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Prime Minister to formally handover DRDO designed and developed Advanced Electronic Warfare Suite 'Shakti' for Indian Naval Ships to Chief of Naval Staff

Advanced Electronic Warfare (EW) System 'Shakti' has been designed and developed by Defence Electronics Research Laboratory (DLRL) Hyderabad a laboratory of Defence Research and Development Organisation (DRDO) for Capital Warships of the Indian Navy for the interception, detection, classification, identification and jamming of conventional and modern Radars. The Shakti EW system will provide an electronic layer of defence against modern radars and anti-ship missiles to ensure electronic dominance and survivability in the maritime battlefield. This system will replace the earlier generation EW Systems of the Indian Navy.

The system has been integrated with the wideband Electronic Support Measures (ESM) and Electronic Counter Measure (ECM) for the defence of Indian Navy Ships against missile attacks. The ESM of the system helps in finding accurate direction and interception of modern radars. The system has a built-in radar fingerprinting and data recording replay feature for post-mission analysis.

First Shakti system has been installed on-board INS Visakhapatnam and is being installed on-board Indigenous Aircraft Carrier, INS Vikrant. Twelve Shakti Systems are under production at Bharat Electronics Ltd (BEL) supported by more than fifty MSMEs at a total cost of Rs 1805 Crores. These systems are scheduled to be installed on-board capital warships under production, including P-15B, P-17A and Talwar class follow-on ships.

Prime Minister Shri Narendra Modi will formally hand over this system to the Indian Navy at a ceremony to be held as part of Rashtra Raksha Samarpan Parv at Jhansi on 19 Nov 2021.

Raksha Mantri Shri Rajnath Singh congratulated DRDO, Indian Navy and Industry Partners for the development of the Shakti EW System. He said that this will enhance the capabilities of the Indian Navy and termed it as a major milestone towards Atmanirbhar Bharat in areas of advanced defence technologies.

Secretary DDR&D and Chairman DRDO, Dr G Satheesh Reddy has congratulated the teams associated with the development of the Shakti EW System and said that the system will further augment the Navy's Electronic Intelligence capability.

https://pib.gov.in/PressReleasePage.aspx?PRID=1773020

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 18 Nov 2021 7:17PM

प्रधानमंत्री भारतीय नौसेना के पोतों के लिए डीआरडीओ द्वारा डिजाइन और विकसित उन्नत इलेक्ट्रॉनिक वारफेयर प्रणाली 'शक्ति' नौसेना प्रमुख को औपचारिक रूप से सौंपेंगे

उन्नत इलेक्ट्रॉनिक वारफेयर (ईडब्ल्यू) प्रणाली 'शक्ति' को रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) की प्रयोगशाला रक्षा इलेक्ट्रॉनिक्स अनुसंधान प्रयोगशाला (डीएलआरएल) हैदराबाद द्वारा डिजाइन और विकसित किया गया है, जो पारंपरिक और आधुनिक राडार की पहचान करने और उसे जाम करने के उद्देश्य से भारतीय नौसेना के प्रमुख युद्धपोतों के लिए निर्मित की गई है। शक्ति ईडब्ल्यू प्रणाली सामुद्रिक युद्ध में इलेक्ट्रॉनिक प्रभुत्व और सरवाइवल सुनिश्चित करने के लिए आधुनिक रडार और जहाज-रोधी मिसाइलों के खिलाफ रक्षा की एक इलेक्ट्रॉनिक परत प्रदान करेगी। यह प्रणाली भारतीय नौसेना की पिछली पीढ़ी के इलेक्ट्रॉनिक वारफेयर (ईडब्ल्यू) सिस्टम की जगह लेगी।

मिसाइल हमलों के खिलाफ भारतीय नौसेना के जहाजों की रक्षा के लिए इस प्रणाली को वाइडबैंड इलेक्ट्रॉनिक सपोर्ट मेजर्स (ईएसएम) और इलेक्ट्रॉनिक काउंटर मेजर (ईसीएम) के साथ एकीकृत किया गया है। सिस्टम का ईएसएम आधुनिक राडार की सटीक दिशा और अवरोध खोजने में मदद करता है। मिशन के बाद विश्लेषण के लिए सिस्टम में एक अंतर्निर्मित रडार फिंगरप्रिंटिंग और डेटा रिकॉर्डिंग रीप्ले सुविधा मौजूद है।

पहली शक्ति प्रणाली आईएनएस विशाखापत्तनम पर स्थापित की गई है और इसे स्वदेशी विमान वाहक, आईएनएस विक्रांत पर स्थापित किया जा रहा है। भारत इलेक्ट्रॉनिक्स लिमिटेड (बीईएल) में बारह शक्ति सिस्टम्स का उत्पादन किया जा रहा है, जो कुल 1805 करोड़ रुपये की लागत से पचास से अधिक एमएसएमई द्वारा सपोर्ट किया जा रहा है। इन प्रणालियों को पी-15बी, पी-17ए और तलवार श्रेणी के फॉलो-ऑन जहाजों सहित उत्पादन के तहत ऑन-बोर्ड प्रमुख युद्धपोतों को स्थापित करने के लिए निर्धारित किया गया है।

प्रधानमंत्री श्री नरेन्द्र मोदी 19 नवंबर 2021 को झांसी में राष्ट्र रक्षा समर्पण पर्व के अंतर्गत आयोजित होने वाले एक समारोह में औपचारिक रूप से इस प्रणाली को भारतीय नौसेना को सौंपेंगे।

