

July
2021

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 : 46 अंक : 150 31 जुलाई 2021

Vol.: 46 Issue : 150 31 July 2021



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

CONTENTS

S. No.	TITLE	Page No.
DRDO News		1-10
DRDO Technology News		1-5
1.	BHVS Nararyana Murthy appointed DG of DRDO's missiles and strategic systems	1
2.	DRDO gets new DG for Missiles & Strategic Systems	2
3.	डॉ BHVS नारायण मूर्ति DRDO मिसाइल और सामरिक प्रणालियों के DG बनाए गए	3
4.	DRDO pitches case to develop next-gen infantry combat vehicle for Army	4
COVID 19: DRDO's Contribution		6-9
5.	Dr Reddy's justifies 2DG price of ₹990 per sachet	6
6.	क्षेत्रीय अस्पताल में अगले हफ्ते से ऑक्सीजन उत्पादन शुरू	7
7.	महिला अस्पताल में 75 बेड के लिए बनेगा आक्सीजन प्लांट	8
8.	ऑक्सीजन की कमी होगी पूरी, एक हजार लीटर प्रति मिनट होगा उत्पादन	9
DRDO on Twitter		10-10
Defence News		11-24
Defence Strategic: National/International		11-24
9.	INS Tabar participates in exercise 'Indra Navy – 21'	11
10.	'इंद्र नेवी - 21' अभ्यास में आईएनएस तबर शामिल	12
11.	36th edition of India – Indonesia coordinated patrol	13
12.	Indian Army Chief rings Nepal's Chief of Army Staff, discusses defense cooperation	14
13.	DefExpo 2022 goes to Gandhinagar, focus on projecting India as manufacturing hub	15
14.	Ordnance factory in Tamil Nadu launches high-tech carbine 'TriCa'	16
15.	MIDHANI's new plants to make bulletproof vests, armoured vehicles	17
16.	India-China face-off: Line of no control	18
Science & Technology News		25-30
17.	ISRO-NASA joint satellite project NISER proposed to be launched early 2023: Jitendra Singh	25
18.	An effective strategy for protecting skyrmions in quantum computing devices	26
19.	Vanderbilt engineer the first to introduce low-power dynamic manipulation of single nanoscale quantum objects	27
20.	Engineers bend light to enhance wavelength conversion	28
COVID-19 Research News		30-30
21.	Early symptoms of Covid-19 vary with age and gender, finds UK study	30

THE TIMES OF INDIA*Sat, 31 July 2021***BHVS Nararyana Murthy appointed DG of DRDO's missiles and strategic systems***By Ch Sushil Rao*

Hyderabad: Distinguished Scientist and director of RCI BHVS Nararyana Murthy has been appointed director general, missiles and strategic system, DRDO, Hyderabad. Murthy succeeds MSR Prasad who retires on superannuation on July 31.

BHVS Nararyana Murthy is a distinguished defence scientist, renowned for his R&D in the indigenous design and development of advanced Avionics technologies for defence and aerospace applications in India. As director and programme director, he spearheaded Research Centre Imarat (RCI), an avionics laboratory of Dr APJ Abdul Kalam Missile Complex



Dr BHVS Nararyana Murthy

steering the design, development and delivery of Avionics and a wide range of missiles and guided weapon systems.

Murthy graduated in electronics and communication engineering from REC, Warangal, completed his MTech from JNTU, Hyderabad and received PhD in Computer Science from IIIT, Hyderabad. He joined DRDO in 1986. Murthy is the chief architect of advanced onboard computer (OBC) technologies for missile systems and other defence applications. His sustained contributions and technology leadership over the last three decades has been transformative for making India self-reliant in advanced Real Time Embedded Computers, mission computing systems and other avionics technologies, the defence ministry said.

He led the design and development of advanced Avionics for "Mission Shakti," India's first anti satellite missile test (A-SAT) and Long Range Missile Agni 5, elevating India into a league of select nations and strengthening indigenous defence capabilities. He played a vital role in the successful development and demonstration of avionics systems for BVRAAM Astra, QRSAM, Akash 1S, Akash NG, HSTDV, NGARM, Long Range Guided Bombs, BrahMos, ATGM Nag, HELINA, MPATGM, SANT, BMD, ANSP, Agni series of missiles and other guided weapon systems.

As project director, he led the conceptualization, design and development of the Smart Anti-Airfield Weapon (SAAW) and laid the foundation for Long Range Smart Guided systems with precision strike capabilities. As an onboard computer specialist and technology director, Dr Murthy significantly contributed in conceptualization, planning, design, development of advanced real-time computer technologies for various missiles, fighter aircrafts and for other strategic applications. He architected the development & production of single chip mission computer - System on Chip, and Integrated Avionics Module (IAM) bringing in quantum jump in miniaturization of Onboard Avionics for futuristic miniaturized smart weapon systems. His R&D

contributions had a major impact on the indigenization of critical aerospace and missile technologies.

For his distinguished contributions, he was conferred with honorary fellowship of computer society of India, elected as fellow of the Indian National Academy of Engineering (INAE) and Indian Society of Systems for Science and Engineering. Other prestigious awards conferred on Murthy include Rocket and Related Technologies Award by the Astronautical Society of India, Agni Award for Excellence in Self Reliance, DRDO Scientist of the Year Award, Path Breaking Research/Outstanding Technology Development Award and DRDO Performance Excellence Award.

<https://timesofindia.indiatimes.com/india/bhvs-nararyana-murthy-appointed-dg-of-drds-missiles-and-strategic-systems/articleshow/84895751.cms>

Telangana Today

Sat, 31 July 2021

DRDO gets new DG for Missiles & Strategic Systems

Hyderabad: Dr BHVS Narayana Murthy, distinguished scientist and Director, Research Centre Imarat (RCI), has been appointed as the Director General (DG), Missiles and Strategic Systems (MSS) at Defence Research and Development Organisation (DRDO), Hyderabad. Dr Murthy will replace distinguished scientist MSR Prasad in the role.

Known for his work in indigenous design and development of advanced avionics technologies, Dr Murthy joined DRDO in 1986. As the Director and Programme Director at the RCI, he steered the design, development and delivery of avionics and missiles.

A graduate in Electronics and Communication Engineering from REC Warangal, he holds an M Tech from JNTU, Hyderabad and a Ph D in Computer Science from IIIT Hyderabad.

The chief architect of advanced onboard computer technologies for missile systems, Dr Murthy led the avionics development for Mission Shakti, India's first Anti-Satellite Missile Test (A-SAT) and Agni 5 missile. He also played a vital role in the avionics systems for several missile systems like Akash NG, ATGM Nag, BrahMos, BVRAAM Astra among others, a press release said.

Dr Murthy also led the conceptualisation and development of Smart Anti-Airfield Weapon (SAAW) and was responsible for the development of advanced real-time computer technologies for various missiles and fighter aircraft.

<https://telanganatoday.com/drdo-gets-new-dg-for-missiles-strategic-systems>

डॉ BHVS नारायण मूर्ति DRDO मिसाइल और सामरिक प्रणालियों के DG बनाए गए

वैज्ञानिक डॉ बीएचवीएस नारायण मूर्ति को रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) के मिसाइल और स्ट्रैटेजिक का डायरेक्टर जनरल नियुक्त किया गया है। शुक्रवार को उनकी नियुक्ति की जानकारी दी गई है।

Edited By Ravindra Singh

नई दिल्ली: वैज्ञानिक डॉ बीएचवीएस नारायण मूर्ति को रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) के मिसाइल और स्ट्रैटेजिक का डायरेक्टर जनरल नियुक्त किया गया है। शुक्रवार को उनकी नियुक्ति की जानकारी दी गई है। डॉ नारायण मूर्ति हैदराबाद में एक मिसाइल प्रयोगशाला के निदेशक के तौर पर भी काम कर रहे हैं। अब उनको ये नई जिम्मेदारी भी दी गई है। बीएचवीएस नारायण मूर्ति उत्कृष्ट वैज्ञानिक एवं निदेशक आरसीआई, 26 जुलाई 2018 से विशिष्ट वैज्ञानिक (डीएस) के रूप में पदोन्नत किये गए हैं। वे प्रसिद्ध एयरोस्पेस वैज्ञानिक हैं जो भारत में मिसाइल प्रौद्योगिकी में अपने आर एवं डी के लिए और एयरोस्पेस उद्योगों की प्रगति की ओर अपने निरंतर योगदान के लिए प्रख्यात हैं।



डॉ बीएचवीएस नारायण मूर्ति (Photo Credit: आईएनएस)

डॉ बीएचवीएस नारायण मूर्ति डॉ. एपीजे अब्दुल कलाम द्वारा स्थापित अनुसंधान केंद्र इमारात, एवियोनिक्स प्रयोगशाला में निदेशक के रूप में नेविगेशन, एंबेडेड कंप्यूटरों, नियंत्रण, मार्गदर्शन, अनुकरण, आरएफ और इंफ्रारेड इमेजिंग सीकर्स, भारतीय मिसाइल और अन्य रक्षा कार्यक्रमों की दूरमापी के गंभीर क्षेत्र में वैमानिकी तकनीकी के विकास के लिए अनुवाई कर रहे हैं। पिछले तीन दशकों में, उन्होंने नूतन दोष सहनीय योजनाओं सहित ऑनबोर्ड कंप्यूटरों, मिसाइल लांच प्रोसेसरों, वास्तविक समय मिशन सॉफ्टवेयरों के डिजाइन, विकास और डिलिवरी तथा राष्ट्रीय महत्व के मिशन हेतु चिप पर सिस्टम की ओर महत्वपूर्ण राष्ट्रीय योगदान दिया है।

