

Mar
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 : 62 26 मार्च 2021

Vol.: 46 Issue : 62 26 March 2021



रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
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DRDO successfully tests new generation Akash missile

Akash-NG “is a new generation Surface to Air Missile meant for use by Indian Air Force with an aim of intercepting high maneuvering low RCS (Radar Cross Section) aerial threats.”

New Delhi: The Defence Research and Development Organisation (DRDO) on Monday successfully conducted the maiden test of the New Generation Akash missile (Akash-NG).

The DRDO said in a statement that it “conducted the successful maiden launch of Akash-NG (New Generation) Missile from Integrated Test Range off the coast of Odisha”.

Akash-NG “is a new generation Surface to Air Missile meant for use by Indian Air Force with an aim of intercepting high maneuvering low RCS (Radar Cross Section) aerial threats,” it said.

The missile, DRDO said, intercepted the target “with text book precision” and the launch “met all the test objectives by performing high maneuvers during the trajectory”.

“The performance of the Command and Control system, onboard avionics and aerodynamic configuration of the missile was successfully validated during the trial. During the test launch, entire flight path of the missile was monitored and the flight data was captured by various Range instruments such as Radar, EOTS and Telemetry systems deployed by ITR, Chandipur,” the statement said. It also mentioned that the multi-function radar was tested for its capability of integration with the system.

The new generation missile system has been developed with “better deployability compared to other similar systems with canisterized launcher and much smaller ground system footprint,” the DRDO stated, and added that the test launch was carried out by a combined team of DRDO, Bharat Dynamics Limited, and Bharat Electronics in the presence of the representatives of Indian Air Force.

<https://indianexpress.com/article/india/drdo-successfully-tests-new-generation-akash-missile-7161693>



The missiles are being produced by BDL under license from French defence major MBDA Missile Systems. (PIB)

India successfully tests new gen Akash missile

- *Akash-NG is a new generation surface-to-air missile meant for use by Indian Air Force to intercept high maneuvering low radar cross-section aerial threats.*

India on Monday announced that it successfully test-fired the Akash-NG (new generation) surface-to-air missile for the first time off the Odisha coast.

Akash-NG missile has been designed to strike low radar cross-section aerial targets. It weighs only half of the existing Akash missile and requires fewer ground systems, officials familiar with the project said.

The existing Akash missile has a range of 25 km, while the upgraded variant (NG) can strike targets at a distance of 30 km, officials said.

“Akash-NG is a new generation surface-to-air missile meant for use by Indian Air Force with an aim of intercepting high maneuvering low radar cross-section aerial threats,” the defence ministry said in a statement.

The weapon was tested by the Defence Research and Development Organisation.

The missile intercepted the target with precision, officials said. “The launch met all the test objectives by performing high maneuvers during the trajectory. The performance of the command and control systems, onboard avionics and aerodynamic configuration of the missile was successfully validated during the trial,” statement said.

The Akash-NG system has been developed with better deployability compared to other similar systems with canisterised launcher and much smaller ground system footprint, it added.

The Union Cabinet, chaired by Prime Minister Narendra Modi, on December 30 gave its go-ahead to the sale of Akash surface-to-air missile systems to friendly foreign countries and created a high-powered panel for swifter approval to export of military hardware at a time India has set a target of clocking defence exports worth \$5 billion by 2024.

The missile --- already in service in the Indian military --- has an indigenous content of 96%. The missile was inducted into the Indian Air Force in 2014 and in the army a year later.

<https://www.hindustantimes.com/india-news/india-successfully-tests-new-gen-akash-missile-101611587766511.html>



Indian Air Force demonstrates its combat and firepower, including Akash Missile, for the first time, in Pokhran, March 18 .(Sonu Mehta/ HT Photo)

DRDO ने किया आकाश न्यू जेनरेशन मिसाइल का सफल परीक्षण, वायुसेना होगी और मजबूत

डीआरडीओ ने सोमवार को ओडिशा के तट से इंटीग्रेटेड टेस्ट रेंज से आकाश एनजी (न्यू जेनरेशन) मिसाइल का सफल प्रक्षेपण किया। आकाश एनजी एक नई पीढ़ी का सरफेस-टू-एयर मिसाइल है जिसका उपयोग भारतीय वायुसेना द्वारा उच्च पैतरेबाजी वाले हवाई खतरों को रोकने के उद्देश्य से किया जाता है।

By Arun Kumar Singh and Nava Pandey

बालेश्वर: भारत द्वारा स्वदेश में निर्मित मध्यम दूरी की सतह से हवा में मार करने वाली आकाश प्रक्षेपास्त्र का सोमवार दोपहर को सफलतापूर्वक परीक्षण किया है यह परीक्षण चांदीपुर परीक्षण परिसर एलसी 3 से दोपहर करीब 2:40 पर किया गया है और यह परीक्षण पूरी तरह से सफल रहा। स्वदेशी निर्मित मध्यम दूरी की सतह से हवा में मार करने वाले प्रक्षेपास्त्र आकाश को रक्षा अनुसंधान और विकास संगठन डीआरडीओ द्वारा विकसित किया गया है। यह प्रक्षेपास्त्र विमान को 30 किलोमीटर दूर एवं 18000 मीटर ऊंचाई तक टारगेट कर सकता है। इसमें लड़ाकू जेट विमान क्रूज मिसाइलों और हवा से सतह वाली मिसाइलों के साथ-साथ बैलिस्टिक मिसाइलों जैसे हवाई लक्ष्यों को बेअसर करने की क्षमता है।

दुश्मन जब तक इसको रोकने का प्रयास करेगा तब तक यह उसे मार कर नेस्तनाबूद कर देगी। इसको एंटी मिसाइल के तौर पर भी उपयोग में लाया जा सकता है। यह भारतीय थल सेना और भारतीय वायु सेना के साथ परिचालन सेवा में है।

आकाश 30 किलोमीटर की एक अवरोधक सीमा के साथ सतह से हवा में मार करने वाली मिसाइल है इसका वजन 720 किलोग्राम व्यास 35 सेंटीमीटर और लंबाई 5.78 मीटर है आकाश सुपर सोनिक गति पर 2.5 मैक के आसपास पहुंचती है यह 18 किलोमीटर की ऊंचाई तक पहुंच सकती है और ट्रक और पहियेदार दोनों प्लेटफार्म से फायर किया जा सकता है। इस मिसाइल को चरण बद्ध सारिणी फायर कंट्रोल रडार द्वारा निर्देशित किया जाता है, जिसे राजेंद्र कहा जाता है। यह बैटरी स्तर रडार बीएलआर के रूप में लगभग 7 किलोमीटर तक के टारगेट की ट्रैकिंग कर सकता है। आज इसके परीक्षण के मौके पर रक्षा अनुसंधान और विकास संगठन तथा अंतरिम परीक्षण परिषद से जुड़े वरिष्ठ अधिकारी और वैज्ञानिक मौके पर मौजूद थे।

1990 में आकाश मिसाइल का पहला परीक्षण उड़ान आयोजित की गई थी और मार्च 1997 तक इसकी विकास की उड़ानें चली। दिसंबर 2007 में भारतीय वायु सेना ने इस मिसाइल के लिए उपयोगकर्ता परीक्षण पूरा किए। पिछले दिनों आकाश मिसाइल की खरीद में दक्षिण एशिया के नौ देशों एवं अफ्रीकी मित्र देशों ने रुचि दिखाई। कुछ मित्र देशों ने आकाश मिसाइल के अतिरिक्त तटीय निगरानी प्रणाली, रडार तथा एयर प्लेटफॉर्म को भी खरीदने में अपना रुझान दिखाया है।

रक्षा अनुसंधान एवं विकास संगठन (डीआरडीओ) द्वारा विकसित आकाश मिसाइल की तकनीक एवं विकास 96 प्रतिशत स्वदेशी है। भारत ने यह भी स्पष्ट कर दिया है कि भारत आकाश मिसाइल केवल उन्हीं देशों को बेचेगा जिनसे उसके बेहतर एवं मैत्रीपूर्ण संबंध हैं।

<https://www.jagran.com/news/national-drdo-conducted-successful-maiden-launch-of-akash-ng-new-generation-missile-21307181.html>



डीआरडीओ को कामयाबी, नई आकाश मिसाइल का पहला परीक्षण सफल

नई दिल्ली: डीआरडीओ ने सोमवार को आकाश मिसाइल के नए संस्करण का सफलतापूर्वक परीक्षण किया। ओडिशा स्थित एकीकृत परीक्षण केंद्र से इसे दागा गया। इसे आकाश-एनजी यानी नई पीढ़ी की आकाश मिसाइल नाम दिया गया है। यह सतह से हवा में मार करने में सक्षम है। इसे भारतीय वायुसेना के लिए खासतौर से बनाया गया है। सीमाओं पर तनाव व बढ़ते हवाई खतरों को देखते हुए आकाश-एनजी कारगर रहेगी।

सभी कसौटी पर खरी उतरी

डीआरडीओ ने बताया कि नई आकाश मिसाइल लक्ष्य पाने में अचूक रही। परीक्षण के दौरान यह सारी कसौटियों पर खरी उतरी। मिसाइल का कमांड कंट्रोल सिस्टम, एवियोनिक्स, एरोडायनेमिक सिस्टम सभी ने ठीक ढंग से काम किया।

