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समाचार पत्रों से चयित अंश Newspapers Clippings

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Government of India

Vice President's Secretariat

Mon, 30 Aug 2021 2:55PM

Vice President asks DRDO Scientists to intensify research to combat any pandemic threat in the future

VP interacts with Scientists and frontline workers from DIPAS at Upa-Rashtrapati Nivas

VP lauds the role of DRDO labs in treatment and management of COVID-19

DRDO Chairman, Dr. G Satheesh Reddy briefs Vice President on various products and equipment developed by DRDO to tackle COVID-19

The Vice President, Shri M Venkaiah Naidu today commended the contribution of scientists and frontline workers from DIPAS (Defence Institute of Physiology and Allied Sciences), a DRDO lab, in the fight against COVID-19 pandemic and advised them to intensify their research to effectively combat any such pandemic in the future.

Around 25 Scientists and technicians from DIPAS were invited to Upa-Rashtrapati Nivas by the Vice President. They were accompanied by DRDO Chairman, Dr G. Satheesh Reddy.

Interacting with them, Shri Naidu said that the pandemic has triggered unprecedented health crisis and severely impacted lives and livelihoods across the world. Lauding DIPAS and other DRDO labs for rising to the occasion and developing various indigenous products for treatment and management of COVID-19, he said that in the wake of the emergence of new variants of SARS-CoV-2, it is important to be ever vigilant to effectively tackle any future threats.

Dr. Satheesh Reddy briefed the Vice President about various products and equipment developed indigenously by DRDO labs for treatment and management of COVID-19. He expressed his gratitude to the Vice President for inviting the Scientists and technicians and sharing his thoughts with them.

The Director of DIPAS, Dr. Rajeev Varshney was also present.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1750406>



पत्र सूचना कार्यालय
भारत सरकार

उप राष्ट्रपति सचिवालय

Mon, 30 Aug 2021 2:55PM

उपराष्ट्रपति ने डीआरडीओ के वैज्ञानिकों से भविष्य में किसी भी महामारी के खतरे से निपटने के लिए अनुसंधान में तेजी लाने को कहा

*उपराष्ट्रपति ने उप-राष्ट्रपति निवास में डिपास के वैज्ञानिकों
और अग्रिम मोर्चे पर तैनात कर्मियों के साथ बातचीत की*

उपराष्ट्रपति ने कोविड-19 के उपचार और प्रबंधन में डीआरडीओ प्रयोगशालाओं की भूमिका की सराहना की

*डीआरडीओ के अध्यक्ष डॉ. जी. सतीश रेड्डी ने उपराष्ट्रपति को कोविड-19 से निपटने
के लिए डीआरडीओ विकसित विभिन्न उत्पादों और उपकरणों के बारे में जानकारी दी*

उपराष्ट्रपति श्री एम. वेंकैया नायडू ने आज कोविड-19 महामारी के खिलाफ लड़ाई में डीआरडीओ की एक प्रयोगशाला डिपास (डिफेंस इंस्टीट्यूट ऑफ फिजियोलॉजी एंड एलाइड साइंसेज) के वैज्ञानिकों और अग्रिम मोर्चे पर तैनात कर्मियों के योगदान की सराहना की। इसके अलावा उन्होंने भविष्य में ऐसी किसी भी महामारी से प्रभावी ढंग से निपटने के लिए अपने शोध में तेजी लाने की सलाह दी।

उपराष्ट्रपति ने डिपास के लगभग 25 वैज्ञानिकों व तकनीशियनों को उप-राष्ट्रपति निवास में आमंत्रित किया था। उनके साथ डीआरडीओ के अध्यक्ष डॉ. जी सतीश रेड्डी भी थे।

उनके साथ बातचीत करते हुए, श्री नायडू ने कहा कि महामारी ने अभूतपूर्व स्वास्थ्य संकट पैदा कर दिया है और पूरे विश्व में जीवन व आजीविका को बुरी तरह प्रभावित किया है। इस अवसर पर आगे बढ़ने और कोविड-19 के उपचार और प्रबंधन के लिए विभिन्न स्वदेशी उत्पादों को विकसित करने के लिए डिपास और अन्य डीआरडीओ प्रयोगशालाओं की सराहना करते हुए, उन्होंने कहा कि सार्स-सीओवी-2 के नए रूपों (वेरिएंट) के सामने आने के मद्देनजर भविष्य के किसी भी खतरे से प्रभावी ढंग से निपटने के लिए हमेशा सावधान रहना महत्वपूर्ण है।

डॉ. जी सतीश रेड्डी ने उपराष्ट्रपति को कोविड-19 के उपचार व प्रबंधन के लिए स्वदेशी रूप से विकसित डीआरडीओ प्रयोगशालाओं के विभिन्न उत्पादों और उपकरणों के बारे में जानकारी दी। उन्होंने वैज्ञानिकों व तकनीशियनों को आमंत्रित करने और उनके साथ अपने विचार साझा करने के लिए उपराष्ट्रपति का आभार व्यक्त किया।

इस अवसर पर डिपास के निदेशक डॉ. राजीव वाष्णीय भी उपस्थित थे।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1750498>

DRDO Chairman briefs VP on in-house developed equipment to tackle Covid

DRDO Chairman Dr G. Satheesh Reddy on Monday briefed Vice President M. Venkaiah Naidu about the various products and equipment developed indigenously by DRDO labs for management Covid pandemic

New Delhi: Defence Research and Development Organisation (DRDO) Chairman Dr G. Satheesh Reddy on Monday briefed Vice President M. Venkaiah Naidu about the various products and equipment developed indigenously by DRDO labs for treatment and management of the ongoing Covid pandemic.

A total of 25 scientists and technicians from the Defence Institute of Physiology and Allied Sciences (DIPAS), along with its Director Dr Rajeev Varshney, and the DRDO chief were invited to the official residence of the Vice President for the briefing.

Interacting with the scientists, Naidu commended the contribution of scientists and the front-line workers from the DIPAS in the fight against the pandemic and advised them to intensify their research to effectively combat any such pandemic in the future.

Noting that the pandemic has triggered unprecedented health crisis and severely impacted lives and livelihoods across the world, he lauded the contribution of DIPAS and other DRDO labs for rising to the occasion but said that it is important to be ever vigilant to effectively tackle any future threats in the wake of the emerging new SARS-CoV-2 variants.

The DRDO has evolved as strong scientific organisation during the pandemic to help the nation come out of the health crisis. It has been tracking the spread of coronavirus since the beginning, and took a call to enhance efforts to create counter-measures to stop the spread of the disease in India. It also started focusing on creating mass supply solutions of critical medical requirements.

Its developed many products for combating the pandemic, delivering some of the best makeshift hospitals, developing an antibody detection kit, and also came up with a quick and effective design for a low-cost ventilator, among others.

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

https://www.business-standard.com/article/current-affairs/drdo-chairman-briefs-vp-on-in-house-developed-equipment-to-tackle-covid-121083000980_1.html



Rs 14,000 crore 'Make in India' boost for Indian Army through Akash missiles, ALH Dhruv choppers procurement

By Ajit K Dubey

New Delhi [India], August 30 (ANI): In a major boost to 'Make in India' in the defence sector, the Indian Army has sent proposals worth around Rs 14,000 crore to acquire two regiments of the Akash-S air defence missile system and 25 Advanced Light Helicopters (ALHs).

The proposal is with the Defence Ministry and a decision on the approval is expected soon at a high-level meeting to be chaired by Defence Minister Rajnath Singh, government sources told ANI.

The Akash-S missiles are a new variant of the Akash missile system with a new indigenous seeker which helps in improving the accuracy in taking down enemy aircraft and cruise missiles at distances up to 25-30 kms, they said.