डॉ बीएचवीएस नारायण मूर्ति एंबेडेड कंप्यूटरों और अन्य महत्वपूर्ण वैमानिकी उप-प्रणालियों के विकास के पथप्रदर्शक हैं जिनका देश की प्रथम आईसीबीएम श्रेणी अग्नि-5 मिसाइल के सभी तीन मिशनों में सफलतापूर्वक उड़ान परीक्षण किया है जिसकी रेंज 5000किमी है। उनके तकनीकी योगदान ने देश के तकनीकी नक्शे के साथ-साथ रक्षा की तैयारी पर एक अमिट छाप छोड़ी है। परियोजना निदेशक के रूप में श्री मूर्ति ने सशस्त्र बलों को सशक्त करने वाले स्मार्ट एंटी एयरफील्ड हथियार विकसित किए। उन्होंने ऑनबोर्ड वैमानिकी के लघुरूप में बहुत बड़ा परिवर्तन लाने के लिए लघु सैटनेव रिसिवरों और चिप पर सिस्टम (एसओसी) का विकास और निर्माण नेतृत्व किया।

डॉ बीएचवीएस नारायण मूर्ति ने आईईसी, वारांगल से इलेक्ट्रॉनिक्स एवं कम्प्यूनिकेशन इंजीनियरिंग में स्नातक किया है और जेएनटीयू, हैदराबाद से एम.टैक की है। अंतरिक्ष इंजीनियरिंग में उनके महत्वपूर्ण जीवन पर्यान्त योगदान के लिए श्री मूर्ति को इंजीनियरिंग की भारतीय राष्ट्रीय अकादमी के फैलो के रूप में

शामिल किया गया। रक्षा आर एवं डी को उनके अग्रणी योगदान के लिए भारतीय वैमानिकी सोसायटी द्वारा उन्हें राकेट और संबंधित प्रौद्योगिकी पुरस्कार प्रदान किया गया है। दल के नेता के रूप में उन्हें आत्मनिर्भरता के क्षेत्र में उत्कृष्टता के लिए प्रतिष्ठित अग्नि पुरस्कार दिया गया। वे डीआरडीओ के वर्ष के वैज्ञानिक पुरस्कार, पथ से हटकर अनुसंधान/उत्कृष्ट तकनीकी विकास पुरस्कार और डीआरडीओ कार्यनिष्पादन उत्कृष्टता पुरस्कार के प्राप्तकर्ता भी हैं।

<https://www.newsnationtv.com/india/news/dr-bhys-narayana-murthy-has-been-appointed-as-dg-of-drdo-missile-and-strategic-systems-198457.html>

THEWEEK

Sat, 31 July 2021

DRDO pitches case to develop next-gen infantry combat vehicle for Army

The Indian Army is keen to get 1,750 FICVs, worth Rs 60,000 crore

By Pradip R Sagar

As the Indian Army's hunt for acquiring 1,750 Future Infantry Combat Vehicles (FICVs) continues, the country's premier defence research agency, the DRDO, has pitched its case for the key project. The FICV is going to be the mainstay of the Indian Army's mechanised forces.

The Indian Army is keen to get 1,750 FICVs, worth Rs 60,000 crore, which will eventually replace the 1980s-era Soviet-designed BMP-2s currently in use with the 49 battalions of the Mechanised Infantry. These BMPs were manufactured by the Ordnance Factory Medak in Telangana under licence production. And the Army has plans to replace the current BMP-2 infantry combat vehicles by 2025.

According to a top official, the Army is conceiving the project under the strategic partnership route, in which the Indian vendors can collaborate with foreign companies. But the DRDO is pitching to get it done through its Combat Vehicles Research and Development Establishment, the main laboratory involved in the development of armoured fighting vehicles. DRDO believes that the CVRDE has the core competency in developing the required technology. Notably, the CVRDE, which is based at Avadi in Chennai, is the developer of India's indigenous Arjun tank.

The key officials of DRDO are having rounds of meetings and giving presentations to the Army and the ministry of defence officials in an attempt to convince them about their capabilities to develop such a platform.

"I believe that the DRDO with the help of Army Design Bureau (ADB) can develop the Future Infantry Combat Vehicle. Once the design is finalised, private industry can be selected as a production agency. Ultimately, private industry will make the tank," said a senior defence official, while adding that the Army Design Bureau should work in tandem with CVRDE to monitor the development of the new armoured vehicle.

The Army Design Bureau is mandated to be the facilitator for research and development efforts and initiation of procurement of weapons and equipment required by the Indian Army. And it acts as a central repository of technical know-how for the Army and collates operational requirements



A concept design for the FICV from Tata Motors | Tata Motors

from the field formations and brings it forward for deliberations with DRDO, OFB, defence public sector units, industry and academia.

Defence scientists maintained as the FICV is the future main battle tank and the DRDO has all the technology under its next-generation main battle tank project, they are hopeful that the Army Design Bureau should join hands with DRDO and both will share their expertise.

"Indirectly, it will be SP route only. I still believe that FICV will come to DRDO, and we are ready with technology. If we get [contract], in another four years, we are confident to deliver the tank to the Army," says a key DRDO official. It is learnt that several top officials of the mechanised force of the Indian Army are also recommending the FICV should come to the DRDO.

In June, the Army issued a request for information (RFI) under the Make-in-India initiative for acquiring 1,750 FICVs. This was the third attempt in over a decade by the Army as the first formal process was initiated in 2009 by the Mechanised Infantry directorate. The FICV project was first envisaged in the mid-2000s. In 2016, the project had hit a hurdle after a series of complaints by rival competitors over cost issues. And only after the independent expert monitors gave a go-ahead in 2017, did the Army restart the process.

The dispute over payment for the project between the Army and the MoD also delayed the project.

As per the Army's new RFI, out of the total quantity of FICVs, around 55 per cent is going to be the 'gun version' and the balance would be specialist vehicles, which will have mini-drones and kamikaze drones. The Army also wants such vehicles should be equipped with at least a 30mm main gun, anti-tank missiles and other fire power, besides being capable of carrying at least eight soldiers.

But defence officials believe that even if the project gets the go-ahead in the next few months, the induction of the system into the Army may not be possible before six to seven years.

<https://www.theweek.in/news/india/2021/07/30/drdo-pitches-case-to-develop-next-gen-infantry-combat-vehicle-for-army.html>

COVID 19: DRDO's Contribution

BusinessLine

Sat, 31 July 2021

Dr Reddy's justifies 2DG price of ₹990 per sachet

Says supplying bigger quantity to States with heavier Covid case load

By G Naga Sridhar

Pharma major Dr Reddy's Laboratories Ltd has justified the pricing of its oral antiviral drug for Covid-19 patients, 2-Deoxy-D-glucose (2DG), developed jointly with Defence Research and Development Organisation (DRDO). The drug is being sold commercially at ₹990 per sachet.

The Hyderabad-based company's response assumes significance as concerns over 2DG's "high" price had been raised in Parliament. The Centre had responded saying pricing was done 'solely' by Dr Reddy's and DRDO gets only 2 per cent royalty for its contribution in developing the product.

When contacted by *Business Line* on the rationale behind pricing, a company spokesperson said, "We offer the product to government institutions at a subsidised rate of ₹595 per sachet (excluding taxes), which constitutes a nearly 40 percent subsidy."

"Our aim has been to ensure widest availability and accessibility to hospitals all over India and to all sections of the public," the spokesperson added.

Process

"The has a purity of 99.5 percent and has received emergency use approval after clinical trials in India. What distinguishes 2DG is its potential to inhibit tumour cell growth, viral infection and inflammation," the company said.

Subsidised pricing

On the quantum of demand and supply of the drug, the company said its production and supply 'fully meet' current demand for 2DG. It has made a dedicated microsite and e-mail ID available to respond to queries on availability and orders on a real-time basis.

"We are supplying bigger quantities of 2DG stock to States that are currently witnessing higher loads of Covid-19 cases. Through measures such as subsidised pricing, we are ensuring that 2DG serves patient needs in every part of India," it added.

At present, Dr Reddy's is working on making the product available to mild Covid-19 patients. 2DG is being seen as a vital drug for Covid patients as it 'addresses' the problem of lower oxygen levels in Covid-19 patients

<https://www.thehindubusinessline.com/news/national/dr-reddys-justifies-2dg-price-of-990-per-sachet/article35638629.ece>



क्षेत्रीय अस्पताल में अगले हफ्ते से ऑक्सीजन उत्पादन शुरू

सोलन: जिले के पहले सरकारी ऑक्सीजन प्लांट से अगले सात दिनों में ऑक्सीजन उत्पादन शुरू हो जाएगा। क्षेत्रीय अस्पताल में शुक्रवार को हाइटेक पीएसए ऑक्सीजन जनरेटर प्लांट स्थापित हो गया है। शुक्रवार को ऑक्सीजन उत्पादन मशीनरी, टैंक और अन्य सामान पहुंच गया है। मशीनरी लगने के तुरंत बाद प्लांट शुरू हो जाएगा। खास बात यह है कि डीआरडीओ के तैयार इस प्लांट में ऑक्सीजन उत्पादन की क्षमता एक मिनट में एक हजार लीटर की होगी। इससे जिले के अन्य अस्पतालों में भी ऑक्सीजन की कमी को दूर किया जाएगा।

इस प्लांट के साथ क्षेत्रीय अस्पताल के सभी वार्ड जुड़ेंगे और इसके लिए 190 प्वाइंट स्थापित किए जाएंगे। अस्पताल प्रशासन ने इस कार्य के लिए 96.56 लाख का प्रस्ताव बनाकर उच्चाधिकारियों को भेजा है। अनुमति के

बाद यह कार्य जल्द पूरा होगा। अस्पताल प्रशासन को ऑक्सीजन सिलिंडर रिफिल करवाने के लिए बार-बार प्लांट नहीं जाना पड़ेगा। टाटा कंपनी के विशेषज्ञों ने इसे अस्पताल में स्थापित किया है। ऑक्सीजन प्लांट के शुरू होने के बाद कोविड सहित सांस की तकलीफ झेल रहे मरीजों को काफी फायदा होगा। क्षेत्रीय अस्पताल सोलन के चिकित्सा अधीक्षक डॉ. एसएल वर्मा ने बताया कि इस प्लांट से आगामी सात दिनों में ऑक्सीजन का उत्पादन शुरू होगा। यह जिले का पहला सरकारी ऑक्सीजन प्लांट है।