मिसाइल तकनीक में आत्म-निर्भरता के लिए उपराष्ट्रपति ने वैज्ञानिकों को सराहा

उपराष्ट्रपति एम वेंकैया नायडु ने मिसाइल तकनीक के मामले में भारत को आत्म-निर्भरता के करीब ले जाने के लिए सोमवार को डीआरडीओ के वैज्ञानिकों की सराहना करते हुए कहा कि रक्षा क्षेत्र में आत्म-निर्भरता हासिल करना केवल सामरिक रूप से ही महत्वपूर्ण नहीं है, बल्कि राष्ट्रीय गौरव के लिहाज से भी जरूरी है।

नायडु ने डॉक्टर एपीजे अब्दुल कलाम मिसाइल परिसर में दो केन्द्रों का उद्घाटन करने के बाद अपने संबोधन में ये बातें कहीं। उन्होंने कहा कि उन्हें यह जानकर बहुत खुशी हुई कि डीआरडीओ के मिसाइल विभाग के वैज्ञानिक अपनी विरासत को बरकरार रखे हुए हैं और उन्होंने नई पीढ़ी की मिसाइल प्रणाली विकसित की है।

एक आधिकारिक विज्ञप्ति के अनुसार नायडु ने 'एक्सपोजीशन ऑफ टेक्नोलॉजी बाय मिसाइल कॉम्प्लेक्स लैबोरेटरी' का भी दौरा किया और कहा कि स्वदेशी उत्पाद देखकर उन्हें अत्यधिक प्रसन्नता हुई।

नायडु ने कहा कि आत्म-निर्भर मिसाइल तकनीक हासिल करने में डीआरडीओ के वैज्ञानिकों की जबरदस्त प्रगति देखकर मैं देश की सुरक्षा और क्षमता को लेकर एक बार फिर आश्वस्त महसूस कर रहा हूँ।

<https://www.amarujala.com/india-news/drdo-succeeds-first-test-of-new-akash-missile-successful?pageId=1>



नई पीढ़ी की आकाश मिसाइल - फोटो : ANI



Press Information Bureau
Government of India

Ministry of Defence

Thu, 25 March 2021 7:13PM

Webinar with Chile on Defence industry global outreach for collaborative partnership

A webinar between India and Chile was held on 25 March 2021. The Theme of webinar was “Indian Defence Industry Global Outreach for Collaborative Partnership: Webinar and Expo”. It was organized under the aegis of Department of Defence Production, Ministry of Defence through *Society of Indian Defence Manufacturers* (SIDM).

Secretary (Defence Production), Shri Raj Kumar; Head of the Technological Development and Industry Division, Ministry of Defence, Government of Chile Mr. Oscar Bustos and other senior officials from both sides participated in the webinar. In his opening remarks, Shri Raj Kumar highlighted the strong capabilities of Indian defence industry in various fields and their willingness to collaborate with Chilean defence companies for co-development and co-production in the areas of mutual interest. Further, the Secretary (Defence Production) stated that Indian defence industry is keen to participate in the bidding procurement process of Chilean Armed Forces.

Indian companies L&T, Bharat Forge, Goa Shipyard Limited, HAL, Mahindra Defence, MKU, OFB and Tata Advanced Systems made presentations on major defence platforms and products. From Chilean side FAMA/E/S2T, ASMAR/SISDEF and ENAER/DTS made company presentations.

The webinar was attended by more than 130 delegates. More than 100 virtual exhibition stalls from Indian companies were set up.

This webinar was a part of the series of webinars which are being organized with friendly foreign countries in order to boost defence exports and achieve defence export target of 5 billion US Dollar by the year 2025.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1707602>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 25 March 2021 7:13PM

रक्षा उद्योग ग्लोबल आउटरीच पर सहयोगात्मक साझेदारी के लिए चिली के साथ वेबिनार

दिनांक 25 मार्च, 2021 को भारत और चिली के बीच एक वेबिनार का आयोजन किया गया। वेबिनार का विषय "इंडियन डिफेंस इंडस्ट्री ग्लोबल आउटरीच फॉर कॉलबोरेटिव पार्टनरशिप: वेबिनार एंड एक्सपो" था। इस वेबिनार का आयोजन रक्षा मंत्रालय के रक्षा उत्पादन विभाग द्वारा सोसाइटी फॉर इंडियन डिफेंस मनुफैक्चरर्स (एसआईडीएम) के माध्यम से किया गया था।

सचिव (रक्षा उत्पादन) श्री राज कुमार; चिली सरकार के रक्षा मंत्रालय के प्रौद्योगिकी विकास एवं उद्योग प्रभाग के प्रमुख श्री ऑस्करबस्तोस तथा दोनों पक्षों के अन्य वरिष्ठ अधिकारियों ने वेबिनार में भाग लिया। अपने उद्घाटन भाषण में श्री राज कुमार ने विभिन्न क्षेत्रों में भारतीय रक्षा उद्योग की मजबूत क्षमताओं और आपसी हित के क्षेत्रों में सह-विकास और सह-उत्पादन के लिए चिली की रक्षा कंपनियों के साथ सहयोग करने की इच्छा पर प्रकाश डाला। इसके अलावा सचिव (रक्षा उत्पादन) ने कहा कि भारतीय रक्षा उद्योग चिली के सशस्त्र बलों की बोली के ज़रिए चलाई जाने वाली अधिग्रहण प्रक्रिया में भाग लेने का इच्छुक है।

भारतीय कंपनियों एल एंड टी, भारत फोर्ज, गोवा शिपयार्ड लिमिटेड, एचएएल, महिंद्रा डिफेंस, एमकेयू, ओएफबी और टाटा एडवांस्ड सिस्टम्स ने प्रमुख डिफेंस प्लेटफॉर्मर्स एवं उत्पादों पर प्रस्तुतिकरण दिया। चिलीकी ओर से FAMA/E/S2T, ASMAR/SISDEF और ENAER/DTS ने कंपनी प्रस्तुतिकरण दिया।

वेबिनार में 130 से अधिक प्रतिनिधियों ने भाग लिया। भारतीय कंपनियों की ओर से 100 से अधिक आभासी प्रदर्शनी स्टॉल लगाए गए थे।

यह वेबिनार उन वेबिनारों की श्रृंखला का हिस्सा थी जो रक्षा निर्यात को बढ़ावा देने और वर्ष 2025 तक 5 अरब अमेरिकी डॉलर के रक्षा निर्यात लक्ष्य को प्राप्त करने के उद्देश्य से मित्र देशों के साथ आयोजित की जा रही हैं।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1707639>



Press Information Bureau
Government of India

Ministry of Defence

Thu, 25 March 2021 6:45PM

Curtain raiser: Visit of H.E. Mr Suh Wook, Minister of National Defence, Republic of Korea to India

As part of increasing bilateral defence cooperation between India and the Republic of Korea, Mr Suh Wook, the Hon'ble Minister of National Defence, Republic of Korea, will be visiting India from 25 to 27 March 2021. The Hon'ble Minister will interact with a number of senior Indian dignitaries over the course of his visit and discuss issues of strategic nature.

Mr Suh Wook will pay his respects at the National War Memorial on 26 March 2021, which will be followed by his inauguration of the Indo-Korean Bilateral Friendship Park in Delhi Cantonment. The Park commemorates the contribution of Indian peacekeepers during the Korean War and is a testament to the strong relations between the two countries. The Hon'ble Minister will be accorded a Tri Services Guard of Honour at Sushma Swaraj Bhawan followed by interaction with the Hon'ble Raksha Mantri.

The Hon'ble Minister will proceed to Agra on 27 March 2021 and witness the operational capabilities of the Parachute Brigade at Agra. The Hon'ble Minister will also visit and interact with personnel of 60 Para Field Hospital, which was actively involved in providing medical aid to United Nations and South Korean personnel during the Korean War. The actions of these Maroon Angels cemented Indo-Korean friendship further. The Hon'ble Minister is scheduled to return later in the evening.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1707594>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 25 March 2021 6:45PM

कोरिया गणराज्य के राष्ट्रीय रक्षा मंत्री महामहिम श्री सुह वूक का भारत दौरा

भारत और कोरिया गणराज्य के बीच द्विपक्षीय रक्षा सहयोग बढ़ानेके एक हिस्से के तौर पर कोरिया गणराज्य के राष्ट्रीय रक्षा मंत्री श्री सुह वूक दिनांक 25 से 27 मार्च 2021 तक भारत का दौरा करेंगे। माननीय मंत्री अपनी यात्रा के दौरान देश के अनेक वरिष्ठ गणमान्य व्यक्तियों के साथ बातचीत करेंगे और रणनीतिक प्रकृति के मुद्दों पर चर्चा करेंगे।

श्री सुह वूक दिनांक 26 मार्च, 2021 को राष्ट्रीय युद्ध स्मारक पर श्रद्धांजलि अर्पित करेंगे, जिसके बाद दिल्ली छावनी में भारत-कोरियाई द्विपक्षीय मैत्री पार्क का उद्घाटन किया जाएगा। यह पार्क कोरियाई युद्ध के दौरान भारतीय शांतिरक्षकों के योगदान की स्मृति में है और यह दोनों देशों के बीच मजबूत संबंधों का एक प्रमाण है। माननीय मंत्री को सुषमा स्वराज भवन में ट्राई सर्विसेज गार्ड ऑफ ऑनर दिया जाएगा और उसके बाद माननीय रक्षा मंत्री के साथ वार्ता आयोजित होगी।

माननीय मंत्री दिनांक 27 मार्च 2021 को आगरा जाएंगे और आगरा में पैराशूट ब्रिगेड की सामरिक क्षमताओं के साक्षी बनेंगे। माननीय मंत्री 60 पैरा फील्ड अस्पताल के कर्मियों के साथ बातचीत करेंगे, जो कर्मी कोरियाई युद्ध के दौरान संयुक्त राष्ट्र और दक्षिण कोरियाई कर्मियों को चिकित्सा सहायता प्रदान करने में सक्रिय रूप से शामिल थे। इन मरून एंजिल्स की कार्रवाई ने भारत-कोरियाई दोस्ती को और अधिक मज़बूत किया। माननीय मंत्री काबआइ में शाम को लौटने का कार्यक्रम है।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1707642>