The missiles are capable of performing in extreme cold weather conditions in Ladakh and would meet all the requirements of the Indian Army in mountainous and other regions along the boundaries with China and Pakistan.

The Defence Research and Development Organisation (DRDO)-developed missile system is already in service with the forces and more upgraded versions are planned to be inducted into the services in coming days.

The DRDO has also recently tested the Akash-New Generation variant of the Akash missile systems which allows the troops to use it for longer range intersection of enemy targets and capability to operate at very high altitude locations along the Northern Borders.

The force is also looking at acquiring 25 ALH Dhruv Mark 3 helicopters for its aviation squadrons.

The Indian Army has been very supportive of the indigenous defence manufacturing capability and has supported the positive list of indigenisation by placing important weapons systems such as artillery guns in the import ban list.

The Army is the largest operator of the ALH Dhruv helicopters in the country and has also helped in bringing in improvements in the choppers produced by the Hindustan Aeronautics Limited. (ANI)

<https://www.aninews.in/news/national/general-news/rs-14000-crore-make-in-india-boost-for-indian-army-through-akash-missiles-alh-dhruv-choppers-procurement20210830154548/>



Akash air defence missile systems (File Photo)

मेक इन इंडिया: आकाश मिसाइल प्रणाली व ध्रुव हेलिकॉप्टर खरीदे जाएंगे, सेना ने भेजा 14 हजार करोड़ का प्रस्ताव

सार

नई दिल्ली: रक्षा क्षेत्र में मेक इन इंडिया को बढ़ावा देने के लिए सेना ने आकाश एस मिसाइल सुरक्षा प्रणाली व ध्रुव हेलिकॉप्टरों की खरीदी का प्रस्ताव तैयार किया है। इससे जहां सेना और सक्षम होगी वहीं देश की सुरक्षा भी मजबूत होगी।

विस्तार

सेना ने आकाश एस मिसाइल प्रणाली की दो रेजिमेंट और 25 उन्नत हल्के हेलिकॉप्टर (एएलएच) खरीदने के लिए 14,000 करोड़ रुपये के प्रस्ताव रक्षा मंत्रालय को भेजे हैं। रक्षा क्षेत्र में 'मेक इन इंडिया' को बढ़ावा देने के लिए यह कदम उठाया गया है।

इस प्रस्ताव पर मंजूरी का फैसला जल्द ही रक्षा मंत्री राजनाथ सिंह की अध्यक्षता में होने वाली एक उच्च स्तरीय बैठक में लिए जाने की उम्मीद है। सरकारी सूत्रों ने बताया कि आकाश एस मिसाइल आकाश मिसाइल प्रणाली का एक नया संस्करण है। यह दुश्मन के विमानों और क्रूज मिसाइलों को 25-30 किलोमीटर की दूरी तक सटीक तौर पर मार गिराने में सक्षम है। ये मिसाइलें लद्दाख में अत्यधिक ठंड के मौसम में भी प्रहार करने में सक्षम हैं। यह मिसाइल चीन और पाकिस्तान की सीमाओं के साथ पहाड़ी और अन्य क्षेत्रों में भारतीय सेना की सभी जरूरतों को पूरा करेगी।



आकाश मिसाइल

बता दें, रक्षा अनुसंधान व विकास संगठन (DRDO) द्वारा विकसित आकाश मिसाइल पहले से ही सेना में शामिल की जा चुकी है। आगामी दिनों में इसके और आधुनिक संस्करण को सेना में शामिल करने की तैयारी है। डीआरडीओ ने हाल ही में आकाश के नए संस्करण का परीक्षण किया है। नया संस्करण उंचाई वाले इलाकों में दुश्मन के ठिकानों को निशाना बनाने में सक्षम होगा और पूरी उत्तरी सीमा पर इसका उपयोग किया जा सकेगा।

सेना 25 एएलएच ध्रुव मार्क 3 हेलिकॉप्टर खरीदने पर भी विचार कर रही है। भारतीय सेना स्वदेशी रक्षा उत्पादन क्षमताओं को बहुत पंसद करती है। वह महत्वपूर्ण हथियारों की स्वदेशी खरीदी को बढ़ावा देती है। इसलिए उसने आर्टिलरी गन को आयात की प्रतिबंधित सूची में डाल दिया है। सेना हिंदुस्तान एरोनॉटिक्स द्वारा तैयार ध्रुव हेलिकॉप्टरों का सबसे ज्यादा इस्तेमाल करती है। वह इनमें आवश्यक सुधारों के लिए भी कंपनी को सुझाव देती है।

<https://www.amarujala.com/india-news/rs-14-000-crore-make-in-india-boost-for-indian-army-through-akash-missiles-alh-dhruv-choppers-procurement>

DFRL to establish food processing unit in Anantapur

The products will help farmers reduce losses and unemployed youths can be a part of these units without investing funds for infrastructures

Anantapur: The Defence Food Research Laboratory (DFRL), a wing of the central Defence Research and Development Organisation (DRDO), would assist in the establishment of food processing units in Anantapur district by using excess crop yields during peak season.

The products will help farmers reduce losses and unemployed youths can be a part of these units without investing funds for infrastructures.

After successful results from experiments done in January last by DFRL scientists, using agro-produces of Anantapur district at the Mysore research centre, the organisation announced it would provide necessary technology including machinery for the food processing units.

A team of DFRL scientists – Dr DP Chauhan, Dr Anand and Dr Rudre Gowd -- from Mysore research station visited the district on Monday. The team held a review meeting with joint collector Gangadhar Gowd, Anantapur MP T Rangaiah and district officials over possibilities of starting food processing units.

Scientist DP Chauhan said the institute had conducted experiments with locally produced agro-products like groundnut, tomato and sweet orange in January and this yielded good results.

“The tomato and sweet orange have citric acid characteristics, but the juices or pulps degrade due to the oxidation process if exposed to an open climate. As part of the process, the sealed sachets of chutney, juice and other products wouldn’t have the impact of oxidation,” the scientist said and added the products can be stored for three months without any damage.

DFRL would extend technical support along with machinery for these units. DFRL would assist in the establishment of one unit while NABARD and Agriculture University will share expertise for two other units in the district.

The team of scientists has also inspected buildings at Rythu Bazar, DRDA’s TTDC campus and DWMA office premises to establish the food processing units.

A Tomato Incubation Centre will be commissioned in two months' time after its location is finalised. The unit needs electricity, water, building and storage facilities. The Tomato Incubation Centre will process at least 200kg of tomatoes a day. This will be procured from farmers.

In the first stage, tomato sauce, ketchup and powder will be processed while the sweet orange and groundnut incubation centres would be started later.

The sweet orange processing units would prepare squash and juice while groundnut seed will be used for preparation of peanut butter, chikki, as also the salted and roasted peanuts.

Anantapur MP Talari Rangaiah, who made efforts to get the support of DRDO and DFRL, said the farmers were unable to sell tomato and other produce during peak season when there would be heavy output from farms.

“Instances of dumping loads of tomatoes on road-sides were common in Rayalaseema region when the farmers were unable to get minimum price on such produces”, Rangaiah recalled. He



A Tomato Incubation Centre will be commissioned in two months' time after its location is finalised. (Representational Photo:PTI)

hoped that the food processing units would improve prices and also help the unemployed youths be part of the processing.

The incubation centres would provide necessary building and machinery for the unemployed youths. They need not invest in infrastructure. “After they succeed, they can establish their own units,” the MP said.

A consultant from AP Food Processing Society would help arrange marketing facilities at all levels.

Joint collector Gangadhar Gowd directed the related departments to increase the number of these processing units in the district.