रक्षा मंत्री श्री राजनाथ सिंह ने शक्ति ईडब्ल्यू प्रणाली के विकास के लिए डीआरडीओ, भारतीय नौसेना और उद्योग भागीदारों को बधाई दी। उन्होंने कहा कि यह भारतीय नौसेना की क्षमताओं को बढ़ाएगा और उन्होंने इसे उन्नत रक्षा प्रौद्योगिकियों के क्षेत्रों में आत्मानिर्भर भारत की दिशा में एक प्रमुख मील का पत्थर करार दिया।

रक्षा अनुसंधान एवं विकास विभाग के सचिव और डीआरडीओ के अध्यक्ष डॉ. जी सतीश रेड्डी ने शक्ति ईडब्ल्यू सिस्टम के विकास से जुड़ी टीमों को बधाई दी है और कहा है कि यह प्रणाली नौसेना की इलेक्ट्रॉनिक इंटेलिजेंस क्षमता को और बढ़ाएगी।

https://pib.gov.in/PressReleasePage.aspx?PRID=1773059

Press Information Bureau
Government of India

Ministry of Defence

Thu, 18 Nov 2021 6:18PM

IAF at the Dubai Air Show

17 November 21, the penultimate day of the Dubai Air Show 2021 commenced with a fascinating combined flypast by the IAF's Suryakiran Aerobatics Team and UAE's Al Fursan Display Team. Nine Hawk-132 of Suryakiran Team flew in sync with seven Aermacchi MB-339 of Al Fursan over important landmarks of Dubai like Burj Khalifa, Palm Jumeirah and Burj Al Arab, in a display which signifies the deep camaraderie and bonhomie between the two Air Forces.

The Suryakirans also participated in a late afternoon aerobatics display which was highly appreciated by the crowd.

The ever increasing popularity of the Tejas was reinforced by the superb demonstration flight flown by the fighter in the afternoon today. The aircraft manoeuvred effortlessly, showing off its agility and versatility; a testament to the rapid strides that the platform has achieved in recent times.

https://pib.gov.in/PressReleasePage.aspx?PRID=1772999

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 18 Nov 2021 6:18PM

दुबई एयर शो में भारतीय वायु सेना

दुबई एयर शो 2021 का अंतिम दिन यानी 17 नवंबर, 2021 भारतीय वायुसेना की सूर्यकिरण एरोबेटिक्स टीम और संयुक्त अरब अमीरात की अल फ़ुरसन डिस्प्ले टीम द्वारा एक आकर्षक संयुक्त फ्लाईपास्ट प्रदर्शन के साथ शुरू हुआ। सूर्यकिरण टीम के नौ हॉक-132 विमानों ने अल फ़ुरसान के सात एर्मैची एमबी-339 विमानों के साथ प्रदर्शन के दौरान दुबई के महत्वपूर्ण स्थलों जैसे बुर्ज खलीफा, पाम जुमेराह और बुर्ज अल अरब पर उड़ान भरी, जो दोनों वायु सेनाओं के बीच गहरे संबंधों तथा सौहार्द को दर्शाता है।

सूर्यकिरण ने दोपहर के बाद एरोबेटिक्स प्रदर्शन में भी भाग लिया, जिसे दर्शकों ने बेहद सराहा।

तेजस की लगातार बढ़ती लोकप्रियता में आज उस समय और वृद्धि हुई, जब दोपहर के समय लड़ाकू विमानों द्वारा किये गए शानदार प्रदर्शन की लोगों ने खूब प्रशंसा की। विमान ने अपनी चपलता और बहुमुखी प्रतिभा का परिचय देते हुए सहजता से युद्धाभ्यास किया; यह तेजी से प्राप्त की गई प्रसिद्धि का साक्षी है, जिसे इसने हाल के दिनों में हासिल किया है।

https://pib.gov.in/PressReleasePage.aspx?PRID=1773043

ZEENEWS

Fri, 19 Nov 2021

PM Narendra Modi to hand over DRDO-designed electronic warfare system 'Shakti' to Indian Navy today

Advanced Electronic Warfare (EW) System 'Shakti' has been designed and developed by Defence Electronics Research Laboratory (DLRL) Hyderabad a laboratory of Defence Research and Development Organisation (DRDO) for Capital Warships of the Indian Navy for the interception, detection, classification, identification and jamming of conventional and modern Radars

Edited By Ritesh K Srivastava

New Delhi: Prime Minister Narendra Modi will formally hand over Defence Research and Development Organisation (DRDO) designed Advanced Electronic Warfare (EW) system 'Shakti' for Naval ships to the Indian Navy at a ceremony in Jhansi on Friday.

The ceremony will be held as part of 'Rashtra Raksha Samarpan Parv' at Jhansi today.

The Prime Minister will kick start the beginning of the significant project on the concluding three-day 'Rashtra Raksha Samarpan Parv` event being organised by the Ministry of Defence (MoD) along with the government of Uttar Pradesh.

What is Advanced Electronic Warfare System 'Shakti'?

Advanced Electronic Warfare (EW) System 'Shakti' has been designed and developed by Defence Electronics Research Laboratory (DLRL) Hyderabad a laboratory of Defence Research and Development Organisation (DRDO) for Capital Warships of the Indian Navy for the interception, detection, classification, identification and jamming of conventional and modern Radars.

Image for representational use only

The Shakti EW system will provide an electronic layer of defence against modern radars and anti-ship missiles to ensure electronic dominance and survivability in the maritime battlefield.

