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A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

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**Press Information Bureau
Government of India**

Ministry of Defence

Mon, 04 Oct 2021 3:17PM

Raksha Mantri gives away DRDO Dare to Dream 2.0 & Young Scientists awards

Shri Rajnath Singh calls for R&D in futuristic technologies

Our aim is to equip our forces with latest machinery to deal with any challenge: RM

Key Highlights:

- **Three indigenously-developed technologies handed over to the Armed Forces**
- **DRDO Directed Research Policy & Records Management Policy launched**
- **Greater linkages between DRDO and academia emphasised**
- **Developing new indigenous technologies important to strengthen national security & overall development, says Shri Rajnath Singh**

Raksha Mantri Shri Rajnath Singh felicitated the winners of 'Dare to Dream 2.0' Contest of Defence Research & Development Organisation (DRDO) in New Delhi on October 04, 2021. The Raksha Mantri gave away awards to 40 winners - 22 in Individual category and 18 in Startup category. He also launched 'Dare to Dream 3.0' to promote innovators & startups and provide a platform for the young ignited minds in the country.

Dare to Dream is DRDO's pan-India contest to promote Indian academicians, individuals and startups to develop emerging defence and aerospace technologies/systems. DRDO provides technical and financial support to the winners for realisation of their ideas under the Technology Development Fund (TDF) scheme.

Shri Rajnath Singh also gave away DRDO Young Scientists awards for the year 2019. Sixteen DRDO scientists, under the age of 35 years, were awarded for their outstanding contribution in areas of their expertise.

Congratulating the winners of 'Dare to Dream' and 'DRDO Young Scientists' awards, Shri Rajnath Singh said, they reflect the energy, enthusiasm and commitment of the youth of the country to create something new. He exuded confidence that the winners in the fields of innovation, design & development will inspire young minds and create path-breaking innovation in future. The 'Dare to Dream' challenge, he said, represents the vision and mission of the Government as also the mandate of DRDO.

The Raksha Mantri reiterated the Government's resolve to build a strong and self-reliant 'New India' which, he said, can only be achieved through a collaborative effort. He termed 'effort' and not just 'desire' as the key for an individual, society and the nation to achieve success. Saying that India is one of the oldest countries in experience & culture and the youngest with about 60 per cent of the young population, he encouraged the youth to observe, learn & create new innovations and play their part in taking the country to greater heights.

Pointing out that global security concerns, border disputes & maritime affairs have forced the world to focus on military modernisation, Shri Rajnath Singh reaffirmed the Government's commitment to modernise the Armed Forces and equip them with latest machinery to deal with any challenge. He described the power of the youth as the hope for the country and called upon the young ignited minds to help the Government in achieving the objective of 'Aatmanirbhar Bharat'.

"Developing new technologies indigenously is the need of the hour. Our vision of 'Aatmanirbhar Bharat' is to ensure that advanced technologies are developed domestically. It is extremely important not just for strengthening national security but also ensuring overall development of the country," said the Raksha Mantri.

Describing private sector participation as crucial to achieving 'Aatmanirbhar Bharat', Shri Rajnath Singh stated that the Government, led by Prime Minister Shri Narendra Modi, has taken a series of reform steps to increase the participation of private industry in the defence sector which has created a suitable growth environment and provided a big boost to indigenous defence capabilities. He listed out some of these steps, including bringing in new categories of acquisition in Defence Acquisition Procedure (DAP) 2020; provision of a specific budget for defence modernisation; notifying two Positive Indigenisation lists; increasing FDI in defence; according top priority to capital procurement and Buy {Indian - Indigenously Designed Developed and Manufactured (IDDM)} to promote indigenous design & development of defence equipment; creating opportunities to build a Mega Defence Programme including fighter aircraft, helicopters, tanks and submarines through Strategic Partnership Model; opening avenues for free Transfer of Technology (ToT) through DRDO and initiatives like Innovations for Defence Excellence (iDEX) and Technology Development Fund.

The Raksha Mantri asserted that due to these measures, the number of contracts being awarded to defence industry have increased; new MSMEs & startups have emerged and more employment opportunities created. "We are not only meeting our domestic needs, but are also exporting technology & equipment to foreign countries," he added.

Shri Rajnath Singh lauded DRDO for playing a central role in the Government's efforts of achieving self-reliance in defence manufacturing and contributing immensely in enhancing the capacity & capability of the Armed Forces even in the rapidly changing geo-political situation. He said, the recent contracts and induction of Light Combat Aircraft (LCA) Mk-1A, Main Battle Tank Arjun Mk-1A and Medium Range Surface to Air Missile system are some noteworthy contributions.

"DRDO is not only trying to match the capabilities of technologically advanced countries, but is also equally engaged in innovation of new technologies. The new generation programmes of DRDO will upgrade our Armed Forces in future as well," the Raksha Mantri hoped.

The Raksha Mantri commended DRDO Young scientists' lab and Advance technology Centres for working in futuristic technologies such as nano technology, quantum computing, artificial intelligence, unmanned and robotic technologies. Terming it as the new dimension of 'New India', he called for increased R&D efforts in such futuristic technologies. He stressed on the need to develop dual use technologies which can be beneficial for both Armed Forces personnel and civilians. He urged all the stakeholders to focus on research & development in order to provide state-of-the-art equipment to the Armed Forces. This will help in establishing the country's identity in the international market and achieving the vision of 'Make in India, make for the world', he said.

Shri Rajnath Singh exhorted the Industry representatives to take full advantage of the policies of the Government and create an organic synergy with DRDO and other government agencies. Saying that Transfer of Technology from DRDO is bearing fruit, he hoped that in the times to come the industry would develop in-house R&D systems on its own.

Cautioning against working in silos and laying special emphasis on identifying cost and time over-run projects and delivering them efficiently in a time-bound manner, the Raksha Mantri called for strengthening the linkages between academia, Industries and DRDO. This collaboration, he said, would ensure overall development.

On this occasion, three products/systems indigenously developed by DRDO were also handed over to the Armed Forces. These are:

- **ARINC818 Video Processing and Switching Module:** The module, developed for the Indian Air Force, was handed over to the Vice Chief of Air Staff Air Marshal Sandeep Singh. It is a state-of-the-art module with high bandwidth, low latency, channel bonding, easy networking and will cater to 5th generation aircraft development programmes.
- **Sonar Performance Modelling System:** Developed for the Indian Navy, the system was handed over to Vice Chief of Naval Staff Vice Admiral Satish Namdeo Ghormade. It is useful for Indian Naval ships, submarines and under water surveillance stations etc.
- **Bund Blasting Device Mk-II:** The device, developed for Indian Army, was handed over to the Vice Chief of Army Staff Lt Gen CP Mohanty. It is used to reduce the height of Ditch-cum-Bund obstacles to enhance the mobility of mechanised infantry during wartime.

A Memorandum of Understanding (MoU) was also exchanged between Prof HA Pandya, Vice Chancellor, Gujarat University and Secretary Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy for establishing an Advanced Technology Centre ‘Sardar Vallabhbhai Patel Centre for Cyber-Security Research’ at Gujarat University for conducting directed research in cyber security.

Shri Rajnath Singh also released two policy documents of DRDO - Directed Research Policy and Records Management Policy 2021. Directed Research Policy provides framework for establishment of Advanced Technology Centres and Research Cells in academic institutes for focussed research on identified subjects such as futuristic surveillance and defensive and offensive capabilities. ‘Long Term Directed Research Policy’ was recently approved by the Government to support & provide impetus to outcome and application oriented directed research in collaboration with academia. The Records Management Policy aims to further strengthen the records management activities of DRDO.

The two-day annual DRDO Directors' Conclave 2021, which began on October 03, 2021, will conclude today. The theme of the conclave is ‘Redesigning the processes to meet the national aspirations’.

In his address, DRDO Chairman Dr G Satheesh Reddy listed out the recent achievements of DRDO and stressed on developing mechanisms for faster development of advanced technologies and ease of working with industry & academia. He congratulated all the awardees and wished them a bright future.

Senior civil and military officials of Ministry of Defence and Industry representatives were among those present on the occasion.