स्वचालित होगा प्लांट

पीएसए ऑक्सीजन प्लांट पूरी तरह से स्वचालित है। इस प्लांट के टैंकों में ऑक्सीजन भरने के बाद से खुद बंद हो जाएंगे। टैंक में ऑक्सीजन कम होने के बाद ऑक्सीजन का उत्पादन भी खुद शुरू हो जाएगा।

<https://www.amarujala.com/himachal-pradesh/solan/oxygen-plant-to-be-functional-in-solan-hospital-nest-week-solan-news-sml3786665178>



सोलन क्षेत्रीय अस्पताल में ऑक्सीजन प्लांट स्थापित करते हुए। संवाद - फोटो : SOLAN

महिला अस्पताल में 75 बेड के लिए बनेगा आक्सीजन प्लांट

मुरादाबाद: कोरोना की तीसरी लहर से लोगों की जान बचाने के लिए प्रशासन लगातार प्रयास कर रहा है। यूपी मेडिकल सर्विसेज कारपोरेशन जिला महिला अस्पताल में 78 बेड के लिए आक्सीजन प्लांट लगाएगा। इस तरह जिला संयुक्त चिकित्सालय में दो आक्सीजन प्लांट हो जाएंगे।

कोरोना की तीसरी लहर से जंग लड़ने के लिए जिले में कुल छह आक्सीजन प्लांट लगने हैं। जिला पुरुष अस्पताल में पीएम केयर फंड से आक्सीजन प्लांट लग रहा है। प्लांट लगाने की जिम्मेदारी डीआरडीओ को दी गई है। यह प्लांट



100 बेडों को आक्सीजन की सप्लाई दे सकेगा। जिला अस्पताल में फाउंडेशन तैयार हो गया है। खुशी की बात यह है कि जिला महिला अस्पताल में भी 78 बेडों को आक्सीजन देने के लिए प्लांट लगना है। इस तरह जिला संयुक्त चिकित्सालय में दो आक्सीजन प्लांट हो जाएंगे। इसके अलावा देहात में मूढापांडे सामुदायिक स्वास्थ्य केंद्र में टोरेंट गैस कंपनी आक्सीजन प्लांट लगा रही है। डिलारी और शरीफनगर(ठाकुरद्वारा) सीएचसी में विधायक निधि की धनराशि से आक्सीजन प्लांट लग रहा है। प्लांटों के लिए फाउंडेशन बना लिए गए हैं। डिलारी, मूढापांडे और शरीफनगर के प्लांट आ चुके हैं। कुंदरकी में प्लांट लगने में सबसे अधिक विलंब हो रहा है। यहां प्लांट लगाने की जिम्मेदारी दीवान शुगर मिल, अगवानपुर की है। मुख्य विकास अधिकारी आनंद ने बताया कि जिले में छह आक्सीजन प्लांट लगने हैं। इनमें डिलारी, मूढापांडे और शरीफनगर के प्लांट जल्द शुरू होंगे। जिला पुरुष अस्पताल में प्लांट लगाए जाने का काम तेजी से हो रही है। महिला अस्पताल में भी दूसरी प्लांट लगना है। इस संबंध में दो दिन पहले ही पत्र मिला है।

मुरादाबाद में बनेंगे छह आक्सीजन प्लांट

प्लांट का स्थान बनवाने वाली संस्था

जिला पुरुष अस्पताल पीएम केयर फंड

जिला महिला अस्पताल यूपी मेडिकल सर्विसेज कारपोरेशन डिलारी: प्राथमिक स्वास्थ्य केंद्र (पीएससी) विधायक निधि

कुंदरकी: सामुदायिक स्वास्थ्य केंद्र (सीएचसी) दीवान शुगर मिल, अगवानपुर

शरीफनगर: प्राथमिक स्वास्थ्य केंद्र (पीएचसी) विधायक निधि

मूढापांडे: प्राथमिक स्वास्थ्य केंद्र (पीएचसी) टोरेंट गैस, कंपनी

<https://www.jagran.com/uttar-pradesh/moradabad-city-oxygen-plant-to-be-built-for-75-beds-in-womens-hospital-21879812.html>

ऑक्सीजन की कमी होगी पूरी, एक हजार लीटर प्रति मिनट होगा उत्पादन

कोविड 19 में ऑक्सीजन की किल्लत झेल चुके जिले के सबसे बड़े सआदत अस्पताल को 15 अगस्त से 275 (डी साइज) के सिलेंडर प्रतिदिन ऑक्सीजन प्लांट की सौगात मिल सकेगी। पीएम केयर फंड के तहत टोंक सआदत अस्पताल में नए ऑक्सीजन प्लांट के निर्माण का कार्य प्रगति पर है।

By Pawan Sharma

टोंक. कोविड 19 में ऑक्सीजन की किल्लत झेल चुके जिले के सबसे बड़े सआदत अस्पताल को 15 अगस्त से 275 (डी साइज) के सिलेंडर प्रतिदिन ऑक्सीजन प्लांट की सौगात मिल सकेगी। पीएम केयर फंड के तहत टोंक सआदत अस्पताल में नए ऑक्सीजन प्लांट के निर्माण का कार्य प्रगति पर है। इस निर्माण कार्य को पूरा होने बाद ऑक्सीजन प्लांट की विधिवत शुरुआत 15 अगस्त तक हो जाएगी।

एनएचएआई व डीआरडीओ करेगा स्थापित:

पीएम केयर फंड की योजना के तहत टोंक सआदत अस्पताल में ट्रोमा यूनिट के सामने अस्पताल प्रशासन की ओर से ऑक्सीजन जनरेशन प्लांट के लिए जमीन आवंटित की गई है। इस ऑक्सीजन जनरेशन प्लांट के लिए सिविल निर्माण कार्य एनएचएआई की ओर से कराया जा रहा है।

एनएचएआई की ओर से सिविल और इलेक्ट्रिकल कार्य किया जाएगा। इस कार्य के पूरा होने के बाद स्वास्थ्य एवं परिवार कल्याण मंत्रालय के अंतर्गत ऑक्सीजन प्लांट की मशीनरी सहित अन्य संसाधन का काम डिफेंस रिसर्च एंड डवलपमेंट ऑर्गेनाइजेशन (डीआरडीओ) की ओर से किया जाएगा।

प्रदेश में होंगे 51 ऑक्सीजन प्लांट स्थापित:

स्टेट पब्लिक हेल्थ कॉर्डिनेटर डॉ रोशन मेंडे ने बताया कि राजस्थान में कुल 51 ऑक्सीजन प्लांट पीएम केयर फंड के तहत स्वीकृत किए गए हैं। डॉ रोशन मेंडे ने सआदत अस्पताल टोंक के डिप्टी कंट्रोलर डॉ बीएल मीणा के साथ ऑक्सीजन प्लांट के निर्माण कार्य का निरीक्षण किया।

उन्होंने बताया कि इस ऑक्सीजन प्लांट के लिए उचित स्थान पर जमीन आवंटन में देरी के कारण निर्माण कार्य विलम्ब से शुरू हो पाया है। उन्होंने बताया कि अब यह निर्माण कार्य पूरा होने के बाद 15 अगस्त से इस प्लांट से ऑक्सीजन उत्पादन शुरू हो जाएगा। इस ऑक्सीजन प्लांट से 1000 लीटर ऑक्सीजन का प्रति मिनट उत्पादन होगा। प्लांट से पाइप लाइन के जरिए सीधे अस्पताल में मरीजों के बेड तक ऑक्सीजन पहुंचाया जाएगा।

DRDO on Twitter



ANI @ANI · 18h

Scientist Dr BHVS Narayana Murthy has been appointed as the Director-General of Defence Research and Development Organisation (DRDO)'s Missile and Strategic Systems.

He is also the Director of a missile laboratory in Hyderabad





Press Information Bureau
Government of India

Ministry of Defence

Fri, 30 July 2021 9:26AM

INS Tabar participates in exercise 'Indra Navy – 21'

The 12th edition of exercise INDRA NAVY, a biennial bilateral maritime exercise between Indian Navy and Russian Navy was held in the Baltic Sea from 28 to 29 July 2021. Initiated in 2003, Ex INDRA NAVY epitomises the long-term strategic relationship between the two navies. This exercise was undertaken as part of the visit of INS Tabar to St Petersburg, Russia to participate in the 325th Navy Day celebrations of the Russian Navy.

INDRA NAVY has matured over the years with increase in scope, complexity of operations and level of participation. The primary aim of this year's edition is to further consolidate inter-operability built up by the two Navies over the years and also to enhance understanding and procedures for multi-faceted maritime operations. The scope of this edition includes wide-ranging and diverse activities across the spectrum of maritime operations.

The Indian Navy was represented by the stealth Frigate INS Tabar whilst the Russian Federation Navy was represented by Corvettes RFS Zelyony Dol and RFS Odintsovo of the Baltic Fleet.

The exercise was progressed over two days and included various facets of fleet operations such as anti-air firings, underway replenishment drills, helicopter ops, boarding drills and seamanship evolutions.