This system will replace the earlier generation EW Systems of the Indian Navy, the Ministry of Defence said in a statement.

"Prime Minister Narendra Modi will formally hand over this system to the Indian Navy at a ceremony to be held as part of Rashtra Raksha Samarpan Parv at Jhansi on 19 Nov 2021," the statement read.

How will it help the Indian Navy?

The system has been integrated with the wideband Electronic Support Measures (ESM) and Electronic Counter Measure (ECM) for the defence of Indian Navy Ships against missile attacks.

The ESM of the system helps in finding accurate direction and interception of modern radars. The system has a built-in radar fingerprinting and data recording replay feature for post-mission analysis.

First Shakti system has been installed on-board INS Visakhapatnam and is being installed on-board Indigenous Aircraft Carrier, INS Vikrant. Twelve Shakti Systems are under production at Bharat Electronics Ltd (BEL) supported by more than fifty MSMEs at a total cost of Rs 1805 Crores. These systems are scheduled to be installed on-board capital warships under production, including P-15B, P-17A and Talwar class follow-on ships.

'Shakti will augment Indian Navy`s Electronic Intelligence capability'

Defence Minister Rajnath Singh congratulated DRDO, Indian Navy and Industry Partners for the development of the Shakti EW System. He said that this will enhance the capabilities of the

Indian Navy and termed it as a major milestone towards Atmanirbhar Bharat in areas of advanced defence technologies.

Secretary DDR&D and Chairman DRDO, Dr G Satheesh Reddy has congratulated the teams associated with the development of the Shakti EW System and said that the system will further augment the Navy`s Electronic Intelligence capability.

Prime Minister Modi will be laying the foundation stone of the Rs 400 crore Uttar Pradesh Defence Industrial Corridor project in Jhansi on Friday.

https://zeenews.india.com/india/pm-narendra-modi-to-hand-over-drdo-designed-electronic-warfare-system-shakti-to-indian-navy-today-2411654.html

Hindustan Times

Fri, 19 Nov 2021

PM Modi to formally handover locally produced military hardware to armed forces in Jhansi

- ***The three-day-long 'Rashtra Raksha Samarpan Parv' is being held in Jhansi as a part of 'Azadi Ka Amrit Mahaotsav' celebrations.***

By Kunal Gaurav

New Delhi: Prime Minister Narendra Modi is set to formally hand over locally produced military hardware to the service chiefs of Indian armed forces today at a ceremony in Jhansi. The ceremony will be held as a part of the three-day-long 'Rashtra Raksha Samarpan Parv', organised by the ministry of defence along with the government of Uttar Pradesh, concluding on Friday. PM Modi will also dedicate several new initiatives of the defence ministry to the nation.

Prime Minister Narendra Modi will hand over Light Combat Helicopters to the Indian Air Force (IAF) on the third day of 'Rashtra Raksha Samarpan Parv', in Jhansi on Wednesday.(ANI)

Marking a big step towards 'Aartmanirbhar Bharat', PM Modi will hand over Defence Research and Development Organisation (DRDO) designed Advanced Electronic Warfare (EW) suite for Naval ships to the Indian Navy. The Advanced EW suite will be used in different naval ships including destroyers and frigates.

He will also hand over Hindustan Aeronautics Limited designed and developed twin-engine Light Combat Helicopter (LCH) to the Chief of the Air Staff. The advanced technologies and stealth features of the LCH will be able to carry out as destruction of enemy air defence, counterinsurgency, search and rescue, anti-tank, and counter surface force operations among others.

The Indian Army chief will be handed over drones designed and developed by Indian startups. The Indian Army has decided to procure these UAVs from the startups after detailed testing and trials, which serves as proof of the "growing maturity of Indian drone industry ecosystem", according to the defence ministry.

"As a demonstration on thrust on 'Aatmanirbhar Bharat, the Indian Army, Indian Air Force and Indian Navy are adopting indigenously designed and developed platforms for their use. Three platforms will be formally handed over by the Prime Minister to respective Service Chiefs on November 19," the defence ministry had said in a statement.

https://www.hindustantimes.com/india-news/pm-modi-to-formally-handover-locally-produced-military-hardware-to-armed-forces-in-jhansi-101637281307679.html

R. REPUBLICWORLD.COM

Fri, 19 Nov 2021

Indian Air Force's Tejas Exhibits 'versatility & Agility' at Dubai Air Show 2021

The HAL-manufactured Light Combat Aircraft (LCA) Tejas, commissioned by the Indian Air Force showcased breathtaking aerial manoeuvres at Dubai Air Show 2021

By Deepan Chattopadhyay

On Thursday, November 18, for the first time in a gulf nation at the Dubai Air Show 2021, Indian Air Force's (IAF) Light Combat Aircraft (LCA) Tejas, developed by Hindustan Aeronautics Limited (HAL), showcased breathtaking aerial manoeuvres grabbing the attention of many.

Image: Twitter/@INDIAN AIR FORCE, ANI

"The aircraft manoeuvred effortlessly, showing off its agility and versatility," the IAF said adding that it is a testament to the rapid strides that the platform has achieved in recent times.

Suryakirans & Al Fursan steal the show

The Dubai's biennial Air Show had commenced with a combined flypast carried out by the Indian Air Force's Suryakiran Aerobatics Team along with the UAE's Al Fursan Display Team. The IAF in a statement called it 'a display that signified the deep camaraderie and bonhomie between the two Air Forces'.