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पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Mon, 04 Oct 2021 3:17PM

रक्षा मंत्री श्री राजनाथ सिंह ने डीआरडीओ डेयर टू ड्रीम 2.0 एवं युवा वैज्ञानिक पुरस्कार प्रदान किए

श्री राजनाथ सिंह ने भविष्य की प्रौद्योगिकियों में अनुसंधान एवं विकास का आह्वान किया

हमारा उद्देश्य हमारी सेनाओं को नवीनतम मशीनरी के साथ लैस करना है ताकि वो किसी भी चुनौती से निपट पाएं: रक्षा मंत्री

प्रमुख बातें:

- स्वदेश में विकसित तीन तकनीकें सशस्त्र बलों को सौंपी गईं
- डीआरडीओ की निर्देशित अनुसंधान नीति एवं रिकॉर्ड प्रबंधन नीति शुरू की गईं
- डीआरडीओ और शिक्षा जगत के बीच अधिक संबंधों पर जोर दिया गया
- राष्ट्रीय सुरक्षा और समय विकास को मजबूत करने के लिए नई स्वदेशी प्रौद्योगिकियों का विकास महत्वपूर्ण: श्री राजनाथ सिंह

रक्षा मंत्री श्री राजनाथ सिंह ने 04 अक्टूबर, 2021 को नई दिल्ली में रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) की 'डेयर टू ड्रीम 2.0' प्रतियोगिता के विजेताओं को सम्मानित किया। रक्षा मंत्री ने 40 विजेताओं को पुरस्कार प्रदान किए। इसमें 22 व्यक्तिगत श्रेणी में और 18 स्टार्टअप श्रेणी में सम्मिलित थे। उन्होंने इनोवेटर्स और स्टार्टअप्स को बढ़ावा देने और देश में उज्ज्वल युवा मस्तिष्क को एक मंच प्रदान करने के लिए 'डेयर टू ड्रीम 3.0' भी लॉन्च किया।

डेयर टू ड्रीम डीआरडीओ की अखिल भारतीय प्रतियोगिता है जो भारतीय शिक्षाविदों, व्यक्तियों और स्टार्टअप्स को उभरती रक्षा और एयरोस्पेस प्रौद्योगिकियों/प्रणालियों को विकसित करने के लिए प्रोत्साहन देती है। डीआरडीओ प्रौद्योगिकी विकास कोष (टीडीएफ) योजना के तहत विजेताओं को उनके विचारों को साकार करने के लिए तकनीकी और वित्तीय सहायता प्रदान करता है।

श्री राजनाथ सिंह ने वर्ष 2019 के लिए डीआरडीओ युवा वैज्ञानिक पुरस्कार भी प्रदान किए। 35 वर्ष से कम आयु के सोलह डीआरडीओ वैज्ञानिकों को उनकी विशेषज्ञता के क्षेत्रों में उनके उत्कृष्ट योगदान के लिए सम्मानित किया गया।

'डेयर टू ड्रीम' और 'डीआरडीओ यंग साइंटिस्ट्स' पुरस्कारों के विजेताओं को बधाई देते हुए श्री राजनाथ सिंह ने कहा, ये कुछ नया बनाने के लिए देश के युवाओं की ऊर्जा, उत्साह और प्रतिबद्धता को दर्शाते हैं। उन्होंने विश्वास व्यक्त किया कि नवाचार, डिजाइन और विकास के क्षेत्र में विजेता युवा मस्तिष्क को प्रेरित करेंगे और भविष्य में उच्च स्तरीय नवाचार करेंगे। उन्होंने कहा कि 'डेयर टू ड्रीम' चुनौती सरकार के विजन और मिशन के साथ-साथ डीआरडीओ के जनादेश का भी प्रतिनिधित्व करती है।

रक्षा मंत्री ने एक मजबूत और आत्मनिर्भर 'न्यू इंडिया' बनाने के सरकार के संकल्प को दोहराया, जिसके लिए उन्होंने कहा, केवल एक सहयोगात्मक प्रयास के माध्यम से प्राप्त किया जा सकता है। उन्होंने एक व्यक्ति, समाज और राष्ट्र के लिए सफलता प्राप्त करने की कुंजी 'प्रयास' को, न केवल 'इच्छा' को बताया। यह कहते हुए कि भारत अनुभव और संस्कृति में सबसे पुराने देशों में से एक है और लगभग 60 प्रतिशत

युवा आबादी के साथ सबसे युवा है, उन्होंने युवाओं को नए नवाचारों को देखने, सीखने और बनाने और देश को और अधिक उंचाइयों पर ले जाने में अपनी भूमिका निभाने के लिए प्रोत्साहित किया।

यह बताते हुए कि वैश्विक सुरक्षा चिंताओं, सीमा विवादों और समुद्री मामलों ने दुनिया को सैन्य आधुनिकीकरण पर ध्यान केंद्रित करने के लिए मजबूर किया है, श्री राजनाथ सिंह ने सशस्त्र बलों के आधुनिकीकरण और उन्हें किसी भी चुनौती से निपटने के लिए नवीनतम मशीनरी से लैस करने की सरकार की प्रतिबद्धता की पुष्टि की। उन्होंने युवाओं की शक्ति को देश की आशा के रूप में वर्णित किया और युवा दैदीप्यमान मन से 'आत्मनिर्भर भारत' के उद्देश्य को प्राप्त करने में सरकार की मदद करने का आह्वान किया।

रक्षा मंत्री ने कहा, "नई तकनीकों को स्वदेशी रूप से विकसित करना समय की आवश्यकता है। 'आत्मनिर्भर भारत' की हमारी दृष्टि यह सुनिश्चित करना है कि उन्नत तकनीकों को घरेलू स्तर पर विकसित किया जाए। यह न केवल राष्ट्रीय सुरक्षा को मजबूत करने के लिए बल्कि देश के समग्र विकास को सुनिश्चित करने के लिए भी अत्यंत महत्वपूर्ण है।"

निजी क्षेत्र की भागीदारी को 'आत्मनिर्भर भारत' की प्राप्ति के लिए महत्वपूर्ण बताते हुए श्री राजनाथ सिंह ने कहा कि प्रधान मंत्री श्री नरेन्द्र मोदी के नेतृत्व वाली सरकार ने रक्षा क्षेत्र में निजी उद्योग की भागीदारी बढ़ाने के लिए कई सुधारवादी कदम उठाए हैं, जिसने एक उपयुक्त विकास वातावरण और स्वदेशी रक्षा क्षमताओं को एक बड़ा बढ़ावा प्रदान किया है। उन्होंने इनमें से कुछ कदमों का जिक्र किया, जिनमें रक्षा अधिग्रहण प्रक्रिया (डीएपी) 2020 में अधिग्रहण की नई श्रेणियां शामिल हैं; रक्षा आधुनिकीकरण के लिए एक विशिष्ट बजट का प्रावधान; दो सकारात्मक स्वदेशीकरण सूचियों को अधिसूचित करना; रक्षा क्षेत्र में एफडीआई बढ़ाना; रक्षा उपकरणों के स्वदेशी डिजाइन और विकास को बढ़ावा देने के लिए पूंजीगत खरीद और खरीद {भारतीय-स्वदेशी रूप से विकसित और निर्मित (आईडीडीएम)} को सर्वोच्च प्राथमिकता देना; सामरिक साझेदारी मॉडल के माध्यम से लड़ाकू विमान, हेलीकॉप्टर, टैंक और पनडुब्बियां सहित एक मेगा रक्षा कार्यक्रम बनाने के अवसर पैदा करना; डीआरडीओ के माध्यम से प्रौद्योगिकी के मुफ्त हस्तांतरण (टीओटी) और रक्षा उत्कृष्टता के लिए नवाचार (आईडेक्स) और प्रौद्योगिकी विकास कोष जैसी पहल के लिए रास्ते खोलना, शामिल हैं।

रक्षा मंत्री ने जोर देकर कहा कि इन उपायों के कारण, रक्षा उद्योग को दिए जाने वाले अनुबंधों की संख्या में वृद्धि हुई है; नए एमएसएमई और स्टार्टअप उभरे हैं और अधिक रोजगार के अवसर पैदा हुए हैं। उन्होंने कहा, "हम न केवल अपनी घरेलू जरूरतों को पूरा कर रहे हैं, बल्कि विदेशों में प्रौद्योगिकी और उपकरणों का निर्यात भी कर रहे हैं।"

श्री राजनाथ सिंह ने रक्षा निर्माण में आत्मनिर्भरता प्राप्त करने के सरकार के प्रयासों में केंद्रीय भूमिका निभाने और तेजी से बदलती भू-राजनीति में भी सशस्त्र बलों की क्षमता को बढ़ाने में अत्यधिक योगदान देने के लिए डीआरडीओ की सराहना की। उन्होंने कहा, हाल ही में अनुबंध और हल्के लड़ाकू विमान (एलसीए) एमके-1ए, मुख्य युद्धक टैंक अर्जुन एमके-1ए और मध्यम दूरी की सतह से हवा में मार करने वाली मिसाइल प्रणाली को शामिल करना कुछ उल्लेखनीय योगदान हैं।

रक्षा मंत्री ने आशा व्यक्त की कि, "डीआरडीओ न केवल तकनीकी रूप से उन्नत देशों की क्षमताओं से मेल खाने की कोशिश कर रहा है, बल्कि नई तकनीकों के नवाचार में भी समान रूप से लगा हुआ है। डीआरडीओ की नई पीढ़ी के कार्यक्रम भविष्य में भी हमारे सशस्त्र बलों का उन्नयन करेंगे।"

रक्षा मंत्री ने नैनो टेक्नोलॉजी, क्वांटम कंप्यूटिंग, आर्टिफिशियल इंटेलिजेंस, मानव रहित और रोबोटिक प्रौद्योगिकियां जैसी भविष्य की प्रौद्योगिकियों में काम करने के लिए डीआरडीओ युवा वैज्ञानिकों की

प्रयोगशाला और उन्नत प्रौद्योगिकी केंद्रों की सराहना की। इसे 'नए भारत' का नया आयाम बताते हुए उन्होंने ऐसी भविष्य की प्रौद्योगिकियों में अनुसंधान एवं विकास प्रयासों को बढ़ाने का आह्वान किया। उन्होंने दोहरे उपयोग वाली प्रौद्योगिकियों को विकसित करने की आवश्यकता पर जोर दिया जो सशस्त्र बलों के कर्मियों और नागरिकों दोनों के लिए फायदेमंद हो सकती हैं। उन्होंने सभी हितधारकों से सशस्त्र बलों को अत्याधुनिक उपकरण प्रदान करने के लिए अनुसंधान और विकास पर ध्यान केंद्रित करने का आग्रह किया। उन्होंने कहा कि इससे अंतरराष्ट्रीय बाजार में देश की पहचान स्थापित करने और 'मेक इन इंडिया, मेक फॉर द वर्ल्ड' के विजन को हासिल करने में मदद मिलेगी।

