

Nov
2020

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

खंड : 45 अंक : 274 27 नवंबर 2020
Vol.: 45 Issue : 274 27 November 2020



रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
Metcalfe House, Delhi - 110 054

CONTENTS

S. No.	TITLE	Page No.
DRDO News		1-6
DRDO Technology News		1-6
1.	DRDO Celebrates Constitution Day	1
2.	स्पेशल रिपोर्ट: DRDO ने मनाया संविधान दिवस	1
3.	DRDO helps Indian fabric replace Chinese, foreign clothing used for making military uniforms	2
4.	चीन को भारत की तीसरी सबसे बड़ी मात, ऐप्स, प्रोडक्ट्स के बाद इस चीज के आयात पर लगेगा बैन!	3
5.	South-South Cooperation: Brazil expresses interest in Indo-Russian BrahMos-NG missiles	4
6.	Six important missile India tested in the last two months	5
Defence News		7-14
Defence Strategic National/International		7-14
7.	Government has given Army free hand to counter PLA across LAC: Rajnath Singh	7
8.	India should be in no hurry to pull back troops in Ladakh — ex-Army Chief Gen V.P. Malik	8
9.	China, India in 'candid, in-depth communication' to disengage troops in Ladakh: Beijing	10
10.	India's Army is going to "Tunnel Defenses" If a War with China Starts	11
11.	Indian Army to get drones from Israel, US for surveillance along China border	12
12.	This is how India plans to kill enemy submarines (thanks to America)	13
13.	Russian, Indian Navies set for joint drills in Baltic Sea	14
Science & Technology News		15-22
14.	Plasma-developed new material fundamental to Internet of Things	15
15.	Ultraviolet light exposure enhances the protective ability of synthetic melanin	16
16.	Researchers create nanoscale slalom course for electrons	17
17.	T-ray technology reveals what's getting under your skin	18
COVID-19 Research News		20-22
18.	Most lungs recover well after Covid-19: Study	20
19.	India's first Covid-19 vaccine: Covaxin Phase-3 trial begins at AIIMS, key updates	21



**Press Information Bureau
Government of India**

Ministry of Defence

Thu, 26 Nov 2020 7:03PM

DRDO Celebrates Constitution Day

Defence Research and Development Organisation (DRDO) celebrated Constitution Day today to commemorate the 70th anniversary of the adoption of the constitution. The most important part of the celebration was the reading of Preamble to the Constitution by the DRDO fraternity. A webinar was organized by DRDO to mark the occasion.

Raksha Rajya Mantri, Shri Shripad Naik, Chief Guest for the occasion, joined the webinar through video conferencing and delivered a talk on “Constitutional Values and Fundamental Principles of Indian Constitution”. In his address, he recalled the contribution of the founding fathers of the Constitution and said that the Constitution is not only a theoretical idea, it must be made important to the lives of individuals in every part of the country. He further added that the Constitution needs to interfaced with the citizens of the country.



Many DRDO DGs, Directors, Senior Scientists and other senior officials joined the webinar through Video Conferencing.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1676105>



Fri, 27 Nov 2020

स्पेशल रिपोर्ट: DRDO ने मनाया संविधान दिवस

नई दिल्ली: रक्षा अनुसंधान एवं विकास संगठन (DRDO) ने भारतीय संविधान की स्थापना की 70 वीं वर्षगांठ के मौके पर एक वीडियो गोष्ठी आयोजित की जिसे रक्षा राज्य मंत्री श्रीपद नायक ने सम्बोधित किया इस वेबीनार का उद्घाटन करते हुए श्रीपद नायक ने कहा कि भारतीय संविधान न केवल एक सैद्धांतिक विचार है बल्कि इसे हर सड़क, हर गली और हर मुहल्ला में लोगों के जीवन के लिये महत्वपूर्ण बनाना होगा।

संविधान के मूल्यों और मौलिक सिद्धांतों पर आयोजित चर्चा में अपने सम्बोधन में श्रीपद नायक ने कहा कि इसे आम लोगों तक पहुंचाने की जरूरत है और हर इसे हर व्यक्ति के लिये अहम बनाने की भी जरूरत है। संविधान पर गोष्ठी के दौरान डीआरडीओ के महानिदेशकों, निदेशकों, सीनियर अधिकारियों और वैज्ञानिकों ने भी भाग लिया और इस दौरान संविधान की मूल प्रस्तावना का सम्मिलित पाठ किया।

<https://www.rakshaknews.com/forces/defence/special-report-drdo-celebrated-constitution-day>



Fri, 27 Nov 2020

DRDO helps Indian fabric replace Chinese, foreign clothing used for making military uniforms

By Sahil Pandey

New Delhi: Seeking to replace Chinese and other foreign clothing used for making military uniforms in the country, Defence Research and Development Organisation (DRDO) is helping Indian textile industries produce yarns which will help to end reliance on import in this sector.

Director of Directorate of Industry Interface and Technology management (DIITM) at DRDO, Dr Mayank Dwivedi said that for Indian army's summer uniform alone, the approximate requirement of the fabric is 55 lakh metres and if all the requirements of Navy, Air Force and Para Military forces are added then the requirement may go well beyond 1.5 crore metres per annum.

"We're following our Prime Minister Narendra Modi's call for Atmanirbhar Bharat or self-reliance in all the products in India and particularly in defence products. If these yarns and fabric are manufactured in India for the purpose of uniform making for the armed forces, then it will be big achievement as it will help us move one step ahead towards Atmanirbhar Bharat," Dr Mayank Dwivedi said.

The advanced fabrics can be used for future requirement of the parachute and bulletproof jackets as well.

The DIITM Director further said that the scope of technical textiles such as glass fabric, carbon fabric, aramid fabric and advanced ceramic fabrics is enormous in defence application. Some industries in Ahmedabad and Surat are manufacturing advanced fabrics being used in defence applications.

In a recent digital interaction organised by Confederation of Indian Industries (CII) with the industries of Surat on September 17, the challenges faced by the textile industry were projected. During the interaction, Dr Dwivedi had talked about opportunities in the areas of textile in the defence sector. He expressed his views on various possibilities of advance textile material and fabric used in the Indian Armed Forces.

"We are working to make technical textile for rocket motors and composite structure for the missile system. We are using technical textile in bullet-proof jackets as well. Similarly, I shared the idea of making blends like nylon 6,6 yarn, lycra fibre, viscose, polyester to make army uniforms at the CII webinar in the Surat industry recently. For a particular requirement of the Indian armed forces, the uniform can be made in a much better way," Dr Dwivedi said.



Dr Mayank Dwivedi, Director of Directorate of Industry Interface and Technology management (DIITM) at DRDO (Photo/ANI)

The major application of advanced textile is required in the uniform worn by the Indian Armed Forces as well as all their accessories such as bags, shoes and tents which are used by the Forces

It was emphasised that the use of advanced textiles blends using yarns of polyester/ nylon 6,6 / cotton/polyurethane/rayon will enhance operational capabilities and comfort of Indian Armed Forces.

Pointing towards the initiative and the participation of Indian companies, he said, "In the webinar, more than 200 companies were interested in getting into this business. Bindal Silk Pvt Ltd, Lakshmiapati Group among a few others were present and wanted to take up this initiative. This will not only boost the economy of the country but also generate lots of employment and eventually give a boost to the GDP also."

https://www.aninews.in/news/national/general-news/drdo-helps-indian-fabric-replace-chinese-foreign-clothing-used-for-making-military-uniforms20201126180957/#.X7_EMUUIUb4.whatsapp



Fri, 27 Nov 2020

चीन को भारत की तीसरी सबसे बड़ी मात, ऐप्स, प्रोडक्ट्स के बाद इस चीज के आयात पर लगेगा बैन!