<https://www.deccanchronicle.com/nation/in-other-news/310821/dfri-to-establish-food-processing-unit-in-anantapur.html>



Tue, 31 Aug 2021

3 food processing units to come up in Anantapur

Highlights

MP Talari Rangaiah revealed that all steps are being taken by the government for setting up three food processing units in the district.

Anantapur: MP Talari Rangaiah revealed that all steps are being taken by the government for setting up three food processing units in the district.

Addressing a food advisory meeting at the DWAMA Conference Hall on Monday, Rangaiah said that tomato farmers in the district were on the losing side and unable to get remunerative price for their produce.

Besides, groundnut and sweet limes were also grown extensively in the district. To handle the fluctuation of prices, efforts are being made with the help of DRDO Food Research Laboratories for setting up food processing units to ensure value addition to the produce.

He revealed that he held discussions with the DRDO chairman in this regard, which resulted in the visit of DRDO scientists to the district.

The MP said that a tomato incubation centre will be set up in two months and subsequently separate incubation centres for groundnut and sweet lemons will also become a reality soon.

Initially, the tomato incubation centre will produce tomato ketchup, powder, sauce and other biproducts. Squash and juice will be produced with sweet lemons and salted roasted peanuts and peanut butter with groundnuts which are in great demand in Western countries.

Joint Collector Gangadhar Goud and DRDO Food Scientists D P Chouhan, Anand and Rudra Goud also spoke.

<https://www.thehansindia.com/news/cities/hyderabad/strengthen-food-processing-units-to-benefit-farmers-ktr-693515?infinitemscroll=1>



MP Talari Rangaiah addressing at the food advisory meeting at the DWAMA Conference Hall in Anantapur on Monday. Joint Collector Gangadhar Goud and DRDO Food Scientists D P Chouhan, Anand and Rudra Goud are also seen

How difficult is it to develop a 4th generation aircraft, 35yrs of development, 16 Prototypes

We have written a lot of articles about the Indian Air Force LCA Tejas Fighter. As the first 4th generation fighter made in India, the development of the LCA tejas Fighter can be described more than simply. From self-development to foreign equipment, the Indian government and the Indian military industry have experienced too many stories. There have also been too many stories about the mass production of the LCA Tejas Fighter and the official service of the Indian Air Force. Today will talk about the huge prototype plan of the LCA fighter.



Indian air force Tejas squadron

The LCA Tejas fighter was developed in the early 1980s. As a light supersonic multi-role fighter, the initial positioning of the LCA fighter is very clear. This fighter is mainly used to replace a large number of MiG-21 light fighters of the Indian Air Force. From the perspective of technical positioning, LCA also meets the technical capabilities of the Indian military industry and the needs of the air force. However, as a developing country, Indian military industry did not have experience in independently developing high-performance fighter jets before. It is almost impossible to develop LCA fighter jets independently. By the end of the 1980s, it was finally formally determined to develop LCA by introducing foreign subsystems and technologies. on January 4, 2001, the KH2001, the first technical verification aircraft of the LCA fighter jet, successfully flew for the first time.

On June 6, 2002, the HAL (Hindustan aeronautics limited) successfully flew the second LCA technical verification aircraft, tail numbered KH2002. According to public information, the early technical verification aircraft was not equipped with a real fire control radar. The body and wing design and fly-by-wire system of the fighter used a large number of French technologies and products, and the engine was a product of the United States. In those days, it was quite difficult for India to make the first flight of these two planes.

On November 25, 2003, the first true prototype of the LCA fighter finally flew successfully. This is the LCA fighter numbered KH2003 in the picture. The KH2003 prototype and two other technical demonstrate aircraft flew in formation, which was a boost for the Indian military industry and the Indian Air Force. For the Indian people, it was also good results After 20 years of hard work, the LCA fighter was finally sent to the sky.

The second prototype of the LCA Tejas Fighter, numbered KH2004, successfully flew for the first time on December 1, 2005. From the time point of view, the second prototype encountered a lot of problems in the trial production process, the reason should be the installation of some subsystems. It can be seen from this that if a country's military industry has a weak foundation, even with the support of developed countries' technology and equipment, it is still very problematic to develop a brand-new third-generation aircraft.

The third prototype of the LCA Tejas Fighter, numbered KH2005, successfully flew on December 1, 2006. From the picture, you can see the R-73 short-range air-to-air missile under the wing. It can be speculated that this prototype aircraft was equipped with airborne radar and a fire control system. According to media reports, the technology of the airborne radar and fire control system used by the LCA fighters comes from Israel and Russia respectively.

On November 26, 2009, the first two-seater prototype number KH-T2009 of the LCA Brilliant Fighter finally successfully flew for the first time. The production number of this fighter is PV-5, and its positioning is equivalent to that of the Chinese J-10S two-seater fighter that successfully flew for the first time in 2003.

The second two-seater prototype of the LCA Tejas Fighter numbered KH-T2010, made its maiden flight on November 8, 2014. The first flight of the two prototypes was 5 years apart. For this specific reason.

In recent years, some foreign government officials and air force generals have fly LCA fighters in India, which are basically completed by these two two-seater prototypes. The pilots who fly are all elite and senior pilots of the Indian Air Force. At present, there are only two Air Force models of LCA Tejas fighters in India, and the subsequent mass production is still not operational because of the Chinese coronavirus pandemic.

On April 27, 2012, the Indian military industry-first flew an LCA fighter carrier-based two-seater prototype. This fighter was numbered KH-T3001. Naval tejas is some few single-engine fighter in the world that can operate from aircraft carrier.

On February 7, 2015, the Indian military successfully flew for the first time a single-seat carrier-based prototype of the LCA Tejas Fighter. The number of this fighter is KH3002. Compared with the KH-T3001, the aerodynamic layout of the two aircraft is the same. KH3002 uses a typical conformal cockpit design, that is, the shape is the same as the two-seater, but after the rear seat is closed, it is used to house avionics and auxiliary fuel tanks. In theory, the range is longer than the two-seater model. These two fighters are also the only two carrier-based aircraft of the LCA Tejas Fighter, and there are only two single-engine carrier-based fighters in the world.

In summary, the LCA fighter has two technical demonstrators, three single-seater prototypes, two two-seater prototypes, and two carrier-based prototypes. There are a total of 9 aircraft. In theory, after many years of test flights, they should be directly mass-produced. However, due to meet the new requirements of the Indian air force HAL developed and produced 7 limited-production models, which are traditionally trial-production models. A trial production model numbered KH2011, successfully flew for the first time on April 25, 2007. The fighter is equipped with an F404-F2J3 turbofan engine.

The second trial production model numbered KH2012, successfully flew for the first time on June 16, 2008. This fighter was equipped with the more powerful F404-IN20 turbofan engine for the first time. Like the KH2011 fighter, the two pre-production fighters are mainly used for engine testing and flight control system testing.

The third trial production model numbered KH2013, successfully flew for the first time on April 23, 2010. This fighter is equipped with a complete version of the airborne avionics system for the first time, which is almost the same as the mass-produced airborne avionics system. This fighter can be understood as the first true LCA brilliant fighter.

The fourth production model numbered KH2014, successfully flew for the first time on June 2, 2010. This fighter is equipped with an electronic warfare system, has a complete sense of combat capability, and is also the first fighter to be delivered to the Indian Air Force. In recent years, many airborne weapon tests of LCA fighters have been completed by KH2014.