Press Information Bureau
Government of India

Ministry of Defence

Thu, 25 March 2021 5:16PM

7th IN BN Staff Talks

Towards further bolstering existing defence relations between India and Bangladesh in the maritime domain, 7th Staff Talks between Indian Navy and Bangladesh Navy were conducted from 23 to 25 March 2021 at New Delhi. Bangladesh Navy delegation was led by Rear Admiral Mohammad Mozammel Haque, Commander Chattogram Naval Area. Rear Admiral J Singh, Assistant Chief of Naval Staff led the delegation from Indian Navy. These Staff Talks were the first bilateral dialogue conducted post relaxation of COVID 19 travel restrictions. During the Staff Talks, issues relating to joint cooperative efforts like Coordinated Patrol along International Maritime Boundary Line, bilateral exercise BONGOSAGAR, conduct of Naval Training and Hydrography were discussed. Bangladesh Navy delegation also held a fruitful interaction with Vice Admiral MS Pawar, PVSM, AVSM, VSM, Deputy Chief of Naval Staff of Indian Navy on 24 March 2021.

India and Bangladesh are jointly celebrating the Golden Jubilee Celebrations of victory in Bangladesh Liberation War and 1971 War this year. A host of joint activities have been conducted which include reciprocal ship visits by both Navies, participation in Republic Day Parade 2021 at New Delhi by Bangladesh Armed Forces Contingent and participation of BN delegation in Indian Ocean Naval Symposium (IONS) Working Group on Information Sharing and Interoperability at New Delhi in February 2021. In March 2021, two Tri-service delegations from Indian Armed Forces are participating in carriage of 'Victory Day Flame' through the battlefields of the 1971 war and 'Independence Day Celebrations' in Bangladesh.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1707556>

Despite Pangong de-escalation, China threat remains: Army Chief

Emphasising the need to demarcate the Line of Actual Control, he said the seriousness of Pakistan with regard to the ceasefire at the Line of Control could only be gauged after the onset of summer

New Delhi: Despite the de-escalation on Pangong Lake in Ladakh, the threat from China has not entirely dissipated, Army Chief MM Naravane said Thursday as he stressed on the need to demarcate the Line of Actual Control. He also said the seriousness of Pakistan with regard to the ceasefire at the Line of Control could only be gauged after the onset of the summer.

“Unless a substantial amount of de-escalation takes place and the troops that had come from multiple places and are currently within striking distance of the border go back, the threat remains,” Naravane said at the Times Now International Economic Conclave.

He said there was tension on the Northern borders which was resolved through multiple rounds of talks culminating in disengagement at Pangong Tso. “The interaction was at different levels including the foreign ministers and defence ministers of both countries and reversion to status quo ante of April 2020 was the bottomline in all discussions.”

On the recently concluded military level talks with Pakistan, the Chief of Army Staff said: “There were talks between the DsGMO of both sides and a joint statement was issued on February 25, agreeing to resuscitate the ceasefire understanding of 2003 which was being honoured more in its breach. The whole month of March, we didn’t witness even a single round being fired on the LC barring one incident. It is for the first time in about five to six years that the LC has been silent. This really bodes well for the future. With peace and tranquillity prevailing on the border, it will contribute to the peace and stability of the country.”

Dwelling upon the reasons for ceasefire violations in the past and Pakistan now agreeing to honour it, he said: “Ceasefire move was prompted by the futility of duels on the LC which was not resulting in any forward movement. They were also facing internal problems and over a period of time, even they realised that it was time to change tack and extend an olive branch. However, terror infrastructure and terrorists still remain in place and we will have to wait till the snow melts in order to see the seriousness with which Pakistanis treat this ceasefire.”

He added that there were primarily three reasons for Pakistan’s move for peace—the threat of FATF sanctions, domestic compulsions, and situation on its Western border with Afghanistan.

On the future of the arrangement, Naravane expressed cautious optimism. “We have reasons to be hopeful as the Pakistani Army is on board. Since the firing along the LC was done to give cover to the terrorists attempting to infiltrate and there has been no firing recently, there is cause to be optimistic about the future. We need to wait and see how things develop before we make any concrete assessment.”

The Army Chief also spoke about the situation in Jammu and Kashmir which he said was “getting better”. He said the statistics on security situation in Kashmir after the abrogation of Article 370 show that the condition in the Valley is getting better. This, he said, is confirmed by the high number of tourists in the peak winter months.

Naravane, however, added that social media was playing a role in radicalising youth.



Army Chief Gen MM Naravane. (File)

“Youth are getting attracted to the romanticism of gun culture, especially through social media. We are taking a number of steps such as generating employment opportunities for them outside J&K, and attempting to wean them away from violence... The people of J&K know what is good for them. But sometimes they are forced to take actions and make statements under the shadow of the gun as the security forces cannot be omnipresent all the time... The youth are not getting radicalised as much as people think,” he said.

<https://indianexpress.com/article/india/despite-pangong-de-escalation-china-threat-remains-army-chief-7245617/>



Fri, 26 March 2021

Starting-up for defence: Government plans to fund at least 250 defence start-ups

By 2030, India's aerospace and defence industry is estimated to reach a market valuation of around \$70 billion (Maier+Vidorno)

By Ajai Chowdhry

Under the 'Make in India' mission, defence has been identified as one of the most promising sectors, contributing towards external and internal peace and security as well as socio-economic development of the country. By 2030, India's aerospace and defence industry is estimated to reach a market valuation of around \$70 billion (Maier+Vidorno).

Against this backdrop, playing a pivotal role in achieving the vision of Atmanirbhar Bharat as well as Make in India is the start-up ecosystem. According to government data, India has around 194 start-ups in the defence-tech space that are leveraging new-age technologies to come up with solutions for empowering the nation's defence and security.

Some such as CRON Systems, Asteria Aerospace, EyeROV and Optimized Electrotech are building solutions to address the key challenges in defence and security forces. They are using technologies such as drones, image analysis, robotics and artificial intelligence for bolstering India's defence capabilities.

At the recent Aero India (Yelahanka air base), the government signed Rs 48,000 crore contract to procure 83 Tejas aircraft from the HAL, and 34 aerospace and defence firms showed interest in investing in Karnataka to spur aviation business in the state.

Looking at the potential the Indian start-ups possess and encouraging their efforts, the government has plans to fund at least 250 defence start-ups over the next five years.

Also, to reduce India's reliance on defence imports, the defence ministry launched the Innovations for Defence Excellence (iDEX) initiative, pushing indigenous innovation and technology development in defence and aerospace. The ministry has earmarked Rs 500 crore to support MSMEs and start-ups through the iDEX. In the US, the DARPA created many technologies by offering grants, test beds and orders for the private sector. Under the iDEX, the government of India is offering grants and joint development with the defence forces.

It would be fair to mention that when the tech prowess of several start-ups adds to India's military might, it will be a win-win not just for citizens and defence personnel, but also for



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entrepreneurs and government officials committed to building self-reliance. While these developments are taking place, the government is leaving no stone unturned. It is pursuing initiatives to achieve higher levels of indigenisation and self-reliance in the defence sector. The capital expenditure for defence saw an increase of nearly 19% this year compared to budget estimates of last year. In the wake of the pandemic-induced economic downturn and healthcare expenditure, emergency defence procurement stood at Rs 20,776 crore that India has had to make. It was made in the face of an increasingly belligerent and assertive China and in the absence of any increase in taxes or the imposition of a Covid-19 cess.

Further strengthening India's defence efforts, the 15th Finance Commission made a host of recommendations in its report that covers years 2021-22 to 2025-26. The panel suggested for a non-lapsable modernisation fund of Rs 2.38 lakh crore for five-year period for defence and internal security. The government has given an in-principle nod to the setting up of the fund. The panel suggested the fund can have four sources of financing: transfers from the Consolidated Fund of India, disinvestment proceeds of defence public sector enterprises, proceeds from monetisation of surplus defence land, and funds from sale of defence land likely to be transferred to state governments and public projects in the future.

All in all, these initiatives and policy measures, if implemented effectively, will help India strengthen its indigenous defence industry. These would go a long way to enable India's defence sector to contribute significantly towards the \$5-trillion economy goal by 2025.

(The author is founder, HCL, board member, IAN, and IC member, IAN Fund_

<https://www.financialexpress.com/opinion/starting-up-for-defence-government-plans-to-fund-at-least-250-defence-start-ups/2220493/>



Fri, 26 March 2021

Exclusive: Satellite images show active Chinese posts near Sikkim's Naku La

The latest satellite imagery accessed by India Today TV confirms heightened activity at Chinese posts opposite Naku La border in Sikkim

By Ankit Kumar

New Delhi: The latest satellite imagery reviewed by India Today TV shows the heightened Chinese activity near Naku La border in Sikkim. Earlier, a report by India Today had highlighted the construction of roads and new posts by the Chinese ground forces in this area. The People's Liberation Army (PLA) activity opposite Naku La visibly increased after the Galwan valley clash in eastern Ladakh.

Doklam and Naku La have been the flashpoints where Indian and Chinese troops have come face to face in standoff situation in recent times. The Doklam plateau, near the crucial India-Bhutan-China trijunction, has been the ground zero of 2017 standoff between Indian and Chinese armies. Earlier this year in January, a minor face-off was reported between the two troops near Naku La.