श्री राजनाथ सिंह ने उद्योग प्रतिनिधियों से सरकार की नीतियों का पूरा लाभ उठाने और डीआरडीओ और अन्य सरकारी एजेंसियों के साथ एक नैसर्गिक तालमेल बनाने का आह्वान किया। यह कहते हुए कि डीआरडीओ से प्रौद्योगिकी का हस्तांतरण फल दे रहा है, उन्होंने आशा व्यक्त की कि आने वाले समय में उद्योग अपने दम पर इन-हाउस आर एंड डी सिस्टम विकसित करेगा।

एक बद्ध आवरण में रहते हुए काम करने के खिलाफ सावधानी बरतते हुए और लागत और समय से अधिक चलने वाली परियोजनाओं की पहचान करने और उन्हें समयबद्ध तरीके से कुशलतापूर्वक वितरित करने पर विशेष जोर देते हुए, रक्षा मंत्री ने शिक्षा, उद्योग और डीआरडीओ के बीच संबंधों को मजबूत करने का आह्वान किया। उन्होंने कहा कि यह सहयोग समग्र विकास सुनिश्चित करेगा।

इस अवसर पर डीआरडीओ द्वारा स्वदेशी रूप से विकसित तीन उत्पादों/प्रणालियों को भी सशस्त्र बलों को सौंपा गया। ये हैं:

एआरआईएनसी 818 वीडियो प्रोसेसिंग और स्विचिंग मॉड्यूल: भारतीय वायु सेना के लिए विकसित मॉड्यूल को वाइस चीफ ऑफ एयर स्टाफ एयर मार्शल संदीप सिंह को सौंपा गया। यह उच्च बैंडविड्थ, कम विलंबता, चैनल बॉन्डिंग, आसान नेटवर्किंग के साथ एक अत्याधुनिक मॉड्यूल है और 5वीं पीढ़ी के विमान विकास कार्यक्रमों को पूरा करेगा।

सोनार परफॉर्मंस मॉडलिंग सिस्टम: भारतीय नौसेना के लिए विकसित इस सिस्टम को वाइस चीफ ऑफ नेवल स्टाफ वाइस एडमिरल सतीश नामदेव घोरमडे को सौंपा गया। यह भारतीय नौसेना के जहाजों, पनडुब्बियों और पानी के नीचे निगरानी स्टेशनों आदि के लिए उपयोगी है।

बंड ब्लास्टिंग डिवाइस एमके-II: भारतीय सेना के लिए विकसित इस डिवाइस को वाइस चीफ ऑफ आर्मी स्टाफ लेफ्टिनेंट जनरल सीपी मोहंती को सौंपा गया। इसका उपयोग युद्ध के दौरान मेकैनाइज़्ड इन्फेंट्री की गतिशीलता को बढ़ाने के लिए डिच-कम-बंड बाधाओं की ऊंचाई को कम करने के लिए किया जाता है।

एक उन्नत प्रौद्योगिकी केंद्र 'सरदार वल्लभभाई पटेल सेंटर फॉर साइबर-सिक्योरिटी रिसर्च' की स्थापना के लिए प्रोफेसर एचए पंड्या, गुजरात विश्वविद्यालय के कुलपति और रक्षा अनुसंधान एवं विकास विभाग के सचिव तथा डीआरडीओ के अध्यक्ष डॉ जी सतीश रेड्डी के बीच गुजरात विश्वविद्यालय में साइबर सुरक्षा में निर्देशित अनुसंधान करने के लिए एक समझौता ज्ञापन (एमओयू) का भी आदान-प्रदान किया गया।

श्री राजनाथ सिंह ने डीआरडीओ के दो नीति दस्तावेज-निर्देशित अनुसंधान नीति और रिकॉर्ड प्रबंधन नीति 2021 भी जारी की। निर्देशित अनुसंधान नीति भविष्य की निगरानी और रक्षात्मक और जैसे पहचाने गए विषयों पर केंद्रित अनुसंधान के लिए शैक्षणिक संस्थानों में उन्नत प्रौद्योगिकी केंद्रों और अनुसंधान प्रकोष्ठों की स्थापना के लिए रूपरेखा प्रदान करती है। शिक्षाविदों के सहयोग से परिणाम और अनुप्रयोग उन्मुख निर्देशित अनुसंधान को समर्थन और प्रोत्साहन प्रदान करने के लिए हाल ही में सरकार द्वारा 'दीर्घकालिक निर्देशित अनुसंधान नीति' को मंजूरी दी गई थी। रिकॉर्ड प्रबंधन नीति का उद्देश्य डीआरडीओ की रिकॉर्ड प्रबंधन गतिविधियों को और मजबूत करना है। दो दिवसीय वार्षिक डीआरडीओ डायरेक्टर्स

कॉन्क्लेव 2021, जो दिनांक 3 अक्टूबर, 2021 को शुरू हुआ, का समापन आज होगा। कॉन्क्लेव का विषय 'राष्ट्रीय आकांक्षाओं को पूरा करने के लिए प्रक्रियाओं को नया स्वरूप देना' है।

अपने संबोधन में डीआरडीओ के अध्यक्ष डॉ जी सतीश रेड्डी ने डीआरडीओ की हालिया उपलब्धियों का जिक्र किया और उन्नत प्रौद्योगिकियों के तेजी से विकास और उद्योग और शिक्षाविदों के साथ काम करने में आसानी के लिए तंत्र विकसित करने पर जोर दिया। उन्होंने सभी पुरस्कार विजेताओं को बधाई दी और उनके उज्ज्वल भविष्य की कामना की।

इस अवसर पर रक्षा और उद्योग मंत्रालय के वरिष्ठ नागरिक और सैन्य अधिकारी उपस्थित थे।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1760960>



Tue, 05 Oct 2021

Need to focus on developing dual-use technologies: Defence Minister Rajnath Singh

“Countries around the world are focusing on military modernisation and demand for military equipment has gone up in view of global security concerns, border disputes and developments in the maritime domain,” Rajnath Singh said

New Delhi: India needs to focus on developing dual-use technologies for both military and civilian agencies and special attention should be paid to research and development for manufacturing state-of-the-art defence platforms, Defence Minister Rajnath Singh said on October 4.

He said the demand for military equipment is increasing around the world in view of global security concerns, border disputes and developments in the maritime sphere, and India must focus to enhance its domestic defence industry.

Addressing an event organised by the Defence Research Development Organisation (DRDO), Mr. Singh said that no corner of the world is left untouched by the changes seen in areas of strategic affairs, military power, trade, economy and communication.

He, however, did not specifically elaborate on the changes that he was talking about.

“Countries around the world are focusing on military modernisation and demand for military equipment has gone up in view of global security concerns, border disputes and developments in the maritime domain,” Mr. Singh said.

“Today, when we are talking about private sector participation for development of defence equipment, it is our utmost concern to strengthen, equip and make them ready for the new role,” he added. The Defence Minister underlined the need for giving special attention to research and development for manufacturing military equipment.

“We need to develop dual-use technologies so that both military and civilian sides benefit. We have to put special attention on research and development to provide state-of-the-art equipment to our armed forces,” he said.

Mr. Singh said work is underway with a focus on futuristic technologies like nano-technology, quantum computing, artificial intelligence and robotic technologies.

“We have moved rapidly in the direction of not only meeting our domestic security needs but also exporting technology and equipment to foreign countries,” he said.

<https://www.thehindu.com/news/national/need-to-focus-on-developing-dual-use-technologies-defence-minister-rajnath-singh/article36822090.ece>



Defence Minister Rajnath Singh. File
| Photo Credit: PTI

Private sector will play key role in achieving self reliance in defence: Rajnath

New Delhi: Defence minister Rajnath Singh on Monday said the Union government was committed to strengthening the private sector and priming it for its new role in developing India's defence capabilities, stressing that private participation was crucial to achieving the goal of Atmanirbhar Bharat or self-reliant India.

Singh said the government had taken a raft of reform measures to increase the participation of the private industry in the defence sector, with focus on providing a boost to indigenous defence capabilities.

“Developing new technologies indigenously is the need of the hour. Our vision of ‘Atmanirbhar Bharat’ is to ensure that advanced technologies are developed domestically. It is extremely important not just for strengthening national security but also ensuring overall development of the country,” the minister said while addressing a Defence Research and Development Organisation (DRDO) function to felicitate young scientists and other achievers.

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

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.

The government will take all measures to modernise the armed forces and equip them with latest weapons and systems to deal with any challenge, the minister said.

Singh lauded DRDO for its contribution to the government's efforts to achieve self-reliance in defence manufacturing and its role in enhancing military capabilities at a time when the geo-political situation is changing rapidly.

“DRDO is not only trying to match the capabilities of technologically advanced countries, but it is also equally engaged in innovation of new technologies. The new generation programmes of DRDO will upgrade our armed forces in future as well,” the minister said.

Singh also released two policy documents of DRDO: Directed Research Policy and Records Management Policy 2021. The first policy seeks to set up advanced technology centres and research cells in academic institutes for focused research on futuristic surveillance, defensive and offensive capabilities.

In a major push to the self-reliance campaign in the defence sector, India has signed contracts and cleared projects worth almost ₹54,000 crore in less than a month to boost the military's capabilities with locally produced weapons and systems including transport planes, tanks, helicopters, airborne early warning systems and counter-drone weapons, as reported by HT on Monday.