Exercise INDRA NAVY-21, being conducted despite the constraints imposed by the pandemic, enables further strengthen mutual confidence, inter-operability and enable sharing of best practices between both Navies. The exercise is another milestone in strengthening cooperation between the two navies and reinforce the long-standing bond of friendship between the two countries.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1740558>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Fri, 30 July 2021 9:26AM

‘इंद्र नेवी - 21’ अभ्यास में आईएनएस तबर शामिल

भारत और रूस की नौसेनाओं के बीच 12वां ‘इंद्र नेवी’ अभ्यास बाल्टिक सागर में 28 और 29 जुलाई, 2021 को आयोजित किया गया। यह सैन्याभ्यास हर दो वर्ष बाद भारत और रूस की नौसेनाओं के बीच किया जाता है। ‘इंद्र नेवी’ अभ्यास की शुरुआत 2003 में की गई थी, जो दोनों देशों की नौसेनाओं के बीच मौजूद दीर्घकालीन रणनीतिक सम्बंधों का परिचायक है। उल्लेखनीय है कि रूस के सेंट पीटर्सबर्ग में रूसी नौसेना का 325वां नौसेना दिवस मनाया जा रहा था, जिसमें शामिल होने के लिये आईएनएस तबर जब वहां पहुंचा, तो यह सैन्याभ्यास किया गया।

‘इंद्र नेवी’ अभ्यास कई वर्षों से होता रहा है और इस दौरान वह परिपक्व हो चुका है। अभ्यास के इतने वर्षों में उसके दायरे, परिचालन की जटिलताओं और भागीदारी के स्तर में बढ़ोतरी हो चुकी है। इस वर्ष के अभ्यास का प्रमुख उद्देश्य है कि इतने वर्षों के दौरान दोनों देशों की नौसेनाओं ने परिचालन की जो आपसी समझ विकसित की है, उसे और बढ़ाया जाये तथा बहुस्तरीय समुद्री गतिविधियों में तेजी लाई जाये। इस अभ्यास में समुद्री गतिविधियों के सिलसिले में विस्तृत और विभिन्न गतिविधियों को भी शामिल किया गया।

भारतीय नौसेना का प्रतिनिधित्व स्टेलथ फ्रिगेट आईएनएस तबर ने किया, जबकि रूसी संघ की नौसेना की तरफ से कॉरवेट्स आरएफएस ज़ेलायनी दोल और आरएफएस ऑदिनत्सोवो ने हिस्सा लिया। ये दोनों जहाज बाल्टिक बेड़े के हैं।

अभ्यास दो दिन चला, जिसमें जहाज पर किये जाने वाले विभिन्न पहलू शामिल थे। इनमें हवा में मार करने, पुनः पूर्ति पहुंचाने का अभ्यास, हेलीकॉप्टर परिचालन, जहाज पर सवार होने का अभ्यास और जहाज के संचालन, तैयारी, तैनाती और मोर्चाबंदी का अभ्यास शामिल था।

महामारी की बाध्यताओं के बावजूद ‘इंद्र नेवी - 21’ अभ्यास किया गया, जिसकी बदौलत दोनों देशों की नौसेनाओं में आपसी विश्वास को मजबूती मिली तथा मिलकर गतिविधियों को संचालित करने और उत्कृष्ट व्यवहारों को साझा करने में मदद मिली। यह अभ्यास दोनों देशों की नौसेनाओं के आपसी सहयोग को सुदृढ़ करने का एक और मील का पत्थर है तथा इससे दोनों देशों के बीच दीर्घकालीन मैत्री संबंध और मजबूत हुये हैं।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1740586>



Press Information Bureau
Government of India

Ministry of Defence

Fri, 30 July 2021 5:53PM

36th edition of India – Indonesia coordinated patrol

Indian Naval Ship (INS) Saryu, an indigenously built Offshore Patrol Vessel is undertaking coordinated patrol (CORPAT) with Indonesian Naval Ship KRI Bung Tomo from 30 to 31 July 2021. The 36th edition of CORPAT between India and Indonesia will also witness participation of Maritime Patrol Aircraft from both nations. The exercise, being conducted as a ‘non-contact, at sea only’ exercise in view of COVID-19 pandemic, highlights the high degree of mutual trust and confidence, synergy and cooperation between the two friendly navies.



India and Indonesia have been carrying out Coordinated Patrols along the International Maritime Boundary Line (IMBL) twice a year since 2002, with an aim of keeping this vital part of the Indian Ocean Region safe and secure for commercial shipping, international trade and conduct of legitimate maritime activities. CORPATs help build understanding and interoperability between navies, and facilitate institution of measures to prevent and suppress Illegal Unreported Unregulated (IUU) fishing, drug trafficking, maritime terrorism, armed robbery and piracy.

As part of Government of India’s vision of SAGAR (Security And Growth for All in the Region), Indian Navy has been proactively engaging with countries in the Indian Ocean Region to enhance maritime security in the region. India and Indonesia have traditionally enjoyed a close and friendly relationship covering a wide spectrum of activities and interactions, which have strengthened over the years. Maritime interactions have been growing steadily between the two navies with frequent port visits, bilateral exercises and training exchanges.

The 36th edition of IND-INDO CORPAT seeks to bolster the maritime cooperation between the two navies and forge strong bonds of friendship across the Indo Pacific.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1740798>

Indian Army Chief rings Nepal's Chief of Army Staff, discusses defense cooperation

Army's Chief General Naravane had earlier held a video telephonic interaction with Lieutenant General Charalampos Lalousis, Chief of Hellenic Army General Staff

By Zaini Majeed

Indian Army Chief, General MM Naravane, on Friday held a telephonic dialogue with Nepal's Chief of Army Staff, Purna Chandra Thapa wherein the two counterparts discussed aspects of strengthening the mutual defense cooperation and the bilateral military ties to enhance the relationship between the forces of the two neighbouring countries.

Army's Chief Naravane had earlier held a video telephonic interaction with Lieutenant General Charalampos Lalousis, Chief of Hellenic Army General Staff, Greece, and had also held an in-person meeting with the Commander of US Special Operations Command, General Richard D. Clarke where the two discussed issues



IMAGE: ANI

of mutual interests. General Naravane and General Clarke also deliberated on the evolving situation in war-torn Afghanistan, sources revealed. General Clarke's meeting with the Indian Army Chief was scheduled just two days ahead of the planned visit of the US Secretary of State Antony Blinken. Clarke held talks with the key Indian defense and US embassy officials.

Clarke laid wreath at India's National War Memorial

Clarke had honoured India's fallen service members by laying a wreath at the National War Memorial. "We are proud to recognize the efforts of all those who've fought and defended India," Clarke said. "Laying this wreath reminds us of what our respective countries have given to protect our ways of life. We thank India's service members who've made the ultimate sacrifice and we appreciate the work of all those who protect India today." In the meeting with Indian defense officials, the latter discussed ways for the US and India to continue working with mutual cooperation to improve defense partnerships and grow interoperability between the two nations. "Our partnership with India is vital in the Indo-Pacific, and our team helps provide security throughout the region," Clarke had said.

<https://www.republicworld.com/india-news/general-news/indian-army-chief-rings-nepals-chief-of-army-staff-discusses-defense-cooperation.html>

DefExpo 2022 goes to Gandhinagar, focus on projecting India as manufacturing hub

The biennial show will be held in Gandhinagar from March 11-13, the department of defence production announced on Friday

By Rahul Singh

India's flagship military exhibition, DefExpo, will be held at Gandhinagar in Gujarat in March 2022, with a focus on projecting the country as an emerging defence manufacturing hub, one of the top priorities for the government in the defence sector, officials familiar with the developments said.

The biennial show will be held in Gandhinagar from March 11-13, the department of defence production announced on Friday. It comes at a time when the government has sharpened its focus on promoting self-reliance in the defence manufacturing sector and positioning India as an exporter of military hardware.



File photo: Uttar Pradesh Chief Minister Yogi Adityanath checks a gun held by Defence Minister Rajnath Singh at the 11th edition of DefExpo in Lucknow. (Nand Kumar / PTI)

In May, the government notified a list of 108 defence items that cannot be imported by the armed forces with the ban kicking off from December 2021. The list, called the 'positive indigenisation list', will be implemented progressively from December 2021 to December 2025.

This was the second such list to be notified by the government in less than a year. In August 2020, the government prepared a list of 101 items on which there would be an embargo on import to give a push to Prime Minister Narendra Modi's 'Atmanirbhar Bharat Abhiyan' (self-reliant India movement). The embargo for items in the first list, then called 'negative import list', kicked in for different items last year and will run through till 2025.

DefExpo was traditionally held in Delhi until 2014 after which it has seen a string of new venues - Goa (2016), Chennai (2018) and Lucknow (2020). The venue was shifted to Goa when late Manohar Parrikar was the defence minister, it moved to Chennai when Nirmala Sitharaman held the portfolio and it was staged in Lucknow with Rajnath Singh as the defence minister.

Defence manufacturing firms from across the world participated in the five-day mega event held in Lucknow last year. Prime Minister Narendra Modi inaugurated DefExpo-2020, attended by ministers from almost 40 foreign countries.

From raising foreign direct investment (FDI) in defence manufacturing to creating a separate budget for buying locally made military hardware and notifying two lists of weapons/equipment that cannot be imported, the government has taken a raft of measures to boost self-reliance in the defence sector over the last two years.

The first list included artillery guns, missile destroyers, ship-borne cruise missiles, light combat aircraft, light transport aircraft, long-range land-attack cruise missiles, communication satellites, basic trainer aircraft, multi-barrel rocket launchers, a variety of radars, assault rifles, sniper rifles, mini-UAVs and different types of ammunition.

The second list consists of several military systems including specified types of helicopters, next-generation corvettes, airborne early warning and Control (AEW&C) systems, tank engines, medium power radar for mountains, medium-range surface to air missile systems and anti-material rifles.

India has set aside ₹70,221 crore this year for domestic defence procurement, accounting for 63% of the military's capital budget. Last year, the ministry spent over ₹51,000 crore, or 58% of the capital budget, on domestic purchases.

India's arms imports fell 33% between 2011-15 and 2016-20, said a report released by the Stockholm International Peace Research Institute (Sipri) in March.

The report on international arms transfers attributed the drop in India's arms imports mainly to an attempt to reduce its dependence on Russian arms and complex procurement processes.