The new satellite images, exclusively accessed by India Today TV, confirm heightened activity at Chinese posts opposite Naku La border, as recent as March 12. High-resolution images, captured in the morning of March 12 by the Synthetic-Aperture Radar (SAR) satellites of space company Capella Space, confirm the presence of military vehicles, new camps and additional structures by the PLA.



Satellite Images show active Chinese Posts near Sikkim's Naku La



SAR satellite image shows an active PLA post opposite Naku La. (Image: Capella Space/ India Today)

The recent imagery shows an additional congregation of possible PLA military vehicles and added structures at a Chinese post, about 4 km from the border.

Another set of images compared with an earlier optical satellite image, taken by Planet Labs satellites in September last year, confirms the ongoing activity at what appears to be a newly created PLA observation post.

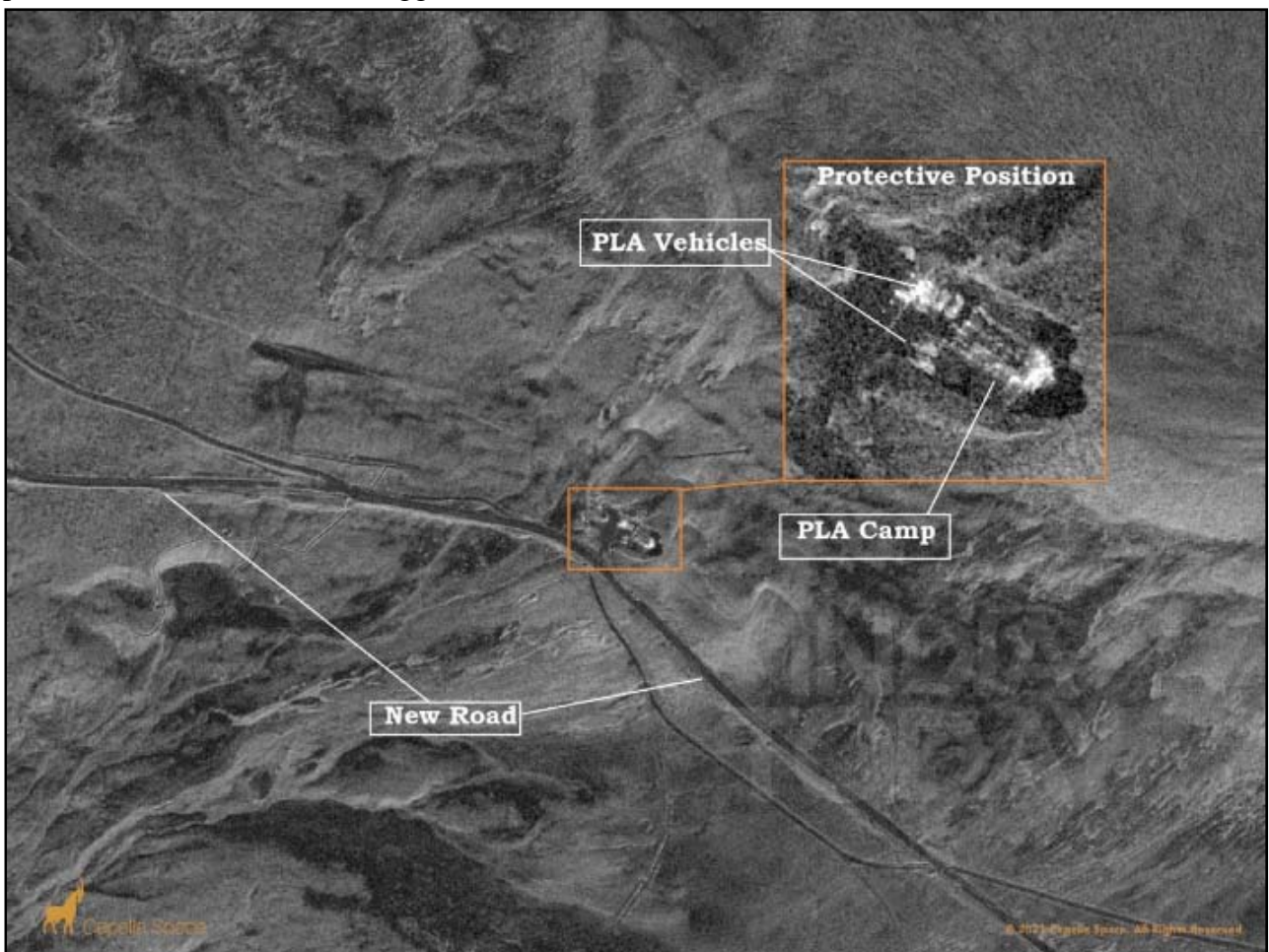
While the optical image from September last year showed excavated land with signs of little human presence, the SAR image, taken earlier this month, shows multiple vehicles and new camp-like structures.

Wider roads seen in the satellite imagery from last September seem to be undergoing further construction which may include possible blacktopping of the roads.

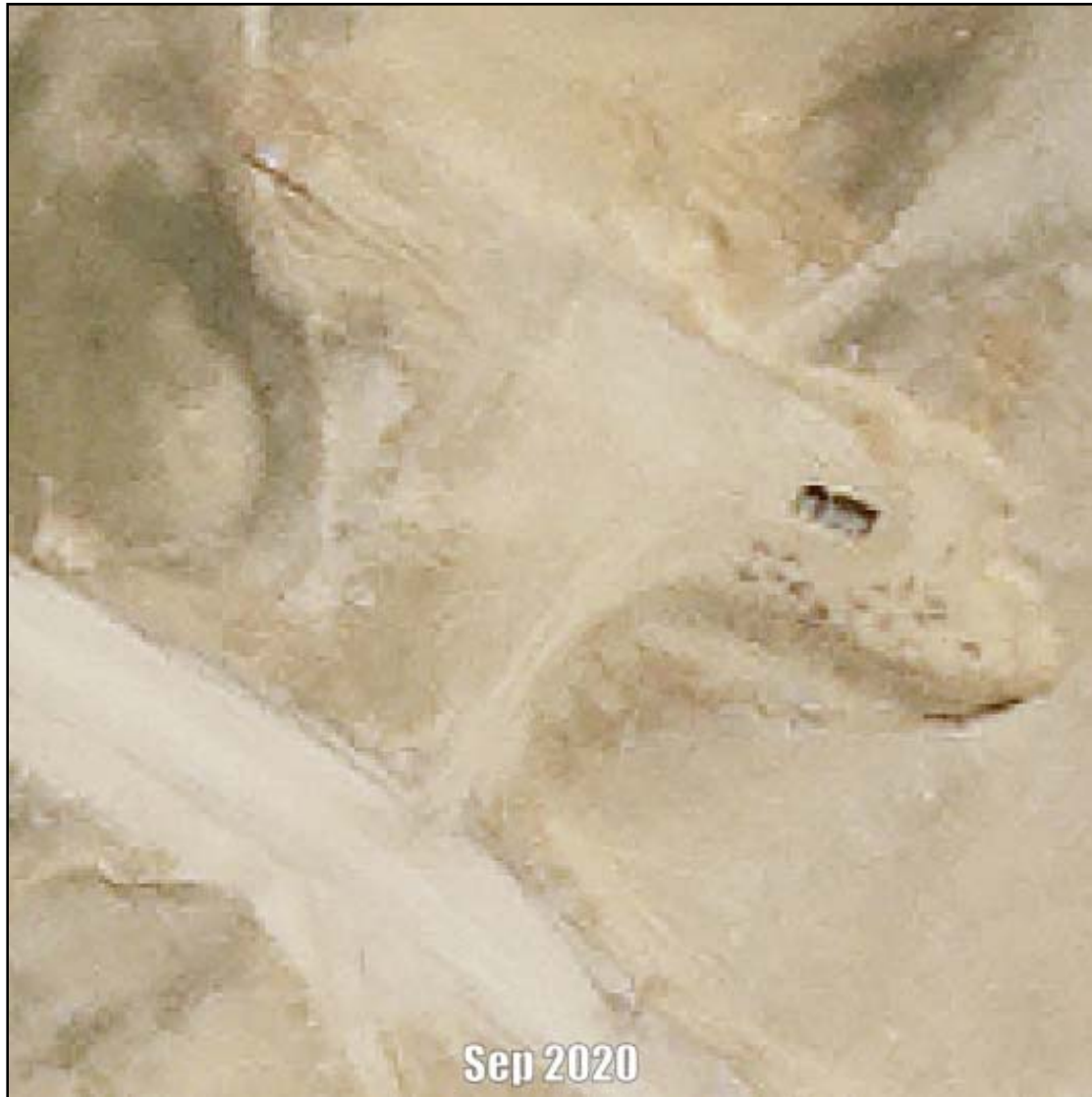
Heightened activities at another PLA post, in the north-east of Naku La, was first observed by US-based geospatial analytics company Hawkeye 360 last year. Chris Biggers, Director of Insights at Hawkeye 360 had spotted PLA's self-propelled artillery at this site last year.

Meanwhile, the Indian Air Force (IAF) is set to raise its second squadron of the Rafale combat aircraft at the Hasimara airbase over the next few weeks. The move is set to serve as a credible counter to future Chinese threats along the eastern front.

The upcoming Rafale squadron in West Bengal's Hasimara is likely to provide a firm deterrence against any Chinese budge in this region. With near 100 km distance from Doklam, and just about 200 km away from Sikkim's Naku La, IAF's second group of combat jets will be strategically placed to counter the Chinese aggression.



