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COVID 19: DRDO's Contribution

Press Information Bureau
Government of India

Ministry of Defence

Tue, 04 May 2021 6:26PM

DRDO to install five Medical Oxygen Plants in Delhi & Haryana

Equipment arrives at AIIMS & RML Hospitals in New Delhi

In order to tackle the surge in Covid-19 cases & subsequent requirement of oxygen, PM-Cares has allocated funds for the installation of 500 Medical Oxygen Plants across the country. These plants are planned to be set up within three months. Defence Research and Development Organisation (DRDO), through its industries, is setting-up five Medical Oxygen Plants within the first week of May in and around Delhi. These are to be installed at AIIMS Trauma Centre, Dr Ram Manohar Lohia Hospital (RML), Safdarjung Hospital, Lady Hardinge Medical College and one at AIIMS, Jhajjar, Haryana. As per schedule, two of these plants reached Delhi on May 4, 2021 and are being installed at AIIMS and RML Hospitals respectively. These have been supplied by M/s Trident Pneumatics Pvt. Ltd., Coimbatore which is the technology partner of DRDO and has been given an order of 48 plants. Order of 332 plants have been placed with M/s Tata Advanced Systems Limited and the delivery will start from mid-May. The delivery schedule is being monitored very closely to deliver before the plants time. Sites are being prepared at each hospital in parallel.



These Medical Oxygen Plants are designed for a flow rate of 1,000 litres per minute (LPM). The system can cater to 190 patients at a flow rate of 5 LPM and charge 195 cylinders per day. The Medical Oxygen Plant (MOP) technology has been developed by DRDO based on the On-Board Oxygen Generation for LCA, Tejas. These plants will overcome the logistics issues of oxygen transportation and help the COVID-19 patients in emergency. CSIR has also ordered 120 MOP plants through its industries.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=1715960>

Centre to set up 581 PSA oxygen plants across India; DRDO to install 5 plants in Delhi

Union Minister Nitin Gadkari said on Tuesday that the central government will set up 581 PSA oxygen plants across India. In addition, the DRDO is installing five oxygen plants in and around Delhi to tide over the surge in Covid cases and shortages faced by hospitals

By Abhishek Bhalla, Manjeet Negi

New Delhi: Around 581 Pressure Swing Adsorption (PSA) medical oxygen plants will be installed across the country, said Union Minister Nitin Gadkari. The NHAI and Ministry of Road Transport will be the nodal agency responsible for setting up these plants, he added.

"Our engineers will work with the doctors to ensure oxygen supply to needy patients. Like record speed in roads, we will construct infrastructure at record speed to save the life of every Indian," Nitin Gadkari said.

With Delhi witnessing an unprecedented surge in daily Covid-19 cases, hospitals across the national capital continue to grapple with an acute shortage of medical oxygen. In view of the increased need for an uninterrupted supply of medical oxygen, the central government on Tuesday decided to install five additional medical oxygen plants in the national capital.

Dr Harsh Vardhan, Union Minister of Health & Family Welfare, chaired a high-level meeting in April to address the issue of oxygen supply. The decision was taken to install five

PSA Oxygen plants by DRDO at different hospitals in the city to ensure adequate and uninterrupted supply of oxygen for effective treatment of severe Covid-19 patients.

Accordingly, the Defence Research and Development Organisation (DRDO) is aiming to set up five oxygen plants in and around Delhi within the first week of May. These are to be installed at AIIMS Trauma Centre, Dr Ram Manohar Lohia Hospital (RML), Safdarjung Hospital, Lady Hardinge Medical College and one at AIIMS, Jhajjar, Haryana.

Delhi gets two oxygen plants

Two medical oxygen plants to be set up by DRDO in Delhi hospitals reached the national capital on May 4 and are being installed at AIIMS and Safdarjung Hospitals, respectively. Installation at both sites is expected to be completed by Tuesday night. Accordingly, oxygen supply to patients will begin tomorrow.

Three more oxygen plants will be installed this week, two in Delhi in RML and Lady Hardinge, and one at AIIMS in Haryana's Jhajjar.

Oxygen plants to be set up under PM-cares fund

This is part of the central government's plan to have 500 medical oxygen plants installed across the country within three months under the PM-CARES fund.

Defence Minister Rajnath Singh said in a tweet on Tuesday, "In order to tackle the surge in COVID-19 cases & subsequent requirement of oxygen, PM-CARES has allocated funds for the installation of 500 Medical Oxygen Plants across the country. These plants are planned to be set up within three months."



Installation of oxygen plants at AIIMS and Safdarjung Hospitals is expected to be completed tonight. (Photo: Manjeet Negi)

DRDO is setting-up five Medical Oxygen Plants within the first week of May in and around Delhi. These are to be installed at AIIMS Trauma Centre, Dr Ram Manohar Lohia Hospital (RML), Safdarjung Hospital, Lady Hardinge Medical College and one at AIIMS, Jhajjar, Haryana.

These oxygen plants are designed for a flow rate of 1,000 litres per minute (LPM). The system can cater to 190 patients at a flow rate of 5 LPM and charge 195 cylinders per day. These plants will enable hospitals to overcome the logistical issues issued with the transportation of medical oxygen and help critical Covid-19 patients. CSIR has also ordered 120 MOP plants for its industries.

These have been supplied by M/s Trident Pneumatics Pvt. Ltd., Coimbatore, which is the technology partner of DRDO and has been given an order for 48 plants. The order for the remaining 332 plants has been placed with M/s Tata Advanced Systems Limited and the delivery will start from mid-May.

<https://www.indiatoday.in/coronavirus-outbreak/story/delhi-gets-2-oxygen-plants-3-more-to-install-delhi-haryana-1798867-2021-05-04>

THE TIMES OF INDIA

Wed, 05 May 2021

Delhi: DRDO begins installing oxygen plants at AIIMS, RML hospital

By Rajat Pandit

New Delhi: Two of the five medical oxygen plants to be set up in and around Delhi by DRDO and its industrial partners are now being installed at the AIIMS Trauma Centre and RML Hospital.

The other plants at the Safdarjung Hospital, Lady Hardinge Medical College and AIIMS, Jhajjar (Haryana) will also be set up this week. “These medical oxygen plants (MOPs) are designed for a flow rate of 1,000 litres per minute (LPM). The system can cater to 190 patients at a flow rate of 5 LPM and charge 195 cylinders per day,” said a DRDO official on Tuesday.

The five MOPs are part of the overall plan to establish 500 such plants at hospitals in different parts of the country within the next three months from the allocations made by the PM Cares Fund, as was announced by defence minister Rajnath Singh earlier.

The equipment for the two plants at AIIMS and RML, which has been supplied by the Coimbatore-based Trident Pneumatics Pvt Ltd, reached the Capital on Tuesday.



The MOP technology, which was developed by DRDO for on-board oxygen generation for the indigenous Tejas fighter, has been transferred to Trident Pneumatics and the Bengaluru-based Tata Advanced Systems Limited.