DRDO भारतीय कपड़ा उद्योगों को यार्न का उत्पादन करने में मदद कर रहा है

जो इस क्षेत्र में आयात पर निर्भरता को समाप्त करने में मदद करेगा

नई दिल्ली: कोरोना, लॉकडाउन के बाद भारत लगातार आत्मनिर्भरता की ओर बढ़ रहा है। आत्मनिर्भर भारत के बढ़ते कदम में अब भारतीय सेना की वर्दी (Military uniforms) में इस्तेमाल होने वाले चीनी और कोरियाई कपड़े (Chinese foreign clothing) की जगह अब स्वदेशी कपड़े लेंगे। देश में सैन्य वर्दी बनाने के लिए इस्तेमाल किए जाने वाले चीनी और अन्य विदेशी कपड़ों की जगह लेने के लिए रक्षा अनुसंधान और विकास संगठन (DRDO) भारतीय कपड़ा उद्योगों को यार्न का उत्पादन करने में मदद कर रहा है जो इस क्षेत्र में आयात पर निर्भरता को समाप्त करने में मदद करेगा।

DRDO में उद्योग इंटरफेस और प्रौद्योगिकी प्रबंधन निदेशालय (DIITM) के निदेशक डॉ. मयंक द्विवेदी ने कहा कि भारतीय सेना की ग्रीष्मकालीन वर्दी के लिए, कपड़े की अनुमानित आवश्यकता 55 लाख मीटर है और यदि नौसेना, वायु सेना और पैरा मिलिट्री की सभी आवश्यकताएं हैं बलों को जोड़ा जाता है तो आवश्यकता 1.5 करोड़ मीटर प्रति वर्ष से अधिक हो सकती है। उन्होंने बताया कि प्रधानमंत्री मोदी के आत्मनिर्भर अभियान के आह्वान से प्रेरित होकर डीआरडीओ ने सभी उत्पादों और विशेष रूप से रक्षा उत्पादों में आत्मनिर्भरता के लिए यह कदम उठाया है।



सेना की वर्दी के कपड़े का उत्पादन आजादी के बाद पहली बार होना शुरू होगा.

पैराशूट और बुलेटप्रूफ जैकेट का भी हो सकता है निर्माण

द्विवेदी ने कहा, अगर ये खास धागे और कपड़े सशस्त्र बलों के वर्दी बनाने के उद्देश्य से भारत में निर्मित किए जाते हैं, तो यह बड़ी उपलब्धि होगी क्योंकि इससे आत्मनिर्भर भारत की ओर एक और कदम आगे बढ़ाने में मदद मिलेगी। उन्होंने आगे कहा कि उन्नत कपड़े का उपयोग पैराशूट और बुलेटप्रूफ जैकेट की भविष्य की जरूरत के लिए भी किया जा सकता है।

सेना के 50 लाख से अधिक जवानों के लिए हर साल 5 करोड़ मीटर से ज्यादा की फैब्रिक्स की आवश्यकता होती है। गुजरात में सितंबर में वर्चुअल बैठक में सूरत की टेक्सटाइल इंडस्ट्री से अनुरोध किया गया था कि वह देश की तीनों सेनाओं सहित विभिन्न सैन्य दलों की आवश्यकता के लिहाज से कपड़ा तैयार करे।

<https://hindi.news18.com/news/nation/drdo-helps-indian-fabric-replace-chinese-foreign-clothing-used-for-making-military-uniforms-3353819.html>

FINANCIAL EXPRESS
Read to Lead

Fri, 27 Nov 2020

South-South Cooperation: Brazil expresses interest in Indo-Russian BrahMos-NG missiles

The government of Brazil has expressed interest in the BrahMos-NG (New Generation) version of the short-range ramjet supersonic cruise missile

By Huma Siddiqui

The government of Brazil has expressed interest in the BrahMos-NG (New Generation) version of the short-range ramjet supersonic cruise missile. The missile an Indo-Russia joint venture is already inducted in the Indian armed forces is being sought by other countries. Financial Express Online has been the first to report about the growing interest for these missiles from countries in South America including Brazil, Chile, Argentina and Venezuela.

Why is Brazil interested?

“There have been initial talks between the two sides. Due to the global pandemic everything was put on hold,” a senior officer said.

Brazil is manufacturing nuclear nuclear-powered general-purpose attack submarine or SSN to be equipped with cruise missile systems. Also, the South American nation is planning for modernization of existing fleet of submarines.

Why? “Because the existing fleet of submarines will undergo mid-life refit and well as capability enhancements. And these platforms can be a potential user for Brahmos-NG,” explained a senior officer who wished to remain anonymous.

Why BrahMos-NG?

The Brazilian Air Force is flying the Swedish Gripen-E of SAAB Company, which was delivered to it in 2019.

“From Brazil, the Indo-Russian missile BrahMos-NG can be suitable choice for their new Gripen aircraft. The new BrahMos-NG systems is designed for wide range of fighter aircraft platforms with best in class specifications.”

Also, “The Brazilian aircraft Embraer can also be a suitable platform for BrahMos –NG,” said the officer quoted above.

SAAB on Embraer

During a recent virtual media interaction, a top Gripen officer had told Financial Express Online, “Embraer is Saab’s main partner in Brazil and they will conduct the final assembly of the Gripen as well as being part of the design and systems development as well as flight test.”



The missile an Indo-Russia joint venture is already inducted in the Indian armed forces is being sought by other countries. (File Photo)

“The main part of this work is being performed at something Saab calls the GDDN (Gripen Design and Development Network). We have also set up our own Saab entity, Saab Aeronáutica Montagens for structural assembly in Brazil. Also, AEL Sistemas, Akaer and Atech are important partners in Brazil for the Gripen Program,” the top SAAB officer had said.

Why are countries interested in BrahMos?

It is a joint venture between India and Russia established in 1998 and has been developed at a low budget of USD 300 million. It has undergone successful tests in India – the Indian Army, Navy and the Air Force have been carrying out tests in different configuration.

About the venture, a top officer of Russia’s FSMTC had told Financial Express Online that “it is a ‘precious gem’ in the defence cooperation between India and Russia. And can be exported to other countries after all the intergovernmental procedures have been cleared.”

More about BrahMos-NG

- It weighs between 1.4-1.6 tonne; and has a length of 6 metre.
- It meets the requirements of all the three services in India.
- And the BrahMos-NG is going to be integrated with the Russian Su 30 MKI fighter aircraft.

<https://www.financialexpress.com/defence/south-south-cooperation-brazil-expresses-interest-in-indo-russian-brahmos-ng-missiles/2137164/>



Fri, 27 Nov 2020

Six important missile India tested in the last two months

The Defence Research and Development Organisation on 24-11-2020 successfully test-fired a land attack version of the BrahMos supersonic cruise from the Andaman & Nicobar Island and it successfully hit its target, which was on another island. The test was conducted by the Indian Army which has many regiments of the DRDO-developed Missile system and the range of BrahMos missile has now been enhanced to over 400 km. The launch was the latest in a string of recent weapons tests amid military tensions with China in the Ladakh sector.



Important Missiles India Tested In the Past Two Months:

Hypersonic Technology Demonstrator Vehicle (HSTDV)

DRDO successfully tested indigenously developed HSTDV on September 7. The state-of-the-art system, which adds up to India's aerospace might, is an unmanned scramjet demonstration aircraft for hypersonic speed flight which can fly at a speed of Mach 6 and move up to an altitude of 32.5 km in 20 seconds. Besides its utility for long-range air missiles, the technology can also be used for launching satellites at low cost.

