering in pressure-quenched silica glass, *npj Computational Materials* (2020). DOI: 10.1038/s41524-020-00408-1

https://phys.org/news/2020-10-high-pressure-key-optical-fibers.html

COVID-19 Research News

Hindustan Times

Tue, 20 Oct 2020

High levels of ultraviolet light 'most strongly' associated with reduced growth of Covid-19

A new study, in which scientists looked at statistical models of the link between weather and the maximum growth rate of Covid-19 globally, found that high levels of ultraviolet light are "most strongly" associated with reduced growth of the deadly virus

By Jahnavi Gupta

A new study, in which scientists looked at statistical models of the link between weather and the maximum growth rate of Covid-19 globally, found that high levels of ultraviolet light are "most strongly" associated with reduced growth of the deadly virus.

A study published in the Proceedings of the National Academy of Sciences on Tuesday said researchers based on the finding, predicted that maximum Covid-19 growth would decline in the summer but rebound during autumn and peak in the winter, albeit with a high degree of uncertainty, indicating that continued social intervention may be necessary.

"Statistical models of the link between weather and the maximum growth rate of Covid-19 worldwide suggest that high levels of ultraviolet light correlated with reduced Covid-19 growth; based on this finding, researchers predicted that maximum Covid-19 growth would decline in the summer but rebound during autumn and peak in the winter, albeit with a high degree of uncertainty, indicating that continued social intervention may be necessary, according to the authors," said the research paper.

The research article from Cory Merow and Mark C. Urban states that "It remains unknown, as of April 2020, whether summer will reduce its spread, thereby alleviating strains on hospitals and providing time for vaccine development."It pointed out that early insights from laboratory studies and research on related viruses predicted that Covid-19 would decline with higher temperatures, humidity, and ultraviolet (UV) light.

"Using current, fine-scaled weather data and global reports of infections, we develop a model that explains 36 per cent of the variation in maximum Covid-19 growth rates based on weather and demography (17 per cent) and country-specific effects (19 per cent)," it added."The ultraviolet light is most strongly associated with lower Covid-19 growth. Projections suggest that, without intervention, Covid-19 will decrease temporarily during summer, rebound by autumn, and peak next winter," the article read.

The study further pointed out that validation based on data from May and June 2020 confirms the generality of the climate signal detected.

"However, uncertainty remains high, and the probability of weekly doubling rates remains 20 per cent throughout summer in the absence of social interventions. Consequently, aggressive interventions will likely be needed despite seasonal trends," the study said further.

As per the latest updates by Johns Hopkins University, there are 38,032,320 Covid-19 cases globally and 1,084,336 deaths due to the pathogen. The US continues to be the worst-affected country in the world with 7,852,008 cases and 215,803 deaths.

India and Brazil are the other two most-affected countries after the US from the pathogen.

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

https://www.hindustantimes.com/health/high-levels-of-ultraviolet-light-most-strongly-associated-with-reduced-growth-of-covid-19/story-TnFSgV6UVLziFfOQnWhSXP.html

The Indian EXPRESS

Tue, 20 Oct 2020

New research: Coronavirus 'molecular scissor' as a target of Covid-19 drugs

In a new study published in Science Advances, American and Polish scientists suggest that drugs for fighting Covid-19 be designed to block this protein — SARS-CoV-2's molecular "scissor"

In the novel coronavirus, an enzyme called SARS-CoV-2-PLpro facilitates infection by processing both viral and human proteins. It stimulates the release of proteins that the virus to needs to replicate. In the human body, it inhibits molecules that signal the immune system to attack the infection. In a new study published in Science Advances, American and Polish scientists suggest that drugs for fighting Covid-19 be designed to block this protein — SARS-CoV-2's molecular "scissor".

Multichannel pipette dropper during research for a Covid-19 vaccine in Austria. Photographer: Akos Stiller/Bloomberg

US scientists solved the three-dimensional structures of SARS-CoV-2-PLpro. Using this knowledge, Polish chemists developed two molecules that inhibit the enzyme. These molecules, called VIR250 and VIR251, are very efficient at blocking the activity of SARS-CoV-2-PLpro, yet do not cross-react with human enzymes with a similar function, researcher Shaun Olsen, of the University of Texas at San Antonio, said in a statement.

The US team also compared SARS-CoV-2-PLpro against similar enzymes from coronaviruses of recent decades, SARS-CoV-1 and MERS. By understanding similarities and differences of these enzymes in various coronaviruses, it may be possible to develop inhibitors that are effective against multiple viruses, the researchers said.

Source: University of Texas at San Antonio

https://indianexpress.com/article/explained/new-research-coronavirus-molecular-scissor-as-a-target-of-covid-19-drugs-6787638/