While Trident Pneumatics has been given an order for 48 plants, Tata Advanced Systems is to manufacture 332 plants. “The delivery schedule is being monitored very closely to ensure the plants are ready in time. Sites are being prepared at the hospitals in parallel,” said the official.

“These plants will overcome the logistical issues of oxygen transportation and help Covid-19 patients in emergency. CSIR has also ordered 120 MOPs through its industries,” he added.

The MOP technology is capable of generating oxygen with 93±3% concentration, which can be directly supplied to hospital beds or can be used to fill medical oxygen cylinders. “It utilizes

pressure swing adsorption (PSA) technique and molecular sieve (Zeolite) technology to generate oxygen directly from atmospheric air,” said the official.

“MOPs have already been installed at some of the Army sites in the north-east and Ladakh. The plant complies with international standards like ISO 1008, European, US and Indian pharmacopeia,” he said.

<https://timesofindia.indiatimes.com/india/delhi-drdo-begins-installing-oxygen-plants-at-aiims-rml-hospital/articleshow/82390438.cms>



Wed, 05 May 2021

दिल्ली में AIIMS और RML में लग रहा DRDO का ऑक्सीजन प्लांट, गुरुवार तक काम करना कर देंगे शुरू

देश में ऑक्सीजन की किल्लत को देखते हुए डीआरडीओ, स्वदेशी फाइटर जेट एलसीए तेजस की ऑक्सीजन तकनीक का इस्तेमाल 500 ऑक्सीजन प्लांट लगाने में करने जा रही है।

By नीरज राजपूत

नई दिल्ली: राजधानी दिल्ली के एम्स और आरएमएल हॉस्पिटल में डीआरडीओ के मेडिकल ऑक्सीजन प्लांट गुरुवार से काम करना शुरू कर देंगे। इन प्लांट्स के बनने का काम शुरू हो गया है। ये जानकारी खुद डीआरडीओ के चेयरमैन ने एबीपी न्यूज़ से खास बातचीत में दी है। खास बात ये है कि ऑक्सीजन प्लांट एलसीए तेजस की तकनीक पर आधारित हैं।

डीआरडीओ चेयरमैन, डॉक्टर जी सतीश रेड्डी ने एबीपी न्यूज़ को बताया कि देश में ऑक्सीजन की किल्लत को देखते हुए डीआरडीओ, स्वदेशी फाइटर जेट एलसीए तेजस की ऑक्सीजन तकनीक का इस्तेमाल 500 ऑक्सीजन प्लांट लगाने में करने जा रही है। ये सभी प्लांट प्राइवेट और सरकारी कंपनियों के जरिए देश के अलग-अलग हिस्सों में लगाए जाएंगे और उनकी फंडिंग पीएम-केयर फंड से की जाएगी। दिल्ली-एनसीआर क्षेत्र में ऐसे पांच प्लांट लगाने का काम 10 मई तक पूरा हो जाएगा।



ऑक्सीजन प्लांट

रेड्डी के मुताबिक राजधानी दिल्ली और एनसीआर क्षेत्र में जिन 5 जगहों पर ये प्लांट लगाए जाएंगे, उनमें ऑल इंडिया इंस्टीट्यूट ऑफ मेडिकल साइंस (एम्स) दिल्ली और झज्जर (हरियाणा) शामिल हैं। इसके अलावा सफदरजंग हॉस्पिटल, लेडी हार्डिंग और आरएमएल हॉस्पिटल शामिल हैं। इनमें से एम्स, दिल्ली और आरएमएल अस्पताल में प्लांट के लिए जरूरी उपकरण पहुंच गए हैं और गुरुवार से इन प्लांट्स में ऑक्सीजन का उत्पादन शुरू हो जाएगा।

डीआरडीओ के चेयरमैन के मुताबिक, एलसीए तेजस लड़ाकू विमान के लिए डीआरडीओ ने मेडिकल ऑक्सीजन प्लांट टेक्नोलॉजी इजाद की थी। इसके तहत आसमान में उड़ान भरते वक्त पायलट को ऑक्सीजन मुहैया कराई जाती है। इसी तकनीक के आधार पर तैयार किए गए प्लांट्स को डीआरडीओ ने

लेह और उत्तर-पूर्व के राज्यों में लगाया है। जहां से सेना को ऑक्सीजन सप्लाई सफलतापूर्वक की जाती है। अब जब देश में कोविड महामारी के दौरान ऑक्सीजन की किल्लत आन पड़ी है, तो डीआरडीओ इस तकनीक को प्राइवेट इंडस्ट्री और सीआईएसआर को सौंप रही हैं।

एक मिनट में 1000 लीटर ऑक्सीजन का उत्पादन

इन प्लांट्स में एक मिनट में करीब 1000 लीटर ऑक्सीजन का उत्पादन किया जा सकता है। ऐसे में इस सिस्टम से एक साथ 190 मरीजों को पांच लीटर ऑक्सीजन सप्लाई की जा सकती है और एक दिन में 195 सिलेंडर को रिफिल किया जा सकता है। डीआरडीओ के मुताबिक, इन प्लांट्स में प्रेशर स्विंग एडसोर्प्शन तकनीक और मोल्क्यूलर सीइव (जियोलाइट) टेक्नोलॉजी का इस्तेमाल कर हवा से ही ऑक्सीजन बनाई जाती है।

चेयरमैन के मुताबिक, इसके लिए डीआरडीओ ने टाटा कंपनी और कोयम्बटूर की एक कंपनी को तकनीक सौंप दी है (ट्रांसफर ऑफ टेक्नोलॉजी)। इसके अलावा काउंसिल ऑफ साइंटिफिक एंड इंडस्ट्रियल रिसर्च (सीएसआईआर) के इंडियन इंस्टीट्यूट ऑफ पेट्रोलियम (आईआईपी) को भी ये तकनीक दी गई है। रक्षा मंत्रालय के मुताबिक, टाटा कंपनी देशभर में ऐसे 380 प्लांट तैयार करेगी, और कायम्बटूर की ट्राइटेंट न्यूमैटिक्स प्राइवेट लिमिटेड 48 ऐसे प्लांट तैयार करेगी। आईआईपी भी 120 प्लांट तैयार करेगा। इन सभी प्लांट्स की फंडिंग पीएम-केयर फंड से होगी। ये सभी प्लांट अगले तीन महीने में बनकर तैयार हो जाएंगे।

सतीश रेड्डी के मुताबिक, डीआरडीओ ने लखनऊ में जो कोविड हॉस्पिटल बनाया है, वो अगले एक-दो दिन में शुरू हो जाएगा। इसके अलावा वाराणसी में कुछ दिनों में डीआरडीओ का कोविड सेंटर शुरू होने वाला है।

<https://www.abplive.com/news/india/drdo-oxygen-plants-at-aiims-and-rml-will-start-working-by-thursday-corona-virus-ann-1910173>