Anti-Tank Guided Missile (ATGM)

DRDO successfully test-fired a laser-guided Anti-Tank Guided Missile (ATGM) from an MBT Arjun Tank in Maharashtra's Ahmednagar on September 23. Laser-guided ATGMs lock and track

the targets with the help of laser designation to ensure precision hit accuracy. The missile employs a tandem HEAT warhead to defeat Explosive Reactive Armour (ERA) protected armoured vehicles.

BrahMos Supersonic Cruise Missile

India successfully conducted its second test-fire of the extended range BrahMos supersonic cruise missile on September 30. The test-fire of the missile, which can hit targets at more than 400-km range, was carried out under PJ-10 project of the DRDO. The missile's airframe and booster have been developed indigenously. The name 'BrahMos' is a portmanteau of India's Brahmaputra River and Russia's Moskva River. The first-ever successful launch of BrahMos was on June 21, 2001. India and Russia are now planning to develop a new generation of Brahmos missile with 600 km-plus range.

Supersonic Missile Assisted Release of Torpedo (SMART)

DRDO conducted successful flight testing of the SMART on October 5, a missile assisted release of lightweight Anti-Submarine Torpedo System for anti-submarine warfare (ASW) operations for far beyond torpedo range. The Ministry of Defence informed about the successful flight testing and stated that all the mission objectives including missile flight have been met perfectly. A number of DRDO laboratories, including DRDL, RCI Hyderabad, ADRDE Agra, NSTL Visakhapatnam have developed the technologies required for SMART.

RUDRAM Anti-Radiation Missile

DRDO added another feather on its cap on October 9 after successful flight test of an advanced anti-radiation missile. The indigenously developed New generation Anti Radiation Missile or RUDRAM was launched from a Sukhoi Su-30MKI fighter aircraft onto a radiation target located on Wheeler Island off the coast of Odisha. A first of its kind missile developed domestically, RUDRAM is integrated on SU-30 Mk1 fighter aircraft as the launch platform, having the capability of varying ranges based on launch conditions. The tactical, air-to-surface missile is a force multiplier for the Indian Air Force and has INS-GPS navigation with Passive Homing Head for the final attack.

SHAURYA Hypersonic Ballistic Missile

India on 3-Oct-2020 successfully test-fired indigenously developed hypersonic nuclear-capable Shaurya missile, an advanced version of Submarine Launched Ballistic Missile (SLBM) K-15 (B-05).

The surface-to-surface medium range Shaurya missile, that can reach speeds of 7.5 Mach (seven and half times the speed of sound), blasted off from a canister. The missile, equipped with multiple advanced computing technology and high accuracy navigation, efficient propulsion, sophisticated control and guidance systems, successfully followed its target in the Bay of Bengal.

The indigenously-developed missile was tracked and monitored through an integrated system of sophisticated radars, electro-optical tracking instruments and a chain of telemetry stations positioned at different points. It performed a manoeuvre in the terminal phase and hit the impact point. It was the first user-specific trial of the missile that is a land variant of submarine-launched ballistic missile K-15.

The two-stage missile that uses solid propellants can deceive enemy radars after launch. The 10 metre-long missile - weighing 6.2 ton - can carry both nuclear and conventional warheads weighing up to 1,000 kilograms. Once launched, Shaurya would be difficult to track by radars as the window for detection, tracking and interception is only 400 seconds. Like the BrahMos supersonic cruise missile, Shaurya can be stored in a composite canister, making it easier to handle and transport.

<http://www.indiandefensenews.in/2020/11/six-important-missile-india-tested-in.html>



Fri, 27 Nov 2020

Government has given Army free hand to counter PLA across LAC: Rajnath Singh

New Delhi: Defence Minister Rajnath Singh on Thursday said that the government has given a free hand to the armed forces to counter any changes on the Line of Actual Control with China with full force.

"Our government has given a free hand to the armed forces to counter any changes across the LAC with China with full force. The Indian Army did exactly that in Galwan valley. With courage they countered the PLA's soldiers and forced them to move back," Singh tweeted.

The Defence Minister, however, accepted that India has "perceptual difference" with China, and added that despite those differences, both countries follow agreements and protocols while patrolling on the Line of Actual Control (LAC).

"It is a fact that India has a perceptual difference between China. Despite this, there are some agreements, protocols that armies of the two countries follow while patrolling the LAC," said Singh in a tweet.

"I want to assure everyone that under Prime Minister Narendra Modi's administration, there will be no compromise on India's border, self-respect and sovereignty," he added.

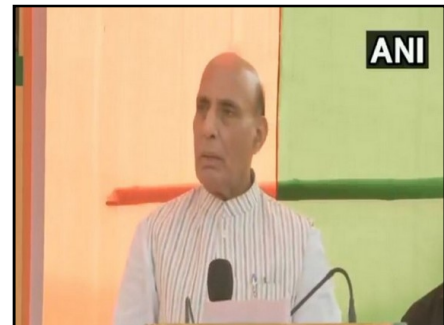
On the stand-off with China, Rajnath Singh said, "Talks have continued, and we will continue to have a dialogue to resolve border stand-off with China. But I believe countries should not be expansionist."

The Defence Minister further emphasised on indigenous solutions to fulfill the country's defence and security requirements.

"Another big reform we have done is to strengthen the security infrastructure of this country. That is under 'Make in India' we are emphasising on indigenous solutions to fulfill our defence and security requirements," he said.

"Under 'Make in India', we are giving an open invitation to defence manufacturers to do manufacturing in this country. We want equipments and platforms made here to meet India's security needs as well as the needs of friendly countries," he added.

Rajnath Singh further said, "In order to promote defence manufacturing in India, our government has released a negative list of more than 100 items under which we will manufacture those equipments and platforms in India instead of importing them in this country." The Defence Minister further said that the comprehensive and integrated approach regarding national security has seen a lot of positive results.



Defence Minister Rajnath Singh (File Photo/ANI)

"There is a need to keep upgrading any good system related to your security at the time of changing and changing requirements. This is why it is not 'This is the End' for us but 'We will always go on'," he added. (ANI)

<https://www.aninews.in/news/national/general-news/government-has-given-army-free-hand-to-counter-pla-across-lac-rajnath-singh20201127013704/>

ThePrint

Fri, 27 Nov 2020

India should be in no hurry to pull back troops in Ladakh — ex-Army Chief Gen V.P. Malik

Gen Malik noted that the incursions by China in multiple locations in Ladakh in early May was an 'intelligence and surveillance failure'

By Snehes Alex Philip

New Delhi: Noting that a situation of “no war nor peace” will prevail between India and China for the time to come, former Army chief Gen V.P. Malik (retd) said the country should not be in any kind of hurry to pull back troops from Ladakh, adding that the forces have to remain alert against the Chinese.

In an interview to ThePrint, Gen Malik also said that the Chinese incursions at multiple locations along the Line of Actual Control (LAC) in Ladakh in early May indicated “intelligence and surveillance failure”.

He, however, added that India’s response has been good, especially in the forces occupying strategic heights in the southern bank of Pangong Tso, also known as the Kailash ranges.

The former Army chief also said that the Chinese actions have affected the entire gamut of bilateral relations and brought back memories of the 1962 war. “Chinese actions have broken the trust. It has whitewashed all confidence building agreements that were signed between the two countries,” he said.

As for the way ahead, Gen Malik said, “Although our forces are in eyeball to eyeball positions, I don’t think it will escalate to a conventional war. I have a feeling this confrontation will carry on for quite some time.

While the negotiations are going on, the forces on both sides are likely to remain on alert. There may be some de-escalation possible but even after de-escalation, it will be a position of no war nor peace.”