Nine Hawk 132 of the Suryakiran Team flew in synchronisation with seven Aermacchi MB-339 of Al Fursan over significant landmarks in Dubai including the Burj Khalifa, Palm Jumeirah, and Burj Al Arab.

Tejas showcases its abilities at Dubai Air Show 2021

The crowd present in the event appreciated the aerobatics displayed by the Suryakirans later in the afternoon. Besides that, the indigenously manufactured Tejas reinforced its ever-increasing popularity by an awe-struck demonstration flight exhibiting its "versatility" and "agility".

Earlier, the Indian Air Force while announcing the arrival of the HAL-manufactured Tejas had said, "Tejas will showcase its superior flying ability, manoeuvrability, and ease of handling against the golden backdrop."

The Dubai Air Show 2021 kicked off at AI Maktoum Airport in Dubai. The Dubai Air Show is one of the leading aerospace events in the Middle East and amongst the growing Air shows across the globe. The show was inaugurated by Dubai Crown Prince and Chairman of Dubai Seikh bin Mohammed bin Rashid Al Maktoum on Sunday, November 14, and concluded on Thursday, November 18.

Global attention on IAF's LCA Tejas

As per reports, so far Malaysia, Argentina, and Egypt have expressed their interest in the IAF's Tejas. Reports say that the Royal Malaysian Air Force (RMAF) has plans to purchase 18 multirole light fighter jets. It also has set an added option to buy another 18 later. The bid is being considered significant for it may emerge as the first global buyer of the India-made Tejas. (With ANI Inputs)

https://www.republicworld.com/india-news/general-news/indian-air-forces-tejas-exhibits-versatility-and-agility-at-dubai-air-show-2021.html

The EurAsian Times

Fri, 19 Nov 2021

LCA Tejas: India eyes global customers for its indigenous Aircraft after spectacular debut at Dubai Airshow

By Aashish Dangwal

The Indian Air Force (IAF) contingent has managed to grab eyeballs at the Dubai Air Show. The indigenous HAL Tejas light combat aircraft and two IAF aerobatics teams — Suryakiran comprising nine Hawk advanced jet trainers (AJTs), and Sarang, with four Dhruv helicopters — presented a spectacular aerial display at the event.

The HAL Tejas in Dubai. (via Twitter)

This is the first time that Tejas, developed by the Hindustan Aeronautics Limited (HAL), has showcased its aerial maneuvers in the Gulf nation, according to news agency PTI.

So far, three countries have shown interest in the HAL Tejas — Malaysia, Argentina, and Egypt. The Royal Malaysian Air Force (RMAF), which has plans to buy 18 planes, with an option to add another 18 later, could emerge as the first foreign buyer of Tejas.

According to Malaysian media reports, six bids have been filed for RMAF light combat aircraft (LCA) tender. The MiG-35 from Russia, the L-15 from China, the FA-50 from Korea Aerospace Industries (KAI), the Hurjet from Turkey Aerospace Industries (TAI), and the Leonardo M-346 from Italy are among the bidders.

The Pakistani-Chinese JF-17 Thunder, which was initially thought to be among the competitors, was not on the list. The Yakovlev Yak-130 and the Boeing T-7A Red Hawk were also missing.

Mid-air refueling, beyond-visual-range (BVR) combat, and supersonic flying capabilities are among the RMAF's tender requirements. Moreover, 30% of the aircraft manufacturing must be done in Malaysia, and delivery must start within 36 months of signing the deal.

R. Madhavan, HAL chief, told Business Standard that the company met practically all of the RMAF's conditions. "The Tejas outperforms the Chinese-Pakistani JF-17 and the other contenders in terms of technology.

"We can easily engineer one or two of the Malaysian parameters that we don't meet. For example, we can rapidly add the onboard oxygen generating system (OBOGS) that they requested," Madhavan explained.

According to the HAL chief, many of the other competitors do not match Malaysian requirements. The Chinese-Pakistani JF-17 lacks the required active electronically scanned array (AESA) radar, and its mid-air refueling capability is currently being evaluated.

Tejas Vs Rest of Contenders

The Turkish aircraft is yet to take to the skies, but the Malaysian tender requires the offered fighter to have flown beforehand. Hence, Turkey's chances are low. Then, the Chinese jet is likely to be looked at with suspicion Given Beijing's aggression in the region.

HAL has pitched the RMAF its Tejas Mark-1A fighter, which features mid-air refueling, an AESA radar, EW capability, and the capacity to shoot BVR missiles.

For the RMAF, price is a major factor, anticipating to pay in the region of $900 million for 18 fighters, or $50 million each fighter. According to reports, the Tejas is being offered at that price.

The Korean fighter is expected to be costlier than the Tejas and the Russian MiG-35 is even more expensive than the price mentioned.

Apart from Malaysia, a few more countries have shown interest in the Indian Tejas LCA.

Argentina

Buenos Aires is looking for 12 light fighters. The matter is being pursued by HAL, but there is a UK embargo on the export of British defense equipment to Argentina that dates back to the Falklands War.

Tejas incorporates several British-made components; hence there might be an export hurdle. Previously, the UK blocked the sale of South Korean fighter jets to Argentina.

So far, Argentina is believed to have received only two proposals for its light fighter jet contract — one from China and a letter of intent from India's HAL.

Several systems and subsystems of the Tejas, which are made in the United Kingdom by companies including BAE Systems, Cobham, and Martin-Baker will need to be replaced by HAL to make the fighter jet eligible for export.