DRDO के ऑक्सिजन प्लांट में होगी तेजस फाइटर प्लेन की टेक्नॉलजी, 1 मिनट में बनेगा 1000 लीटर ऑक्सिजन

रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) कुल 500 ऑक्सीजन संयंत्र में से इस सप्ताहांत तक दिल्ली के इर्द-गिर्द पांच ऑक्सिजन संयंत्र स्थापित करेगा।

By Raghavendra Shukla

हाइलाइट्स:

- ऑक्सिजन प्लांट में तेजस विमान की टेक्नॉलजी होगी इस्तेमाल
- डीआरडीओ बना रहा है देश भर में 500 ऑक्सिजन प्लांट
- 1 मिनट में 1000 हजार लीटर ऑक्सिजन का उत्पादन करेगा प्लांट

नई दिल्ली: कोरोना काल में देशभर में ऑक्सिजन की किल्लत के बाद डीआरडीओ ने इस समस्या को सुलझाने के लिए महत्वपूर्ण पहल की है। रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) पीएम केयर फंड की मदद से सिर्फ तीन महीनों में ही 500 ऑक्सिजन प्लांट लगाने की तैयारी में है। जानकारी के मुताबिक, रक्षा संगठन ने प्लांट के निर्माण में तेजस लड़ाकू विमान में इस्तेमाल की गई तकनीकी का सहारा लिया है।

डीआरडीओ ने तेजस लड़ाकू विमान में एक ऐसी तकनीकी विकसित की है, जिसकी मदद से विमान में ऑनबोर्ड ऑक्सिजन जनरेट किया जा सकता है। ऐसे में डीआरडीओ के ऑक्सिजन प्लांट्स में इसी तकनीकी का इस्तेमाल किया जा रहा है। इसके जरिए प्लांट्स एक मिनट में एक हजार लीटर ऑक्सिजन का उत्पादन कर सकेंगे। बता दें कि इस तरह की टेक्नॉलजी में प्लांट सीधे वायुमंडल से ऑक्सिजन बनाता है। पूर्वोत्तर भारत के अलावा लद्दाख के इलाकों में इस तकनीक का इस्तेमाल किया जाता है।

93 प्रतिशत सांद्रता वाला ऑक्सिजन

जिन प्लांट्स का निर्माण डीआरडीओ कर रहा है वह 93% सांद्रता वाली ऑक्सिजन तैयार करेगी, जिसे सीधे मरीजों को दिया जा सकेगा। डीआरडीओ के अध्यक्ष जी सतीश रेड्डी ने बताया कि पीएम केयर्स फंड के जरिए हमने टाटा एडवांस्ड सिस्टम्स लिमिटेड और ट्राइडेंट न्यूमेटिक्स प्राइवेट लिमिटेड से 380 प्लांट मंगवाए हैं।

दिल्ली में स्थापित होंगे पहले पांच प्लांट्स

इसके अलावा सीएसआईआर उद्योगों से 120 संयंत्र मंगाए गए हैं। उन्होंने बताया कि पहले 5 प्लांट दिल्ली में स्थापित किए जाएंगे, जिनमें से दो एम्स और आरएमएल अस्पताल में स्थापित किए जा रहे हैं। उन्होंने बताया कि 500 ऑक्सिजन प्लांट देश भर में अलग-अलग जिलों में स्थापित किए जाएंगे। आने वाले तीन महीनों में तकरीबन हर जिले में कम से कम एक प्लांट स्थापित किया जाएगा।

बता दें कि देश में कोरोना वायरस संक्रमण की दूसरी लहर चल रही है। संक्रमित मरीजों की संख्या बढ़ने से कई राज्यों में अस्पतालों में ऑक्सीजन, जरूरी दवाओं, उपकरणों और बेड की कमी हो गयी है। रक्षा मंत्रालय ने बताया कि तय कार्यक्रम के मुताबिक 5 संयंत्रों में से दो के उपकरणों की खेप मंगलवार को दिल्ली पहुंच गयी और एम्स तथा आरएमएल अस्पताल में संयंत्र स्थापित किए जा रहे हैं।

<https://navbharattimes.indiatimes.com/india/tejas-fighter-aircraft-technology-in-oxygen-plants-to-be-made-by-drdo-across-country/articleshow/82393260.cms>

लखनऊ: DRDO का 500 बेड वाला कोविड हॉस्पिटल तैयार, आज से भर्ती किए जाएंगे मरीज

लखनऊ के शिल्पग्राम स्थित इस अस्पताल का सारा मेडिकल
सपोर्ट सेना और वायुसेना के डॉक्टर्स और मेडिकल स्टाफ देखेंगे

लखनऊ: राजधानी लखनऊ (Lucknow) में कोविड संक्रमितों के बेहतर इलाज के लिए शहीद पथ स्थित अवध शिल्प ग्राम में डीआरडीओ (DRDO) की ओर से 500 बेड वाला कोविड अस्पताल शुरू हो जाएगा। अस्पताल में आज से मरीजों को भर्ती किया जाएगा। रक्षामंत्री राजनाथ सिंह वर्चुअल माध्यम से इस कोविड अस्पताल का शुभारंभ करेंगे। मुख्यमंत्री योगी आदित्यनाथ भी अस्पताल की शुरुआत के समय मौजूद रहेंगे।

मैनेजमेंट का काम राज्य सरकार के कर्मचारियों के जिम्मे

लखनऊ के शिल्पग्राम स्थित इस अस्पताल का सारा मेडिकल सपोर्ट सेना और वायुसेना के डॉक्टर्स और मेडिकल स्टाफ देखेंगे। बाकी मैनेजमेंट का काम राज्य सरकार के कर्मचारियों के जिम्मे में होगा। इस अस्पताल में रजिस्ट्रेशन के माध्यम से



File Photo

ICU और वेंटिलेटर वाले बेड्स और अल्ट्रासाउंड करने के बारे में डाक्टर्स के द्वारा तय किया जाएगा।

सभी 500 बेडों पर ऑक्सीजन का इंतजाम

कोविड मरीजों के बेहतर इलाज के लिए DRDO की तरफ से तैयार किए गए 500 वाले कोविड हॉस्पिटल में 4 हॉल तैयार करके उनमें बेड की व्यवस्था की गई है। 2 हॉल में General Ward की व्यवस्था की गई है तो वहीं दो में ICU के बेड का इंतजाम किया गया है। जानकारी के मुताबिक, जनरल वार्ड में कोरोना मरीजों के लिए कुल 350 बेड बनाए गए हैं। ICU वार्ड में वेंटिलेटर के साथ 150 बेड तैयार किए गए हैं। सभी 500 बेडों पर Oxygen का इंतजाम किया गया है।

14 वरिष्ठ चिकित्सा अधिकारियों की कमेटी गठित

यूपी सरकार ने 14 वरिष्ठ चिकित्सा अधिकारियों की कमेटी गठित की है। प्रदेश भर के आला चिकित्सा अधिकारियों को कमेटी में शामिल किया गया है।