<https://www.hindustantimes.com/india-news/private-sector-will-play-key-role-in-achieving-self-reliance-in-defence-rajnath-singh-101633375511040-amp.html>



Defence Minister Rajnath Singh addresses during DRDO Directors Conclave 2021 in New Delhi on Monday. Singh said the Centre was committed to strengthening the private sector. (ANI)

Rajnath Singh felicitates winners of 'Dare to Dream 2.0' contest of DRDO

New Delhi [India], October 4 (ANI): Defence Minister Rajnath Singh felicitated the winners of 'Dare to Dream 2.0' contest of Defence Research and Development Organisation (DRDO) in New Delhi on Monday.

The Union Minister gave away awards to 40 winners of which 22 were in the individual category and 18 were in the startup category, read the release by the defence ministry.

He also launched 'Dare to Dream 3.0' to promote innovators and startups and provide a platform for the young ignited minds in the country.

Dare to Dream is DRDO's pan-India contest to promote Indian academicians, individuals and startups to develop emerging defence and aerospace technologies/systems. DRDO provides technical and financial support to the winners for the realisation of their ideas under the Technology Development Fund (TDF) scheme.

Rajnath Singh also gave away DRDO Young Scientists awards for the year 2019. Sixteen DRDO scientists, under the age of 35 years, were awarded for their outstanding contribution in areas of their expertise.

Congratulating the winners of 'Dare to Dream' and 'DRDO Young Scientists' awards, Rajnath Singh said, they reflect the energy, enthusiasm and commitment of the youth of the country to create something new. He exuded confidence that the winners in the fields of innovation, design and development will inspire young minds and create path-breaking innovation in future. The 'Dare to Dream' challenge, he said and added that they represent the vision and mission of the government as also the mandate of DRDO.

Singh reiterated the government's resolve to build a strong and self-reliant 'New India' which, he said, can only be achieved through a collaborative effort. He termed 'effort' and not just 'desire' as the key for an individual, society and the nation to achieve success. Saying that India is one of the oldest countries in experience and culture and the youngest with about 60 per cent of the young population, he encouraged the youth to observe, learn and create new innovations and play their part in taking the country to greater heights.

Pointing out that global security concerns, border disputes and maritime affairs have forced the world to focus on military modernisation, Rajnath Singh reaffirmed the government's commitment to modernise the Armed Forces and equip them with the latest machinery to deal with any challenge. He described the power of the youth as the hope for the country and called upon the young ignited minds to help the government in achieving the objective of 'Aatmanirbhar Bharat'.

"Developing new technologies indigenously is the need of the hour. Our vision of 'Aatmanirbhar Bharat' is to ensure that advanced technologies are developed domestically. It is extremely important not just for strengthening national security but also ensuring the overall development of the country," said Singh.

Describing private sector participation as crucial to achieving 'Aatmanirbhar Bharat', Rajnath Singh stated that the central government, led by Prime Minister Narendra Modi, has taken a series of reform steps to increase the participation of private industry in the defence sector which has created a suitable growth environment and provided a big boost to indigenous defence capabilities.



The Union Minister asserted that due to these measures, the number of contracts being awarded to the defence industry has increased; new MSMEs and startups have emerged and more employment opportunities created.

"We are not only meeting our domestic needs but are also exporting technology and equipment to foreign countries," he added.

Rajnath Singh lauded DRDO for playing a central role in the government's efforts of achieving self-reliance in defence manufacturing and contributing immensely in enhancing the capacity and capability of the Armed Forces even in the rapidly changing geopolitical situation.

He said, "The recent contracts and induction of Light Combat Aircraft (LCA) Mk-1A, Main Battle Tank Arjun Mk-1A and Medium Range Surface to Air Missile system are some noteworthy contributions." "DRDO is not only trying to match the capabilities of technologically advanced countries but is also equally engaged in innovation of new technologies. The new generation programmes of DRDO will upgrade our Armed Forces in future as well," Union Minister said.

On this occasion, three products/systems indigenously developed by DRDO were also handed over to the Armed Forces.

The two-day annual DRDO Directors' Conclave 2021, which began on October 03, 2021, concluded today. The theme of the conclave is 'Redesigning the processes to meet the national aspirations'. (ANI)

<https://www.malaysiasun.com/news/271393626/rajnath-singh-felicitates-winners-of-dare-to-dream-20-contest-of-drdo>



Tue, 05 Oct 2021

राजनाथ सिंह बोले- सैन्य आधुनिकीकरण पर है फोकस, बढ़ रही सैन्य उपकरणों की मांग; जानें और क्या बोले रक्षा मंत्री

दिल्ली में आज डेयर टू ड्रीम पुरस्कार विजेताओं और डीआरडीओ (DRDO) के युवा वैज्ञानिकों के अभिनंदन कार्यक्रम के संबोधन में रक्षा मंत्री ने यह बयान दिया। राजनाथ सिंह ने कहा कि देश अपने सैन्य आधुनिकीकरण पर ध्यान केंद्रित कर रहा है।

By Pooja Singh

नई दिल्ली: रक्षा मंत्री राजनाथ सिंह ने आज वैश्विक सुरक्षा चिंताओं, सीमा विवादों और समुद्री मामलों के महत्व पर बयान दिया। उन्होंने कहा कि न केवल नई बल्कि स्वदेशी प्रौद्योगिकियां भी समय की मांग हैं। हम उन्नत और स्वदेशी प्रौद्योगिकियों की दिशा में काम कर रहे हैं क्योंकि इन प्रौद्योगिकी वाले देश दुनिया में अपना प्रभुत्व बनाता है। इससे हमारे समय विकास में भी मदद मिलेगी।

दिल्ली में आज 'डेयर टू ड्रीम' पुरस्कार विजेताओं और डीआरडीओ (DRDO) के युवा वैज्ञानिकों के अभिनंदन कार्यक्रम के संबोधन में रक्षा मंत्री ने यह बयान दिया। राजनाथ सिंह ने कहा कि देश अपने सैन्य आधुनिकीकरण पर ध्यान केंद्रित कर रहा है। यही वजह है कि सैन्य उपकरणों की मांग बढ़ रही है।



इसके साथ ही राजनाथ सिंह ने कहा कि आज ट्रेड, इकानोमी, संचार, यानी हर क्षेत्र में बदलाव देखा जा रहा है। इनसे दुनिया का कोई कोना अछूता रह जाए, मैं समझता हूं वह संभव नहीं है।

दुनिया भर में हो रहे यह बदलाव राष्ट्रों की सुरक्षा को भी उतनी ही बढ़ा रहे हैं। इसके साथ ही राजनाथ सिंह ने कहा कि आज के इस कार्यक्रम में जो चीज मुझे सबसे अधिक आकर्षित कर रहा है वह है 'Dare to Dream' चुनौती। ये तीन शब्द हमारे विजन और मिशन को बहुत साफ तौर से दर्शाते हैं।

उन्होंने कहा कि यह सपने ही हैं, जो साकार होकर दुनिया को नई नई दिशाएं देते गए। ये सपने ही हैं जिन्होंने असंभव सी लगने वाली चीजों को अपनी मुट्ठी में कर लिया। दुनिया की जितनी बड़ी से बड़ी खोज और अविष्कार हैं आप देखेंगे तो पाएंगे कि वे सब किसी न किसी सपने का ही परिणाम है। आगे मंत्री ने कहा कि हमारे पूर्व प्रधानमंत्री श्री अटल बिहारी वाजपेई जी ने ऐसे भारत का सपना देखा था, जहां बस सुदूर क्षेत्र ही नहीं, बल्कि लोगों के दिल आपस में मज़बूती से जुड़ें।

इसके साथ ही रक्षा मंत्री ने कहा कि आज लगभग 60 फीसद युवा आबादी के साथ हमारा देश, दुनिया का सबसे युवा देश है। हमारा युवा न केवल आज की जरूरतों, बल्कि आने वाले कल की आशा और सपने को भी पूरा करने के लिए बिलकुल तैयार है।

<https://www.jagran.com/news/national-rajnath-singh-over-global-security-concerns-border-disputes-and-maritime-affairs-at-elicitation-ceremony-of-drdo-22081926.html>



Tue, 05 Oct 2021

Field Artillery rationalisation and India's Indigenous Artillery Gun Ecosystem

The preferred caliber was 155/52 based on desired ranges and other desired operational performance parameters

By Col Ashwani Sharma

Recently, the Corps of Indian Artillery commemorated its raising day, this is the right time to revisit its ambitious rationalization plan and its progress so far. Indian Army's Field Artillery Rationalisation Programme, conceived in the 1990s, envisaged upgrading and standardization of Artillery guns to 155 mm, similar to Bofors guns acquired in 1986. The preferred caliber was 155/52 based on desired ranges and other desired operational performance parameters. The revised modernization plan in 2007 projected the induction of approximately 2800 gun systems by 2017 in a number of configurations to suit op requirements. These guns were to be procured in different configurations like self-propelled tracked (on tank chassis) and wheeled (wheeled vehicle), towed, ultra-light and Mounted Gun Systems (fitted on 6×6 vehicles). These guns were to equip the Artillery's almost 280 operational regiments (with a dozen equipped with rockets). Ultra-light howitzers have been acquired from BAE and tracked guns from South Korea, but the bulk of the artillery still needs upgrading.



As per a detailed study carried out by SIDM in 2020, one of the remarkable defence industrial developments over the last decade has been the huge strides made in indigenous artillery.