The fifth trial production model numbered KH2015, successfully flew for the first time on November 19, 2010. This fighter, like KH2014, also has complete combat capabilities. Its cockpit night lighting equipment and autopilot functions are more complete. It can be seen through time that in 2010, the Indian military industry successfully flew three LCA trial-production fighters for the first time, which caused quite a stir in India at that time. For the Indian Air Force, also sees the hope of officially equipping the LCA Tejas Fighter. At this time, the development of this fighter has been nearly 30 years. While China was preparing for its first 5th gen fighter aircraft to test.

On March 9, 2012, the Indian military successfully flew the 6th and 7th limited series production fighters of the LCA Tejas Fighter, which were numbered KH2017 and KH2018 respectively. From the appearance of these two fighters, The APU air intake at the front end of the

vertical tail is very different from the previous prototype, and the two fighters are almost the same as the later official mass-production models. The follow-up improvement and flight test of the LCA fighters are currently mainly completed by these LSP.

The first mass-produced model of the LCA Tejas Fighter flew successfully on September 1, 2014. In the summer of 2016, the Indian Air Force was finally officially equipped with the LCA Glorious Fighter. For a total of 35 years, the Indian military industry has developed and produced 2 technical demonstrators, 5 air force prototypes, 2 navy prototypes, 7 air force LSP, a total of 16 aircraft. These fighters have undergone a total of 15 years of scientific research and flight tests, and finally the LCA fighters have matured. In the meantime, how much manpower, material resources, and financial resources have been spent can no longer be counted. It can be seen from this that a developing country is still a regional power. In order to develop a new light forth-generation fighter, with the help of many developed countries and military industry giants, how difficult it is for Indian military industry to develop the LCA Brilliant fighter.

Regarding the specific technical indicators of the LCA Tejas Fighter and the ranking of this fighter in the world's forth generations. Judging from the final result, the Indian military industry has completed the goals set in the early 1980s. As for the future development plan of the LCA Tejas Fighter, I believe that there are still some problems waiting for the scientific and technical personnel of the Indian military industry. In comparison, we can also see how difficult it is for Indian aviation industry to achieve the current results.

The purpose of this article is to share with you: how difficult it is for India to develop the LCA Tejas Fighter. In 35 years, with 16 prototypes, the Indian military industry has made too much effort. This is also a major breakthrough for the Indian military industry. There are many improved models of the LCA Tejas Fighter, and you can also see the ambitions of the Indian military industry.

<https://defenceview.in/how-difficult-is-it-to-develop-a-4th-generation-aircraft-35yrs-of-development-16-prototypes/>

अमरउजाला

Tue, 31 Aug 2021

अब नहीं रहेगी ऑक्सीजन की किल्लत, एक और मशीन मिली

सहारनपुर: उम्मीद है कि भविष्य में जिला अस्पताल में मरीजों को ऑक्सीजन की किल्लत नहीं रहेगी। पीएम केयर फंड से 1000 एलपीएम (लीटर प्रति मिनट) क्षमता की ऑक्सीजन जनरेटर मशीन सोमवार को ही जिला अस्पताल पहुंची है। इससे पहले भी जिला अस्पताल और जिला महिला अस्पताल में दो ऑक्सीजन जनरेटर मशीनें स्थापित की जा चुकी हैं।

कोरोना की दूसरी लहर से पहले तक जिला अस्पताल और जिला महिला अस्पताल में ऑक्सीजन सिलिंडर से ऑक्सीजन की सप्लाई होती थी। कोरोना की दूसरी लहर में ऑक्सीजन की किल्लत से अधिकारियों ने सबक लेते हुए कदम उठाए। नतीजा जिला अस्पताल को ऑक्सीजन जनरेटर मशीन के लिए नगर निगम ने करीब दो करोड़ रुपये दिए। इसके बाद डीआरडीओ से 850 एलपीएम की मशीन आई, जो स्थापित हो चुकी है।

जिला महिला अस्पताल में पीएम केयर फंड से 650 एलपीएम की मशीन स्थापित की गई है, इसे पीआईसीयू से कनेक्ट भी कर दिया है। अब जिला अस्पताल में पीएम केयर फंड से 1000 एलपीएम की मशीन आई है, इसे हड्डी वार्ड के पास स्थापित किया जाएगा। मशीन की कीमत दो करोड़ रुपये से अधिक बताई गई है। इस मशीन के लिए पाइपलाइन पहले से डाली जा चुकी है। सिलिंडर से ऑक्सीजन सप्लाई पर हर माह एक लाख रुपये से अधिक खर्च हो रहे थे। अब ऑक्सीजन जनरेटर मशीनों से ऑक्सीजन तैयार होगी, इससे सिलिंडर का खर्च बचेगा। हालांकि सिलिंडर की भी व्यवस्था रहेगी, मगर उन्हें बैकअप के लिए रखा जाएगा।

<https://www.amarujala.com/uttar-pradesh/saharanpur/now-there-will-be-no-shortage-of-oxygen-found-another-machine-saharanpur-news-mrt5540681106>

अस्पताल में ऑक्सीजन प्लांट का मुख्यमंत्री कर सकते हैं उद्घाटन

सोलन: क्षेत्रीय अस्पताल में लगे ऑक्सीजन प्लांट का कार्य पूरा हो गया है। जल्द ही इस प्लांट का उद्घाटन मुख्यमंत्री जयराम ठाकुर कर सकते हैं। जिले में लोगों को ऑक्सीजन प्लांट से काफी फायदा मिलने वाला है।

बीते दिनों उपायुक्त, पुलिस अधीक्षक समेत अन्य आला अधिकारी पीएसए प्लांट का निरीक्षण कर चुके हैं। खास बात यह है कि डीआरडीओ के बनाए इस प्लांट में ऑक्सीजन उत्पादन की क्षमता एक मिनट में एक हजार लीटर की होगी। वहीं जिले के अन्य बड़े अस्पतालों में भी ऑक्सीजन प्लांट पर कार्य चला है। इससे जिले में ऑक्सीजन की कमी दूर होगी। टाटा कंपनी के विशेषज्ञों ने इसे अस्पताल में लगाया है।

क्षेत्रीय अस्पताल सोलन ने जिले का पहला सरकारी ऑक्सीजन प्लांट स्थापित किया है। ऑक्सीजन प्रोडक्शन मशीनरी, टैंक और अन्य सामान लगवा दिया है। क्षेत्रीय अस्पताल सोलन के चिकित्सा अधीक्षक डॉ. एसएल वर्मा ने बताया कि इस प्लांट का कार्य पूरा हो गया है। यह जिले का पहला सरकारी ऑक्सीजन प्लांट है। इससे मरीजों को लाभ होगा।

ऑक्सीजन सिलिंडर का झंझट होगा खत्म

इस प्लांट के साथ क्षेत्रीय अस्पताल के सभी वार्ड जुड़ेंगे और इसके लिए 190 प्वाइंट स्थापित किए जाएंगे। अस्पताल प्रशासन ने इस कार्य के लिए 96 लाख 56 हजार का प्रस्ताव बनाकर उच्च अधिकारियों को भेजा है। अस्पताल प्रशासन को ऑक्सीजन सिलिंडर रिफिल करवाने के लिए बार-बार ऑक्सीजन प्लांट के लिए नहीं जाना पड़ेगा।

<https://www.amarujala.com/himachal-pradesh/solan/oxygen-plant-construction-completed-in-solan-hospital-solan-news-sml3821048168>

DRDO on Twitter



Vice President of India ✓ @VPSecretariat · 17h

The Vice President lauded the role of DRDO labs in treatment and management of COVID-19. He advised DRDO scientists to intensify research to combat any pandemic threat in the future.



Vice President of India ✓ @VPSecretariat · 17h

The Vice President during an interaction with the scientists and technicians of the Defence Institute of Physiology & Allied Sciences (DIPAS) at Upa-Rashtrapati Nivas today. @DRDO_India Chairman, Dr G. Satheesh Reddy was also present.