The officer, who led the Army during the Kargil battle, said India should not talk in segments with China when it comes to Eastern Ladakh.

“We should not talk in segments of the Pangong Tso area or Galwan Valley or Depsang,” he said. “If we want lasting peace along the LAC, we should be taking the whole eastern Ladakh border together because if we have advantage in the Pangong Tso area, we are at disadvantage at many other places also.”

“We should not be in a hurry to give away the advantage we have and accept some less advantageous positions on the northern side,” he added. “For lasting peace, the whole eastern Ladakh border should be taken together.”

Have to be patient while negotiating with Chinese

Gen Malik again reiterated that India should not be “in a hurry to withdraw our troops”.



Former Army chief Gen V.P. Malik (retd) | ThePrint

The former Army chief said he believes that the talks will continue for a long time and India “will have to be patient while negotiating with the Chinese”.

“There should be no great hurry to pull out our forces because of winter or any other situation. We have to look at Chinese military strength on that side,” he said.

Asked if he fears that India is in a hurry to disengage, he replied that was not the case.

“I don’t think so (India is in a hurry to disengage) but pressure will start building. At the moment it does not look like it. I have a feeling that the Army is quite firm on keeping our troops and the troops are also not seen as wanting,” he said. “They are quite sturdy and are prepared to go through all these handicaps. But there is pressure due to the economic situation, this pressure might start building up.”

Long-term objective should be delineation of LAC

Gen Malik said that while the short-term goal is status quo ante, the long-term objective should be to make the Chinese agree to delineation of the LAC on the maps.

“Because unless that is, these kind of intrusions and small actions that take place on the LAC will continue,” he said.

Explaining the relations with China, he said it is competitive and cooperative at the same time.

Gen Malik said the armed forces have been talking about the competitive part of it, the “Ministry of External Affairs and elsewhere have been talking about the cooperative part of it”.

Intelligence and surveillance failure

Gen Malik, however, noted that the Chinese incursions were the result of ‘some intelligence and surveillance failure’.

“Because if surveillance is there and there are some intelligence reports, you should not be taken by surprise,” he said, adding that agencies had poorly assessed two big Chinese formations that had come to Tibet for a military exercise before the incursions.

“That assessment should have been there that these can be used against us on the LAC,” he said. “I have mentioned these because they were some weaknesses that have come out. And I think we have drawn some lessons from it.”

He added that India’s response since has been “fairly good”.

“After we came to know, the action has been fairly good between the Army and the Air Force. The mobilisation that has taken place is very good,” he said. “The response in the Galwan Valley and elsewhere has been good, particularly the response of occupying the Kailash range which has really turned the table.”

<https://theprint.in/defence/india-should-be-in-no-hurry-to-pull-back-troops-in-ladakh-ex-army-chief-gen-v-p-malik/552337/>

China, India in 'candid, in-depth communication' to disengage troops in Ladakh: Beijing

The Chinese and Indian militaries held the 8th round of Corps Commander-level meeting on November 6 to resolve the military standoff that erupted in early May

Beijing: China and India have maintained "candid and in-depth communication and coordination" to promote disengagement in areas along the Line of Actual Control (LAC) in eastern Ladakh after the eighth round of talks to resolve the current standoff, the Chinese military said on Thursday.

The Chinese and Indian militaries held the 8th round of Corps Commander-level meeting on November 6 to resolve the military standoff that erupted in early May.

"Since the 8th round of China-India Corps Commander-level meeting, the situation in the China-India border areas have remained stable on the whole" Senior Colonel Ren Guoqiang, spokesperson for China's Ministry of National Defence told an online media briefing responding to a question on the current situation at the India-China border.

"Following the meeting, China and India have maintained candid and in-depth communication and coordination to promote disengagement in areas along the Line of Actual Control in the western sector of China-India boundary," Ren was quoted as saying by official website of the Ministry of Defence of China.

Nearly 50,000 troops of the Indian Army are currently deployed in a high state of combat readiness in various mountainous locations in eastern Ladakh in sub-zero conditions as multiple rounds of talks between the two sides have not yielded any concrete outcome yet to resolve the border standoff.

China has also deployed an equal number of troops, according to officials.

Ren noted that both sides have agreed to earnestly implement the important consensus reached by the leaders of the two countries and ensure their frontline troops exercise restraint and avoid misunderstanding and miscalculation.

"China is ready to maintain communication with the Indian side through military and diplomatic channels. We hope that the Indian side will work with China towards the same goal, implement bilateral consensus with a sincere attitude and positive actions, so as to jointly safeguard peace and stability in the border areas," he said.

<https://www.newindianexpress.com/nation/2020/nov/27/china-india-in-candid-in-depth-communication-to-disengage-troops-in-ladakh-beijing-2228735.html>



An Indian army convoy moves on the Srinagar- Ladakh highway at Gagangeer, northeast of Srinagar, Wednesday, Sept. 9, 2020. (Photo | AP)

India's Army is going to "Tunnel Defenses" If a War with China Starts

After dismissing the news that the Chinese People's Liberation Army (PLA) employed microwave energy weapons against the troops stationed near the Line of Actual Control earlier this year, the Indian Army announced that it has begun to employ "tunnel defenses" to pre-empt any "transgression" from the Chinese forces

By Peter Suci

After dismissing the news that the Chinese People's Liberation Army (PLA) employed microwave energy weapons against the troops stationed near the Line of Actual Control (LAC) earlier this year, the Indian Army announced that it has begun to employ "tunnel defenses" to pre-empt any "transgression" from the Chinese forces.

It was August 29–30 that Indian Army soldiers along with Special Front Force personnel occupied the position at the LAC south of Pangong Tso lake on the Kailash Range ridgeline for the first time since 1962. Despite some claims that the PLA used the microwave energy weapons to drive off the Indian forces, the Indian Army maintains that it not only has maintained its presence at that forward position, but it has taken a page from the Chinese military playbook by digging in.



The Hindustan Times reported that Indian military leaders have noted how the Chinese successfully used tunnel defenses against the Japanese forces during the Second Sino-Japanese War, while also how the Vietcong utilized similar tactics against American forces during the Second Indo-China War (Vietnam War). Tunneling efforts were also employed by the Japanese on Iwo Jima and other islands, while the North Koreans also used tunnels during the Korean War and has continued to build up its Tunnels of Aggression, which feature electrical lighting, weapon-storage and sleeping accommodations.

The PLA has also built tunnel shelters to house aircraft at Lhasa airbase and underground pens to house nuclear ballistic missile submarines in the Hainan Islands in the South China Sea.

The recent PLA tunnels, as well as those being constructed by the Indian Army, are much more than mere holes in the ground. The Indian Army has reportedly deployed large-diameter Hume-reinforced concrete pipes to support the tunnels, which can help shield the troops from an enemy attack. The reinforced pipes are reportedly six to eight feet in diameter and allow for easy troop movement underground from one location to another without being exposed to enemy fire.

Another benefit of the tunnel complex is that these can be heated and shelter the troops from the extreme cold as winter sets in. Both sides have moved in men and material, including armored vehicles that can operate in extreme conditions while the PLA forces have been equipped with prefabricated thermal shelters that include dormitories, washrooms, toilets and warehouses as well as heating equipment. These shelters can operate in temperatures up to minus 55 degrees Celsius and maintain an interior temperature around 15 degrees Celsius (approx. 60 degrees Fahrenheit).

The Indian Army lacks such amenities, and instead, its troops have been issued arctic tents that are designed to accommodate three to five soldiers with only basic kerosene-fuelled heaters to keep them warm. The tunnels could certainly be an improvement, provided they could be heated safely.