As per a detailed study carried out by SIDM in 2020, one of the remarkable defence industrial developments over the last decade has been the huge strides made in indigenous artillery. There are a number of gun production hubs and MSMEs in the country which have created a self-sufficient ecosystem in the country. DRDO's ARDE possesses adequate capability in terms of required data

and knowledge, even though it is a constantly evolving field. Large Indian defence OEMs like L&T, TATA Advanced Systems and Bharat Forge have set up gun production lines within the country to compete with the erstwhile state-owned ordnance factories. SIDM's study report further states that there exists the capability to not just build guns within the country but also an ecosystem to refit, upgrade and export them. Orders, of course, have been somewhat slow to come. The army's DG Artillery, Lt General T.K. Chawla, recently told the media that the army was 'hand holding' the domestic industry to ensure indigenous projects like the Advanced Towed Array Gun System and the OFB-produced Dhanush howitzer to meet their requirements.

ATAGS deserves a special compliment being a Greenfield project, designed and developed through successful partnership between DRDO and the Indian Private sector. Despite a few critics, and a few hiccups, the gun system has many 'firsts' to its credit – 25L chamber, long ranges and rapid and sustained rate of fire, to name a few. Built in safety using multiple sensors (IoT) is novel. Its mobility in high altitude and deserts too has taken its critics by surprise.

As part of its defence indigenization drive, the MoD banned the imports of 155 mm howitzers after December 2021. The army will have no choice but to turn to indigenous gun industry. Another important aspect brought out by the SIDM report is that Indian R&D and industry have more than adequate capability to design and develop any type of gun system within the country. All that is needed is a system to harness the potential.

FARP, however, needs to be modified. In fact, considering the rapid changes in the nature of warfare brought about by the fast-emerging technologies, there is a definite need to change the proposed profile. Slow acquisition process inadvertently provides a twofold opportunity; (i) exploit indigenous capability to fulfill all the requirements, be it new gun systems or upgrades; (ii) balance out gun tube artillery units with more Self-propelled Rockets and Autonomous Munition Units. Equip more number of Artillery regiments with rockets, missiles and guided munitions and reduce the number of units with gun tubes. External ballistics and precision greatly enhance effect at the terminal objective and save enormously on costs and logistics.

(The author is Editor, South Asia Defence & Strategic Review. Views expressed are personal and do not reflect the official position or policy of Financial Express Online.)

<https://www.financialexpress.com/defence/field-artillery-rationalisation-and-indias-indigenous-artillery-gun-ecosystem/2343914/>



Tue, 05 Oct 2021

India offers LCA Tejas for RAAF trainer requirement

India's state-owned Hindustan Aeronautics Limited (HAL) is hopeful of winning a contract to supply its Light Combat Aircraft (LCA) Tejas as Lead in Fighter Trainer (LIFT) configuration to the Royal Australian Air Force (RAAF), writes Jay Menon.

RAAF had floated a tender in June 2020 for a new advanced jet trainer to replace its age-old BAE Systems Hawk 127 LIFT aircraft.

"We have responded to a request for information (RFI) from Australian DoD for the Air 6002 Phase 1 requirement , which was issued on June 1, 2020, by offering our LCA as LIFT configuration," says an HAL official.

RAAF is yet to fully define the requirements for Air 6002 Phase 1 Future LIFT aircraft.

According to the RFI, the aircraft performance and aircraft mission systems that bridge between the pilot training system and fast jet conversion courses will be critical requirements. The Future Lead-in Fighter Training System will be expected to remain relevant to its role in training fast jet

aircrew and supporting joint force training, to be adaptable to those needs as they evolve, to be affordable, and to be safe out to an indicative timeframe of 2050.

“The Tejas should form the lynchpin of India’s export strategy. If strategised correctly in terms of cost, timely delivery and product support, the aircraft can become an excellent export prospect, though the global fighter market is ruthlessly competitive and is exceptionally difficult for new entrants. This requires an integrated effort that combines foreign policy, military diplomacy, and aggressive defence marketing and cooperation. Since the Mk1/1A incorporates critical equipment that are of foreign origin (for example, the GE engine) it makes eminent sense to create risk-sharing partnerships with these companies to ensure successful exports. Effectively, this 4/4.5-generation aircraft should be pitched as the best value for money to a large number of countries in Asia, Africa, Europe and Latin America. While the Mk 1 and 1A become the most affordable high-performance aircraft and best value for money, the trainer by itself has immense potential. The Tejas trainer is an ideal aircraft for the LIFT role for all air forces,” noted Air Marshal M Matheswaran (retd) and former Deputy Chief of India’s Integrated Defence Staff.



HAL has reasons to be hopeful as it secured an approximately US\$7 Billion deal to manufacture 83 LCA Tejas jets for the Indian Air Force (IAF). Since then, HAL has also been confident about the indigenous fighter/trainer’s prospects on the export market.

According to the HAL official, the production rate for this increased requirement by IAF is being augmented by HAL from 8 to 16 aircraft every year through the creation of a state-of-the-art new facility in Bengaluru.

“The LCA has got foreign countries interested and we are confident of one such contract soon,” said Chairman and Managing Director R. Madhavan.

HAL is also expected to respond to a Request for Proposal (RfP) from the Royal Malaysian Air Force (RMAF). The Malaysian Air Force has sent out a global request for low-cost light fighter aircraft.

HAL has also offered the LCA (Naval Twin seat Trainer) to US Navy in July 2020.

LCA-Tejas Mark 2, the second generation fighter prototypes are underway in association with the DRDO’s Aeronautical Development Agency (ADA). “We expect the first prototype to be ready by next year-end. It will be lengthier and is under design stage with structural and systems plans in place. It will take one year for the ground runs and the then flight trails will start to be completed by 2026-27,” the HAL chief said.

<https://www.arabianaerospace.aero/india-offers-lca-tejas-for-raaf-trainer-requirement.html>

Indian Navy to operate a mix of nuclear, conventional submarine fleet

Across the world, major navies like the American, French, British and now Australian have switched over to nuclear submarine fleet

Against the backdrop of Australian decision to scrap a USD 90 billion deal with France to build conventional diesel-electric submarines and opt for building nuclear boats only, a senior government official on Monday said the Indian Navy will operate a mix of both nuclear and conventional submarines to deal with the threats around the country.

"For Australia, the threat is more in the open oceans and the areas around that area. The decision to scrap a conventional submarine deal makes sense for them. While for us, the need is to tackle threats both near our coastal areas as well as open seas. That is why the Indian Navy would build a fleet which would include both nuclear as well as conventional submarines," a senior government official told ANI.

The official was commenting on the ongoing debate on whether India and other navies should follow suit and go for building only nuclear submarines as they are more capable and stealthier than conventional submarines.

Notably, after scrapping the deal, Australia has joined hands with the Americans who would now help Canberra build nuclear attack submarines to tackle the main threat from the Chinese Navy.



For a country like India, having a mix of both types of submarines makes more sense economically as well as the cost of operating and building nuclear attack submarines is more than double of building conventional diesel-electric submarines, according to the official.

As far as the economics of the project goes, the entire project to build six nuclear submarines under the Kalvari class (Scorpene) boats for India would come around Rs 25,000 crore on completion whereas the proposal to build the first three nuclear attack submarines to be built by the Defence Research and Development Organisation (DRDO) at its Submarine Building Centre would cost more than Rs 50,000 crore, said the senior official.

Even though the cost difference between the nuclear and conventional submarines is substantial, the nuclear boats provide a huge capability to the navies as the boats can stay underwater for months without the need to come out on the surface at regular intervals as is required by conventional boats to charge their batteries.

Indian Navy has plans of operating 24 new submarines of which six are of the Kalvari class, six would be built under Project 75 India whose tender has been issued and a proposal for building six nuclear submarines is pending with the Cabinet Committee on Security.

The decision on the last batch of six submarines under the plan would be taken at a later stage, the sources said.

At present, India has a fleet of Russian-origin Kilo Class, German-origin HDWs and an indigenous ballistic nuclear submarine in the form of 'INS Arihant'. Five nuclear submarines were re-planned to be built under the Arihant Class project which is separate from the 24 submarine programme.

Across the world, major navies like the American, French, British and now Australian have switched over to nuclear submarine fleet only but the Chinese and Russian Navy operate a mix of both nuclear and conventional submarines, the official said.

India has been leasing nuclear attack submarines from Russia for the last three decades and is in the process of leasing another one soon from there.

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

https://www.business-standard.com/article/current-affairs/indian-navy-to-operate-a-mix-of-nuclear-conventional-submarine-fleet-121100401045_1.html

COVID 19: DRDO's Contribution

The Telegraph online

Tue, 05 Oct 2021

Bengal's biggest oxygen plant opens in Siliguri

The second wave of Covid-19 led to an urgent demand for a state-of-the-art oxygen plant at the NBMCH

By Binita Paul

Siliguri: Bengal's largest oxygen plant was opened on Monday at the North Bengal Medical College and Hospital (NBMCH) in Susrutanagar, on the outskirts of Siliguri.

The second wave of Covid-19 led to an urgent demand for a state-of-the-art oxygen plant at the NBMCH. Funds were allocated by the Centre for a pressure swing absorption (PSA) plant in July this year, with the involvement of the National Highways Authority of India and Defence Research & Development Organisation in its setting up.

"This plant has a capacity to generate 2,000 LPM (litres per minute) of oxygen. As of now, there is no other government or private hospital in the state that has a plant of this capacity," said a source in the NBMCH. Sushanta Roy, officer on special duty deputed by the state health department in north Bengal, said this plant will ensure piped medical oxygen supply to patients.