Madhavan earlier said more than 50 systems and subsystems, including the Martin-Baker ejection seat, will have to be replaced. Furthermore, the replacement parts will need to be tested and certified. He further stated that there will be a cost attached to it.

Egypt

Egypt had been rumored to be interested in the Tejas since the Bahrain air show 2018. Another reason for the Tejas' appearance at the Dubai Air Show is to gauge interest in the region. However, weaning Cairo off US platforms, which Washington has long provided at subsidized rates, will be a big challenge.

"It's for the reason that we're heading to Egypt. The plan is to build Tejas there by establishing a factory," Madhavan said.

The Egyptian Air Force is considering replacing its aging Dassault/Dornier Alpha aircraft, which was purchased in the 1980s and is nearing the end of its lifespan. The EAF seeks a full-fledged combat aircraft that may also be used for pilot training on occasions.

The service has recently purchased the Sukhoi-35 and Dassault Rafale. The EAF also operates the F-16, Mirage-2000, and Mirage-III aircraft.

Australia

As reported earlier by Eurasian Times, HAL claimed that it has proposed Tejas as a Lead-In Flight Trainer to the Royal Australian Air Force (RAAF).

According to HAL's annual report, the Royal Australian Air Force (RAAF) issued a Request for Information (RFI) for a trainer aircraft in July of last year, to which HAL has already responded. The RAAF trainer fleet now consists of roughly 30 'Hawk MK-127' LIFT aircraft that have been in service since 2001.

Sri Lanka

Sri Lanka has a small air force with only a few aircraft. During the civil war, these fighters were primarily responsible for bombing insurgents. Sri Lanka has already turned down Pakistan's offer of the JF 17 Thunder and is believed to have shown interest in the Indian Tejas.

Tejas makes use of more efficient technology and has an American engine. As a result, it will be less expensive to operate than Russian platforms that require a lot of maintenance or platforms that employ Russian engines.

However, it's unlikely that Sri Lanka, which is currently experiencing economic hardship, would like to spend funds on military hardware. Besides, the island nation does not face any major threat from any of its neighbors, and hence, its air force would have to manage with its existing fleet of aircraft.

https://eurasiantimes.com/tejas-makes-its-dubai-debut-its-maker-hal-hopes-to-clinch-deals/

DRDO on Twitter

A. Bharat Bhushan Babu
@SpokespersonMoD

Prime Minister Shri @narendramodi to formally handover @DRDO_India designed and developed #AdvancedElectronicWarfareSuite #Shakti for #IndianNaval Ships to Chief of the Naval Staff Admiral Karambir Singh
Find out more here: pib.gov.in/PressReleasePa...

7:24 PM · Nov 18, 2021

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Prime Minister @narendramodi to Formally Handover DRDO Designed and Developed Advanced Electronic Warfare Suite 'Shakti' for Indian Naval Ships to Chief of Naval Staff

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8:51 PM · Nov 18, 2021

ANI
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Replying to @ANI

IAF's Light Combat Aircraft (LCA) Tejas carried out demonstrations flight at Dubai Airshow 2021 today afternoon. The aircraft maneuvered effortlessly, showing off its agility & versatility, a testament to the rapid strides that the platform has achieved in recent times: IAF

5:05 PM · Nov 18, 2021

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Thu, 18 Nov 2021 7:20PM

Government signs contract for procurement of two Fixed Base Full Mission Simulator (FBFMS) for Jaguar Aircraft from HAL for IAF

The government has signed a contract for procurement of two Fixed Base Full Mission Simulators (FBFMS) for Jaguar Aircraft from HAL for IAF with five years Comprehensive Annual Maintenance Contract (CAMC) at a combined total cost of Rs.357 crore. These simulators would be installed at Air Force Stations Jamnagar and Gorakhpur.

Under the Atmanirbhar Bharat Abhiyan, India is continuously growing in its power to indigenously design, develop and manufacture advanced cutting-edge technologies and systems in the Defence Sector. The manufacturing of Fixed Base Full Mission Simulator (FBFMS) by HAL will give a further push to the Atmanirbhar Bharat initiative and boost indigenization of defence production and the defence industry in the country.

The commissioning of the first FBFMS with associated equipment shall be completed within 27 months from the contract at Air Force Station Jamnagar & the 2nd FBFMS shall be completed within 36 months from the contract at Air Force Station Gorakhpur.

With the procurement of these simulators, IAF will enhance the quality of flying training to higher standards by exposing the pilots to various contingencies in the entire operating envelope including simulation of advanced long-range weapons.

https://pib.gov.in/PressReleasePage.aspx?PRID=1773023

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 18 Nov 2021 7:20PM

सरकार ने भारतीय वायुसेना के लिए हिन्दुस्तान ऐरोनॉटिक्स लिमिटेड से जगुआर विमान हेतु दो फिक्स्ड बेस फुल मिशन सिम्युलेटर (एफबीएफएमएस) की खरीद के अनुबंध पर हस्ताक्षर किए

सरकार ने भारतीय वायुसेना के लिए 357 करोड़ रुपये की कुल लागत पर पांच साल के व्यापक वार्षिक रखरखाव अनुबंध (सीएएमसी) के साथ हिन्दुस्तान ऐरोनॉटिक्स लिमिटेड से जगुआर विमान हेतु दो फिक्स्ड बेस फुल मिशन सिमुलेटर (एफबीएफएमएस) की खरीद के एक करार पर हस्ताक्षर किए हैं। ये सिमुलेटर जामनगर और गोरखपुर वायुसेना स्टेशनों में स्थापित किए जाएंगे।