कैंसर संस्थान में स्थापित 100 बेड के डेडिकेटेड कोविड हॉस्पिटल का लोकार्पण

मुख्यमंत्री योगी आदित्यनाथ ने मंगलवार को राजधानी लखनऊ स्थित कैंसर संस्थान में स्थापित 100 बेड के डेडिकेटेड कोविड हॉस्पिटल का लोकार्पण किया। इस अवसर पर उन्होंने चिकित्सालय का निरीक्षण किया और अस्पताल में रोगियों के लिए उपलब्ध सुविधाओं की जानकारी प्राप्त की।

<https://zeenews.india.com/hindi/india/up-uttarakhand/lucknow/lucknow-drdo-500-bed-covid-hospital-is-ready-patients-will-be-admitted-from-today-cm-yogi-rajnath-singh-pcup/895430>

बीएचयू में बनाए जा रहे डीआरडीओ के अस्थायी कोविड अस्पताल

बिजली के लिए करेगा मासिक छह करोड़ रुपये का भुगतान

डीआरडीओ द्वारा वाराणसी के बीएचयू में बनाए जा रहे अस्थायी कोविड अस्पताल से बिजली विभाग को हर माह करीब छह करोड़ रुपये का आय होगा। अस्थायी कोविड अस्पताल में बिजली आपूर्ति के लिए विभाग नौ हजार किलोवाट का कनेक्शन देगा।

By Saurabh Chakravarty

वाराणसी: डीआरडीओ द्वारा बीएचयू में बनाए जा रहे अस्थायी कोविड अस्पताल से बिजली विभाग को हर माह करीब छह करोड़ रुपये की आय होगी। अस्थायी कोविड अस्पताल में बिजली आपूर्ति के लिए विभाग नौ हजार किलोवाट का कनेक्शन देगा। जिसमें अस्पताल आठ हजार किलोवाट तक बिजली की खपत करेगा। जिसके लिए एक लाख बानबे हजार यूनिट का बिल हर माह अस्पताल विभाग को अदा करेगा। जिसकी अनुमानित राशि लगभग छह करोड़ प्रति माह आने का अनुमान है।

ट्रांसफार्मर और केबल बिछाने के लिए गत 28 अप्रैल को त्रिदेव कंस्ट्रक्शन को डेढ़ करोड़ रुपये का टेंडर दिया गया है। विभाग नौ हजार किलोवाट का कनेक्शन देने के लिए दो विद्युत सबस्टेशन बना रहा है। इसमें 3150 केवीए का छह ट्रांसफार्मर लगाएगा। बिजली विभाग कनेक्शन देने के बाद अस्पताल को निर्बाध आपूर्ति देने के लिए वहां शिफ्टवार कर्मचारियों की नियुक्ति भी करेगा।



जिला अस्पताल के एसआईसी के नाम जारी हुआ कनेक्शन

अधीक्षण अभियंता द्वितीय दीपक अग्रवाल ने बताया कि बीएचयू में बन रहे अस्थायी कोविड अस्पताल का कनेक्शन जिला अस्पताल के एसआईसी के नाम दिया गया है। कनेक्शन की कागजी प्रक्रिया पूरी करने के बाद बिजली विभाग ने कनेक्शन दे दिया है।

60 फीसद काम हुआ पूरा

अधीक्षण अभियंता द्वितीय दीपक अग्रवाल ने बताया कि त्रिदेव कंस्ट्रक्शन कम्पनी ने अस्थायी कोविड अस्पताल में करीब 60 फीसद काम पूरा कर लिया है। शेष 40 फीसद काम बाकी है। जिसे ससमय पूरा कर लिया जाएगा। कार्य के प्रगति की स्थिति जानने के लिए सोमवार को डीआरडीओ के अधिकारियों ने बिजली विभाग के अधिकारियों संग वीडियो कॉन्फ्रेंसिंग करके बैठक भी किया था।

अस्पताल पूरी तरह अत्याधुनिक सुविधाओं से लैस होगा। इसमें एंबुलेंस के लिए अलग से ग्रीन कॉरिडोर बनेगा तो वहीं अलग से एडमिनिस्ट्रेशन सेक्शन, पेशेंट वार्ड, डाक्टर्स एकोमोडेशन, ड्यूटी रूम भी होगा। इसके अलावा वाहनों के लिए पार्किंग की व्यवस्था की जाएगी। दर्जनों शौचालय होंगे तो वहीं भोजन की व्यवस्था के लिए भी अलग से व्यवस्था रहेगी। इसके अलावा आक्सीजन व फॉयर सर्विस आदि के बारे में बताया। इसके अलावा सुरक्षा व्यवस्था के साथ ही अस्पताल इंटरनल अन्य कई सुविधाएं होगी।

<https://www.jagran.com/uttar-pradesh/varanasi-city-drdo-temporary-covid-hospital-to-be-built-in-bhu-will-pay-rs-6-crore-monthly-for-electricity-varanasi-up-news-21615709.html>

Div Com visits DRDO 500-bedded Covid hospital site

Budgam: The Divisional Commissioner (Div Com) Kashmir, Pandurang K Pole today visited Reshipora village in Budgam district to take stock of ongoing construction work of DRDO 500-bedded Covid hospital.

The Div Com was accompanied by Deputy Commissioner Budgam, Shahbaz Mirza, CE PWD, CE PHE, divisional heads or various departments, a team of DRDO headed by Additional CE, (Scientist- E) Ravindra Kumar, ADC Budgam, Tehsildar Budgam, DD Health Services Kashmir and other concerned were also present on the occasion.



Div Com taking stock of ongoing construction work of DRDO 500 bedded Covid hospital.

The Div Com said that work on the project is to be completed within 35 days' time duration and the hospital will have a facility of 125 beds as intensive care units and rest of the beds shall have oxygen supply facility.

The construction shall also include 50- double room accommodation facility for doctors and paramedics staff. The construction is coming up on the 72 kanals of land and the earthwork on the approach road has also been completed.

During the visit, the Div Com directed concerned officers to ensure supply of electricity and water facility is made available on war footing, besides developments of approach and interior roads with metal work and construction of 4 number of Culverts within a week's time be also completed.

He emphasized carrying out the ground levelling work and extracting tree roots before Monday. Health authorities were directed to ensure timely deployment of doctors as well as paramedical staff for smooth functioning of the hospital to ensure better Healthcare facilities to the Covid patients.

The Div Com was apprised that the hospital shall be constructed with pre-engineered thermal insulated material having life of more than 25 years. DRDO team informed that the material and piling work shall be started by Monday and the project, having the facility of sufficient oxygen store shall be completed in time.

Meanwhile, speaking to the media, the Div Com said that the facility shall be turned into a full-fledged hospital later also once the Covid dies down.

He said that there is sufficient supply of oxygen available at all hospitals as an audit is being conducted to check out supply of oxygen is going smoothly and there is no leakage or mussy use of the same.