PIB in Odisha ✓ @PIBBhubaneswar · 22h

Vice President Shri @MVenkaiahNaidu asks @DRDO_India scientists to intensify research to combat any pandemic threat in the future

DRDO Chairman, Dr. G. Satheesh Reddy briefs the VP on various products & equipment developed by #DRDO to tackle #COVID19

pib.gov.in/PressReleasePa...





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Rs 14,000 crore 'Make in India' boost for Indian Army through Akash missiles, ALH Dhruv choppers procurement

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3:47 अपराह्न · 30 अग. 2021



Defence Strategic: National/International



Press Information Bureau
Government of India

Ministry of Defence

Mon, 30 Aug 2021 5:22PM

Raksha Mantri Shri Rajnath Singh delivers address on ‘National Security’ as part of late Balramji Das Tandon lecture series

Nation should remain vigilant and be prepared to deal with any threat: RM

Raksha Mantri assures the Nation that Armed Forces are fully capable of protecting the borders; There will be no compromise on safety & security of the people

Our priority is to equip our Armed Forces with modern weaponry & make it the most powerful military: RM

All efforts being made to upgrade national security system to deal with challenges emerging due to modern technology

Raksha Mantri Shri Rajnath Singh delivered a lecture on ‘National Security’ as part of late Balramji Das Tandon lecture series through video conferencing on August 30, 2021. The Raksha Mantri defined national security as a strong belief to remain vigilant and prepared to deal with every threat & challenge that endangers the existence, development and interests of the Nation, stressing that being sensitive towards national security is the topmost priority of every Government.

Shri Rajnath Singh recalled the challenges by India on its land and maritime boundaries in the last 75 years and lauded the Armed Forces for facing & overcoming every challenge that threatened national security. “Ever since Independence, there has been a constant attempt by some anti-India forces to create an atmosphere of instability within the country. When they realised that they cannot fight with us in front-wars, they resorted to a proxy war. They began to train and finance terrorists to target India,” he said.

Commending the Armed Forces for their ongoing efforts to counter terror activities in Jammu & Kashmir for the last seven years, the Raksha Mantri exuded confidence that the Union Territory will soon be free of terrorism. “The strength that separatist forces used to get due to Article 370 and 35A is now nowhere to be seen,” he added.

Shri Rajnath Singh termed “increased morale of the security forces and their changed modus operandi” as a major change in the response against terrorism in the last seven years. Stressing that the Government does not believe in politicising issues related to national security, he said there is now a belief in the Armed Forces that they can perform their duty in the service of the nation with no interference of any kind. “There hasn’t been a major terrorist incident in the hinterland of India

in the last seven years. This shows the increased morale and confidence of our Armed Forces,” he said.

Referring to the cross-border strikes on terror camps, the Raksha Mantri said there will be no compromise on national security. He said the model of terrorism adopted by the evil forces is slowly collapsing. “The anti-India forces have understood that they are no longer in a position to do much in the Kashmir Valley, especially after the abrogation of Article 370. I want to assure you that no power in the world can separate Jammu & Kashmir from India,” he stated.

On ceasefire violations, Shri Rajnath Singh said the Armed Forces have always given a befitting reply that shows their alertness and bravery. He assured the Nation that the Armed Forces are vigilant at all times to safeguard the interests of the Nation and ensure the safety & security of its people.

The Raksha Mantri said, the Government is closely watching the recent developments in Afghanistan which have posed new security challenges. “Security of Indians is a cause of concern for the Government. We also do not want that anti-India forces take advantage of the evolving Afghan situation for cross-border terrorism,” he added.

Referring to the 2020 Galwan Valley incident, the Raksha Mantri said, the Armed Forces are very well aware that any unilateral action should not be ignored. He commended the Indian Army for dealing the situation at Northern border with bravery and restraint. Paying tributes to the Indian soldiers who laid down their lives, he said the Nation will never forget the supreme sacrifice made by the Armed Forces for their motherland. Shri Rajnath Singh maintained that any border dispute can only be resolved peacefully and through dialogue. He, however, assured the Nation that the Government, under the leadership of Prime Minister Shri Narendra Modi, will never compromise when it comes to India’s borders, its honor and self-respect.

Identifying strengthening of border infrastructure as a crucial element for national security, Shri Rajnath Singh said Border Roads Organisation (BRO) is leaving no stone unturned to build roads, bridges and other infrastructure projects in border areas. He listed out some of the projects completed by BRO including Atal Tunnel and added that Ladakh is being given all weather connectivity and work has started on many alternative roads. “These projects are beneficial for the people residing in border areas. They are also our strategic assets. Keeping their interests in mind, it is necessary to strengthen the border infrastructure,” he added. The Raksha Mantri also touched upon the infrastructure projects in North East, saying that he recently inaugurated 12 roads in North East and 63 bridges in Ladakh, terming it as an important part of National Security Grid.

Shri Rajnath Singh stated the Armed Forces are fully capable of protecting the borders & the sea and Government is providing all possible support to them. “It is our priority to equip our Armed Forces with modern technology and weaponry so that they become one of the strongest and most modern militaries in the world,” he emphasised. The Raksha Mantri said while the induction of fighter aircraft like Rafale has strengthened the firepower of the Indian Air Force and increased the capability to respond to any challenge, the Government’s aim is to reduce dependence on imports and make India self-reliant in every field. “The dream of Prime Minister Shri Narendra Modi is ‘AatmaNirbhar Bharat. We want to ‘Make in India and ‘Make for the World’. This is our resolve for self-reliance,” he added.

The Raksha Mantri listed out a number of reforms undertaken by the Government to achieve self-reliance in defence and make India a global manufacturing hub. The reforms include appointment of Chief of Defence Staff, creation of Department of Military Affairs and notifying two Positive Indigenisation Lists to promote exports. “We are working towards creating Theater Commands in a new way. This is also going to be a revolutionary step in itself,” he added.

The Raksha Mantri reiterated the Government’s commitment towards unity, integrity & security of the country at every front, from external and internal security to the task of protecting and strengthening India’s strategic interests on the diplomatic front. “Work is being carried out on a large scale for our national security. We will ensure that the nefarious intentions of anti-India forces do not even touch the people of the country,” he stressed. Shri Rajnath Singh added that new

threats to national security have emerged due to the development of modern technology. The Government is making all efforts to continuously update and upgrade the national security system to deal with such challenges, he said.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1750476>



The Sentinel
of this land, for its people

Tue, 31 Aug 2021

Indian Navy procures indigenously developed Robotic Lifebuoys from startup

In a big boost to the 'Self Reliant India' campaign, Indian Navy signed a Rs 13 crore contract to procure country's first indigenously developed Robotic Lifebuoys

New Delhi: In a big boost to the 'Self Reliant India' campaign, Indian Navy signed a Rs 13 crore contract to procure country's first indigenously developed Robotic Lifebuoys. The contract was bagged by a startup — Saif Seas — based in Visakhapatnam.

Robot lifebuoys are autonomous and are fitted out with sensors and electronic equipment that allow them to locate a stranded person in the water, and head out to them automatically.

In India it has been developed under the Innovations For Defence Excellence (iDEX) challenge "Unmanned Surface Vehicles".

Defence Secretary Ajay Kumar appreciated the efforts of iDEX. He said, "iDEX is revolutionising Defence innovation — creating new tech solutions in fraction of cost and fraction of time." He termed development of indigenously developed Robotic Lifebuoys as "the great success story of Atmanirbhar Bharat (Self Reliant India)"

Saif Seas promoter Aliasagar Calcuttawala said on social media after winning the challenge, "iDEX has provided us with a launchpad to launch into the higher orbit of success."