भारत 'आत्मनिर्भर भारत' अभियान के तहत, रक्षा क्षेत्र में उन्नत अत्याधुनिक तकनीकों एवं प्रणालियों को स्वदेशी रूप से डिजाइन, विकसित और इनका निर्माण करने की अपनी शक्ति में लगातार वृद्धि कर रहा है। एचएएल द्वारा फिक्स्ड बेस फुल मिशन सिम्युलेटर (एफबीएफएमएस) का निर्माण आत्मनिर्भर भारत पहल को और अधिक बढ़ावा देगा तथा देश में रक्षा उत्पादन एवं रक्षा उद्योग के स्वदेशीकरण में भी इससे बढ़ोत्तरी होगी।

संबद्ध उपकरणों के साथ पहले एफबीएफएमएस को जामनगर वायु सेना स्टेशन में अनुबंध से 27 महीने के भीतर पूरा कर लगाया जाएगा और दूसरा एफबीएफएमएस गोरखपुर वायुसेना स्टेशन में अनुबंध से 36 महीने के भीतर पूरा किया जाएगा।

इन सिमुलेटरों की खरीद के साथ, भारतीय वायुसेना उन्नत लंबी दूरी के हथियारों के अनुकरण सहित पूरे संचालन आवरण में विभिन्न आकस्मिकताओं को पायलटों के लिए प्रदर्शित करके उड़ान प्रशिक्षण की गुणवत्ता को उच्च मानकों तक बढ़ाएगी।

https://pib.gov.in/PressReleasePage.aspx?PRID=1773056

Press Information Bureau
Government of India

Ministry of Defence

Thu, 18 Nov 2021 6:19PM

WNC conducts exercise Prasthan in western offshore development area

An offshore security exercise, code-named 'Prasthan' was conducted in the Offshore Development Area (ODA) off Mumbai on 16th November 2021, under the aegis of Headquarters, Western Naval Command. Conducted every six months, this exercise is an important element of ensuring offshore security and aims to integrate the efforts of all maritime stakeholders, including the Indian Navy, Indian Air Force, Coast Guard, ONGC, the Port Trust, Customs, the state fisheries department and the Marine Police, in refining SOPs and response-actions to a variety of contingencies in the ODAs.

The exercise was conducted on the MHN platform of ONGC located about 94 nm west of Mumbai.

Contingencies such as terrorist intrusion, bomb explosion, major fire, oil spill, man overboard, casualty evacuation, loss of control of vessel and mass evacuation were exercised. The exercise provided all stake holders a realistic scenario to assess their readiness to respond to and combat contingencies in the Western ODA, as also to operate together in a coordinated manner.

https://pib.gov.in/PressReleasePage.aspx?PRID=1773000

पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Thu, 18 Nov 2021 6:19PM

डब्ल्यूएनसी ने पश्चिमी अपतटीय विकास क्षेत्र में प्रस्थान अभ्यास किया

पश्चिमी नौसेना कमान के मुख्यालय के तत्वावधान में 16 नवंबर 2021 को मुंबई से दूर अपतटीय विकास क्षेत्र (ओडीए) में प्रस्थान कोड नाम से एक अपतटीय सुरक्षा अभ्यास आयोजित किया गया था। हर छह महीने में आयोजित होने वाला यह अभ्यास अपतटीय सुरक्षा सुनिश्चित करने का एक महत्वपूर्ण तत्व है और इसका उद्देश्य अपतटीय विकास क्षेत्रों (ओडीए) में विभिन्न प्रकार की आकस्मिक घटनाओं पर एसओपी और कार्रवाइयों को बेहतर करने में भारतीय नौसेना, भारतीय वायु सेना, तटरक्षक बल, ओएनजीसी,पोर्ट ट्रस्ट, सीमा शुल्क, राज्य मत्स्य पालन विभाग और समुद्री पुलिस सहित सभी समुद्री हितधारकों के प्रयासों को एकीकृत करना है।

अभ्यास मुंबई के पश्चिम में लगभग 94 एनएम पर स्थित ओएनजीसी के एमएचएन प्लेटफॉर्म पर आयोजित किया गया था।

इसमें आतंकवादी घुसपैठ, बम विस्फोट, बड़ी आगजनी, तेल रिसाव, जहाज पर अधिक सवार, हताहतों की निकासी, पोत पर नियंत्रण खोना और सामूहिक निकासी जैसी आकस्मिक घटनाओं का अभ्यास किया गया। इस अभ्यास में सभी हितधारकों को वास्तविक परिदृश्य प्रदान किया गया ताकि पश्चिमी ओडीए में आकस्मिक घटनाओं पर सटीक प्रतिक्रिया और उनका मुकाबला करने में उनकी तत्परता और एक साथ आपसे में तालमेल करके कार्रवाई करने की उनकी क्षमता का आकलन किया जा सके।

https://pib.gov.in/PressReleasePage.aspx?PRID=1773031

Press Information Bureau
Government of India

Ministry of Defence

Thu, 18 Nov 2021 6:14PM

OP SANKALP - Mission-based deployment to Persian Gulf by INS Trikand

INS Trikand is currently deployed in the Persian Gulf and Gulf of Oman as part of Operation Sankalp, the Indian Navy's effort to maintain a frontline ship in the region to ensure safe and secure movement of trade, instill confidence in the maritime community and contribute to regional maritime security.