<https://nationalinterest.org/blog/buzz/india%E2%80%99s-army-going-%E2%80%9Ctunnel-defenses%E2%80%9D-if-war-china-starts-173381>

Indian Army to get drones from Israel, US for surveillance along China border

By Ajit K Dubey

- ***The deals for the acquisition of the Heron surveillance drones is in the final stages and is expected to be inked in Dec. The Herons are going to be deployed in the Ladakh sector and they will be more advanced than the existing fleet in the Indian armed forces, the report says***

New Delhi: In a major boost to its capabilities, the Indian Army is soon going to get Israeli Heron and American mini drones for upgrading its surveillance capabilities in Eastern Ladakh and other areas along the China border.

"The deals for the acquisition of the Heron surveillance drones is in the final stages and is expected to be inked in December. The Herons are going to be deployed in the Ladakh sector and they will be more advanced than the existing fleet in the Indian armed forces," government sources told ANI.

The acquisition of these drones is being done under the emergency financial powers granted by Prime Minister Narendra Modi-led government to the defence forces under which they can buy equipment and systems worth ₹500 crores to upgrade their warfighting capabilities, amid ongoing border conflict with China, they added.

According to sources, the other small or mini drones are being acquired from the US that will be provided at the Battalion level to the troops on ground and the hand-operated drones would be used to attain awareness about a specific location or area in their respective areas of responsibility.

The Indian defence forces have been taking these initiatives to acquire weapon systems which can help them in the ongoing conflict with China. The last time such a facility was given to the defence forces was in 2019 right after the Balakot air strikes against terrorist camps in Pakistan.

Using the same facility, the Indian Navy has leased two Predator drones which have been taken from American firm General Atomics.

The Indian Air Force had exercised the same powers to acquire a large number of Hammer air to ground standoff missiles with a strike range of around 70 kilometres.

<https://www.livemint.com/news/india/indian-army-to-get-drones-from-israel-us-for-surveillance-along-china-border-11606380593495.html>



The Indian defence forces have been taking these initiatives to acquire weapon systems which can help them in the ongoing conflict with China (Photo: iStock)

This is how India plans to kill enemy submarines (thanks to America)

Meet Boeing's P-8I Poseidon maritime patrol aircraft

By Peter Suci

The Indian Navy's ability to spot potential adversaries has been enhanced as it took delivery of its ninth Boeing P-8I Poseidon maritime patrol aircraft. It will help expand the Navy's long-range maritime reconnaissance anti-submarine warfare (ASW) capabilities.

The Indian Navy was the first and is now the largest international customer of the P-8 and recently completed seven years of operating the fleet of patrol planes. The latest aircraft is the first to be delivered under an option contract, worth around \$1 billion for four additional patrol planes that were ordered by the Indian Ministry of Defence in 2016.



In addition to ASW and maritime reconnaissance, the P-8I can be deployed to assist during disaster relief and humanitarian missions.

“Our focus has been, and will be, on delivering the world's best maritime patrol aircraft to the Indian Navy,” said Surendra Ahuja, managing director of Boeing Defence India. “The P-8I, with its exceptional maritime surveillance and reconnaissance capabilities, versatility and operational readiness, has proven to be an important asset to the Indian Navy. We remain committed to supporting the modernization and mission readiness of India's defence forces.”

Boeing has supported India's growing P-8I fleet by providing training of Indian Navy flight crews, spare parts, ground support equipment and field service representative support. According to the international defense contractor, its integrated logistics support has further provided the highest state of fleet readiness at the lowest possible cost.

The company has also been completing construction of its Training Support & Data Handling Centre at INS Rajali, Arakkonam, Tamil Nadu, as well as a secondary center at the Naval Institute of Aeronautical Technology, Kochi, as part of a training and support package contract signed in 2019. This indigenous, ground-based training was developed to allow the Indian Navy crew to increase mission proficiency in a shorter time while also reducing the on-aircraft training time resulting in increased aircraft availability for mission tasking.

Indian Variant

The P-8I is the Indian variant of the P-8A Poseidon, which was designed for long-range ASW, as well as anti-surface warfare, and intelligence, surveillance and reconnaissance missions. It can also be employed in other critical missions including search-and-rescue and anti-piracy, and also used to support other arms of the military.

The multi-mission aircraft is fitted with a combination of state of the art sensors and advanced weapons systems. The export version was specifically developed for the Indian Navy, and it features two components not fitted on the P-8A including a Telephonics APS-143 OceanEye aft radar and a magnetic anomaly detector. The wings are fitted with hardpoints and can carry air-to-surface missiles. In its ASW role it can employ AGM-84L Harpoon Block II missiles and Mk 54 All-Up-Round Lightweight torpedoes.

The Indian P-8I has surpassed 25,000 flight-hours and has provided India's maritime forces with a significant edge in the strategically important Indian Ocean region. It is currently the second largest fleet of P-8 aircraft in the world. The aircraft is powered by two CFM56-7 engines and each

provides 27,300 pounds of thrust. The P-8I is 39.47 meters in length, has a wingspan of 37.64 meters and is 12.83 meters in height. It has a maximum speed of 490 knots (789 km/h), a range of 1,200 nautical miles and a ceiling of 12,496 meters. The P-8I has a crew of nine.

The P-8I was employed in the search of the missing Malaysian Airlines flight MH370 in 2014, highlighting its ability to conduct search-and-rescue operations.

<https://nationalinterest.org/blog/buzz/how-india-plans-kill-enemy-submarines-thanks-america-173353>



Fri, 27 Nov 2020

Russian, Indian Navies set for joint drills in Baltic Sea

Russia and India signed contracts in November 2018 on the delivery of four Project 11356 frigates

Kaliningrad, November 25. /TASS/. The Russian and Indian Navies may hold joint drills in the Baltic Sea, following a meeting of their representatives at the headquarters of Russia's Baltic Fleet, the Fleet's press office reported on Wednesday.

"During a meeting of the Indian military delegation led by Naval Attache at the Embassy of the Republic of India in Russia Commodore Manish Chadha with Baltic Fleet Commander Admiral Alexander Nosatov, the Indian side expressed its wish to hold joint drills of the fleets of both countries in the Baltic Sea and take part in the events of celebrating Russia's Navy Day in 2021," the press office said in a statement.

The meeting also discussed the issues of bilateral naval cooperation and joint drills. The Baltic Fleet commander noted the Indian naval sailors' high skills demonstrated, in particular, during the Indra-2019 Russian-Indian naval anti-piracy maneuvers held in the Indian Ocean in December 2019, the statement says.

The level of interaction between the Navies of both countries is very high and should be developed further. This will be facilitated by new joint drills, which the Indian side proposes holding in the Baltic Sea. India's representative pointed out.

At their meeting, the Russian and Indian delegations also discussed bilateral interaction in building warships for the Indian Navy at Russian shipyards and holding their trials at Baltic Sea ranges. Currently, Russia's Yantar Shipyard on the Baltic coast in Kaliningrad has laid down two frigates for the Indian Navy, the press office reported.

Russia and India signed contracts in November 2018 on the delivery of four Project 11356 frigates. Under the deal, two frigates will be built at Russia's Yantar Shipyard on the Baltic coast (part of the United Shipbuilding Corporation) and the other two at India's Goa Shipyard Limited (GSL).

Project 11356 frigates are designed to deliver strikes against enemy surface ships and submarines in coastal and oceanic zones and fight air targets both independently and as part of a naval group. The warships of this type are armed with A-190 100mm artillery guns, striking missile and air defense systems, including Kalibr and Shtil weapons and torpedo armament. The frigates displace 3,620 tonnes, are 124.8 meters long, develop a speed of 30 knots and have an operating range of 4,850 miles. The frigates can carry a Ka-27 helicopter and its modification.