He said, "The whole thought process of iDEX and the programme is not just to develop prototypes suitable for use in the Indian Defence Industry, but to develop defence innovation partners and defence industry with the help of startups, aiming towards more of Make in India."

On August 19, Defence Minister Rajnath Singh launched Defence India Startup Challenge 5 under iDEX leveraging the startup ecosystem to develop India's defence technologies, equipment design and manufacturing capabilities.

iDEX provides a platform for different stakeholders in the defence and aerospace sectors, essentially acting as an umbrella organisation to oversee technology development and potential collaborations in the specific field, the defence ministry had stated.

The areas where challenges were thrown such as Situational awareness, Augmented Reality, Artificial Intelligence, Aircraft-trainer, Non-lethal devices, 5G network, Under-water domain awareness, Drone SWARMS and Data Capturing.

The problem statements, designed to ensure military advantage in the foreseeable future, are the highest in any edition, so far. (IANS)

<https://www.sentinelassam.com/national-news/indian-navy-procures-indigenously-developed-robotic-lifebuoys-from-startup-552687>





Tue, 31 Aug 2021

Exclusive: Gaganyaan spacecraft engines tested successfully by ISRO, all you need to know

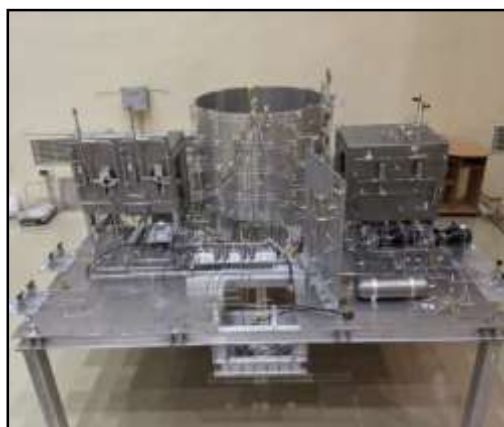
This cluster of engines would help Indian astronauts remain in orbit and also aid their safe return

By Sidharth MP, Edited By Rahul Jaywant Bhise

Highlights

- 1. The launching of satellites and human-carrying spacecraft are quite similar, but the latter is exponentially sophisticated in terms of the technology and reliability that has to be developed.**
- 2. The GSLV Mk3, India's heaviest rocket is meant to carry the Gaganyaan to space.**

Chennai: Launching rockets and placing satellites in orbit has been routine business for the Indian Space Research Organization. Meanwhile, Gaganyaan(Sanskrit for SkyCraft), a hugely complex mission to send Indian astronauts to space, is a work in progress. Recently, ISRO announced the successful completion of a crucial test of the Gaganyaan spacecraft's propulsion system. This cluster of engines would help Indian astronauts remain in orbit and also aid their safe return. Zee Media spoke to Chairman ISRO, DR.K.Sivan and Director, Vikram Sarabhai Space Center, Dr. S. Somanath to throw light on the latest test and the mission plan.



The launching of satellites and human-carrying spacecraft are quite similar, but the latter is exponentially sophisticated in terms of the technology and reliability that has to be developed. In both cases, the payload sits on the top-most portion of the rocket. The expendable rocket's task ends about 16-20 minutes after lift-off and it falls back into the sea(in a phased manner), after ejecting the satellite. Once placed into orbit, the satellite/spacecraft is an independent entity in space that needs to navigate and propel itself, without the powerful propulsion of the rocket that got it up there.

The payload(satellite or the module carrying astronauts) must stay in orbit for a designated mission time, while enduring the harsh conditions of zero-gravity, severe temperature variations, and orbital movement at very high speeds. For context, the International Space Station which continues to orbit the earth moves at a whopping 7km/second or 27,850km/hour.

While satellites stay in orbit for many years, India's Gaganyaan mission is meant to remain in orbit for up to a week. This process of staying in a designated orbit requires the use of the spacecraft's own engines. It was this system, Gaganyaan Service Module Propulsion System – System Demonstration Model (SDM) that was tested a few days ago.

The GSLV Mk3, India's heaviest rocket is meant to carry the Gaganyaan to space. "The launch vehicle will put the 7.5ton Gaganyaan module into 170x400kms orbit(170kms from earth and 400kms from earth at its nearest and farthest points in orbit respectively). Thereafter, the system which we now tested will raise the Gaganyaan module to a uniform 400kms orbit(Low earth

orbit)” Dr. K. Sivan explained to Zee Media. He also added that, the same propulsion system would be used to lower the orbit and bring the spacecraft closer to earth for aiding re-entry.

On its website, ISRO mentions that the first hot test of the System Demonstration Model (SDM) of the Gaganyaan Service Module Propulsion System was done for a duration of 450seconds at ISRO Propulsion Complex (IPRC), Mahendragiri, Tamil Nadu. The system performance met the test objectives and there was a close match with the pre-test predictions. Further, a series of hot tests are planned to simulate various mission conditions as well as off-nominal conditions, it added.

Dr. S. Somanath, Director, VSSC, ISRO, said that Gaganyaan integrated module consists of two parts - Crew Module and Service module. While the Crew module will house astronauts, the service module will provide the propulsion to raise the orbit and later lower the orbit. “To slow down the spacecraft (which is traveling at nearly 7.5kms per second) and facilitate re-entry, we will fire the five engines(as used in the GISAT Satellites) on the service module. Once the re-entry is facilitated, the Service module will detach and the Crew module alone will make a controlled descent, with its parachutes and Crew module propulsion systems” he explained to Zee Media.

While the latest test is a boost for India's ambitious Human Spaceflight programme, it must be kept in mind that each propulsion system that goes into the GSLV Mk3 rocket and the spacecraft will be further tested for longer durations and various parameters. Such tests are part of ‘Human-rating’ the launch vehicle and its systems. It essentially means that a rocket that is used for hauling Cargo(satellites) to space is being modified, certified for carrying humans, while ensuring higher safety and reliability.

<https://zeenews.india.com/india/exclusive-gaganyaan-spacecraft-engines-tested-successfully-by-isro-all-you-need-to-know-2389857.html>



Tue, 31 Aug 2021

Fundamental mechanics help increase battery storage capacity and lifespan

By Avni Shah

Batteries are widely used in everyday applications like powering electric vehicles, electronic gadgets and are promising candidates for sustainable energy storage. However, as you've likely noticed with daily charging of batteries, their functionality drops off over time. Eventually, we need to replace these batteries, which is not only expensive but also depletes the rare earth elements used in making them.

A key factor in battery life reduction is the degradation of a battery's structural integrity. To discourage structural degradation, a team of researchers from USC Viterbi School of Engineering are hoping to introduce "stretch" into battery materials so they can be cycled repeatedly



Credit: Pexels, Mohamed Abdelghaffar

without structural fatigue. This research was led by Ananya Renuka-Balakrishna, WiSE Gabilan Assistant Professor of Aerospace and Mechanical Engineering, and USC Viterbi Ph.D candidate, Delin Zhang, as well as Brown University researchers from Professor Brian Sheldon's group. Their work was published in the *Journal of Mechanics and Physics of Solids*.

A typical battery works through a repetitive cycle of inserting and extracting Li-ions from electrodes, Zhang said. This insertion and extraction expands and compresses the electrode lattices. These volume shifts create microcracks, fractures and defects over time.

"These microcracks and fractures in the battery material will lead to structural degradation, which will eventually decrease battery capacity," Zhang said. "Ultimately, the battery will have to be replaced with a new one."