<https://www.dailyexcelsior.com/div-com-visits-drdo-500-bedded-covid-hospital-site/>

Uttarakhand govt releases Rs 40 crore to DRDO for 2 temporary Covid hosps

By Kautilya Singh

Dehradun: The state government on Tuesday released Rs 40 crore to Defence Research and Development Organisation (DRDO) for establishing two temporary 500-bed Covid hospitals in Kumaon and Garhwal. The makeshift hospitals will be set up in Haldwani and Rishikesh.

In other major decisions, the state has released Rs 140 core for MLALAD funds so legislators can carry out development works in their constituencies and IAS officer Senthil Pandiyan has been appointed the nodal officer for mental health and post-Covid stress management.

<https://timesofindia.indiatimes.com/city/dehradun/uttarakhand-govt-releases-rs-40-crore-to-drdo-for-2-temporary-covid-hosps/articleshow/82393458.cms>



Wed, 05 May 2021

HSL contributes Rs 10 Lakh to DRDO for setting up 500-bed COVID hospital in Lucknow

Visakhapatnam, May 4 (UNI) Hindustan Shipyard Limited (HSL), which also been actively doing its bit towards India's anti-COVID-19 efforts, has contributed Rs 10 Lakh from its Corporate Social Responsibility (CSR) funds to Defence Research and Development Organisation (DRDO) for setting up a dedicated 500-bed COVID hospital in Lucknow of Uttar Pradesh.

The second wave of the COVID-19 has hit the entire country and it is battling against the deadly virus.

In view of the surge in COVID Cases, the entire country is united to strengthen its health infrastructure on a war footing to battle against this pandemic.

In a release here on Tuesday, HSL said under its CSR initiatives, it is also supplying oxygen filled cylinders to the designated COVID hospitals referred by district administration.

About 50 cylinders have been supplied to Siddhartha Hospital which is declared as a Covid-19 Hospital by Visakhapatnam District Administration.

<http://www.uniindia.com/hsl-contributes-rs-10-lakh-to-drdo-for-setting-up-500-bed-covid-hospital-in-lucknow/business-economy/news/2386975.html>

Business Standard

Wed, 05 May 2021

Rolls-Royce partners with Hindustan Aeronautics for warship engines

The partnership will provide packaging, installation, marketing and services support for the MT30 engine

By Ajai Shukla

New Delhi: Hindustan Aeronautics Limited (HAL) and Rolls-Royce signed a memorandum of understanding (MoU) on Tuesday to establish a support system in India for the highly regarded Rolls-Royce MT30 marine engines.

The HAL-Rolls-Royce partnership will provide packaging, installation, marketing and services support for the MT30 engine, creating a business case for the Indian Navy to consider using the engine for powering and propelling its warships.

The Indian Navy, one of the world's major warship builders, has not used the MT30 for even a single warship. Most Indian frigates and destroyers are propelled by Ukrainian Zorya turbines or by American General Electric LM-2500 gas turbines.

The MT30 engine, however, powers the world's most sophisticated warships. It gives the US Navy's Littoral Combat Ship, USS Freedom, the ability to move at 40 knots, or 75 km per hour. It also powers the US Navy's all-electric Zumwalt class destroyers and propels the Royal Navy's two new aircraft carriers: Her Majesty's Ship (HMS) Queen Elizabeth and HMS Prince of Wales.

The British government has been actively lobbying New Delhi to power the Indian Navy's second indigenous aircraft carrier (IAC-2), INS Vishal, with the MT30 engine.

Like the two British carriers, for which Rolls-Royce has already tailor-made a propulsion package, INS Vishal will be a 65,000-tonne vessel that embarks 55-60 aircraft.

Rolls-Royce points out that seven major ship types have chosen propulsion solutions based on the MT30 turbine. These include South Korea's Daegu-class frigates, the Royal Navy's Type 26 City-class frigates, the Australian navy's Hunter-class and the Canadian navy's Surface Combatant programmes.

"The Italian Navy's future flagship, the Landing Helicopter Dock, will be powered by two MT30s. Japanese Maritime Self-Defense Force's new 30FFM frigates will also be powered by MT30," states the Rolls-Royce's website.

Rolls-Royce is famous for its aerospace and land system engines, but the company's marine engines division is also a major money earner. So far, Rolls-Royce and HAL have collaborated mainly in building the Adour aero engines that power the Jaguar fighter and Hawk advanced jet trainer.



“Rolls-Royce has a shared history of successful collaboration with HAL in defence aerospace, and we are proud to strengthen our valued partnership to work together for the MT30 naval gas turbine,” said Tom Bell, President, Rolls-Royce Defence.

https://www.business-standard.com/article/economy-policy/rolls-royce-partners-with-hindustan-aeronautics-for-warship-engines-121050401281_1.html

THE ECONOMIC TIMES

Wed, 05 May 2021

Amidst Covid, Army worked on mammoth explosives clearance drive billed as biggest since WWII

By Manu Pubby

Synopsis

Bomb disposal teams of the Pulgaon based Central Ammunition Depot were tasked with clearing stockpiles of seized explosives and dangerous scrap material, following the Beirut port explosion last year, which raised awareness about the danger of such materials at yards close to inhabited areas.

Amidst the Covid 19 crisis, the Army has worked overtime since January this year to complete a mammoth explosives clearance drive, which is being billed as the largest such exercise undertaken since World War II.

Bomb disposal teams of the Pulgaon based Central Ammunition Depot were tasked with clearing stockpiles of seized explosives and dangerous scrap material, following the Beirut port explosion last year, which raised awareness about the danger of such materials at yards close to inhabited areas.

ET has been told that that post the Beirut incident, the ministry of home affairs approached the department of military affairs for assistance in neutralising and clearing seized explosives strewn across urban centers like Mumbai, Jaipur, Jodhpur, Kanpur and the port towns of Kundla and Mundra.

The fear was that seized explosive material, a lot which had been illegally imported from war torn countries as part of metal scrap could pose a risk to populated areas. A lot of scrap metal had reached Indian shores in recent years, specially from conflict hit middle east and had been placed at dump yards after inspections.

After the Department of Military Affairs was approached in December last year, the bomb disposal teams from Pulgaon were pressed into action for an urgent clearance mission for Explosive Remnants of War (ERW) and Unexploded Ordnance (UXOs), some of which had been lying at yards for over three decades.

Small squads of explosives experts were deployed by the army to first identify and segregate the threats, followed by which the dangerous explosives were moved from various locations to Pulgaon. “Each team worked round the clock to painstakingly scan through each of the extremely deteriorated Shells, Rockets, Bombs Grenades, Mortars and other innumerable War Scrap and carefully segregate all those with explosive content left in them and neutralize them simultaneously,” sources said.



The task was specially challenging as decades of storage had resulted in accumulation of dirt and mud on scrap material, making identification and transport extremely difficult. Also, a lot of the ammunition was of Gulf and NATO origin, making it very different from the explosives used in India on which soldiers have expertise.