The ship entered Manama, Bahrain, on 13th November 21 for a three-day operational turn round (OTR). During her stay at port, the ship engaged extensively with various maritime security agencies to enhance cooperation in all aspects of maritime security, including training and other mutually beneficial subjects.

Commanding Officer, INS Trikand, Captain Harish Bahuguna, visited the Combined Maritime Forces (CMF) Headquarters at Bahrain on 15th November 21 and called on the Deputy Commander of CMF, Commodore Edward Ahlgren. The port call offered the ship the opportunity to visit the US Coast Guard's (USCG) Visit Board Search and Seizure (VBSS) facility titled 'Ship in a Box'. It also enabled a better understanding of the SOPs and training methodologies of other maritime forces, besides allowing the ship's team to interact with the newly-formed Task Force (TF 59 - Unmanned Force), an experimental unit in a niche domain

Commanding Officer INS Trikand also called on His Excellency, the Ambassador of India to Bahrain, Mr. Piyush Srivastava, who was deeply appreciative of the role the Indian Navy played through such ship-visits in furthering bilateral relations and enhancing maritime security in the region.

INS Trikand is a state-of-the-art guided missile stealth frigate and is part of the Western Fleet that operates under the Flag Officer Commanding-in-Chief, Western Naval Command, based at Mumbai.

https://pib.gov.in/PressReleasePage.aspx?PRID=1772995

THE TIMES OF INDIA

Fri, 19 Nov 2021

India no longer weak, will give befitting reply to anyone threatening its territorial integrity: Rajnath

New Delhi: Asserting that India was no longer a weak nation, defence minister Rajnath Singh on Thursday said India will give a befitting reply to anyone threatening its sovereignty and territorial integrity, in a veiled message to China on the 59th anniversary of the epic battle of Rezang La in eastern Ladakh.

Nobody can "show an eye" to India and get away as the country is fully determined to protect every inch of its land, the defence minister said after paying glowing tributes to the Indian soldiers who inflicted heavy casualties on the Chinese military in the battle of Rezang La on November 18, 1962.

The defence minister also dedicated a revamped war memorial in the high-altitude region and said it is a tribute to the "bravehearts" and a symbol of India's preparedness to protect its integrity.

"The renovation of the memorial is not only a tribute to our valiant armed forces but also a symbol of the fact that we are fully prepared to protect the integrity of the nation," Singh said.

"This monument symbolises the government's stand of giving a befitting reply to anyone who threatens our sovereignty and integrity. India is no longer a weak nation. It has become a powerful country," he said in a brief address in presence of Chief of Defence Staff Gen Bipin Rawat and several other top military officials.

His comments came on a day India and China held another round of diplomatic talks on border affairs that focused on resolving the nearly 18-month-long border row along the Line of Actual.

Singh also said he will continue to visit Rezang La to pay homage to the fallen soldiers till he remains the defence minister.

The battle of Rezang La is largely considered as the finest moment for the Indian Army during the 1962 war with China as over 100 Indian soldiers pushed back a large number of Chinese troops, displaying raw courage and indomitable spirit.

The defence minister said India has never intended to occupy the land of any other country but it has given a befitting reply to anyone eyeing the country's territory and that Indian soldiers are capable of protecting every inch of the nation.

Singh described the memorial as an example of the determination and indomitable courage displayed by the Indian Army that he said is not "only immortal in the pages of history, but also beats in our hearts".

The defence minister said the "battle of Rezang La is considered one of the 10 greatest and most challenging military conflicts in the world."

"The historic battle of Rezang La, fought at an altitude of 18,000 feet, is difficult to imagine even today. Major Shaitan Singh and his fellow soldiers fought till 'last bullet and last breath' and wrote a new chapter of bravery and sacrifice," he said.

"I am saluting the 114 Indian soldiers who made supreme sacrifices in the 1962 war after reaching Rezang La, located amidst the inaccessible hills of Ladakh," Singh said.

The memorial was constructed in 1963 in the Chushul plains right at the India-China border to honour the troops of Charlie Company of 13 Kumaon Regiment, who were involved in the battle.

The decision to renovate the memorial was taken by Singh when he had visited Leh in June.

The renovated complex includes a double-storied museum, a mini-theatre to screen a special documentary on the battle, a large helipad and various other tourist amenities.

The Rezang La Memorial, located very close to the Pangong Lake in Ladakh, is set to become a major tourist attraction in the coming years, the defence ministry said.

The battle of Rezang La began at around 4 am on November 18, 1962, and lasted till around 10 pm during which the 'C' company of 13th battalion of the Kumaon Regiment led by Major Shaitan Singh not only stood their ground but inflicted heavy casualties on the Chinese despite being outnumbered by the adversary.

Major Singh was later posthumously conferred with Param Vir Chakra, India's highest military decoration.

"It was a saga of unparalleled bravery as Major Shaitan Singh and 113 soldiers had made the supreme sacrifice, fighting one of the world's rarest 'last man, last bullet' battles," the defence ministry said.

Defence minister Singh also met Brig (retd) R B Jatar who was part of the battle of Rezang La.

"I am overwhelmed by the feeling of respect for him and I salute his courage," Singh said.

The revamped war memorial has been thrown open at a time India and China have been locked in a bitter border row in eastern Ladakh for nearly one and half years.

The Indian Army had occupied a number of mountain peaks in the Rezang La region in August last year following China's aggressive posturing and failed attempt to intimidate Indian troops.