To discourage this, Zhang, who studies intercalation materials—a class of materials used as electrodes in lithium-ion batteries—stretches these intercalation electrodes ahead of time. This change in the initial stress state regulates the phase transformation voltages thus making electrodes more resilient to fracture or amorphization (losing its crystalline properties).

Broader voltage, greater capacity

Phase transformations, when the battery materials shift physical form, result from the cycle of expansion and compression that accompanies daily charging and use. Said Zhang: "These phase transformations can make the electrodes more susceptible to structural degradation, especially when the process is repeated so frequently."

Reversibility of phases is key in allowing batteries to maintain efficient functionality over time. Said Renuka-Balakrishna: "Reversibility is most enhanced by making sure the material stays in its crystalline form. At certain voltages, when the materials pass from one phase to another, they can become powdery, which is not ideal for efficient operation of the battery."

The researchers thus asked themselves, "Is there a way to keep battery materials in their crystalline form while they cycle back and forth between energy landscapes?" The answer: changing the structure of the materials by introducing an initial stress state.

Said Zhang: "By stretching the electrodes prior to charging and discharging, we are changing the energy landscape across which an electrodes goes from the charged to the discharged state. This initial strain allows us to reduce the energy barrier for these transformations and prevent detrimental lattice deformations that lead to material failure. This change in the energy landscape helps prevent microcracks and fractures, protecting the battery's sustainability and energy storage capacity."

An added benefit, Renuka-Balakrishna said, is that by stretching the electrodes, the battery can also operate in a wider voltage window, making it more efficient in its energy storage capacity.

Challenges of modern energy storage

One of the key concerns of the energy storage community, Renuka-Balakrishna said, is moving away from flammable liquid electrolytes typically used in batteries and putting them into solid materials. "This introduces new challenges," she said.

Solid objects, as we all know, can deteriorate over time when repeatedly stressed. Once a crack is introduced, the two sides of a surface will lose contact. In the case of the battery, it creates a simple mechanics problem; without the connection, it's difficult to transport ions across the material, Renuka-Balakrishna said.

Approaches such as that identified by Zhang are an attempt to move forward toward safer, more sustainable batteries while tackling this mechanical challenge. The novelty of this approach is instead of finding a new material to improve battery lifespan, you can improve an existing material's lifespan it by introducing fundamental mechanics concepts to improve their lifespans, the researchers said.

"Mechanics hasn't always been an integral part of developing batteries," Renuka-Balakrishna said. "But now engineers can play with this theory/tool Zhang has created and work to engineer the lifespans of battery materials."

Improving the lifespans of batteries would benefit users of electronic devices and electric vehicles enabling longer use of devices and minimizing battery replacement, Zhang said. Given the cost of a lithium-ion battery, it could also save users lots of money over time.

More than that, Zhang said sustainable energy storage is an important part of reducing harmful greenhouse gas emissions and reducing battery waste, and we hope with our work we open a new line of research to enhance material reversibility.

More information: Delin Zhang et al, Film strains enhance the reversible cycling of intercalation electrodes, *Journal of the Mechanics and Physics of Solids* (2021). DOI: [10.1016/j.jmps.2021.104551](https://doi.org/10.1016/j.jmps.2021.104551)
<https://phys.org/news/2021-08-fundamental-mechanics-battery-storage-capacity.html>



Tue, 31 Aug 2021

Unusual bandgap renormalization in 2D inorganic lead-halide perovskite nanoplatelets

By Liu Jia

Owing to high quantum yields, large absorption cross-section, excellent carrier transport performance and narrow-band emission, inorganic lead-halide perovskite semiconductors have received increasing attention for their applications in solar cells, LEDs, laser devices, etc. Understanding the physical origin of temperature dependence of bandgap in inorganic lead-halide perovskites is essential and important.

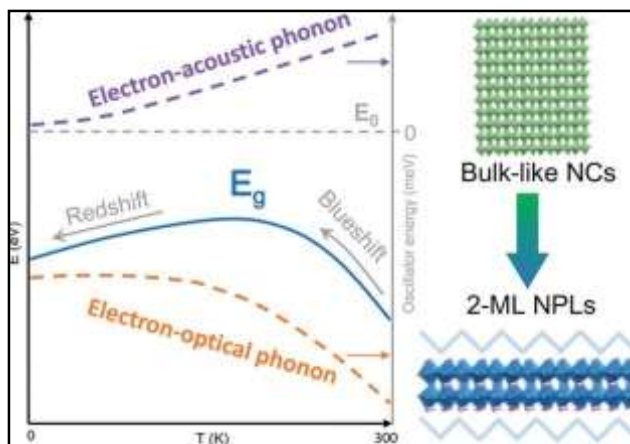
In a study published in *Advanced Science*, the research group led by Prof. Chen Xueyuan from Fujian Institute of Research on the Structure of Matter (FJIRSM) of the Chinese Academy of Sciences (CAS) found that the temperature dependence of bandgap in CsPbBr₃ perovskites is variable with material dimensionality.

The researchers conducted a comparative investigation on the temperature-dependent bandgap in quasi-3D bulk-like CsPbBr₃ nanocrystals (NCs) with weak quantum confinement and 2D 2-monolayer-thick CsPbBr₃ nanoplatelets (2-ML NPLs) featuring strong quantum confinement.

For the sake of more accurate determination of bandgap shift, the researchers elaborately extracted the bandgap energy through fitting the absorption coefficient near the band edge to the Elliot model. The extracted bandgap value of CsPbBr₃ 2-ML NPLs exhibited an initial blueshift and then a redshift trend with decreasing temperature from 290 to 10 K, in sharp contrast to the monotonous redshift usually observed in CsPbBr₃ bulk-like NCs.

From the theoretical point of view, the bandgap renormalization essentially arises from the lattice thermal expansion and electron-phonon interactions. However, for a large variety of semiconductor materials and in particular the lead-based compounds, the thermal expansion contribution to bandgap renormalization was not taken into account because it had a relatively small magnitude with respect to the contribution from electron-phonon interactions.

Owing to the breaking translational periodicity in the thickness direction of 2D CsPbBr₃ 2-ML NPLs, the electron and phonon structures, and consequently the bandgap renormalization deriving from electron-phonon interactions are apt to change remarkably relative to the quasi-3D CsPbBr₃ NCs counterparts. The strong quantum confinement effect and the reduced dielectric screening due



Schematic illustration of the unusual blueshift-redshift crossover of bandgap with temperature in CsPbBr₃ 2-ML NPLs, which is tentatively attributed to the trade-off between the opposite contributions of electron-acoustic phonon and electron-optical phonon interactions to the bandgap renormalization. Credit: DOI: [10.1002/advs.202100084](https://doi.org/10.1002/advs.202100084)

to the low dielectric constant of surface organic ligands in CsPbBr₃ 2-ML NPLs also influence the electron-phonon interactions.

The researchers adopted the Bose-Einstein two-oscillator model to determine the effective electron-phonon interaction coefficient through fitting the bandgap as a function of temperature. The results manifested significantly larger weight of contribution from electron-optical phonon interaction to bandgap renormalization in the NPLs than that in the NCs accounts for the blueshift-redshift crossover of bandgap in NPLs.

This study provides new insights into the pivotal role of electron-phonon interactions in the bandgap renormalization for 2D inorganic lead-halide perovskites, which may pave the way for further investigations on the optical and optoelectronic properties of 2D perovskite nanomaterials.