“The teams carefully handled and scanned through more than 1600 Metric Tons of War Scrap with their bare hands. They were then able to segregate, and make safe for transport, the most dangerous of the scrap which had a very high content of RDX and TNT,” source said.

Alarmingly, the teams found over 2,500 kgs of RDX and TNT during the clearing exercise, which could have resulted in substantial damage to the urban population in the vicinity. The city most at danger was Mumbai and was given the highest priority during the mission. The clearing phase of the operation was completed last month but a big task remains ahead as the final disposal of the explosives is to take over during the next few months at Pulgaon.

<https://economictimes.indiatimes.com/news/defence/amidst-covid-army-worked-on-mammoth-explosives-clearance-drive-billed-as-biggest-since-wwii/articleshow/82390618.cms>



Wed, 05 May 2021

India, UK agree on technology collaboration for combat aircraft

India, UK agree on co-production of military hardware; technology collaboration for combat aircraft

New Delhi: In a major move, India and the UK on Tuesday vowed to expand bilateral defence cooperation, including through technology collaboration in developing combat aircraft and complex weapons, during a virtual summit between Prime Minister Narendra Modi and his British counterpart Boris Johnson.

A 10-year roadmap unveiled at the summit for boosting overall India-UK ties mentioned that the two countries will strengthen cooperation to take "decisive and concerted actions" against globally proscribed terrorists and terror entities.

In the talks, the two sides also agreed to increase maritime co-operation while India invited the UK's liaison officer to the Indian Navy's information fusion centre, a key facility that keeps a hawk-eyed vigil on developments and movement of ships in the Indian Ocean region.

A 10-year roadmap unveiled at the summit for boosting overall India-UK ties mentioned broadening dialogue on "combat air collaboration to determine how the UK can support India's ambitions for their light combat air MK2 programme".

"Both prime ministers agreed to deepen their defence and security cooperation through the India-UK defence and international security partnership framework and welcomed the finalisation of the new logistics MoU," said a joint statement on Modi-Johnson talks.

It said the two leaders agreed that there is a promising new era ahead for India-UK collaboration on key military technologies including combat aircraft, maritime propulsion system and complex weapons, harnessing the strengths of Indian and British industries, government laboratories and academia.



Prime Minister Narendra Modi and his UK counterpart Boris Johnson in a virtual summit.(PTI)

The statement said such collaborations will help in delivering the next generation defence and security capabilities through co-development and co-production.

Joint Secretary in the Europe West division in the Ministry of External Affairs Sandeep Chakravorty said at a media briefing that the two sides discussed co-development and co-production of military hardware.

"They agreed to increase maritime co-operation, inviting the UK's Liaison Officer to India's information fusion centre, establishing an annual India-UK maritime dialogue and strengthening operational coordination," the statement said.

"During the deployment of the UK's Carrier Strike Group in the Indian Ocean Region in 2021, they agreed to hold joint exercises that will deepen cooperation in a region of critical strategic importance to both countries," it said.

The 10-year roadmap said India and the UK will work in a strategic partnership to strengthen efforts to tackle cyber, space, crime and terrorist threats and develop a free, open and secure Indo-Pacific region.

"Our shared interests will underpin greater cooperation in multilateral fora where a strengthened UK India relationship will build understanding among diverse partners on international security and will help set global rules for cybersecurity and space taking into account their respective interests," it said.

It also mentioned that the two sides will aim to further enhance cooperation to promote international security and stability in cyberspace including through bilateral cooperation on critical national infrastructure, healthcare and vaccines.

The joint statement said both leaders reiterated their full support to a free, open, peaceful and secure cyberspace and agreed to strengthen cooperation through an enhanced India-UK cyber security partnership to tackle growing cyber threats.

"They affirmed their shared vision of an open, free, inclusive and rules-based Indo-Pacific region, underpinned by respect for territorial integrity and sovereignty, rule of law, transparency, freedom of navigation and overflight in the international seas, unimpeded lawful commerce, and peaceful resolution of disputes," it said.

<https://www.hindustantimes.com/india-news/india-uk-agree-on-technology-collaboration-for-combat-aircraft-101620172808260.html>

Wed, 05 May 2021

China undertaking special recruitment drive for ethnic Tibetans amid border standoff with India

China's People's Liberation Army (PLA) is for the first time forming exclusive military formations manned by ethnic Tibetans.

India's external and military intelligence officials told IANS that senior PLA officials are touring specific areas of Tibet to raise the Tibetan-only force.

But they said that most of the recruits are mixed Tibetans -- mostly children of Tibetan mothers and Han Chinese fathers or otherwise.

Most of them are children of ex-PLA Han Chinese soldiers who got married to Tibetans, intelligence officials said.

PLA officers based in Lhasa have been to Ngari Prefecture in the far west of Tibet Autonomous Region (TAR) and then to the border county of Zanda or Tsamda County to recruit for the Special Tibetan Army Unit.

The recruitment rallies began in February and are still continuing.

"It is a fairly long process because the security vetting process after the initial selection on the basis of a tough physical and IQ test is very extensive," said an intelligence official monitoring the process.

He said the Chinese authorities are keen to ensure that no anti-Beijing Tibetan sneaks into the force. "So not only are Tibetan localities with a history of protest against Beijing's rule scrupulously avoided, but past records of individual recruits even in the most secure places are screened extensively," the official said, but on condition of anonymity for obvious reasons.

The PLA also carried out a phased recruitment drive in Lhasa to induct many Tibetans.

The plan is to raise a four battalion force initially for special operations on the lines of India's secretive Tibetan force, the Special Frontier Force or SFF.

The SFF was raised in 1960s by Major General Sujan Singh Uban, a legendary expert in irregular warfare, for special operations inside Tibet in the event of a conflict with China.

During last year's Ladakh standoff, the SFF commandoes unleashed take-and-hold operations on some unoccupied heights around Pangong Tso which finally forced the Chinese to settle on a mutually agreed pullback.

The SFF's success and the ease with which these Tibetans negotiated the icy heights on the Himalayas convinced PLA commanders they would do better than Han Chinese troops.

"These new recruitment drives are happening because units with Han Chinese troops are suffering serious health problems such as severe mountain sickness and high altitude pulmonary edema," said an Indian medical service expert in high altitude sickness.

According to PLA Daily, China's military has framed guidelines to help troops serving in Tibet save themselves from altitude sickness.

In the 2 million plus PLA, only 3,000 to 4,000 Tibetans serve at the moment.

"So this recruitment is significant," said Lt Gen J.R. Mukherjee, former Chief of Staff in India's Eastern Army.

He told IANS the Chinese have been looking to recruit both Tibetans and Nepali Gurkhas.



People's Liberation Army soldiers show off their skills in Beijing, China (Feng Li/Getty Images)

"They have failed to get Gurkhas because they are tied to the Indian army for historical and emotional reasons, so they have to find Tibetans because an average Chinese soldier cannot match our boys in the high Himalayas physically," Mukherjee said.