<https://www.hindustantimes.com/india-news/defexpo-2022-goes-to-gandhinagar-focus-on-projecting-india-as-manufacturing-hub-101627650310816.html>

THE ECONOMIC TIMES

Sat, 31 July 2021

Ordnance factory in Tamil Nadu launches high-tech carbine 'TriCa'

Synopsis

The lighter and compact weapon, the 7.62X39 mm carbine TriCa is designed for the infantry combat vehicle, helicopter crew and security personnel for operations that call for a compact and relatively powerful individual automatic weapon.

A high-tech, low sound carbine named 'TriCa' with a range more effective than a typical sub-machine gun and small enough to be packed in the jacket of security personnel was unveiled at the Ordnance Factory in Tiruchirappalli, Tamil Nadu, on Thursday.

The lighter and compact weapon, the 7.62X39 mm carbine TriCa is designed for the infantry combat vehicle, helicopter crew and security personnel for operations that call for a compact and relatively powerful individual automatic weapon.

The weapon is also for paratroopers, police and security personnel guarding highly secure facilities such as airports, and for use by the Special Operation Forces, a defence press release here said.

TriCa has a special muzzle booster which helps in hiding the flash and mitigating the sound when fired, the release said.

An advantage is that it can use ammunition and magazines as well as the inter-changeable parts of general assault rifles (TAR and AK-47).

The carbine could be concealed in clothes and hidden in jackets of security personnel.

It was developed by the in-house research and development unit of the Ordnance Factory.

TriCa was unveiled by the general manager of the factory Sanjay Dwivedi at a function. Rajiv Jain and A K Singh, both additional general managers, and S Krishnaswamy, joint general manager, were present on the occasion.

<https://economictimes.indiatimes.com/news/defence/ordnance-factory-in-tamil-nadu-launches-high-tech-carbine-trica/articleshow/84887491.cms>



TriCa has a special muzzle booster which helps in hiding the flash and mitigating the sound when fired

MIDHANI's new plants to make bulletproof vests, armoured vehicles

One of its two new production facilities coming up at Kanchanbagh

By V. Geetanath

Mishra Dhatu Nigam Limited (MIDHANI), the specialised metals and metal alloys manufacturing public sector undertaking under Ministry of Defence, is getting ready to fully commission two new production facilities, including the ₹550-crore special steel, titanium and nickel alloy sheet and plate-making plant at Kanchanbagh here.

In the second ₹60-crore plant at Rohtak (Haryana), it will be making a maiden foray into making bullet-proof vests and armoured personal vehicles for the armed forces, disclosed chairman and managing director S.K. Jha on Friday.

“Both facilities will be commissioned in the next few months. In fact, even as the Rohtak plant is under construction, we have delivered about 20 armoured vehicles for BSF on an urgent request in view of the face-off at the China border,” he said, in an exclusive interaction. The PSU is assuring armour bullet-proof plating or even mine-proof without affecting the overall vehicle performance for any chassis sourced by the end user with capacity to make up to 25-30 vehicles a year. After scouting for a technology partner in vain, it has taken the support of Bhabha Atomic Research Centre (BARC) for bullet-proof vests to make 30,000 units annually, to be scaled to 50,000 units.

“Demand is for one lakh bullet-proof vests in the country. Though in defence area, this is a complete diversification. We are going to harp on good quality and reliability to the end user,” said Dr. Jha, who took charge last May.

It was able to meet COVID pandemic challenges ensuring there was no slack in production, in commissioning ‘unique’ projects to meet the needs of strategic sectors like defence, aerospace and nuclear power even while strengthening indigenous efforts as part of ‘Atmanirbhar’ policy.

Last year’s lockdown did cause some loss and decline in sales in the first quarter but the period also enabled the personnel to come up with innovative solutions towards production of high grade alloys and composite material. Vaccination for entire staff and safety protocols are in place, he said. MIDHANI has supplied steel and cobalt alloy material to ISRO human flight ‘Gaganyaan’ mission, titanium alloy metal for HAL-AMCA (Advanced Multi-Combat Aircraft) and light weight nickel-titanium engine for the unmanned aerial vehicles engine in collaboration with DRDO.

Other ‘novel’ works were in production of indigenous RHA steel used for missiles development replacing expensive imported substitute, special impeller blades for uranium mining replacing German-made with the first assembly set to be tried out at Kadapa mines and steam generators, earlier imported from Europe, for new nuclear plants in association with NFC for BHEL.

New defence procurement policy with mandatory clause of sourcing for special metals from within the country augers well for the firm. MIDHANI is aiming to double turnover of current ₹800 crore within the next five years with 15-20% growth, even as the third greenfield project of developing composite material with HAL (Tumkur near Bengaluru), could take off with detailed project report under preparation, added the CMD.

<https://www.thehindu.com/news/cities/Hyderabad/midhanis-new-plants-to-make-bulletproof-vests-armoured-vehicles/article35635186.ece>



Midhani CMD S.K. Jha at an interview with The Hindu at Kanchanbagh on Friday. | Photo Credit: RAMAKRISHNA G

India-China face-off: Line of no control

With India and China both mounting heavily armed strike formations on the disputed northern border, the threat of military escalation heightens

By Sandeep Unnithan

New Delhi: Like gigantic grey concrete aircraft carriers standing out against a dun-coloured Tibetan plateau, Beijing's big military aviation build-up is unfolding in clear view of imaging satellites. Satellite photos show a frenetic pace of construction, unrivalled in recent years. New airfields are being built and old ones expanded with new taxi tracks, aprons and longer runways. Fighter jets are being pushed under concrete pens with three-foot-thick walls that can withstand direct hits from missiles and air-dropped precision bombs. Launch pads around the bases bristle with HQ-9 long-range missiles which can shoot down aircraft over 100 km away. Concrete has been trucked into various military sites across the plateau since May (the building season is May-October in the heights as concrete does not set easily in winter), and one government source mentions having counted up to 800 trucks working at various sites across the plateau. China is building three new airports at Tashkurgan in Xinjiang and Tingri and Damxung in Tibet and expanding and upgrading infrastructure at the existing airbases in Kashgar, Hotan, Ngari-Gunsa, Lhasa and Bangda. Beijing's 14th five-year plan (2021-25), approved in March this year, included the construction of 20 multi-purpose airfields in Tibet. China is preparing for war or, at the very least, a new round of border belligerence.



In May 2020, after nearly four years of infrastructure-building and military drills at high altitudes, the PLA (People's Liberation Army of China) rushed two divisions along the 840-km Line of Actual Control (LAC) in eastern Ladakh. The PLA's forward move was its most blatant attempt to alter the LAC since the 1962 India-China border war and destroyed over three decades

of carefully constructed confidence-building measures. The Indian army, surprised by what it believed were PLA divisions conducting routine manoeuvres, responded by rushing two infantry divisions (around 15,000 soldiers each) towards the LAC and activating its forces along the entire 3,488-km-long boundary. The face-off, what New Delhi now recognises to be military coercion, led to a violent scuffle in the Galwan Valley on June 15 last year—killing 20 Indian soldiers and four on the Chinese side—the largest loss of life since the 1967 Nathu La and Cho La clashes.

On February 16, after a nine-month standoff, both sides pulled back troops, tanks and artillery pieces to the north bank of the Pangong Tso and plains south of the lake where the Indian army had in August 2020 occupied heights overlooking the Chinese garrison of Moldo. The pullback, by nearly two kilometres in that one location, has not resulted in de-escalation or the complete withdrawal of troops out of eastern Ladakh. The Indian army wants the PLA to withdraw first because it feels the Chinese can reach the LAC far quicker than they can. Hence, close to 200,000 soldiers are now deployed along both sides of the LAC.



Google Earth image of the Ngari Gunsa air base, a civilian airport in Tibet very near the LAC. Since the May 2020 standoff in Ladakh, it has been expanded and upgraded to host military aircraft

On July 21, Xi landed in Tibet for a three-day visit, the first by a Chinese president so near to the LAC in three decades. He also went to Lhasa to meet his top military commanders

India and China are eyeballing each other at three places—the Hot Springs, Gogra and the Depsang Plains. Ladakh is a largely barren high-altitude desert but of enormous strategic significance to both sides. The Chinese incursion points are along the vital DSDBO road which connects Leh with the northernmost edge of Indian territory—guarded by the Daulat Beg Oldie military post. Aksai Chin, claimed by India but held by China since the 1962 war, links Xinjiang with Tibet.

These standoffs are likely to figure in the 12th round of the Corps Commander-level talks to be held sometime in August. Nearly two-thirds of the Depsang plateau is being controlled by the PLA who have denied Indian soldiers patrolling access to five patrol points on the LAC since last year.

The Indian army, in a July 15 media communique, denied media reports that there were clashes between the army and the PLA after the February disengagement. It said that ‘both sides have continued with negotiations to resolve the balance issues, and regular patrolling in respective areas continues’, and that the situation on the ground continues as before. PLA activities, including turnover of troops, continue to be monitored by the Indian army.

Chinese weiqi moves are being matched by Indian chaturanga counter-moves as the two Asian heavyweights engage in a high-altitude board game. Tanks, troops, missiles and fighter jets are the pieces in the game.

The Indian army, which once extensively planned and prepared for warfare on the plains of Punjab and the sandy wastes of the Thar desert, is now reorienting itself to fight along a second front—the high-altitude deserts of the world’s toughest battlefield. The official term for this move towards the north is ‘rebalancing’. Before 2021, nine of the army’s 13.5 corps faced Pakistan while four-and-a-half faced China (each corps has two divisions each with 15,000 soldiers). Now the ratio has changed to eight corps facing Pakistan and six China. Close to 50,000 fresh troops have been moved all along the LAC.

The most significant move has been the Mathura-based 1 Corps, a strike corps aimed at Pakistan’s heartland across the Cholistan desert, which has now been wheeled around and directed northwards, towards Chinese-occupied Aksai Chin. A Rashtriya Rifles ‘force headquarters’, a division-sized force of around 15,000 meant to fight insurgency, has been dislodged from Jammu and Kashmir and moved to Ladakh. The Panagarh-based Mountain Strike Corps, whose raising was halted at a single infantry division over cost considerations in 2016, has been reinforced with a second division in Ranchi; the corps is now exclusively focused in the eastern sector.