More information: Shaohua Yu et al, Unusual Temperature Dependence of Bandgap in 2D Inorganic Lead-Halide Perovskite Nanoplatelets, *Advanced Science* (2021). [DOI: 10.1002/advs.202100084](https://doi.org/10.1002/advs.202100084)

Journal information: [Advanced Science](https://doi.org/10.1002/advs.202100084)

<https://phys.org/news/2021-08-unusual-bandgap-renormalization-2d-inorganic.html>



Tue, 31 Aug 2021

Physicist helps confirm a major advance in stellarator performance for fusion energy

By John Greenwald

Stellarators, twisty magnetic devices that aim to harness on Earth the fusion energy that powers the sun and stars, have long played second fiddle to more widely used doughnut-shaped facilities known as tokamaks. The complex twisted stellarator magnets have been difficult to design and have previously allowed greater leakage of the superhigh heat from fusion reactions.

Now scientists at the Max Planck Institute for Plasma Physics (IPP), working in collaboration with researchers that include the U.S. Department of Energy's (DOE) Princeton Plasma Physics Laboratory (PPPL), have shown that the Wendelstein 7-X (W7-X) device in Greifswald, Germany, the largest and most advanced stellarator in the world, is capable of confining heat that reaches temperatures twice as great as the core of the sun.

Key indicator

A diagnostic instrument called the XICS, chiefly designed, built and operated by PPPL physicist Novimir Pablant in collaboration with IPP physicist Andreas Langenberg, is a key indicator of a sharp reduction of a type of heat loss called "neoclassical transport" that has historically been greater in classical stellarators than in tokamaks. Causing the troublesome transport are frequent collisions that knock heated particles out of their orbits as they swirl around the magnetic field lines that confine them. Contributing to the transport are drifts in the particle orbits.

A recent report on W7-X findings in *Nature* magazine confirms the success of the efforts of designers to shape the intricately twisted stellarator magnets to reduce neoclassical transport. First author of the paper was physicist Craig Beidler of the IPP Theory Division. "It's really exciting news for fusion that this design has been successful," said Pablant, a coauthor along with Langenberg of the paper. "It clearly shows that this kind of optimization can be done."



IPP physicist Andreas Langenberg, left, and PPPL physicist Novimir Pablant before installation of the XICS diagnostic on the W7-X. Credit: Scott Massida

David Gates, head of the Advanced Projects Department at PPPL that oversees the laboratory's stellarator work, was also highly enthused. "It's been very exciting for us, at PPPL and all the other U.S. collaborating institutions, to be part of this really exciting experiment," Gates said. "Novi's work has been right at the center of this amazing experimental team's effort. I am very grateful to our German colleagues for so graciously enabling our participation."

Carbon-free power

The fusion that scientists seek to produce combines light elements in the form of plasma—the hot, charged state of matter composed of free electrons and atomic nuclei, or ions, that makes up 99 percent of the visible universe—to generate massive amounts of energy. Producing controlled fusion on Earth would create a virtually inexhaustible supply of safe, clean, and carbon-free source of power to generate electricity for humanity and serve as a major contributor to the transition away from fossil fuels.

Stellarators, first constructed in the 1950s under PPPL founder Lyman Spitzer, can operate in a steady state with little risk of the plasma disruptions that tokamaks face. However, their complexity and history of relatively poor heat confinement has held them back. A major goal of the optimized design of W7-X, which produced its first plasma in 2015, has been to demonstrate the appropriateness of an optimized stellarator as an eventual fusion power plant.

Results obtained by the XICS demonstrate hot ion temperatures that could not have been achieved without a sharp reduction in neoclassical transport. These measurements were also made by the CXRS diagnostic built and operated by IPP, which were thought to be a little more accurate but could not be made in all conditions. The final temperature profiles in the *Nature* report were taken from CXRS and supported by measurements with XICS in similar plasmas.

'Extremely valuable'

"Without the XICS we probably would not have discovered this [good confinement] regime," said Robert Wolf, head of the W7-X heating and operation division and a co-author of the paper. "We needed a readily available ion temperature measurement and this was extremely valuable."

Researchers conducted a thought experiment to check the role that optimization played in the confinement results. The experiment found that in a non-optimized stellarator large neoclassical transport would have made the high temperatures recorded on W7-X for the given heating power impossible. "This showed that the optimized shape of W7-X reduced the neoclassical transport and was necessary for the performance seen in W7-X experiments," Pablant said. "It was a way of showing how important the optimization was."

The results mark a step toward enabling stellarators based on the W7-X design to lead to a practical fusion reactor, he added. "But reducing neoclassical transport isn't the only thing you have to do. There are a whole bunch of other goals that have to be shown, including running steady and reducing the turbulent transport." Producing turbulent transport are ripples and eddies that run through the plasma as the second main source of heat loss.

The W7-X will reopen in 2022 following a three-year upgrade to install a water-cooling system that will lengthen fusion experiments and an improved divertor that will exhaust high-performance heat. The upgrades will enable the next step in the investigation by W7-X researchers of the worthiness of optimized stellarators to become blueprints for power plants.

More information: C. D. Beidler et al, Demonstration of reduced neoclassical energy transport in Wendelstein 7-X, *Nature* (2021). [DOI: 10.1038/s41586-021-03687-w](https://doi.org/10.1038/s41586-021-03687-w)

Journal information: *Nature*

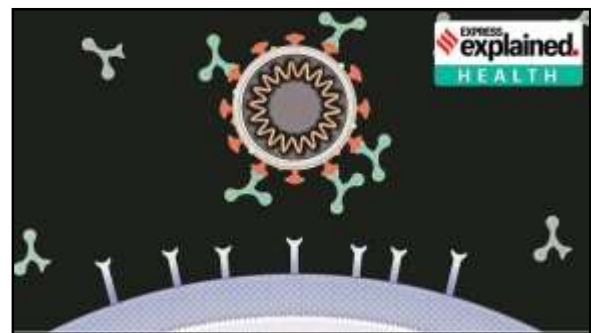
<https://phys.org/news/2021-08-physicist-major-advance-stellarator-fusion.html>

New research: Combo antibody treatment reduces hospitalisation

Of the nearly 1,400 Mayo Clinic patients enrolled in this study, 696 received the drug combo between December 2020 and early April.

New Delhi: In an observational study, Mayo Clinic researchers have found that a combination of casirivimab and imdevimab — two monoclonal antibody treatments that have emergency use authorisation from the US Food and Drug Administration — keep high-risk patients out of the hospital when infected with mild to moderate Covid-19. The study has been published in The Lancet’s EClinicalMedicine.

Of the nearly 1400 Mayo Clinic patients enrolled in this study, 696 received the drug combo between December 2020 and early April. An equal number of patients didn’t receive the drug combo. Upon evaluation of their status at 14, 21 and 28 days after treatment, the numbers for hospitalisation were found to be significantly lower for the treated group, at each stage.



An illustration of Covid-19.

At 14 days, 1.3% of the treated group was hospitalised, while 3.3 % of the non-treated group was hospitalised. At day 21, the percentages of people hospitalised from the treated and non-treated groups were 1.3 and 4.2, respectively. At day 28, 1.6% of the treated patients were hospitalised compared to 4.8% of the non-treated patients.

From this data, it can be inferred that there was 60%-70% relative reduction in hospitalization among treated patients, Mayo Clinic said in a press release.

The release quoted Raymund Razonable, a Mayo Clinic infectious disease specialist and senior author of the study, as saying that when a combination of monoclonal injections is used to treat patients who are at high risk due to a range of comorbidities, and contract a mild or moderate case of Covid-19, they get an opportunity to recover without being hospitalised.

“Our conclusion overall at this point is that monoclonal antibodies are an important option in treatment to reduce the impact of Covid-19 in high-risk patients,” Dr Razonable was quoted as saying.

<https://indianexpress.com/article/explained/combo-antibody-treatment-reduces-hospitalisation-study-7479119/>