(This news has been published via a Syndicated feed. Only the headline is changed.)

<https://swarajyamag.com/news-brief/china-undertaking-special-recruitment-drive-for-ethnic-tibetans-amid-border-standoff-with-india>

Science & Technology News



Wed, 05 May 2021

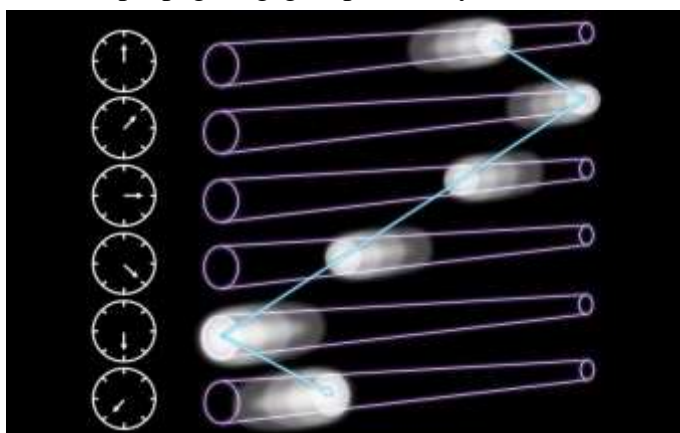
Laser light makes a comeback (literally)

Straight-line constant-speed propagation in free space is a basic characteristic of light. In a recent study published in *Communications Physics*, researchers from Osaka University discovered the phenomenon of reciprocating propagation of laser pulse intensity in free space.

Spatiotemporal couplings have been recently used to produce light with tunable group-velocity, direction, and trajectory in free space. For example, the flying focus (a moving laser pulse intensity in the extended Rayleigh length), where longitudinal chromatism and temporal chirp are combined to control the spectrum-dependent focus-separation in space and spectrum-dependent pulse-location in time, respectively, has arbitrarily tunable propagating group-velocity and direction in space and time.

However, in the previous result, the flying focus can only propagate along a certain direction either forward or backward, although the propagating group-velocity can be freely controlled.

In this study, by dramatically increasing the Rayleigh length in space and the temporal chirp in time, the newly created flying focus propagates along a reciprocating straight-line trajectory in free space. A clear reciprocating flying focus with a high spatial resolution is also possible by further increasing the temporal chirp.



Schematic of reciprocating propagation of laser pulse intensity at different observation times. Credit: Osaka University

"The newly created flying focus propagates along the longitudinal axis first forward, then backward, and lastly forward again, showing a reciprocating straight-line trajectory in space and time. The forward-propagating velocity is the light speed in the vacuum, while the backward-propagating velocity is subluminal," explains corresponding author Zhaoyang Li.

This intriguing phenomenon changes the traditional understanding of light propagation and may be applied in both fundamental and applied physics.

"For example, in our radiation pressure simulation, it can produce an on-axis reciprocating trapping or pushing force for a small or big sphere, respectively, in the Rayleigh scattering regime," says Zhaoyang Li.

The article, "Reciprocating propagation of laser pulse intensity in free space," was published in *Communications Physics*.

More information: "Reciprocating propagation of laser pulse intensity in free space," *Communications Physics* (2021). DOI: [10.1038/s42005-021-00590-8](https://doi.org/10.1038/s42005-021-00590-8)

Journal information: [Communications Physics](https://phys.org/news/2021-05-laser-comeback-literally.html)
<https://phys.org/news/2021-05-laser-comeback-literally.html>



Wed, 05 May 2021

Photonics research harnesses the power of light

By Gary Polakovic

In a lab at USC, Mercedeh Khajavikhan engineers new structures that change the shape of light as it is transported. She creates groundbreaking structures in a field of science called photonics. Her work is important because it affects many things used in daily life, including lasers for imaging and sensing, fiber optic cables for advanced communications and computer chips to increase processing capabilities to a level earlier generations couldn't have dreamed of.

We caught up to Khajavikhan, the IBM Early Career Chair and associate professor of electrical and computer engineering at the USC Viterbi School of Engineering, to talk about the project her team is working on.

What do you work on?

Our lab conducts research that combines cutting-edge theories in mathematics and physics with photonics to create new engineering designs that shape light in ways we couldn't do without marrying the two fields.

What is photonics?

Photonics is a relatively new field of science that's about 100 years old. It is all about light: new types of lasers, holographic streams, light that transmits information, different ways to project light and use it across structures. It's about changing structures at the limits of optics, that everything should be symmetrical. If you get past that, then you get new opportunities to make light move more efficiently than standard lasers.

What is an 'active photonic system'?

Active photonic systems are materials used to manipulate light, and they are more important to modern life than people realize. In medical devices, they might be used to improve sensing and data collection. When implemented in semiconductors, they greatly increase computing power. They play an important role in navigation, where photonic gyroscopes provide improved GPS capabilities. Light can even be manipulated for optical data transmission. In fact, some new forms of twisted light beams could make the speed of our current fiber optics totally obsolete.

What kind of companies are interested in this research?

Photonics plays an important role in so many technologies, so you can imagine lots of industries are interested; everything from communications, transportation and defense, to entertainment, health, and manufacturing. It's hard to imagine many areas of engineering that don't benefit directly from photonics research. Any industry you can think of would directly benefit from smaller, smarter, more programmable technology—photonics is essential to that.

One particular area that stands out is semiconductor manufacturing. Today, the United States is at risk of falling behind our competitors—with great implications for our economy and security.



Mercedeh Khajavikhan is the IBM Early Career Chair and associate professor of electrical and computer engineering at the USC Viterbi School of Engineering. Credit: USC Photo/Ben Paul

What is your goal in research?

To move the frontiers of science. What interests me most is gaining knowledge because knowledge is a wonderful thing. I like the challenge, and photonics is a field where you can press the limits to make non-symmetrical light—how much you can deform its structure and yet keep its shape.

What led you into engineering instead of traditional physics?

I wanted to be a physicist, but my dad said to study engineering because otherwise you'll end up as a high school teacher. By working in electro-physics electrical engineering, we are able to make real-world applications. USC is a good place for this because there are lots of faculty.

What's your latest research about?

We published a paper in *Nature Physics* that shows how we built a never-before-seen shape of light. Creating a new shape of light can be thought of as something like writing a new algorithm or a new piece of computer code; it has the potential to lead to any number of technological advances, depending on how creative the engineer is. It's possible our light form, and others like it, will one day help change the nature of communications, computing, transportation or any number of other industries society relies on every single day.

The better we get at building these materials, and the more creatively we think about them, the more we can do. You might think about photonic systems as something like Legos. You can build a lot of amazing things with Legos, even though the pieces only connect to each other on two sides and always in the same way. But if one day you invented pieces that were able to connect on all sides and move around and change color, you'd be able to do things you never previously imagined. That's what I love about photonic systems—each new structure we design and each new material we build opens up previously unimagined possibilities.