<https://tass.com/defense/1227925>

Plasma-developed new material fundamental to Internet of Things

QUT Professor Ken Ostrikov from the School of Chemistry and Physics and QUT Centre for Materials Science said the new material could be used to develop new transistor devices for electronics and photodetectors for such applications as fibre-optic communication systems and environmental sensing.

"Transistors are tiny electric switches that make up computer chips that run lighting devices such as LEDs, and photodetectors, which detect light of different colours and intensities," Professor Ostrikov said.

"These are all elements of sensing and communications devices in the Internet of Things and are the next generation of smart devices.

"The new material we have developed will enable smart devices to process information more quickly, and better talk to each other, make decisions, and take action. "Everything from space travel to healthcare, smart cities to our homes will potentially benefit from this material."

The new semi-conducting material was developed by using plasma (ionised gas) to separate layers of atomically thin semiconductors with oxygen atoms.

"It is normally very difficult to fit oxygen molecules between the layers so we used the plasma and the plasma generated electric fields to charge the oxygen molecules and then drive them to squeeze between the two layers, lifting the top layer away from the bottom one," he said.

"When separated, the two atomic layers become electrically insulated from each other and the electrons can flow along each 2-D layer without losing electrons to the neighbouring layer.

"This process resulted in new properties like strong photoluminescence and photocurrent which can be used in devices to give greater controllability and achievable currents, light doses and response speeds that are currently difficult to achieve.

"This new material could make Internet of Things and other devices more effective and rapid, and cheaper to produce."

The research article 2-D atomic crystal molecular superlattices by soft plasma intercalation was published in *Nature Communications*.

The collaborative project was co-led by QUT visiting researcher Professor Shaoqing Xiao from Jiangnan University and Professor Kostya (Ken) Ostrikov from the QUT School of Chemistry and Physics and QUT Centre for Materials Science.

It involved a team of researchers and students from Jiangnan University, co-mentored by professors Xiao and Ostrikov, and Professor Aijun Du from the QUT School of Chemistry and Physics and QUT Centre for Materials Science.

More information: Lufang Zhang et al. 2D atomic crystal molecular superlattices by soft plasma intercalation, *Nature Communications* (2020). [DOI: 10.1038/s41467-020-19766-x](https://doi.org/10.1038/s41467-020-19766-x)

Journal information: [Nature Communications](https://phys.org/news/2020-11-plasma-developed-material-fundamental-internet.html)
<https://phys.org/news/2020-11-plasma-developed-material-fundamental-internet.html>



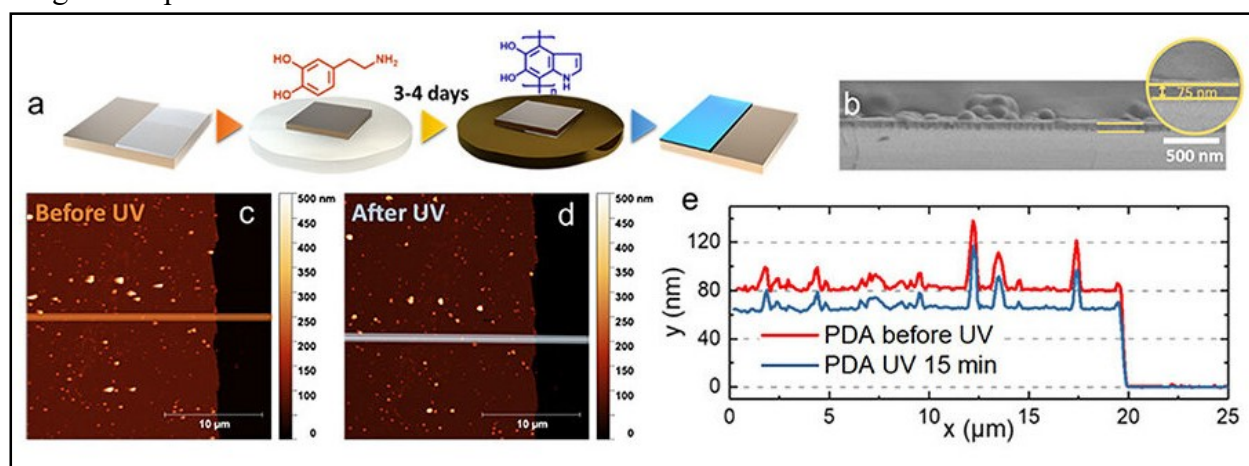
Credit: CC0 Public Domain

Ultraviolet light exposure enhances the protective ability of synthetic melanin

By Jodi Ackerman Frank

Melanin's high refractive index (RI) and broadband absorption capability contribute to the pigment's ability to protect against ultraviolet radiation (UV). These optical properties also contribute to the vibrant structural colors seen in birds and many other animals and plants.

Researchers believe UV light exposure influences the RI and absorption, as melanin undergoes chemical structural changes when exposed to UV light, but it remains unclear exactly what types of changes take place.



Credit: University of Akron

To provide insights, Li et al. measured the RI and changes in absorption of synthetic melanin thin films exposed to a broad spectral range, from UV to near-infrared waves (360–1700 nanometers). They found both the RI and absorption coefficient significantly increased after UV exposure, especially near 400 nanometers. The findings suggest the protective function of melanin is enhanced after intense UV exposure.

To generalize their study against the large family of melanin pigments, the researchers used two types of synthetic melanin: polydopamine and a more natural version called poly(dopamine–L-DOPA).

"Although the L-DOPA-based films had slightly higher reflective indices after UV light exposure, the consistency of the RI and absorption coefficient changes observed after exposure in both films was the most prominent finding, and we observed these changes through accurate measurements of refractive indices for the first time," said author Dr. Ali Dhinojwala, interim director of The University of Akron's School of Polymer Science and Polymer Engineering and H.A. Morton Professor of polymer science.

Applications of the research include a better understanding of the photoprotective behavior of natural melanin and the structural colors in animals and plants, as well as the possibility of designing synthetic melanin materials for advanced UV protection. The researchers plan to investigate other melanin chemistries in the same way.

More information: Weiyao Li et al. Characterization of broadband complex refractive index of synthetic melanin coatings and their changes after ultraviolet irradiation, *Applied Physics Letters* (2020). DOI: [10.1063/5.0024229](https://doi.org/10.1063/5.0024229)

Journal information: *Applied Physics Letters*

<https://phys.org/news/2020-11-ultraviolet-exposure-ability-synthetic-melanin.html>

Researchers create nanoscale slalom course for electrons

A research team led by professors from the Department of Physics and Astronomy have created a serpentine path for electrons, imbuing them with new properties that could be useful in future quantum devices.

Jeremy Levy, a distinguished professor of condensed matter physics, and Patrick Irvin, research professor, are coauthors of the paper "Engineered spin-orbit interactions in $\text{LaAlO}_3/\text{SrTiO}_3$ -based 1D serpentine electron waveguides," published in *Science Advances* on November 25.

"We already know how to shoot electrons ballistically through one-dimensional nanowires made from these oxide materials," explains Levy. "What is different here is that we have changed the environment for the electrons, forcing them to weave left and right as they travel. This motion changes the properties of the electrons, giving rise to new behavior."

The work is led by a recent Ph.D. recipient, Dr. Megan Briggeman, whose thesis was devoted to the development of a platform for "quantum simulation" in one dimension. Briggeman is also the lead author on a related work published earlier this year in *Science*, where a new family of electronic phases was discovered in which electrons travel in packets of 2, 3, and more at a time.