SAR satellite image shows a possible PLA observation post opposite Naku La. (Image: Capella Space/ India Today)

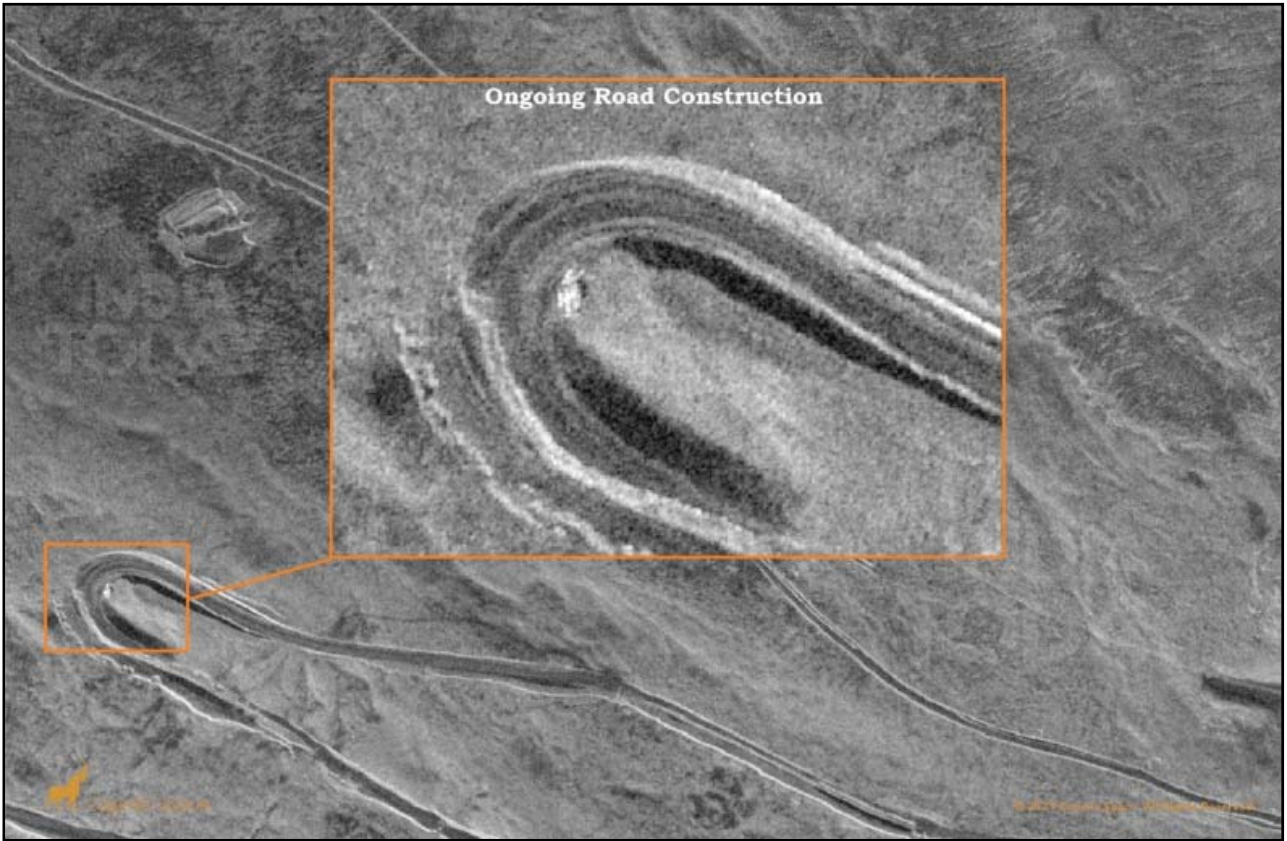


A comparison of optical and SAR satellite image of PLA observation post location. (Image: Planet Labs Inc. and Capella Space)

Earlier this year, a Chinese state broadcaster released footage of a PLA post overlooking the Sikkim border. Chinese media reports claimed that the post has been constructed at an altitude of over 5000 m in the mountains. The CCTV visuals showed an obscure looking observation post with a large tunnel-like underground setting.

India said that it is aware of the development of Chinese infrastructure in the border regions opposite the country in the Tibet region.

Responding to a written question in Parliament on "Chinese construction along the Indo-China border", V Muraleedharan, Minister of State for External Affairs said, "The Indian government has increased the budgetary allocation for construction of roads and bridges in the border areas."



SAR satellite image shows parts of newly constructed roads in Xigaze. (Image: Capella Space/ India Today)



Overview of Naku La, Doklam and Hasimara. Modified satellite (Images from Planet Lab, Capella Space and Google Earth)

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Outside setting of a high-altitude PLA post in Xigaze. (Image: CCTV)

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Inside setting of a high-altitude PLA post in Xigaze. (Image: CCTV)

<https://www.indiatoday.in/india/story/exclusive-satellite-images-active-chinese-posts-sikkim-naku-la-1783782-2021-03-26>

India, Madagascar discuss maritime security and interoperability between Navies

By Elizabeth Roche

- *The INS Shardul and Malagasy Navy ship MNS Trozona carried out a Passage Exercise (PASSEX) on 24 March*
- *In recent years, Indian naval ships have increased their presence and patrols in the waters of the Indian Ocean region that New Delhi considers as lying within its sphere of influence*

Indian naval ship INS Shardul made a port call in Madagascar's Antsiranana as part of increasing patrols of the Indian Ocean in recent years given a surge in Chinese naval activity in these waters.

Adhering to covid19 protocols, the port call was conducted in "a non-contact format and a virtual conference with officials of Madagascar Armed Forces was held on 23 March," an Indian navy statement said.

The conference was attended by Gen Montroque Fitz Gerald, Chief of Ankarana Defence Zone, Captain Sam Hieng Twion, Commander of the Antsiranana Naval Base on the Madagascar side. From India, Captain Aftab



Photo: ANI

Ahmed Khan (Senior Officer First Training Squadron) and Commander Akshay Khanna who is the Commanding Officer INS Shardul, took part in the conference. The Chief of Ankarana Defence Zone welcomed the INS Shardul and appreciated the growing relations between the defence forces of two nations. The conference was followed by a visit of Captain Sam Hieng Twion, Naval Base Commander of Antsirana to INS Shardul, the statement said.

The INS Shardul and Malagasy Navy ship MNS Trozona also carried out a Passage Exercise (PASSEX) on 24 March.

"The joint exercise bears testimony to the growing bonds between the maritime forces of both the nations and aimed at common objectives of ensuring maritime security by India and Madagascar and interoperability between the two navies," the statement said.

In recent years, Indian naval ships have increased their presence and patrols in the waters of the Indian Ocean region that New Delhi considers as lying within its sphere of influence. Indian naval vessels have acted as first responders to nations affected by natural calamities on the eastern sea board of Africa – a case in point three Indian ships of the Navy assisted Mozambique in relief and rescue operations in March 2019 after Cyclone Idai made devastated southern and eastern Africa.

In recent months after covid-19 impacted the world, Indian naval ships have been making port calls in Comorros, Madagascar and in Seychelles besides the Maldives with food and medical supplies.

<https://www.livemint.com/news/india/india-madagascar-discuss-maritime-security-and-interoperability-between-navies-11616682864717.html>

मेडागास्कर में गश्त लगा रहा भारतीय नौसेना का युद्धपोत, जानें कैसे बढ़ेगी चीन-पाकिस्तान की टेंशन

भारत हिंद महासागर में रणनीतिक रूप से अहम देश मेडागास्कर की नौसेना के साथ समुद्री गश्त कर रहा है। ऐसा पहली बार हुआ है जब मेडागास्कर की नौसेना भारतीय नौसेना के युद्धपोतों के साथ पेट्रोलिंग कर रही है।

By Priyesh Mishra

हाइलाइट्स:

- हिंद महासागर में चीन की परेशानी बढ़ाने को तैयार भारतीय नौसेना
- मेडागास्कर की नौसेना के साथ गश्त कर रहा भारत का आईएनएस शार्दुल
- भारत ने सूखे से जूझ रहे मेडागास्कर को दिया चावल और दवाईयां

मेडागास्कर: भारत हिंद महासागर में रणनीतिक रूप से अहम देश मेडागास्कर की नौसेना के साथ समुद्री गश्त कर रहा है। ऐसा पहली बार हुआ है जब मेडागास्कर की नौसेना भारतीय नौसेना के युद्धपोतों के साथ पेट्रोलिंग कर रही है। भारतीय नौसेना की तरफ से इस मिशन में आईएनएस शार्दुल शामिल हुआ है, जबकि मेडागास्कर की तरफ से तोरोजोना ने हिस्सा लिया। हिंद महासागर के महत्वपूर्ण इलाके में भारतीय नौसेना की मौजूदगी से चीन और पाकिस्तान दोनों की परेशानी बढ़ने वाली है।

भारत ने सूखे से जूझ रहे मेडागास्कर की सहायता की

एक दिन पहले ही भारत ने मेडागास्कर को 1000 टन चावल और 1 लाख हाइड्रॉक्सीक्लोरोक्लीन की टेबलेट्स सौंपी थी। बता दें कि मेडागास्कर के दक्षिणी इलाके में भीषण सूखा पड़ा है। जिसके कारण भारत ने अपना पड़ोसी धर्म निभाते हुए हिंद महासागर के इस देश को सबसे पहले सहायता उपलब्ध कराई है। इस मदद को लेकर मेडागास्कर पहुंचे भारतीय नौसेना के जहाज आईएनएस जलाश्व को रिसीव करने खुद प्रधानमंत्री लुईस नेत्से पहुंचे हुए थे।