The LAC has been ‘hardened’, a military term meant to indicate that defences are manned, ammunition and firepower in place, troops acclimatised to fight at high altitude, and the air force kept on the alert. Pre-2020, there was just one infantry division in Ladakh. There are now four divisions there. The Leh-based 14 Corps has begun the process of winter stocking—stockpiling food and fuel for the winter which sets in October—to cater to this expanded garrison.

A top military official terms the redeployments the Indian army’s largest since Independence. China’s actions, matched by India, have turned the undemarcated boundary into the world’s longest, most dangerous military frontier, poised on the brink of conflict. More than fighting an all-out conventional war, the Indian army’s deployments appear to be aimed at stopping further Chinese incursions and using its troops to launch what are called ‘quid pro quo’ operations—to capture enemy territory which can then be exchanged in negotiations. Even so, these deployments are fraught with risk because the specific border protocols codified in 1996 have collapsed after the 2020 PLA incursions.

“In the absence of such protocols, even a local incident can trigger off an escalation. That remains a big worry. For instance, if they (the Chinese) come in at one place, are we going to react locally or go and occupy something else in another sector?” asks Lt General D.S. Hooda, former Northern Army Commander. The worry among experts is that the LAC is turning out to be a Line of No Control that can easily lead to a dangerous military confrontation.

This view is echoed by an April 7 report by the US think-tank Strategic Futures Group which warns that the two nuclear powers could ‘slip into a conflict’ that neither side wanted. This could

happen ‘especially if military forces escalate a conflict quickly to challenge each other on a critical part of the contested border’, says the think-tank, which reports to the topmost US intelligence body, the National Intelligence Council. ‘The geopolitical backlash cost for China for using military coercion has been low’, the scholar Ketian Zhang explains in her 2018 MIT doctoral thesis, ‘Calculating Bully: Explaining Chinese Coercion.’ New Delhi is exploring ways to raise these costs.

Relations between the two countries have been frosty since the incursions. India has made a return to status quo ante a pre-condition to restoring the relationship while China wants it to move forward irrespective. Last year, India banned 267 Chinese apps. In May this year, India’s telecom ministry left Chinese telecom service providers Huawei and ZTE out of

fifth generation or 5G telecom service trials in India. Bilateral trade between the two countries, however, continues to remain high—it rose to \$77 billion last year—and China is India’s No. 1 trade partner.

On July 15, foreign minister S. Jaishankar met China’s foreign minister Wang Yi on the sidelines of the Shanghai Cooperation Organisation in Dushanbe. He once again reiterated New Delhi’s line that ‘unilateral change in the status quo along the LAC was not acceptable to India’. ‘Full restoration and maintenance of peace and tranquility in border areas is essential for development of our ties,’ the foreign minister said in a Twitter post.

Chinese Accupressure

On July 21, in an enormously symbolic visit, Chinese president Xi Jinping landed in Nyingchi Mainling airport for an unannounced three-day tour of Tibet. The Nyingchi prefecture is just 20 km north of Arunachal Pradesh, an Indian state that China claims as ‘Southern Tibet’. This is the first such visit by a Chinese president so near the LAC in three decades. Xi was accompanied by a high-level delegation, including the vice-chairperson of the Central Military Commission, General Zhang Youxia. Xi travelled to Lhasa by train where he addressed a separate gathering of the region’s top military commanders. Xi’s rallying of his troops came just a fortnight after Prime Minister Narendra Modi publicly wished the Dalai Lama, the spiritual leader of the Tibetan people, on his 86th birthday. “Xi’s visit to Tibet at this juncture indicates that the incursions into Ladakh were not a one-off; they are part of a broader Chinese plan to solidify their territorial claims against us and should be watched very closely,” says Jayadeva Ranade, former additional secretary, R&AW, and currently president, Centre for China Analysis and Strategy.

The PLA air force and PLA army have networked their missile units, creating vast air defence bubbles over the plateau. But the IAF still retains a formidable punch

Xi’s ascension to power in 2012 and China’s increasingly authoritarian turn are mirrored in the conduct of its border dispute with India. Since 2013 and culminating in the 2020 manoeuvres, the standoffs have been longer, directly involve the PLA and specifically designed to intimidate New Delhi. The three biggest incursions by the PLA were recorded at Daulat Beg Oldie and Chumar in 2013 and Demchok in 2014.

New Delhi has stayed away from Xi’s flagship’s projects like the Belt and Road Initiative and objected to the China Pakistan Economic Corridor (CPEC) as it passes through Pakistan Occupied Kashmir.

There is, of course, a familiar pattern to the rapid Chinese build-up and the Himalayan Cold War it has sparked off. For Beijing, infrastructure development precedes military coercion. Over the past decade, China has fortified man-made islands with airfields and missile sites in an attempt to convert the South China Sea into a Chinese lake and intimidate maritime neighbours like Vietnam and the Philippines. Its construction activity in Tibet is a signal that while the reunification of Taiwan is a top priority—as highlighted by Xi in his July 1 speech on the Chinese Communist Party’s 100th anniversary—Beijing can strike along its contested boundary with India at a time and place of its choosing.

China completed the Qinghai-Tibet Railway (QTR) which traverses a distance of 1,142 km from Golmud to Lhasa in 2006 and backed it up with a massive network of roads and military airfields. The Tibet-Qinghai stretch of the world's highest railway could rush troops to the LAC in days rather than weeks. India's slow infrastructure build-up picked up speed only around 2015. The burst of road and bridge-building by the Border Roads Organisation (BRO) has continued through the military standoff and through the pandemic. Visiting Ladakh on June 28 this year, defence minister Rajnath Singh inaugurated 63 bridges spread across six states and two Union territories. Among the projects costing Rs 240 crore was a 50-metre-long bridge on the Leh-Loma road which will ensure 'unhindered movement of heavy weapons systems including guns, tanks and other specialised equipment.' The BRO hopes to complete all 61 vital roads along the LAC by 2023. These roads will enable the army to move troops and equipment swiftly to the border regions and overcome some of the deficiencies revealed in a 2009 secret wargame, 'Divine Matrix'. The table-top exercise wargamed how the infrastructure would give the Chinese military a decisive edge in any future conflict. It emphasised the importance of raising a new mountain strike corps to take the battle into Tibet. The wargame was the army fighting the 1962 war all over again, and did not factor in the advantage enjoyed by the Indian Air Force over the PLAAF.

Speaking during the 72-day Doklam standoff between India and China in 2017, former Air Chief Marshal B.S. Dhanoa had said in Doklam that the PLAAF deployment on the Tibetan plateau was not meant for offensive operations: "There is a difference in airfields in which they mean business and the airfields in Tibet." In August 2021, there can be no doubt that the PLAAF means business. From these new bases, it can launch hundreds of fighter jets, bombers and UCAVs (Unmanned Combat Aerial Vehicles) at targets across north India. The long-range missiles are positioned to strike at IAF warplanes as they ascend the Himalayas from the Indian plains carrying full weapon loads and fuel (which the Chinese jets on the plateau cannot because of the thin air, see box). "All of these developments create a different level of competition and typology of air operations, hence newer war games and plans will have to be undertaken," says Lt General Rakesh Sharma, former GoC of the Leh-based 14 Corps.

China's first burst of army-specific military infrastructure construction began after the 2017 standoff in Bhutan's Doklam plateau. The PLA began constructing heated, insulated troop shelters, supply depots and bases to station its troops close to the LAC. When the troops were pushed in May 2020 and stayed through the winter, it was their first such high-altitude deployment. The Chinese then initiated a second bulking up of military aviation infrastructure after studying the IAF's response to the border standoff when it rushed fighter aircraft and gunships into the area. "The new phase of aviation infrastructure is specifically targeted to counter the IAF's combat edge," admits an air force officer. How many sorties a fighter aircraft can generate is a function of the availability of fuel, ammunition at an airbase. Hence the PLAAF's new aviation infrastructure includes fuel and ammunition storage sites thought to be hidden under several tunnels bored into hillsides.

Wargames conducted by the Shillong-based Eastern Air Command some years back described waves of Chinese bombers flying over the Himalayas and saturating IAF airbases with long-range cruise missile strikes. Worryingly for the IAF, over the past few months, the PLAAF and PLA Army have networked their missile units creating vast air defence bubbles over the plateau. Defence analysts, however, say the IAF still retains a formidable punch. "We can position 250-300 fighter aircraft from all our bases located at much lower altitudes. The Chinese can't field more than 70-90 aircraft from Hotan, Kashgar and Ngari-Gunza that are near Ladakh," says Air Marshal Anil Chopra, director-general of the IAF think-tank, Centre for Air Power Studies (CAPS).

It is too early to predict if the enhanced military aviation infrastructure will lead to a pattern of Chinese air intrusions of the kind seen over the South and East China Seas to intimidate Japan and Taiwan, but experts say nothing can be ruled out.

"I don't get the sense that things are going to settle down on the India-China front, either at the foreign policy level or in the border areas. Looking at the current state of play, it's not like China is willing to de-escalate; on the contrary, they are opening up more fronts and increasing the number

of friction points,” says Rajeswari Pillai Rajagopalan, director, Centre for Security, Strategy and Technology, Observer Research Foundation.

What Are India's Options?

The towering Chinese build-up brings an uncomfortable reality that India has never dealt with before—the prospect of a superpower at its doorstep. For the military, it is a realisation of their worst fears, the prospect of live unsettled borders with China and its close ally Pakistan. The vast difference in GDP—China’s is \$14.9 trillion and India’s \$2.6—also plays out in the defence budgets. China has a \$252 billion defence budget whereas India’s budget is \$72 billion. China has embarked on the largest military expansion of any nation after the Cold War, overseen by Beijing’s most powerful leader since Mao Zedong.