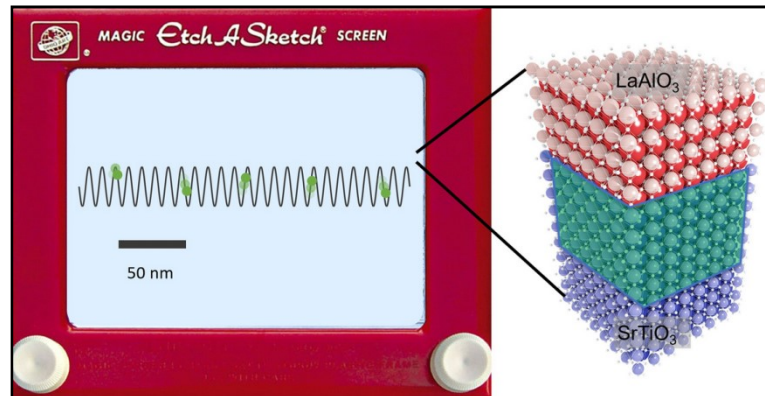


Illustration of sketched serpentine nanowires created from lanthanum aluminate and strontium titanate. The side-to-side motion of the electrons as they travel gives them additional properties that can be used to make quantum devices. Credit: Jeremy Levy

Electrons behave very differently when forced to exist along a straight line (i.e., in one dimension). It is known, for example, that the spin and charge components of electrons can split apart and travel at different speeds through a 1D wire. These bizarre effects are fascinating and also important for the development of advanced quantum technologies such as quantum computers. Motion along a straight line is just one of a multitude of possibilities that can be created using this quantum simulation approach. This publication explores the consequences of making electrons weave side to side while they are racing down and otherwise linear path.

One recent proposal for topologically-protected quantum computation takes advantage of so-called "Majorana fermions", particles which can exist in 1D quantum wires when certain ingredients are present. The $\text{LaAlO}_3/\text{SrTiO}_3$ system, it turns out, has most but not all of the required interactions. Missing is a sufficiently strong "spin-orbit interaction" that can produce the conditions for Majorana fermions. One of the main findings of this latest work from Levy is that spin-orbit interactions can in fact be engineered through the serpentine motion that electrons are forced to undertake.

In addition to identifying new engineered spin-orbit couplings, the periodic repetition of the serpentine path creates new ways for electrons to interact with one another. The experimental result of this is the existence of fractional conductances that deviate from those expected for single electrons.

These slalom paths are created using a nanoscale sketching technique analogous to an Etch A Sketch toy, but with a point size that is a trillion times smaller in area. These paths can be sketched

and erased over and over, each time creating a new type of path for electrons to traverse. This approach can be thought of as a way of creating quantum materials with re-programmable properties. Materials scientists synthesize materials in a similar fashion, drawing atoms from the periodic table and forcing them to arrange in periodic arrays. Here the lattice is artificial—one zig-zag of the motion takes place in a ten nanometer of space rather than a sub-nanometer atomic distance.

Levy, who is also director of the Pittsburgh Quantum Institute, stated that this work contributes to one of the main goals of the Second Quantum Revolution, which is to explore, understand, and exploit the full nature of quantum matter. An improved understanding, and the ability to simulate the behavior of a wide range of quantum materials, will have wide-ranging consequences. "This research falls within a larger effort here in Pittsburgh to develop new science and technologies related to the second quantum revolution," he said.

More information: "Engineered spin-orbit interactions in LaAlO₃/SrTiO₃-based 1D serpentine electron waveguides" *Science Advances* (2020). advances.sciencemag.org/lookup...1126/sciadv.aba6337

Journal information: [Science Advances](https://phys.org/news/2020-11-nanoscale-slalom-electrons.html) , [Science](https://phys.org/news/2020-11-nanoscale-slalom-electrons.html)
<https://phys.org/news/2020-11-nanoscale-slalom-electrons.html>



Fri, 27 Nov 2020

T-ray technology reveals what's getting under your skin

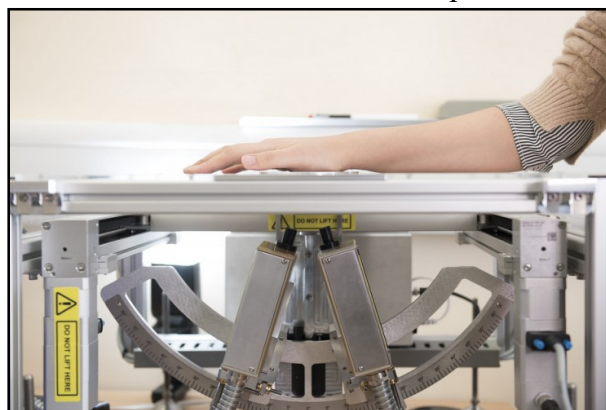
A new method for analyzing the structure of skin using a type of radiation known as T-rays could help improve the diagnosis and treatment of skin conditions such as eczema, psoriasis and skin cancer.

Scientists from the University of Warwick and The Chinese University of Hong Kong (CUHK) have shown that using a method that involves analyzing T-rays fired from several different angles, they can build a more detailed picture of the structure of an area of skin and how hydrated it is than current methods allow.

Their method is reported in *Advanced Photonics Research* and could provide a new tool for scientists and clinicians for characterizing the properties of skin in individuals, to assist in managing and treating skin conditions.

Terahertz (THz) radiation, or T-rays, sit in-between infrared and WiFi on the electromagnetic spectrum. T-rays can see through many common materials such as plastics, ceramics and clothes, making them potentially useful in non-invasive inspections. The low-energy photons of T-rays are also non-ionizing, making them very safe in biological settings including security and medical screening.

Only the T-rays passing through the outer layers of skin (stratum corneum and epidermis) before being reflected back can be detected, as those traveling deeper are attenuated too much. This makes T-ray imaging a potentially effective way of monitoring these outermost layers. To test this, terahertz light is focused onto the skin via a prism, to align the ray in a particular focal plane. Depending on the properties of the skin, that light will be reflected back slightly differently. Scientists can then compare the properties of the light before and after it enters the skin.



A demonstration of how the T-ray equipment can be used to scan an individual's skin. Credit: University of Warwick

There are limitations in standard THz reflection spectroscopy however, and to overcome these the scientists behind this new research instead used ellipsometry, which involves focusing T-rays at multiple angles on the same area of skin.

They successfully demonstrated that using ellipsometry they could accurately calculate the refractive index of skin (which determines how fast the ray travels through it) measured in two directions at right angles to each other. The difference between these refractive indices is termed birefringence—and this is the first time that the THz birefringence of human skin has been measured in vivo. These properties can provide valuable information on how much water is in the skin and enable the skin thickness to be calculated.

Professor Emma Pickwell-MacPherson, from the Department of Physics at the University of Warwick and the Department of Electronic Engineering at CUHK, said: "We wanted to show that we could do in-vivo ellipsometry measurements in human skin and calculate the properties of skin accurately. In ordinary terahertz reflection imaging, you have thickness and refractive index combined as one parameter. By taking measurements at multiple angles you can separate the two.

"Hydrated skin will have a different refractive index from dehydrated skin. For people with skin disorders, we'll be able to probe the hydration of their skin quantitatively, more so than existing techniques. If you're trying to improve skincare products for people with conditions like eczema or psoriasis, we would be potentially be able to make quantitative assessments of how the skin is improving with different products or to differentiate types of skin.

"For skin cancer patients, you could also use THz imaging to probe the skin before surgery is started, to get a better idea of how far a tumour has spread. Skin cancer affects the properties of the skin and some of those are unseen as they're beneath the surface."