भारतीय नौसेना और मेडागास्कर की नौसेना

चीन बढ़ा रहा अपनी मौजूदगी

मेडागास्कर और कोमोरोस के भू-राजनीतिक महत्व को स्वीकार करते हुए, जहां चीन अपनी कनेक्टिविटी और सेक्यू-रिटी संबंधी गतिविधियों को लगातार बढ़ा रहा है। ऐसे में विदेश मंत्रालय ने हिंद महासागर के देशों श्रीलंका, मालदीव, मॉरीशस और सेशेल्स को एक डिविजन के अंतर्गत लाने का फैसला लिया था। विदेश मंत्रालय ने इसके लिए इंडियन ओसियन रीजन डिविजन के गठन का भी फैसला लिया था।

मेडागास्कर को अभी भी इंतजार

हालांकि मेडागास्कर 2019 से दोनों देशों के बीच एक रक्षा अधिकारी की नियुक्ति का इंतजार कर रहा है। रक्षा मंत्रालय को जल्द ही प्रस्ताव को मंजूरी मिलने की उम्मीद है। भारत ने 2018 में मेडागास्कर के साथ एक रक्षा समझौता ज्ञापन पर हस्ताक्षर किए थे, जिसके तहत उन्हें मेडागास्कर के रक्षा कर्मियों के क्षमता निर्माण और प्रशिक्षण के लिए कई परियोजनाओं पर चर्चा करने के लिए कहा गया था।

चीन भी पीछे नहीं

चीन की ओर से भी कहा गया है कि वो सुरक्षा से जुड़े मुद्दों पर नजर रखने के लिए मेडागास्कर में एक रक्षा अटैशे नियुक्त करने पर भी विचार किया जा रहा है।

भारत और चीन दोनों के लिए, भू-सामरिक द्वीपों के साथ द्विपक्षीय जुड़ाव को तेज करना महत्वपूर्ण है क्योंकि वे पश्चिमी हिंद महासागर में अपनी नौसेना की उपस्थिति को बढ़ाते हैं।

मेडागास्कर में भारत की उपस्थिति से चीन को डर

चीन की सरकारी मीडिया ग्लोबल टाइम्स ने मेडागास्कर में भारत की मौजूदगी पर खीज निकालते हुए कहा कि नई दिल्ली पश्चिमी हिंद महासागर में बीजिंग के कथित प्रभाव का मुकाबला करने के लिए मेडागास्कर और कोमोरोस के साथ अपनी सुरक्षा और रक्षा सहयोग को बढ़ा रहा है। हालाँकि, इस क्षेत्र के देशों को नई दिल्ली के प्रयासों में दिलचस्पी नहीं हो सकती है जो उन्हें भारत के पक्ष में खींच सके।

हिंद महासागर के देशों को भारत के खिलाफ उकसा रहा

चीनी मीडिया ने मेडागास्कर और कोमोरोस को उकसाते हुए लिखा कि यह दोनों देश संप्रभु राष्ट्र हैं। उन्हें अपनी विदेश नीतियों को स्वयं बनाने और अपने अंतर्राष्ट्रीय मामलों को स्वयं करने का अधिकार है। वे आंख मूंदकर खुद को भारत के साथ नहीं आएंगे। इसके अलावा इन देशों ने हमेशा चीन के साथ मैत्रीपूर्ण संबंध बनाए रखे हैं। क्योंकि, चीन हिंद महासागर क्षेत्र में अपनी उचित भूमिका निभाने के लिए सक्रिय रूप से उनका समर्थन करता है।

<https://navbharattimes.indiatimes.com/world/asian-countries/indian-navy-warships-patrolling-in-madagascar-know-how-china-pakistan-tension-will-increase/articleshow/81687852.cms>



Fri, 26 March 2021

For the first time India and Quad Nations to join France for war games

For the first time ever Indian Navy will participate in the French naval exercise in the Bay of Bengal early next month. According to sources Quad member nations are going to be part of this drill – the US, Japan and Australia

By Huma Siddiqui

April is going to be a busy month for the French Navy in the Indian Ocean. It is deploying its Carrier Battle Group to the region and participating in two major exercises – La Perouse a French Naval war game which will have the Quad countries and the other Ex Varuna a trilateral exercise with India and the UAE in the western Indian Ocean. This, according to an Indian Navy veteran “underlines the importance France accords to the entire Indo-Pacific where its economic and strategic interests including a large EEZ interests extend from the Horn of Africa to beyond Polynesia.”

“France has always maintained a significant naval presence in the Indian Ocean headed by a 2-star Admiral called Alindien and was also the first country to appoint an observer at the IOR-IFC (Indian Ocean Region Information Fusion Centre) set up by India on the outskirts of the national capital,” Commodore Anil Jai Singh, Vice President of the Indian Maritime Foundation, tells Financial Express Online.

Indo-France Military Relations

“The strategic relationship between France and India, which has been on an upward trajectory ever since France was supportive of India’s nuclear tests in 1998 when most of the western world’s first



The 18th edition of the Indo-French bilateral naval Ex Varuna is scheduled in the last week of April.

reaction was to impose sanctions, has expanded considerably in the last two decades. The fact that India is a large defence market also helps. Encouraging India to buy French weapons and equipment is part of the French Government's thrust in India and the success can be seen in the sale of the Project 75 submarines and the Rafale fighter aircraft amongst others through a G2G arrangement," Commodore Anil Jai Singh, says.

The former Indian Navy submariner says, "France is also pitching very strongly for the P75(I) submarine programme and is projecting itself as an integral part of India's 'Atmnirbharta' drive though any meaningful transfer of technology showing this resolve is yet to be seen. France has also offered to share its civilian nuclear technology and has offered nuclear reactors to India."

"This deepening bilateral relationship also dovetails seamlessly into the larger French engagement with the region and strengthens the 'arc of maritime democracies' in their efforts to ensure a Free and Open Indo-Pacific and maintain a rules-based international order in the region particularly in the maritime domain," he says.

India-France Maritime Cooperation

According to Commodore Singh, "The French naval ships are also visiting Kochi later in April. Following the articulation of its Indo-Pacific strategy it is the first country in the world to have appointed an Ambassador to the Indo-Pacific and is also looking to deepen the European engagement with this region. This was reflected in the Indo-Pacific strategies that followed from Euro-centric countries like Germany and The Netherlands who also appreciate the importance of ensuring a Free and Open Indo-Pacific and the safety and security of their trade."

Bilateral Naval Drills

The 18th edition of the Indo-French bilateral naval Ex Varuna is scheduled in the last week of April. Last year due to the global pandemic Ex Varuna could not take place in its original format. This year the drill is taking place during the ongoing tensions between India and China. There will be larger participation of air assets from both navies; interoperability and jointness, and maritime security as the focus. Also on carrier operations and Anti-Submarine Warfare (ASW) training, and air surveillance. Besides the three Kalvari class (Scorpene) and other ships, the air component of the exercise will witness dogfights between the Mig-29K fighters and Rafale-M, P-8I Maritime Patrol Aircraft, helicopters and other assets will be part of drill.

More about Ex Varuna

The Indo-French bilateral service exercise was initiated in 1983 and is the base of the strategic partnership between the two countries. And was christened as 'Varuna' in 2001.

And these war games between the two countries have fully-grown in scope and complexity and are in line with the Joint Strategic Vision Cooperation within the Indian Ocean Region.

La Perouse

For the first time ever Indian Navy will participate in the French naval exercise in the Bay of Bengal early next month. According to sources Quad member nations are going to be part of this drill – the US, Japan and Australia.

According to the Indian Navy officials, the drill is from April 5-7.

Significance of the drills

The drills which are taking place soon after the first ever Leader's Summit of the Quad and the visits of the US Secretary of Defence Lloyd Austin and the defence Minister of South Korea Mr Suh Wook.

<https://www.financialexpress.com/defence/naval-exercise-varuna-quad-nations-to-join-for-war-drills-with-the-french-navy/2220392/>

Chinese flying instructor explains why J-16 Fighters are ‘far superior’ to Sukhoi SU-30 Jets

By Mansij Asthana

China’s home-grown J-16 multi-role fighter is flawless and far superior to the Russian-made Sukhoi Su-30, a PLA flight instructor claims. The J-16 is seen as a Chinese copy of the Russian combat aircraft.

Wang Songxi is a flying instructor with the People’s Liberation Army (PLA) Northern Theatre Command Air Force. He claims to have flown many Chinese fighter jets as well as the Russian-made Sukhoi Su-30 during his career.

Designed and developed by Sukhoi Aviation Corporation during the Soviet-era, the Sukhoi Su-30 is a twin-engine, two-seat supermaneuverable fighter jet.

The all-weather, multi-role fighter can carry out air-to-air and air-to-surface deep interdiction missions. Currently, China and its neighbor India, possess the Russian fighter jet. The two countries have modified their Su-30 fighters, according to their needs.

The Indian Air Force (IAF) operates the Su-30MKI variant and China’s PLA flies two variants of the Su-30 fighters — Su-30MKK, and the Su-30MK2 fighters. Since 2002, the Sukhoi has been IAF’s staple warhorse.

According to Chinese experts, the Su-30MKK is considered the most powerful variant of the Su-30 family, with the fighter offering enhanced combat capabilities against the aerial, ground, and sea-based targets.

Beijing has also upgraded the fighter jet’s fire control system, enabling it to use its indigenous weapons including the deadly YJ-12 and YJ-18 anti-ship and land-attack cruise missiles.

Wang, however, claims that the Shenyang J-16 fighter, which is based on the Su-30 fighter, is a generation more advanced than the latter.