For India, rapidly building up military muscle to deter China from provoking a conflict is now an imperative. The Ladakh standoff will, in the short term at least, lead to a rush for new weapons systems. Government sources say the IAF is to shortly initiate a case for buying 36 additional Rafale fighter jets. These will add to the 36 Rafales it purchased from France in 2016 and whose deliveries will be completed by June 2022. “The Rafales are superior to anything in the PLAAF’s inventory,” says an IAF official. The IAF, which accounts for 40 per cent of the capital acquisitions of the defence budget, wants the deal to be signed quickly so that the next batch of jets can start deliveries after three years as indicated by French manufacturer Dassault Aviation. The IAF needs to increase the number of blast pens for its aircraft and start storing critical aviation infrastructure like fuel and stores underground to protect them from pre-emptive attacks. The army, meanwhile, wants 350 light tanks and 400 artillery pieces to equip its newly deployed formations.

Analysts believe India needs to focus on hardening the LAC to raise the costs of a Chinese invasion. “China wants to become a superpower, not us. If we harden the LAC and defend it well, it will mean greater investments in troops and weaponry for China in what it regards as a secondary theatre, at the cost of its primary theatre, Taiwan. Force structuring and deployment even for them is a zero-sum game,” says Lt General P. Ravi Shankar, former D-G Artillery.

Some 22 years after Kargil, the army and the air force still do not have the same radio frequencies or map grids that are critical for coordinating joint strike missions

More than piecemeal buys, India needs to get its long-pending military reform off the ground. The Chinese began their manoeuvres in Tibet in 2016 when they had completed their military reforms, cutting down manpower-intensive forces and subsuming seven military regions to just five military theatres with integrated air and land forces and raising mobile, technology-intensive forces. India has only now begun the process of combining its 17 disparate single-service commands into five integrated theatre commands by 2023. (The restructuring of the Udhampur-based Northern Command has been put on hold because of the current standoff.)

Recommendations like those made by the committee of experts led by Lt General D.B. Shekatkar in 2016—that the forces need to prepare for wars at high altitude because all its contested boundaries with both Pakistan and China are in regions above 10,000 feet—are being seriously examined only now. Some of those lessons have still not been learned despite the Kargil conflict of 1999 where the air force had to improvise high-altitude tactics to bomb peaks and bunkers occupied by Pakistani troops. Twenty-two years after Kargil, the army and the air force still do not have the same radio frequencies or map grids critical for coordinating joint strike missions. As a senior IAF official says, the army and the IAF talk to each other only at the corps and command level—messages sent from field units have to travel up and down these bureaucratic chains of command.

Leh airport, the only air bridge to the region in winter, has a single runway that remains vulnerable to a pre-emptive enemy strike. A second runway less than a kilometre away was considered over two decades ago but never built.

To offset at least some of this military imbalance vis-a-vis China, India is now actively participating in groupings like the Quadrilateral Security Dialogue or ‘Quad’, an informal grouping

of the United States, Japan, India and Australia. The four countries held their largest defence exercise till date in the Bay of Bengal last November even as the standoff with China continued. At the first-ever virtual summit on March 12, the heads of government of the four Quad countries—Prime Minister Narendra Modi, US President Joe Biden, Prime Minister Yoshihide Suga of Japan and Prime Minister Scott Morrison of Australia—issued a joint statement supporting the ‘rule of law, freedom of navigation and overflight, peaceful resolution of disputes, democratic values and territorial integrity’.

The Quad, however, has one great weakness in that it is almost exclusively focused on the maritime domain. Indian officials admit that none of the other three members are likely to get involved in a Sino-Indian land dispute—that battle is for India to fight on its own.

The Indian navy is said to have contingency plans to interdict Chinese shipping in the Malacca straits in the event of a conflict on land, but this move is risky

The Indian navy is believed to have contingency plans to interdict Chinese shipping in the Malacca Straits in the event of a conflict on land but this move could be fraught with enormous risk as it could disrupt international shipping. What India could do is perhaps use its statecraft (for friends, places and bases) and reshape maritime muscle to deploy in the South China Sea more robustly and create pressures on China besides, of course, keep leveraging the Indian navy’s greater power in the IOR (Indian Ocean Region). “Rather than wait for China to enter the Indian Ocean—which could likely happen—India may have to consider ways and means of taking naval leverages and readiness for battle into the South China Sea. Sea power’s reach and offensive potential would matter there,” says Rear Admiral Sudarshan Shrikhande, former flag officer, Foreign Cooperation and Naval Intelligence. With China threatening to breathe fire down the Himalayas, no option can be considered too far-fetched.

<https://www.indiatoday.in/magazine/cover-story/story/20210809-india-china-face-off-line-of-no-control-1834353-2021-07-31>



Sat, 31 July 2021

ISRO-NASA joint satellite project NISER proposed to be launched early 2023:

Jitendra Singh

While NASA is developing L-band SAR and associated systems, ISRO is developing S-band SAR, spacecraft bus, the launch vehicle and associated launch services

New Delhi: The ISRO-NASA joint mission NISER (NASA-ISRO Synthetic Aperture Radar) satellite, aimed at making global measurement of land surface changes using advanced radar imaging, is proposed to be launched in early 2023, Earth Sciences Minister Jitendra Singh said on Friday. In a written response to a question in the Lok Sabha, he said NISAR is a joint Earth-Observation mission between ISRO and US space agency NASA for global observations over all land masses including the Polar cryosphere and the Indian Ocean region.



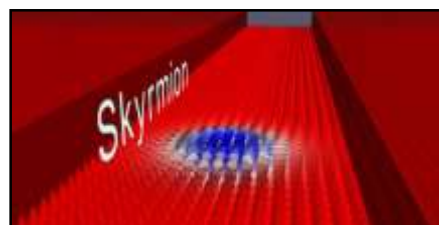
"NASA-ISRO Synthetic Aperture Radar (NISER) has not been launched yet. NISER is proposed to be launched in early 2023," said Singh, who also is the minister for the Department of Space. It is a dual-band (L-band and S-band) radar imaging mission with the capability of full polarimetric and interferometric modes of operation to observe minor changes in land, vegetation and cryosphere.

NASA is developing L-band SAR and associated systems, while ISRO is developing S-band SAR, spacecraft bus, the launch vehicle and associated launch services, Singh said. The major scientific objectives of the mission are to improve understanding of the impact of climate change on Earth's changing ecosystems, land and coastal processes, land deformations and cryosphere, he said. NISER is one of the crucial collaborations of the ISRO and NASA. India and the US had agreed upon this mission during then President Barack Obama's visit to India in 2015.

<https://www.news18.com/news/india/isro-nasa-joint-satellite-project-niser-proposed-to-be-launched-early-2023-jitendra-singh-4027013.html>

An effective strategy for protecting skyrmions in quantum computing devices

A magnetic skyrmion is a versatile topological object that can be used to carry information in future spintronic information processing devices. As potential non-volatile information carriers, excellent endurance and robust retention are desired properties of skyrmions in spintronic devices. However, previous studies have suggested that skyrmions can be easily destroyed at device edges during high-speed operations due to the so-called skyrmion Hall effect.



A magnetic skyrmion confined in a designed channel within a ferromagnetic film, where the skyrmion is protected from being touching the film edge.

For these reasons, one focus of current skyrmion research is to find effective ways to protect skyrmions from being destroyed by touching device edges. Typical solutions include the elimination of the skyrmion Hall effect in antiferromagnetic and synthetic antiferromagnetic systems.

In a study published in *Nano Letters*, the group led by Prof. Xiaoxi Liu from the Department of Electrical and Computer Engineering, Shinshu University, Japan and their collaborators demonstrate in experiments that skyrmions can be effectively confined in channels and protected from being destroyed at device edges in more commonly used ferromagnetic systems. The confinement of skyrmions in designed channels is fundamental for any practical applications based on the accumulation and transport of skyrmions. The authors find that the position of skyrmions in ferromagnetic materials can be controlled by engineered energy barriers and wells.

Therefore, they experimentally fabricated a magnetic multilayer film with many energy barriers and wells formed by patterns with modified magnetic properties, where they find that skyrmions can be attracted or repelled by the boundaries of patterns. By fabricating square and stripe patterns with modified magnetic properties in a large ferromagnetic film, the authors show the possibility of building reliable channels for confinement, accumulation, and potential transport of skyrmions as information carriers.

In addition, this method reported in this research also offers the possibility for future study of the skyrmions interacting with one-dimensional and two-dimensional substrates, which are important dynamic problems that have been investigated theoretically in past decades.

"Our research demonstrated that a robust topological protection of skyrmions can be achieved by a simple but effective approach, which has practical application importance," explains experimentalist Prof. Xiaoxi Liu of Shinshu University, who led this research study.

Senior JSPS researcher Dr. Xichao Zhang says that "the research results suggest that we can use patterns of modified magnetic properties to control the static and dynamic behaviors of skyrmions." He then adds, "In our future work, we will investigate the current-induced dynamics of skyrmions in designed channels, which will be another important step toward skyrmion-based spintronic devices."

More information: Kentaro Ohara et al, Confinement and Protection of Skyrmions by Patterns of Modified Magnetic Properties, *Nano Letters* (2021). DOI: [10.1021/acs.nanolett.1c00865](https://doi.org/10.1021/acs.nanolett.1c00865)

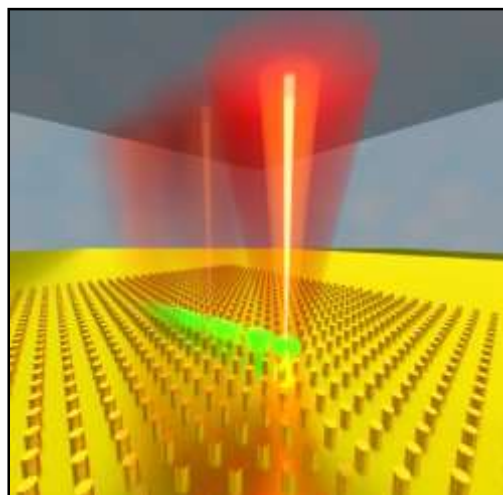
Journal information: *Nano Letters*

<https://phys.org/news/2021-07-effective-strategy-skyrmions-quantum-devices.html>

Vanderbilt engineer the first to introduce low-power dynamic manipulation of single nanoscale quantum objects

Led by Justus Ndukaife, assistant professor of electrical engineering, Vanderbilt researchers are the first to introduce an approach for trapping and moving a nanomaterial known as a single colloidal nanodiamond with nitrogen-vacancy center using low power laser beam. The width of a single human hair is approximately 90,000 nanometers; nanodiamonds are less than 100 nanometers. These carbon-based materials are one of the few that can release the basic unit of all light—a single photon—a building block for future quantum photonics applications, Ndukaife explains.