<https://www.telegraphindia.com/west-bengal/bengals-biggest-oxygen-plant-opens-in-siliguri/cid/1833426>



A view of the machinery at the oxygen plant inaugurated at the NBMCH, on the outskirts of Siliguri. (Passang Yolmo)

DRDO on Twitter









 **Rajnath Singh** @rajnathsingh · 14h
Felicitated the DRDO Dare to Dream 2.0 award winners and the Young Scientists a function in New Delhi today. There is a great need for R&D in futuristic defence technologies. Our aim is to equip our forces with latest machinery to deal with any challenge.
pib.gov.in/PressReleasePa...



 **Rajnath Singh** @rajnathsingh · 19h
Speaking at the Felicitation Ceremony of 'Dare to Dream 2.0' Award Winners & Young Scientists of DRDO. @DRDO_India



 **Rajnath Singh** @rajnathsingh
Speaking at the Felicitation Ceremony of 'Dare to Dream 2.0' Award Winners & Young Scientists of DRDO.

-  **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 19h ...
आज के इस programme में जो component मुझे सबसे अधिक आकर्षित कर रहा है वह है 'Dare to Dream' challenge. ये तीन words हमारे vision, और mission को बहुत clarity से दर्शाते हैं। DRDO की mandate, मैं समझता हूँ इसी 'Dare to Dream' पर आधारित है: रक्षा मंत्री
-  **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 19h ...
मैं Chairman, DRDO डॉ रेड्डी जी की सराहना करता हूँ, कि आपके leadership में DRDO, ना सिर्फ technologically advanced countries की capabilities को match करने का प्रयास कर रहा है , बल्कि अपनी तरह की नई technologies के innovation में भी बराबर लगा हुआ है: रक्षा मंत्री
-  **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 19h ...
शुरु से लेकर अभी हाल के LCA Mark 1-A, Arjun Mark-1-A Main Battle Tank और MR-SAM के contracts और induction तक, DRDO हमारी Armed Forces की capacity और capability बढ़ाने में लगातार सहयोग कर रहा है: रक्षा मंत्री
-  **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 19h ...
आज हम New India के नए dimension में, futuristic technologies, जैसे- Nano technology, Quantum computing, Artificial intelligence and robotic technologies आदि पर काम कर रहे हैं। DRDO Young scientists lab और Advance technology centers इन क्षेत्रों में कार्य करना शुरू कर चुके हैं: RM
-  **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 19h ...
आज जिस तरह DRDO से Industry की ओर Technology transfer की बात हो रही है, आने वाले समय में हमारी कोशिश होनी चाहिए कि हमारी Industry को इसकी जरूरत ही न पड़े: रक्षा मंत्री
-  **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 19h ...
आज हमने DRDO की Directed Research Policy भी release की है। यह futuristic surveillance, defensive और offensive capabilities जैसे important subjects पर focused research में एक important role निभाएगा: रक्षा मंत्री
-  **रक्षा मंत्री कार्यालय/ RMO India** ✓ @DefenceMinIndia · 19h ...
मुझे खुशी है कि Gujarat University और DRDO ने मिलकर इस initiative को आगे बढ़ाने के लिए concrete steps उठाए हैं। इस momentous occasion पर गुजरात विश्वविद्यालय के Vice Chancellor और Chairman DRDO को मैं अपनी ओर से congratulate करता हूँ: रक्षा मंत्री
-  **DRDO** ✓ @DRDO_India · 16h ...
Raksha Mantri gives away DRDO Dare to Dream 2.0 awards. pib.gov.in/PressReleasePa...

IAF gives glimpse of stealth cruise missile on Rafale?

The Scalp is manufactured by European defence giant MBDA

Ever since the Narendra Modi government first announced its decision to buy 36 Dassault Rafale fighters from France in 2015, much has been written on what capabilities the aircraft will bring the Indian Air Force.

In addition to its highly advanced radar and sensors, the Rafale brings the Indian Air Force a new generation of air-to-air and air-to-surface weapons. Prominent among the air-to-surface weapons is the Scalp cruise missile.

On Monday, the Indian Air Force tweeted rare images of a Rafale carrying the Scalp cruise missile. Giving the caption "When you know how to be Smart and Pretty—Ways of the World", the Indian Air Force shared images of a Rafale and a Netra

airborne early-warning aircraft firing flares, which are used to distract infrared-homing air-to-air or surface-to-air missiles. Three of the images showed a Rafale carrying what appeared to be a Scalp missile on its 'centreline' pylon (the weapon station mounted at the centre of the fuselage).

The aircraft was also carrying two external fuel tanks and what appeared to be four MICA air-to-air missiles.

Why the Scalp is a big deal

The Scalp is manufactured by European defence giant MBDA. Designated as the Storm Shadow by the UK, the Scalp is capable of destroying "high-value fixed or stationary targets such as hardened bunkers or key infrastructure", according to MBDA.

The Scalp is considered a stealthy weapon as it has a design meant to minimise its chances of radar detection and can fly at very low level. The cruise missile navigates using a combination of GPS, inertial navigation and "terrain reference". Terrain reference involves feeding characteristics of the terrain around a target into the missile, which allows it to dodge and fly around structures such as hills or buildings, which are en route. The Scalp also has an imaging infrared seeker to match the image of the target with its database to ensure accuracy and minimise collateral damage.

While MBDA says the Scalp has a range "in excess of 250km", some experts claim the cruise missile can hit targets up to 560km away, depending on its launch altitude.

The Scalp missile and its British derivative, the Storm Shadow, have been used in multiple conflicts in the past two decades, including the invasion of Iraq and air strikes over Libya and Syria. In addition to the air forces of France and the UK, the Scalp missile and Storm Shadow have been exported to Italy, Greece, Saudi Arabia and Qatar, among others.



A Rafale carrying what appears to be a Scalp missile | [Twitter handle of IAF](#)

The Rafale can carry two Scalp missiles, along with three large fuel tanks, in a long-range attack configuration. Along with the air-launched Brahmos missile, the Scalp will be the first 'deep strike' missile of the Indian Air Force. However, in its current configuration, the Brahmos is too heavy and a single Su-30 MKI can only carry one missile.

As China bolsters its air defence capabilities, which already includes the Russian S-400 system, the Scalp is expected to play a pivotal role in the Indian Air Force's plans to deter Beijing.

<https://www.theweek.in/news/india/2021/10/04/iaf-gives-glimpse-of-stealth-cruise-missile-on-rafale.html>

Ambala Cantonment: Indian Army Chief visits Kharga Corps

Ambala: Chief of Army Staff General Manoj Mukund Naravane visited the Ambala Cantonment based Kharga Corps on Monday to review operational preparedness and laid the wreath at the Vijay Smarak in remembrance of the sacrifices made by soldiers of the Indian Army in the past 50 years.

General Naravane addressed a special Sainik Sammelan at the Raina Auditorium, where he lauded the exemplary zeal displayed by all ranks of the corps during every operation till date.

A statement issued by the army said that Naravane also motivated all ranks to dedicate themselves towards achieving the highest professional and operational standards set by the Corps.

“The Kharga Corps was raised to battle at Krishna Nagar in West Bengal under the leadership of Lt General TN Raina, MVC (Later General TN Raina, COAS). The Corps has earned distinction in various battles since and developed into a mighty fighting force with immense capacity and versatility,” the statement reads.

The chief also visited Air Force Station, where a historic affiliation of 17 Squadron of Indian Air force with the Sikh Light Infantry of Indian Army was formally signed at a solemn ceremony in the presence of Air Marshal Amit Dev, Air Officer Commanding-in-Chief, Western Air Command.

The ceremony was also marked by aerobatics display by the Rafale aircraft and a display on the ground by the Sikh Light Infantry Regiment.

“The affiliation of the Regiment with the Rafale Squadron of Western Air Command will assist in the development of mutual understanding of joint ethos, capability, limitations and core competencies of both services through a common understanding of military tactical doctrines and concepts in the contemporary conflict environment,” another statement reads.

<https://www.hindustantimes.com/cities/chandigarh-news/ambala-cantonment-indian-army-chief-visits-kharga-corps-101633374369331.html>



Indian Army chief General Manoj Mukund Naravane during his visit to Kharga Corps in Ambala Cantonment on Monday.

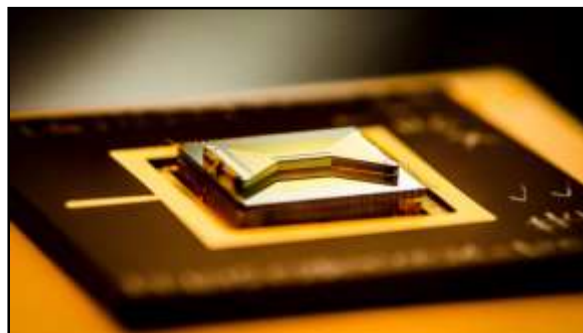


Tue, 05 Oct 2021

Foundational step shows quantum computers can be better than the sum of their parts

By Bailey Bedford

Pobody's nerfect—not even the indifferent, calculating bits that are the foundation of computers. But JQI Fellow Christopher Monroe's group, together with colleagues from Duke University, have made progress toward ensuring we can trust the results of quantum computers even when they are built from pieces that sometimes fail. They have shown in an experiment, for the first time, that an assembly of quantum computing pieces can be better than the worst parts used to make it. In a paper published in the journal *Nature* on Oct. 4, 2021, the team shared how they took this landmark step toward reliable, practical quantum computers.