More information: Yuzhou G. N. Liu et al. Gain-induced topological response via tailored long-range interactions, *Nature Physics* (2021). DOI: [10.1038/s41567-021-01185-4](https://doi.org/10.1038/s41567-021-01185-4)

Journal information: *Nature Physics*

<https://phys.org/news/2021-05-photonics-harnesses-power.html>



Wed, 05 May 2021

Complex shapes of photons to boost future quantum technologies

As the digital revolution has now become mainstream, quantum computing and quantum communication are rising in the consciousness of the field. The enhanced measurement technologies enabled by quantum phenomena, and the possibility of scientific progress using new methods, are of particular interest to researchers around the world.

Recently two researchers at Tampere University, Assistant Professor Robert Fickler and Doctoral Researcher Markus Hiekkamäki, demonstrated that two-photon interference can be controlled in a near-perfect way using the spatial shape of the photon. Their findings were recently published in the prestigious journal *Physical Review Letters*.

"Our report shows how a complex light-shaping method can be used to make two quanta of light interfere with each other in a novel and easily tuneable way," explains Markus Hiekkamäki.

Single photons (units of light) can have highly complex shapes that are known to be beneficial for quantum technologies such as quantum cryptography, super-sensitive measurements, or quantum-enhanced computational tasks. To make use of these so-called structured photons, it is crucial to make them interfere with other photons.

"One crucial task in essentially all quantum technological applications is improving the ability to manipulate quantum states in a more complex and reliable way. In photonic quantum technologies, this task involves changing the properties of a single photon as well as interfering multiple photons with each other," says Robert Fickler, who leads the Experimental Quantum Optics group at the university.

Linear optics bring promising solutions to quantum communications

The demonstrated development is especially interesting from the point of view of high-dimensional quantum information science, where more than a single bit of quantum information is used per carrier. These more complex quantum states not only allow the encoding of more information onto a single photon but are also known to be more noise-resistant in various settings.

The method presented by the research duo holds promise for building new types of linear optical networks. This paves the way for novel schemes of photonic quantum-enhanced computing.

"Our experimental demonstration of bunching two photons into multiple complex spatial shapes is a crucial next step for applying structured photons to various quantum metrological and informational tasks," continues Markus Hiekkamäki.

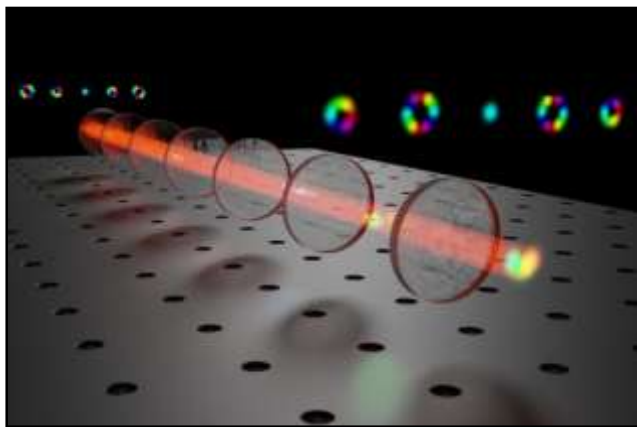
The researchers now aim at utilizing the method for developing new quantum-enhanced sensing techniques, while exploring more complex spatial structures of photons and developing new approaches for computational systems using quantum states.

"We hope that these results inspire more research into the fundamental limits of photon shaping. Our findings might also trigger the development of new quantum technologies, e.g. improved noise-tolerant quantum communication or innovative quantum computation schemes, that benefit from such high-dimensional photonic quantum states," adds Robert Fickler.

More information: Markus Hiekkamäki et al, High-Dimensional Two-Photon Interference Effects in Spatial Modes, *Physical Review Letters* (2021). DOI: [10.1103/PhysRevLett.126.123601](https://doi.org/10.1103/PhysRevLett.126.123601)

Journal information: [Physical Review Letters](https://doi.org/10.1103/PhysRevLett.126.123601)

<https://phys.org/news/2021-05-complex-photons-boost-future-quantum.html>



Conceptual image of the used method for manipulating the spatial structures of photons using multiple consecutive lossless modulations. Credit: Markus Hiekkamäki/Tampere University

COVID-19: Canadian researchers unveil first structural images of B.1.1.7 mutation

Canadian researchers unveiled the structural images of B.1.1.7 COVID-19 mutation, which was first detected in UK and now spreading across Canada and India

By Bhavya Sukheja

Canadian researchers on May 3 unveiled the first structural images of B.1.1.7 COVID-19 mutation, which was first detected in the UK and now accounting for a growing number of cases across India and Canada. According to a press release, the pictures were taken at near-atomic resolution and it provides critical insight as to why the B.1.1.7 variant is more infectious. The researchers at the University of British Columbia said that the images also add to the growing body of data indicating that existing vaccines are likely to remain effective in preventing mild and severe cases caused by the COVID-19 mutant.

The research team was led by Dr Sriram Subramaniam, professor in UBC faculty of medicine's department of biochemistry and molecular biology. The researchers found of "particular interest" a mutation known as N501Y located on the coronavirus's spike protein, which is what it uses to attach itself to human cells that it infects. Subramaniam said that the images that his team captured proved the first glimpse of the N501Y mutant and show that the changes resulting from the mutation are localised.

"In fact, the N501Y mutation is the only mutation in the B.1.1.7 variant that is located on the portion of the spike protein that binds to the human ACE2 receptor, which is the enzyme on the surface of our cells that serves as the entry gate for Sars-CoV-2," Subramaniam added.

According to the press note, the coronavirus is 100,000 times smaller than a pinhead and it is undetectable using a regular microscope. The researchers said that to "visualise the detailed shapes of viruses and proteins, they used cryo-electron microscopes called cryo-EM that can be up to 12 feet high. The imaging technology uses beams of electrons to picture the samples at liquid nitrogen temperatures, the team added.

Existing vaccines likely to remain effective

On a positive note, the researchers revealed that even though the N501Y mutant can bind and enter our cells more readily, it can still be neutralised by antibodies that block the entry of the unmutated version of the virus into cells. They said that the "important observation" adds to the growing body of evidence that the majority of antibodies elicited in the immune system by existing vaccines are likely to remain effective in protecting against the B.1.1.7 variant.

Further, the UBC researchers said that they are additionally also examining other variants, including P.1 (Brazilian), B.1.351 (South African), B.1.427/B.1.429(Californian) and B.1.617 (Indian) variants, and trying to understand how these mutations alter how the spike protein interacts with neutralising antibodies. They said that they are also looking at how the mutations may change how the virus binds to ACE2.

"It's important to understand the different molecular structures of these emerging variants to determine whether they'll respond to existing treatments and vaccines and ultimately find ways to control their spread more effectively," the press note read. "

<https://www.republicworld.com/technology-news/science/covid-19-canadian-researchers-unveil-first-structural-images-of-b-dot-11-dot-7-mutation.html>