“The J-16 has no flaws because it is equipped with many types of weapons and can operate under all weather conditions,” Wang told the state-owned China Central Television (CCTV).

“People usually can’t tell the difference between a J-16 and a Su-30 from their appearance, but many things are different from the inside. There is a gap that makes the J-16 a generation more advanced than the Su-30,” he added.

Built by Shenyang Aircraft Corporation, the Shenyang J-16 tandem-seat, twinjet, a multirole strike fighter is a domestically-produced copy of the Russian Su-30, operated by the People’s Liberation Army Air Force (PLAAF).

<https://eurasianimes.com/chinas-home-grown-j-16-far-superior-to-the-russian-sukhoi-su-30-fighter-jet/>



नवभारत टाइम्स

Fri, 26 March 2021

कभी NASA ने लगाया था प्रतिबंध, अब वही ISRO 'हनुमान' बन ले जाएगा सबसे अडवांस्ड इमेजिंग सैटलाइट, 0.4 इंच तक तेज निगाह

इस सैटलाइट में अब तक का सबसे बड़ा रिफ्लेक्टर एंटेना लगाया गया है। दिलचस्प बात यह है कि ISRO का जो रॉकेट इस सैटलाइट को लेकर जाएगा 1992 में अमेरिका ने उस पर प्रतिबंध लगाया था।

By Shatakshi Asthana

भारतीय स्पेस रिसर्च ऑर्गनाइजेशन (ISRO) और अमेरिकी स्पेस एजेंसी NASA एक साथ मिलकर 1.5 अरब डॉलर की कीमत की एक सैटलाइट साल 2022 में लॉन्च करने वाले हैं। NASA को इसके लिए एक खास S-बैंड सिंथेटिक अपचर रेडार (SAR) की जरूरत थी जो भारत ने उपलब्ध कराया है। इसके साथ ही SUV के आकार की इस सैटलाइट को पूरा करने की अहम कड़ी को जोड़ लिया गया। इस सैटलाइट में अब तक का सबसे बड़ा रिफ्लेक्टर एंटेना लगाया गया है। दिलचस्प बात यह है कि ISRO का जो रॉकेट इस सैटलाइट को लेकर जाएगा 1992 में अमेरिका ने उस पर प्रतिबंध लगाया था।

क्या करेगा काम?

2200 किलो वजन की NASA-ISRO SAR (NISAR) को दुनिया की सबसे महंगी इमेजिंग सैटलाइट माना जा रहा है और यह कैलिफोर्निया में NASA की जेट प्रोपल्शन लैबोरेटरी में तैयार की जा रही है। NISAR धरती की सतह पर ज्वाकामुखियों, बर्फ की चादरों के पिघलने और समुद्र तल में बदलाव और दुनिया भर में पेड़ों-जंगलों की स्थिति में बदलाव को ट्रैक किया जाएगा। NASA ने बयान में कहा है, 'धरती की सतह पर होने वाले ऐसे बदलावों की मॉनिटरिंग इतने हाई रेजॉल्यूशन और स्पेस-टाइम में पहले कभी नहीं की गई है।'

0.4 इंच तक सटीक

यह सैटलाइट 40 फुट के तार के जाल वाले रेडार रिफ्लेक्टर एंटेना का इस्तेमाल करेगी जो 30 फुट के बूम पर लगा होगा। इससे धरती की सतह से रेडार सिग्नल भेजे जाएंगे और रिसीव किए जाएंगे। NISAR हर 12 दिन में पूरी धरती को स्कैन किया जाएगा और यह एक टेनिस कोर्ट के आधे हिस्से में 0.4 इंच तक मूवमेंट तक को डिटेक्ट कर सकेगा। यह पहला ऐसा सैटलाइट मिशन होगा जो दो अलग-अलग रेडार फ्रीक्वेंसी का इस्तेमाल करेगा और धरती की सतह पर एक सेंटीमीटर दूर तक होने वाले बदलाव को नाम सकेगा।

कभी लगाया था प्रतिबंध

हाई रेजॉल्यूशन रेडार बादलों और घने जंगल के आर-पार भी देख सकते हैं। इस क्षमता से मिशन दिन हो या रात, बारिश हो या सूरज, कोई भी बदलाव ट्रैक कर सकेगा। अमेरिका और भारत ने 2014 में NISAR समझौता साइन किया था। दिलचस्प बात यह है कि पूर्व अमेरिकी राष्ट्रपति जॉर्ज बुश ने 1992 में ISRO पर प्रतिबंध लगाए थे और रूस को दिल्ली के साथ क्रायोजेनिक इंजन टेक्नॉलजी देने से रोक दिया था। अमेरिका को डर था कि भारत उसका इस्तेमाल



कभी NASA ने लगाया था प्रतिबंध, अब वही ISRO 'हनुमान' बन ले जाएगा सबसे अडवांस्ड इमेजिंग सैटलाइट, 0.4 इंच तक तेज निगाह

लंबी दूरी की मिसाइल बनाने के लिए करेगा। अब उसी Geosynchronous Satellite Launch Vehicle रॉकेट से इस सैटलाइट को लॉन्च किया जाएगा।

<https://navbharattimes.indiatimes.com/world/science-news/isro-to-provide-rocket-and-radar-for-nasa-earth-imaging-satellite-most-advanced-and-expensive/articleshow/81691838.cms?story=2>

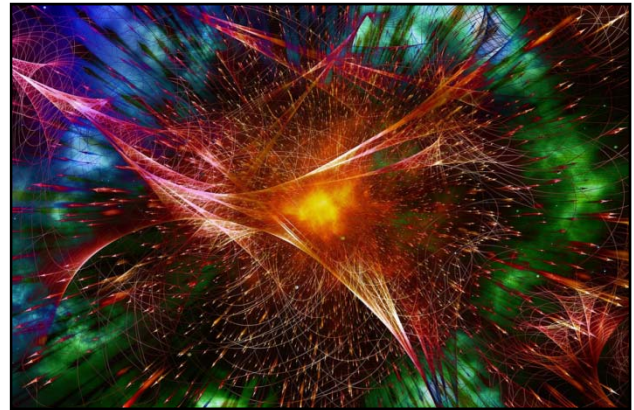


Fri, 26 March 2021

Team finds an easier optimal detection scheme for near-term quantum sensors

Quantum holds the promise of increasing the power of sensing technologies. While the field of quantum sensing has shown a lot of potential for detecting very small signals, the ability to truly optimize these sensors has been thwarted by the complexity of control schemes.

In a paper published on March 25 in Nature Partner Journals *Quantum Information*, a research team based at the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Maryland, explained how they applied two theoretical tools of quantum information to these types of extremely sensitive signal detection tasks. Their research suggests that honing this sensitivity to detect signals while rejecting background noise will enable the use of quantum detectors even when this surrounding noise is strong relative to the signal of interest.



Credit: Pixabay/CC0 Public Domain

"This field has seen a lot of recent interest through theoretical progress and impressive experimental results on a variety of platforms," said Paraj Titum, a quantum scientist in APL's Research and Exploratory Development Department and the lead author of the paper. "Our results are readily implementable in a variety of quantum computing and quantum sensing platforms such as superconducting qubits, NV-diamonds, and Silicon Carbide."

The authors applied filter functions and optimal quantum control theories to a use case of quantum bit (qubit) sensors that mirror a classic problem in signal detection theory: optimal detection of a known signal from background noise with a controllable quantum sensor. The research team obtained analytical insight into the optimal control protocol when the background noise is white.

"This turned out to be the ubiquitous spin-locking control scheme," Titum said. "More generally, we developed a simple numerical technique for arbitrary signal and background noise." This is similar to the well-known matched filtering scheme that is the optimal method to use in classical signal processing.

The APL team already has plans to explore this scheme in detecting realistic signals in an experimental setting. Another promising theoretical path they plan to explore is the use of quantum entanglement to enhance detection likelihood as compared with classical sensors.

More information: Paraj Titum et al, Optimal control for quantum detectors, *npj Quantum Information* (2021). DOI: [10.1038/s41534-021-00383-5](https://doi.org/10.1038/s41534-021-00383-5)

<https://phys.org/news/2021-03-team-easier-optimal-scheme-near-term.html>

Detecting photons transporting qubits without destroying quantum information

Even though quantum communication is tap-proof, it is so far not particularly efficient. Researchers at the Max Planck Institute of Quantum Optics want to change this. They have developed a detection method that can be used to track quantum transmissions. Quantum information is sent over long distances in the form of photons (i.e. light particles). However, these are quickly lost. Finding out after only a partial distance whether such a photon is still on its way to its destination or has already been lost, can significantly reduce the effort required for information processing. This would make applications such as the encryption of money transfers much more practicable.

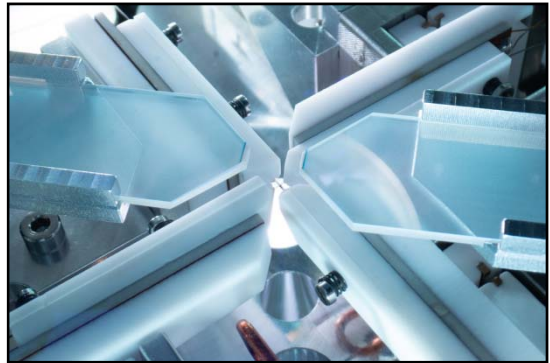
Quantum cryptography could soon become the method of choice to secure the data traffic of government agencies or banks. However, in the foreseeable future, it will probably not protect our email traffic from uninvited readers. The exchange of qubits, the smallest unit of quantum information, is simply far too complex. One of the biggest problems: Light particles that carry qubits over long distances and are easily deflected from their path in the air or absorbed in glass fibers—and suddenly, the quantum information is lost. Because most photons are lost in a transmission over around 100 km, thousands of photons would have to be transmitted in order to directly transmit only a single qubit over this distance. The transmission of quantum information can thus become a lengthy affair, even though light travels very fast and can cover the distance from Munich to Berlin (around 600 km) in only about two milliseconds.