In their experiment, the researchers combined several qubits—the quantum version of bits—so that they functioned together as a single unit called a logical qubit. They created the logical qubit based on a quantum error correction code so that, unlike for the individual physical qubits, errors can be easily detected and corrected, and they made it to be fault-tolerant—capable of containing errors to minimize their negative effects.

A chip containing an ion trap that researchers use to capture and control atomic ion qubits (quantum bits). Credit: Kai Hudek/JQI

"Qubits composed of identical atomic ions are natively very clean by themselves," says Monroe, who is also a Fellow of the Joint Center for Quantum Information and Computer Science and a College Park Professor in the Department of Physics at the University of Maryland. "However, at some point, when many qubits and operations are required, errors must be reduced further, and it is simpler to add more qubits and encode information differently. The beauty of error correction codes for atomic ions is they can be very efficient and can be flexibly switched on through software controls."

This is the first time that a logical qubit has been shown to be more reliable than the most error-prone step required to make it. The team was able to successfully put the logical qubit into its starting state and measure it 99.4% of the time, despite relying on six quantum operations that are individually expected to work only about 98.9% of the time.

That might not sound like a big difference, but it's a crucial step in the quest to build much larger quantum computers. If the six quantum operations were assembly line workers, each focused on one task, the assembly line would only produce the correct initial state 93.6% of the time (98.9% multiplied by itself six times)—roughly ten times worse than the error measured in the experiment. That improvement is because in the experiment the imperfect pieces work together to minimize the chance of quantum errors compounding and ruining the result, similar to watchful workers catching each other's mistakes.

The results were achieved using Monroe's ion-trap system at UMD, which uses up to 32 individual charged atoms—ions—that are cooled with lasers and suspended over electrodes on a chip. They then use each ion as a qubit by manipulating it with lasers.

"We have 32 laser beams," says Monroe. "And the atoms are like ducks in a row; each with its own fully controllable laser beam. I think of it like the atoms form a linear string and we're plucking it like a guitar string. We're plucking it with lasers that we turn on and off in a programmable way. And that's the computer; that's our central processing unit."

By successfully creating a fault-tolerant logical qubit with this system, the researchers have shown that careful, creative designs have the potential to unshackle quantum computing from the constraint of the inevitable errors of the current state of the art. Fault-tolerant logical qubits are a way to circumvent the errors in modern qubits and could be the foundation of quantum computers that are both reliable and large enough for practical uses.

Correcting errors and tolerating faults

Developing fault-tolerant qubits capable of error correction is important because Murphy's law is relentless: No matter how well you build a machine, something eventually goes wrong. In a computer, any bit or qubit has some chance of occasionally failing at its job. And the many qubits involved in a practical quantum computer mean there are many opportunities for errors to creep in.

Fortunately, engineers can design a computer so that its pieces work together to catch errors—like keeping important information backed up to an extra hard drive or having a second person read your important email to catch typos before you send it. Both the people or the drives have to mess up for a mistake to survive. While it takes more work to finish the task, the redundancy helps ensure the final quality.

Some prevalent technologies, like cell phones and high-speed modems, currently use error correction to help ensure the quality of transmissions and avoid other inconveniences. Error correction using simple redundancy can decrease the chance of an uncaught error as long as your procedure isn't wrong more often than it's right—for example, sending or storing data in triplicate and trusting the majority vote can drop the chance of an error from one in a hundred to less than one in a thousand.

So while perfection may never be in reach, error correction can make a computer's performance as good as required, as long as you can afford the price of using extra resources. Researchers plan to use quantum error correction to similarly complement their efforts to make better qubits and allow them to build quantum computers without having to conquer all the errors that quantum devices suffer from.

"What's amazing about fault tolerance, is it's a recipe for how to take small unreliable parts and turn them into a very reliable device," says Kenneth Brown, a professor of electrical and computer engineering at Duke and a coauthor on the paper. "And fault-tolerant quantum error correction will enable us to make very reliable quantum computers from faulty quantum parts."

But quantum error correction has unique challenges—qubits are more complex than traditional bits and can go wrong in more ways. You can't just copy a qubit, or even simply check its value in the middle of a calculation. The whole reason qubits are advantageous is that they can exist in a quantum superposition of multiple states and can become quantum mechanically entangled with each other. To copy a qubit you have to know exactly what information it's currently storing—in physical terms you have to measure it. And a measurement puts it into a single well-defined quantum state, destroying any superposition or entanglement that the quantum calculation is built on.

So for quantum error correction, you must correct mistakes in bits that you aren't allowed to copy or even look at too closely. It's like proofreading while blindfolded. In the mid-1990s, researchers started proposing ways to do this using the subtleties of quantum mechanics, but quantum computers are just reaching the point where they can put the theories to the test.

The key idea is to make a logical qubit out of redundant physical qubits in a way that can check if the qubits agree on certain quantum mechanical facts without ever knowing the state of any of them individually.

Can't improve on the atom

There are many proposed quantum error correction codes to choose from, and some are more natural fits for a particular approach to creating a quantum computer. Each way of making a quantum computer has its own types of errors as well as unique strengths. So building a practical quantum computer requires understanding and working with the particular errors and advantages that your approach brings to the table.

The ion trap-based quantum computer that Monroe and colleagues work with has the advantage that their individual qubits are identical and very stable. Since the qubits are electrically charged ions, each qubit can communicate with all the others in the line through electrical nudges, giving freedom compared to systems that need a solid connection to immediate neighbors.

"They're atoms of a particular element and isotope so they're perfectly replicable," says Monroe. "And when you store coherence in the qubits and you leave them alone, it exists essentially forever. So the qubit when left alone is perfect. To make use of that qubit, we have to poke it with lasers, we have to do things to it, we have to hold on to the atom with electrodes in a vacuum chamber, all of those technical things have noise on them, and they can affect the qubit."

For Monroe's system, the biggest source of errors is entangling operations—the creation of quantum links between two qubits with laser pulses. Entangling operations are necessary parts of operating a quantum computer and of combining qubits into logical qubits. So while the team can't hope to make their logical qubits store information more stably than the individual ion qubits, correcting the errors that occur when entangling qubits is a vital improvement.

The researchers selected the Bacon-Shor code as a good match for the advantages and weaknesses of their system. For this project, they only needed 15 of the 32 ions that their system can support, and two of the ions were not used as qubits but were only needed to get an even spacing between the other ions. For the code, they used nine qubits to redundantly encode a single logical qubit and four additional qubits to pick out locations where potential errors occurred. With that information, the detected faulty qubits can, in theory, be corrected without the "quantum-ness" of the qubits being compromised by measuring the state of any individual qubit.

"The key part of quantum error correction is redundancy, which is why we needed nine qubits in order to get one logical qubit," says JQI graduate student Laird Egan, who is the first author of the paper. "But that redundancy helps us look for errors and correct them, because an error on a single qubit can be protected by the other eight."

The team successfully used the Bacon-Shor code with the ion-trap system. The resulting logical qubit required six entangling operations—each with an expected error rate between 0.7% and 1.5%. But thanks to the careful design of the code, these errors don't combine into an even higher error rate when the entanglement operations were used to prepare the logical qubit in its initial state.

The team only observed an error in the qubit's preparation and measurement 0.6% of the time—less than the lowest error expected for any of the individual entangling operations. The team was then able to move the logical qubit to a second state with an error of just 0.3%. The team also intentionally introduced errors and demonstrated that they could detect them.

"This is really a demonstration of quantum error correction improving performance of the underlying components for the first time," says Egan. "And there's no reason that other platforms can't do the same thing as they scale up. It's really a proof of concept that quantum error correction works."

As the team continues this line of work, they say they hope to achieve similar success in building even more challenging quantum logical gates out of their qubits, performing complete cycles of error correction where the detected errors are actively corrected, and entangling multiple logical qubits together.

"Up until this paper, everyone's been focused on making one logical qubit," says Egan. "And now that we've made one, we're like, 'Single logical qubits work, so what can you do with two?'"

In addition to Monroe, Brown and Egan, the other coauthors of the paper are the following: JQI research scientist Marko Cetina; JQI graduate students Andrew Risinger, Daiwei Zhu and Debopriyo Biswas; Duke University physics graduate student Dripto M. Debroy; Duke University postdoctoral researchers Crystal Noel and Michael Newman; and Georgia Institute of Technology graduate student Muyuan Li.

More information: Fault-tolerant control of an error-corrected qubit, *Nature* (2021). [DOI: 10.1038/s41586-021-03928-y](https://doi.org/10.1038/s41586-021-03928-y), www.nature.com/articles/s41586-021-03928-y

Journal information: [Nature](https://www.nature.com)
<https://phys.org/news/2021-10-foundational-quantum-sum.html>



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Induced flaws in quantum materials could enhance superconducting properties

In a surprising discovery, an international team of researchers, led by scientists in the University of Minnesota Center for Quantum Materials, found that deformations in quantum materials that cause imperfections in the crystal structure can actually improve the material's superconducting and electrical properties.

The groundbreaking findings could provide new insight for developing the next generation of quantum-based computing and electronic devices.

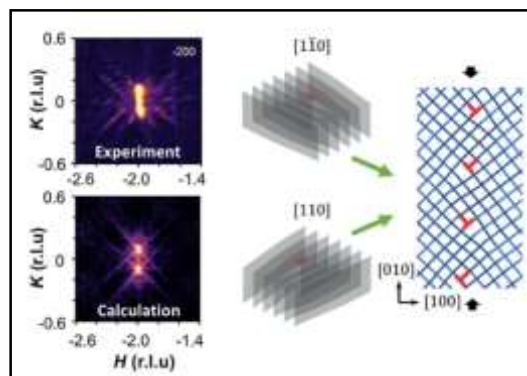
The research just appeared in *Nature Materials*.