Dr. Xuequan Chen, the study's first author and post-doctoral fellow from the Department of Electronic Engineering at CUHK, said: "T-rays have been known to be sensitive to the hydration level of skin. However, we point out that the cellular structure of the stratum corneum also reacts to the terahertz reflections. Our technique enables this structure property to be sensitively probed, which provides comprehensive information about the skin and it is highly useful for skin diagnosis."

To test their method, the researchers had volunteers place their arm on the imaging window of their T-ray equipment for 30 minutes, after acclimatizing to the ambient temperature and dryness of the laboratory. By holding their skin against the surface of the imaging window, they blocked water from escaping from their skin as perspiration, a process referred to as occlusion.

The researchers then made four measurements at right angles to each other every two minutes over half an hour, so they could monitor the effect of occlusion over time. Because T-rays are particularly sensitive to water, they could see a noticeable difference as water accumulated in the skin, suggesting that the method could show how effective a product is at keeping skin hydrated, for example.

Further research will look at improving the instrumentation of the process and how it might work as a practical device.

Professor Pickwell-MacPherson said: "We don't have anything that's really accurate for measuring skin that clinicians can use. Dermatologists need better quantitative tools to use, and use easily.

"If this works well you could go into a clinic, put your arm on a scanner, your occlusion curve would be plotted and a suitable product for your skin could be recommended. We could get more tailored medicine and develop products for different skin responses. It could really fit in with the current focus on tailored medicine."

More information: Xuequan Chen et al. Exploiting Complementary Terahertz Ellipsometry Configurations to Probe the Hydration and Cellular Structure of Skin In Vivo, *Advanced Photonics Research* (2020). DOI: [10.1002/adpr.202000024](https://doi.org/10.1002/adpr.202000024)
<https://phys.org/news/2020-11-t-ray-technology-reveals-skin.html>

Most lungs recover well after Covid-19: Study

The patients were examined by CT scan and a lung functional test. After three months, the researchers took stock, which revealed that the patients' lung tissue is recovering well

London: Lung tissue of patients who suffer severely from Covid-19 shows good recovery in most cases, according to a study.

The researchers at the Radboud University in the Netherlands found that the group which was referred by a GP did not recover as well as patients who were admitted to the hospital's Intensive Care Unit (ICU).

The study, published in the journal *Clinical Infectious Diseases*, included 124 patients who had recovered from acute Covid-19 infections.

The patients were examined by CT scan and a lung functional test. After three months, the researchers took stock, which revealed that the patients' lung tissue is recovering well.

Residual damage in the lung tissue was generally limited, and was most often seen in patients who were treated in the ICU, they said.

According to the study, the most common complaints after three months are fatigue, shortness of breath and chest pains.

"The patterns we see in these patients show similarities with recovery after acute pneumonia or acute respiratory distress syndrome (ARDS), in which fluid accumulates in the lungs," pulmonologist Bram van den Borst said.

"Recovery from these conditions also generally takes a long time. It is encouraging to see that lungs after Covid-19 infections exhibit this level of recovery," van den Borst said in a statement.

In the study, the patients were divided into three categories: a group who were admitted to the ICU, patients who were admitted to a nursing ward in the hospital, and those who could stay home but experienced persisting symptoms that eventually warranted a referral from their GP.

The study assessed how patients fared after three months, and revealed that the patients who were referred to the aftercare clinic by their GP showed the worst recovery in the following period, the researchers said.

This latter group of patients was referred because of their persisting symptoms, they said.

"However, it does seem that there is a clear subgroup of patients who initially experienced mild Covid-19 symptoms and later kept experiencing persistent long-term complaints and limitations," van den Borst explained.

"What is striking is that we barely found any anomalies in the lungs of these patients. Considering the variety and seriousness of the complaints and the plausible size of this subgroup, there is an urgent need for further research into explanations and treatment options," he said.

<https://www.hindustantimes.com/health/most-lungs-recover-well-after-covid-19-study/story-bJ8CUD5uLwcsCR4yJx6umK.html>



According to the study, the most common complaints after three months are fatigue, shortness of breath and chest pains.(ANI file photo)

India's first Covid-19 vaccine: Covaxin Phase-3 trial begins at AIIMS, key updates

- *AIIMS' Dr Srivastava was the first one to receive the shot*
- *The dose will be given to around 15,000 volunteers at the medical institute over the next few days*

India-made coronavirus vaccine Covaxin began its phase-three human clinical trial at AIIMS in New Delhi on Thursday with Dr M V Padma Srivastava, the chief of Neurosciences Centre at the premier institute, and three other volunteers receiving the first dose.

AIIMS' Dr Srivastava was the first one to receive the shot, which would be given to around 15,000 volunteers at the medical institute over the next few days, reports news agency *PTI*.

The first dose of 0.5 ml intramuscular injection was given to four volunteers. They were under observation for two hours and will be monitored for the next few days, the report said.

Dr Srivastava said, "Covaxin is the first indigenously-developed anti-coronavirus vaccine and on top of that, my institute is participating in the trial. I am honoured to be the first volunteer to receive the shot. I am happy to be a part of such a great cause. I am perfectly fine and I'm working."



The first dose of 0.5 ml intramuscular injection was given to four volunteers (Representative image). (REUTERS)

Coronavirus vaccine trail

As part of the trial application, a dose of 0.5 ml would be given on day 0 and on day 28, the report added.

The phase-three randomised double-blind placebo-controlled multi-centre trial would cover around 28,500 subjects aged 18 years and above. It would be conducted in around 25 sites across 10 states. The trial has already started at a few sites.

The Bharat Biotech has been given the permission for conducting phase-3 human clinical trials of the Covaxin from the Drugs Controller General of India (DCGI).

The safety and immunogenicity data of the phase one and two trials were submitted to the central drug regulator. The Hyderabad-based firm, while applying for phase-three trial, stated that the vaccine was well-tolerated in all dose groups and no serious adverse events have been reported.

The most common adverse event was pain at the injection site, which resolved transiently.

Covaxin shots reach Ahmedabad hospital

Earlier on Wednesday, a consignment of Covaxin, one of the coronavirus vaccine candidates, reached Sola civil hospital in Gujarat for the phase-III clinical trials.

The Sola civil hospital in Ahmedabad is one among the 130 centres across India where the third phase of clinical trials of Covaxin would be conducted, H G Koshia, Commissioner, Gujarat Food and Drug Control Administration (FDCA) said.

'Covaxin' is being developed by Bharat Biotech in collaboration with the Indian Council of Medical Research (ICMR).

Besides, Covaxin, four other vaccines are under different phases of clinical trial in India with the Serum Institute of India conducting phase-three trial of the Oxford-Astrazeneca COVID-19 vaccine while the indigenously developed vaccine by Zydus Cadila has completed phase-two clinical trial in the country.

Dr Reddy's Laboratories will soon start combined phase two and three clinical trials of the Russian COVID-19 vaccine Sputnik V in India. Also, Biological E. Ltd has started early phase 1 and 2 human trials of its COVID-19 vaccine candidate, officials had said last week.

Meanwhile, India recorded 44,489 fresh Covid-19 infections in a span of 24 hours and 524 deaths due to the infection, according to the Union Ministry of Health and Family Welfare on Thursday.

The overall cases in India now stand at 92,66,706, including 86,79,138 discharges and 4,52,344 active cases. The cumulative toll of the country has reached 1,35,223. *With agency inputs*

<https://www.livemint.com/news/india/india-s-first-covid-19-vaccine-covaxin-phase-3-trial-begins-at-aiims-key-updates-11606389911232.html>