The detector does not read the quantum information

A team around Dominik Niemietz and Gerhard Rempe at the Max Planck Institute of Quantum Optics has now developed a physical protocol that can indicate whether the qubit has gone already lost at intermediate stations of the quantum transmission. "If this is the case, the transmitter can send the qubit again with significantly less delay than if the loss is noticed only at the receiving end," says Dominik Niemietz, who developed the detector for photonic qubits (as it is called in technical jargon) as part of his dissertation. "It is essential that we do not destroy the qubit. We are thus only detecting the qubit photon and not measuring it." In other words: The detector detects whether the photon is there or not but does not read the quantum information encoded into it. It's something like tracking a shipment online without being able to see inside the package. "This is crucial because the laws of quantum physics rule out copying a qubit 1 to 1—this is what quantum cryptography is based on." Quantum post can thus not be refreshed at an intermediate station—neither by those who installed the transmitter and receiver, nor by spies.

Two resonators and one atom enable the detection of the qubit

In order to detect a photon carrying quantum information without reading the message itself, the physicists work with an atom that they trap in two perpendicular resonators. The two resonators each consist of two mirrors so that the atom is surrounded by four mirrors arranged in a cross. One of the resonators is designed in such a way that the atom recognizes the presence of the photon by an extremely gentle touch: The resonator is located at the end of an optical fiber through which a



Inside a vacuum chamber, physicists of the Max Planck Institute of Quantum Optics trap a single atom with two crossing optical resonators. They are each made of two optical fibres which are visible in the crossing point. This setup enables a destruction-free detection of photonic qubits. Credit: Christoph Hohmann, MPQ

photon reaches it—or not. When the photon arrives there, it is reflected and changes the state of the atom. What is important here is that the quantum information remains unaffected by this—in much the same way as package deliverers leave messages if the recipients are not home and take the package away again. The photon influences the state of the atom. In the process, the atomic spin is changed—similar to a spinning top, the rotation of which is reversed by 180 degrees from one moment to the next. In contrast, the quantum information is packed into the oscillation plane—physicists speak of polarization—of the photon.

But how can we tell whether the photon was there and changed the state of the atom or not? This is the job of the second resonator. If no photon arrives at the detector at the expected time, the Garching physicists can make the atom glow by irradiating it with laser light. They can easily detect the glow via the second pair of mirrors and with a classical photodetector. If a photon is reflected at the other resonator, changing the state of the atom, this does not work, and the atom remains dark.

From 14 kilometers, the detector accelerates quantum communication

The Max Planck researchers have shown with model calculations that the detection of photons transporting qubits makes quantum communication more efficient. Accordingly, the detector they used for their experiment would accelerate the transmission of quantum information at a greater distance than 14 kilometers. "A detector for photonic qubits can also be useful at shorter distances," says Pau Farrera, who was part of the research team. However, in order for this to happen, the detection would have to work even more reliably than it did in the current experiment. "This is not a fundamental problem but rather only a technical one," explains the physicist. The efficiency of the detector currently suffers primarily because the resonator reflects only about one third of the incoming photons. Only in the case of a reflection does a photon leave a trace in the atom. "However, we can increase this efficiency to almost 100 percent by improving the fabrication of the resonators."

A detector that reliably detects a photonic qubit would not only be helpful in tracking quantum information during transmission but could also confirm the arrival of quantum post at its destination. This is beneficial if the information encoded in the photon is to be further processed in a complex manner—for example, if it is to be transferred to entangled atoms. Entanglement is a quantum mechanical phenomenon that can be used to encrypt and process data. In this process, two spatially widely separated particles become a single quantum entity. Changes in one particle thus directly lead to changes in the other. "Creating entanglement is complex," says Gerhard Rempe, Director at the Max Planck Institute of Quantum Optics. "You should use it to process a qubit only if you are sure that this qubit is there."

Demonstrating how quantum post tracking could be used in information processing is a possible goal of future experiments in Gerhard Rempe's group: "We would like to use the detector for quantum communication between our Institute in Garching and a more distant location. For example, to make the step from our laboratory to practical application," says the Max Planck Director. "In this way, we are once again getting a little closer to our great long-term goal, the quantum internet."

More information: Dominik Niemietz et al. Nondestructive detection of photonic qubits, *Nature* (2021). DOI: [10.1038/s41586-021-03290-z](https://doi.org/10.1038/s41586-021-03290-z)

Journal information: *Nature*
<https://phys.org/news/2021-03-photons-qubits-quantum.html>

Scientist discovers a new type of 'bi-molecule' with applications for quantum sensors

Dr. Rosario González-Férez, a researcher at the Department of Atomic, Molecular and Nuclear Physics and the Carlos I Institute of Theoretical and Computational Physics of the University of Granada, has published an article titled "Ultralong-Range Rydberg Bi-molecules" in *Physical Review Letters*. The results of the study show a new type of bi-molecule formed from two nitric oxide (NO) molecules, both in their ground state and in the Rydberg electronic state.

The work was made possible thanks to the scientific collaboration between the researcher and the Institute for Theoretical Atomic, Molecular and Optical Physics (ITAMP) at Harvard University. The study began during her stay at Harvard between March and July 2020, meaning that the entire process, from data-gathering and analysis to final written conclusions, was conducted during the COVID-19 pandemic. The stay, which was funded by the Fulbright Foundation and the Salvador de Madariaga program of the Spanish Ministry of Science, Innovation and Universities, enjoyed the scientific collaboration of ITAMP's Hossein R. Sadeghpour and Janine Shertzner.

This new type of bi-molecule is the result of the union of two molecules of nitric oxide (NO) whose structure is arranged in such a way that the NO and NO⁺ ion are located in opposite poles. The electron orbits around both, acting like a "glue" that binds the bi-molecule. In addition, its size corresponds to between 200 and 1,000 times that of NO, and its lifetime is long enough to enable its observation and experimental control, as these fragile systems are easily manipulated by means of very weak electric fields.

This type of bi-molecule enables researchers to implement and study chemical reactions at low temperatures from a quantum perspective and facilitates the investigation of intermolecular interactions at large distances, since they coexist at low temperatures.

Dr. González-Férez observes that the use of these bi-molecules in quantum technologies would be interesting, both for the processing of information by entanglement and for the development of quantum sensors, with multiple technological applications in quantum optics and quantum computing.

González-Férez continues her work with two research groups, from the University of British Columbia in Canada and the University of Stuttgart in Germany, which aims to create this bi-molecule experimentally and confirm the theoretical predictions made over the last year.

More information: Rosario González-Férez et al. Ultralong-Range Rydberg Bimolecules, *Physical Review Letters* (2021). DOI: [10.1103/PhysRevLett.126.043401](https://doi.org/10.1103/PhysRevLett.126.043401)

Journal information: *Physical Review Letters*

<https://phys.org/news/2021-03-scientist-bi-molecule-applications-quantum-sensors.html>





Fri, 26 March 2021

VSU's research team discovers effective treatment for COVID-19

By Jennifer Morejon

Valdosta, Ga. (WALB) - While many felt like the world stopped last year, scientists began the race to find treatments and a cure for COVID-19.

A Valdosta State University (VSU) team, initially working on a Tuberculosis treatment, switched gears when the pandemic hit.

Long hours were spent at the lab, developing something that will help fight the virus.

Eventually, they created a COVID-19 treatment.

It's one they say shows promise in reducing the overall viral load in an infected person.

"One day I'm in the lab and I'm like, 'okay I'm going to help these 2.3 billion people but they're not in the U.S. and now I'm trying to make a treatment just so I can go see my grandma kind of thing,'" said Jenu Mari Thomas-Richardson, research team leader.

Thomas-Richardson began working with Dr. Thomas Manning, a VSU chemistry professor, three years ago. She and Manning were researching tuberculosis when the pandemic hit.

"We pivoted and the reason for that, we were developing methods to attack the TB bacteria deep in the lungs so that worked and now we just pivoted to using a similar approach to attacking the viral load associated with COVID that was deep in the lungs," said Manning.

The research team consisting of students, a professor, and international collaborators, have been working in this lab since last March. They tell us results for the treatment have been positive with human data.

Manning said deaths lowered from 14 percent to 2 percent.

Those published findings come from an Iranian doctor, testing on patients.

A Mississippi doctor also tested it on 83 sick patients.

Manning said some patients were cured or were in the hospital for a shorter time.

"I believe it's a game-changer in many different ways," said Thomas-Richardson.

Thomas-Richardson said the treatment and the way it's delivered, can be used for other lung-related diseases.

She says it shows how medicine can be given in more creative ways.

Manning said it's been an exciting project.

He hopes it will reach the global market.

Their goal was to provide something inexpensive that showed results.

"So worldwide, it's still a problem and with these new strands popping up, it's more easily transmittable and have higher toxicity. It's a problem and coronavirus isn't new. It's been around in different forms for decades, so this is not going to be a one-and-done type of this, that's our opinion. That's why we are going to keep pushing ahead on it," said Manning.

The FDA must approve the solution and funding for it. Clinical trials happen next. They're now working on business plans and pitching to investors.

<https://www.walb.com/2021/03/26/vsus-research-team-discovers-effective-treatment-covid/>