"Quantum materials have unusual magnetic and electrical properties that, if understood and controlled, could revolutionize virtually every aspect of society and enable highly energy-efficient electrical systems and faster, more accurate electronic devices," said study co-author Martin Greven, a Distinguished McKnight Professor in the University of Minnesota's School of Physics and Astronomy and the Director of the Center for Quantum Materials. "The ability to tune and modify the properties of quantum materials is pivotal to advances in both fundamental research and modern technology."

Elastic deformation of materials occurs when the material is subjected to stress but returns to its original shape once the stress is removed. In contrast, plastic deformation is the non-reversible change of a material's shape in response to an applied stress—or, more simply, the act of squeezing or stretching it until it loses its shape. Plastic deformation has been used by blacksmiths and engineers for thousands of years. An example of a material with a large plastic deformation range is wet chewing gum, which can be stretched to dozens of times its original length.

While elastic deformation has been extensively used to study and manipulate quantum materials, the effects of plastic deformation have not yet been explored. In fact, conventional wisdom would lead scientists to believe that "squeezing" or "stretching" quantum materials may remove their most intriguing properties.

In this pioneering new study, the researchers used plastic deformation to create extended periodic defect structures in a prominent quantum material known as strontium titanate (SrTiO_3). The defect structures induced changes in the electrical properties and boosted superconductivity.



Irreversible, plastic deformation causes extended crystalline defects in the quantum material strontium titanate (SrTiO_3) to organize into periodic structures, as revealed by neutron and x-ray scattering processes. These structures enhance electronic properties such as superconductivity. Credit: S. Hameed et al., University of Minnesota

"We were quite surprised with the results" Greven said. "We went into this thinking that our techniques would really mess up the material. We would have never guessed that these imperfections would actually improve the materials' superconducting properties, which means that, at low enough temperatures, it could carry electricity without any energy waste."

Greven said this study demonstrates the great promise of plastic deformation as a tool to manipulate and create new quantum materials. It can lead to novel electronic properties, including materials with high potential for applications in technology, he said.

Greven also said the new study highlights the power of state-of-the-art neutron and X-ray scattering probes in deciphering the complex structures of quantum materials and of a scientific approach that combines experiment and theory.

"Scientists can now use these techniques and tools to study thousands of other materials," Greven said. "I expect that we will discover all kinds of new phenomena along the way."

In addition to the University of Minnesota, the team included researchers from the University of Zagreb, Croatia; Ariel University, Israel; Peking University, Beijing, China; Oak Ridge National Laboratory; and Argonne National Laboratory.

More information: Enhanced superconductivity and ferroelectric quantum criticality in plastically deformed strontium titanate, *Nature Materials* (2021). DOI: [10.1038/s41563-021-01102-3](https://doi.org/10.1038/s41563-021-01102-3) , www.nature.com/articles/s41563-021-01102-3

Journal information: *Nature Materials*
<https://phys.org/news/2021-10-flaws-quantum-materials-superconducting-properties.html>

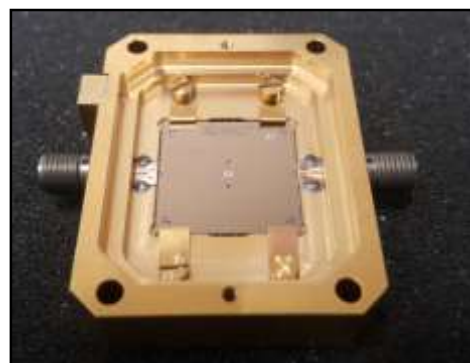


Tue, 05 Oct 2021

Spectral resolution of superconducting single photon detectors more than doubled

Scientists use superconducting detectors (MKIDs) to capture single photons coming from exoplanets. MKIDs constantly monitor their own kinetic inductance, which changes proportionally to the energy of an incoming photon. Researchers from SRON Netherlands Institute for Space Research have now more than doubled their spectral resolution by re-trapping most of the leaked energy. The research was published in *Physical Review Applied*.

In a superconductor at low temperature, most electrons live in pairs. An oscillating current accelerates and decelerates these pairs, giving rise to an effect called kinetic inductance. When a photon strikes a superconductor, its energy cascades through the material, breaking up thousands of electron pairs. A lower density of pairs means a higher kinetic inductance.



Credit: Pieter de Visser (SRON)

Scientists use this property to detect single visible and near-infrared photons, for example from exoplanets, by building superconducting single-photon detectors in the shape of microwave resonators, called Microwave Kinetic Inductance Detectors (MKIDs). These detectors constantly measure the kinetic inductance of their material and deduce if a photon has hit. And if so, with what wavelength, so that each pixel can also measure a spectrum. Pieter de Visser at SRON Netherlands Institute for Space Research and colleagues have now modified the design of MKIDs to achieve a 2.5-fold increase in the precision with which the device can measure a photon's wavelength.

Currently, conventional single photon detectors are superconducting circuits, deposited on a thick (>300 μm) silicon or sapphire substrate. The spectral resolution of these detectors is limited, because part of the initial energy from the detected photon can leak away into the substrate through acoustical waves—phonons— before it is registered. This energy loss increases the statistical variance of the kinetic-inductance signal used to detect a photon, which broadens the measured spectrum.

In their redesigned device, De Visser and his colleagues replace the substrate with a thin (110 nm) silicon-nitride membrane. They show that phonons escaping from the superconducting wire into this membrane reflect from the membrane's bottom surface back into the superconductor. There they finish their job breaking up more electron pairs. The researchers experimentally achieved resolving powers of 52 and 19 for optical and near-infrared photons, respectively. For conventional MKIDs these numbers were 21 and 10.

They now plan to address two challenges. Firstly to reach even higher spectral resolution by stronger phonon-trapping, using so-called phononic crystals. Secondly to apply this method to devices with many pixels, to create instruments suitable for astronomical and biological applications, such as studying exoplanet atmosphere and fluorescence measurements of biological samples.

More information: Pieter J. de Visser et al, Phonon-Trapping-Enhanced Energy Resolution in Superconducting Single-Photon Detectors, *Physical Review Applied* (2021). [DOI: 10.1103/PhysRevApplied.16.034051](https://doi.org/10.1103/PhysRevApplied.16.034051)
<https://phys.org/news/2021-10-spectral-resolution-superconducting-photon-detectors.html>

COVID-19 Research News

INDIA
TODAY

Tue, 05 Oct 2021

Blood thinners significantly reduce Covid related mortality, hospitalisation: Study

According to the study, patients who use blood thinners may have a nearly 50 per cent reduced risk of death

New Delhi: Covid-19 patients who use blood thinners may have a nearly 50 per cent reduced risk of death and a 43 per cent lower risk of hospitalisation, according to a study published in Lancet's EClinical Medicine journal.

The research was conducted on 6,195 patients over the age of 18 who were diagnosed with Covid-19 from March 4 to August 27, 2020, in 12 hospitals and 60 clinics in the US.

The researchers from the University of Minnesota, US, and Basel University in Switzerland analysed the relationship between 90-day anticoagulation therapy among out-patients before Covid-19 diagnosis and the risk for hospitalisation and mortality.

The researchers also evaluated the association between anticoagulation therapy, which is used to prevent blood clots, and mortality risk among admitted patients.

The study found that patients on blood thinners before contracting Covid-19 were 43 per cent less likely to be admitted to hospital, despite being older and having more chronic medical conditions than their peers.

Blood thinners, regardless of being used before being infected with Covid-19 or started when admitted to the hospital for treatment of the viral disease, reduce deaths by almost half, they added.

The researchers noted that, overall, hospitalised Covid-19 patients benefit from blood thinners regardless of the type or dose of the medication used.

“Many individuals with Covid-19 develop abnormal blood clots from high inflammation, which can lead to serious health complications and mortality,” said study lead author Sameh Hozayen, an assistant professor at the University of Minnesota.

“Blood thinners are medications prescribed to prevent blood clots in patients with a prior blood clot in their lungs or legs. They also prevent blood clots in the brain secondary to abnormal heart rhythms, like atrial fibrillation,” Hozayen wrote in the journal.

The researchers said blood thinners are the standard of treatment in these diseases, which is why they looked at data to see if it impacted hospitalisations related to Covid-19.

“We already know that overwhelmed hospitals have a higher risk for death among their patients, so reducing hospitalisation may have a positive impact during a Covid-19 surge,” Hozayen added.

The researchers also noted that about half the patients prescribed blood thinners for blood clots in their legs, lungs, abnormal heart rhythms or other reasons do not take them.

Increasing adherence for people already prescribed blood thinners can potentially reduce the bad effects of Covid-19, they said.

“At most centers around the world now, there are protocols for starting blood thinners when patients are first admitted to the hospital for Covid-19 — as it is a proven vital treatment option,” Hozayen said.

“Outside of Covid-19, the use of blood thinners is proven to be lifesaving for those with blood coagulation conditions,” the scientist added.

The team is currently working with research groups in other parts of the world such as Egypt to look at how blood thinners impact patients in less-invested health care systems and in different patient populations.

<https://www.indiatoday.in/coronavirus-outbreak/story/covid-blood-thinners-hospitalisation-study-1860590-2021-10-04>