Currently it is possible to trap nanodiamonds using light fields focused near nano-sized metallic surfaces, but it is not possible to move them that way because laser beam spots are simply too big. Using an atomic force microscope, it takes scientists hours to push nanodiamonds into place one at a time near an emission enhancing environment to form a useful structure. Further, to create entangled sources and qubits—key elements that improve the processing speeds of quantum computers—several nanodiamond emitters are needed close together so that they can interact to make qubits, Ndukaife said.



Low frequency electrothermoplasmonic tweezer device rendering. Credit: Justus Ndukaife

"We set out to make trapping and manipulating nanodiamonds simpler by using an interdisciplinary approach," Ndukaife said. "Our tweezer, a low frequency electrothermoplasmonic tweezer (LFET), combines a fraction of a laser beam with a low-frequency alternating current electric field. This is an entirely new mechanism to trap and move nanodiamonds." A tedious, hours-long process has been cut down to seconds, and LFET is the first scalable transport and on-demand assembly technology of its kind.

Ndukaife's work is a key ingredient for quantum computing, a technology that will soon enable a huge number of applications from high resolution imaging to the creation of unhackable systems and ever smaller devices and computer chips. In 2019, the Department of Energy invested \$60.7 million in funding to advance the development of quantum computing and networking.

"Controlling nanodiamonds to make efficient single photon sources that can be used for these kinds of technologies will shape the future," Ndukaife said. "To enhance quantum properties, it is essential to couple quantum emitters such as nanodiamonds with nitrogen-vacancy centers to nanophotonic structures."

Ndukaife intends to further explore nanodiamonds, arranging them onto nanophotonic structures designed to enhance their emission performance. With them in place, his lab will explore the possibilities for ultrabright single photon sources and entanglement in an on-chip platform for information processing and imaging.

"There are so many things we can use this research to build upon," Ndukaife said. "This is the first technique that allows us to dynamically manipulate single nanoscale objects in two dimensions using a low power laser beam."

The article, "Electrothermoplasmonic Trapping and Dynamic Manipulation of Single Colloidal Nanodiamond" was published in the journal *Nano Letters* on June 7 and was coauthored by graduate students in Ndukaife's lab, Chuchuan Hong and Sen Yang, as well as their collaborator, Ivan Kravchenko at Oak Ridge National Laboratory.

More information: Chuchuan Hong et al, Electrothermoplasmonic Trapping and Dynamic Manipulation of Single Colloidal Nanodiamond, *Nano Letters* (2021). [DOI: 10.1021/acs.nanolett.1c00357](https://doi.org/10.1021/acs.nanolett.1c00357)

Journal information: [Nano Letters](https://doi.org/10.1021/acs.nanolett.1c00357)

<https://phys.org/news/2021-07-vanderbilt-low-power-dynamic-nanoscale-quantum.html>



Sat, 31 July 2021

Engineers bend light to enhance wavelength conversion

Electrical engineers from the UCLA Samueli School of Engineering have developed a more efficient way of converting light from one wavelength to another, opening the door for improvements in the performance of imaging, sensing and communication systems.

Mona Jarrahi, professor of electrical and computer engineering at UCLA Samueli, led the *Nature Communications*-published research.

Finding an efficient way to convert wavelengths of light is crucial to the improvement of many imaging and sensing technologies. For example, converting incoming light into terahertz wavelengths enables imaging and sensing in optically opaque environments. However, previous conversion frameworks were inefficient and required bulky and complex optical setups.

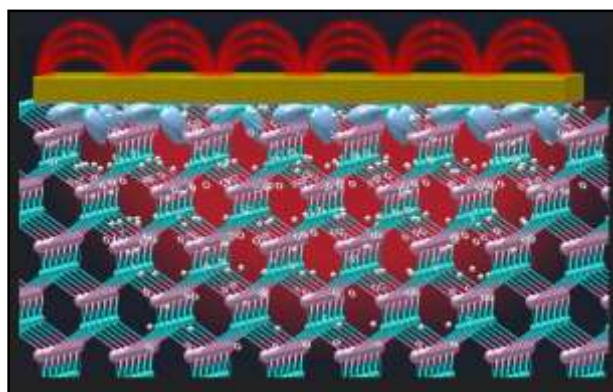
The UCLA-led team has devised a solution to enhance wavelength-conversion efficiency by exploring a generally undesirable but natural phenomenon called semiconductor surface states.

Surface states occur when surface atoms have an insufficient number of other atoms to bind to, causing a breakdown in atomic structure. These incomplete chemical bonds, also known as "dangling bonds," cause roadblocks for electric charges flowing through semiconductor devices and affect their performance.

"There have been many efforts to suppress the effect of surface states in semiconductor devices without realizing they have unique electrochemical properties that could enable unprecedented device functionalities," said Jarrahi, who leads the UCLA Terahertz Electronics Laboratory.

In fact, since these incomplete bonds create a shallow but giant built-in electric field across the semiconductor surface, the researchers decided to take advantage of surface states for improved wavelength conversion.

Incoming light can hit the electrons in the semiconductor lattice and move them to a higher energy state, at which point they are free to jump around within the lattice. The electric field created across the surface of the semiconductor further accelerates these photo-excited, high-energy electrons, which then unload the extra energy they gained by radiating it at different optical wavelengths, thus converting the wavelengths.



Schematic of InAs lattice in contact with a nanoantenna array that bends incoming light so it is tightly confined around the shallow surface of the semiconductor. The giant electric field created across the surface of the semiconductor accelerates photo-excited electrons, which then unload the extra energy they gained by radiating it at different optical wavelengths. Credit: Deniz Turan/UCLA

However, this energy exchange can only happen at the surface of a semiconductor and needs to be more efficient. In order to solve this problem, the team incorporated a nanoantenna array that bends incoming light so it is tightly confined around the shallow surface of the semiconductor.

"Through this new framework, wavelength conversion happens easily and without any extra added source of energy as the incoming light crosses the field," said Deniz Turan, the study's lead author and a member of Jarrahi's research laboratory who recently graduated with his doctorate in electrical engineering from UCLA Samueli.

The researchers successfully and efficiently converted a 1,550-nanometer wavelength light beam into the terahertz part of the spectrum, ranging from wavelengths of 100 micrometers up to 1 millimeter. The team demonstrated the wavelength-conversion efficiency by incorporating the new technology into an endoscopy probe that could be used for detailed in-vivo imaging and spectroscopy using terahertz waves.

Without this breakthrough in wavelength conversion, it would have required 100 times the optical power level to achieve the same terahertz waves, which the thin optical fibers used in the endoscopy probe cannot support. The advance can apply to optical wavelength conversion in other parts of the electromagnetic spectrum, ranging from microwave to far-infrared wavelengths.

More information: Wavelength conversion through plasmon-coupled surface states, *Nature Communications* (2021). DOI: [10.1038/s41467-021-24957-1](https://doi.org/10.1038/s41467-021-24957-1)

Journal information: [Nature Communications](https://phys.org/news/2021-07-wavelength-conversion.html)
<https://phys.org/news/2021-07-wavelength-conversion.html>



Sat, 31 July 2021

Early symptoms of Covid-19 vary with age and gender, finds UK study

The study found that loss of smell was not significant in people over 60 and not at all relevant in people over 80

New Delhi: Early symptoms indicating a COVID-19 infection varies between age groups and also between men and women, new UK research has found.

The study, which was published in 'The Lancet Digital Health' journal on Thursday, was carried out by researchers at King's College in London using data from the self-reported ZOE COVID Symptom Study app.

They studied 19 symptoms, including the most common ones such as a persistent cough and loss of smell, as well as abdominal pain and blisters on the feet.

"We aimed to estimate the probability of an individual being infected with SARS-CoV-2 (COVID-19) on the basis of early self-reported symptoms to enable timely self-isolation and urgent testing," the researchers note.

"Model performance to predict COVID-19 positivity was compared in terms of sensitivity, specificity, and area under the receiver operating characteristic curve (AUC) in the test set," they said.

As per their findings, in people aged over 60, loss of smell was not significant and it was not at all relevant in people over 80. But these older age groups were more likely to suffer diarrhoea.

For those aged 40 to 59, a persistent cough had a higher relevance to detect COVID-19 and chills or shivers had a lower relevance compared with individuals 80 years or older. Chest pain, unusual muscle pain, shortness of breath, and loss of smell were the most relevant features for people aged 60 to 70.

On the gender variations, men were most likely to report shortness of breath, fatigue, chills and fever. Women were more likely to report loss of smell, chest pain and a persistent cough.

"It's important people know the earliest symptoms are wide-ranging and may look different for each member of a family or household," said Claire Steves, one of the authors from King's College London.

"Testing guidance could be updated to enable cases to be picked up earlier, especially in the face of new variants which are highly transmissible. This could include using widely available lateral flow tests for people with any of these non-core symptoms," she said.

The interpretation of the study concludes that early detection based on this model is crucial to contain the spread of COVID-19 and efficiently allocate medical resources.

<https://www.indiatoday.in/coronavirus-outbreak/story/covid-corona-early-symptoms-vary-age-gender-uk-study-1834904-2021-07-30>