The eastern Ladakh border standoff between the Indian and Chinese militaries erupted on May 5 last year following a violent clash in the Pangong lake areas and both sides gradually enhanced their deployment by rushing in tens of thousands of soldiers as well as heavy weaponry.

The tension escalated following a deadly clash in Galwan Valley on June 15 last year.

As a result of a series of military and diplomatic talks, the two sides completed the disengagement process in the north and south banks of the Pangong lake in February and in the Gogra area in August.

Each side currently has around 50,000 to 60,000 troops along the Line of Actual Control (LAC) in the sensitive sector.

https://timesofindia.indiatimes.com/india/india-no-longer-weak-will-give-befitting-reply-to-anyone-threatening-its-territorial-integrity-rajnath/articleshow/87786455.cms

NDTV

Fri, 19 Nov 2021

Top officials to discuss rising border threat, drone attacks with PM Modi

Interestingly, Uttar Pradesh Chief Minister Yogi Adityanath is also going to attend the conference. UP goes to the polls early next year

By Neeta Sharma, Edited by Akhil Kumar

New Delhi: Starting tomorrow, top intelligence and security officials of the country will discuss for three days the rising threat from China and Pakistan. The Intelligence Bureau - which is responsible for the internal security of the country - is organising a 56th DGP level conference in Lucknow. Prime Minister Narendra Modi will chair the conference.

Drone used to smuggle drugs into India intercepted by BSF in Punjab.

"Drone attacks in Jammu have shown that there is a major change as far as terror attacks and dealing with our neighbours is concerned, so it's going to be one of the major focus areas in the conference," a senior official disclosed.

Two Indian Air Force personnel were injured when two explosive devices were dropped from a drone on the IAF station in Jammu on the intervening night of June 26-27 this year. The IAF station was 14-15 km from the International Border with Pakistan.

Union Home Minister Amit Shah after the attack had asked border guarding forces to map border areas and identify weak spots.

Last month during his visit, he had pulled up the armed forces as the Poonch encounter had spilled over for days. Following this, all border guarding forces conducted mammoth exercises to strengthen the security grid in both eastern and western border areas. "Drones have introduced a new element along the border areas. To counter it, border guarding forces have taken measures, and to strengthen the efforts of guarding the border, states are also being roped in. So, a discussion is slated on this issue too," the senior official added.

Border Security Force plays a crucial role in guarding the western sector while Indo Tibetan Border Police (ITBP) does the same for the eastern sector.

Another issue that is going to be discussed is the trust deficit of the public at large on men in uniform. Recent cases in many states have shown that the public does not trust men in khaki. How to make the police force more people-friendly is another agenda item in the three-day conference which starts on Friday afternoon in Lucknow.

The conference is being held in a hybrid format this year. National Security Advisor Ajit Doval, Research Analysis Wing Secretary Samanth Goel along with DGP of States/UTs and Heads of Central Armed Police Forces and Central Police Organizations will attend the Conference physically at the venue in Lucknow, while the remaining invitees will participate virtually from 37 different locations at IB/SIB Headquarters.

As per the Ministry of Home Affairs, top cops will also discuss other issues including Cyber Crime, Data Governance, Counter-Terrorism challenges, Left Wing Extremism, Emerging Trends in Narcotics trafficking, Prison Reforms among others.

Officials claim that since 2014, PM has taken a keen interest in the DGP conference. "Unlike the symbolic presence earlier, he makes it a point to attend all sessions of the conference and encourages free and informal discussions that provide an opportunity to top police officials to

directly brief the Prime Minister on key policing and internal security issues affecting the country," an MHA official said.

Interestingly, Uttar Pradesh Chief Minister Yogi Adityanath is also going to attend the conference. UP goes to the polls early next year.

"The conference is being held outside Delhi since 2014, and the sitting state CM is always invited wherever it's held," a senior MHA official explained.

"There is nothing wrong in inviting a Chief Minister of the state where the conference is being held. DGPs discuss very serious issues and involvement of CMs is a welcome step," says former Special Director and IB veteran Yashowardhan Azad.

In line with the Prime Minister's vision, the annual conference which used to be customarily organised in Delhi is being organised outside the capital since 2014, with an exception of the year 2020 when the conference was held virtually.

The conference was organised in Guwahati in 2014; Dhordo, Rann of Kutch in 2015; National Police Academy, Hyderabad in 2016; BSF Academy, Tekanpur in 2017; Kevadiya in 2018; and IISER, Pune in 2019.

https://www.ndtv.com/india-news/top-sleuths-to-discuss-rising-border-threats-drone-attacks-from-tomorrow-2616189

NDTV

Fri, 19 Nov 2021

Army Chief lays Wreath at Indian Soldiers War Memorial in Israel

General Naravane, who is on a five-day maiden visit to Israel, on Tuesday visited the northern border of the country and on Wednesday the Israel Defence Forces headquarters

Tel Aviv: Indian Chief of Army Staff General MM Naravane, on his five-day visit to Israel, visited Indian Soldiers War Memorial in Jerusalem on Thursday, laid wreath and paid tribute to the Indian army personnel who lost lives during World War l.

General Naravane visited the Indian Soldiers War Memorial in Jerusalem on Thursday.

"General MM Naravane #COAS laid a wreath at the Indian Soldiers War Memorial in #Jerusalem & paid homage to the #Bravehearts of #IndianArmy who made the supreme sacrifice during the World War I," informed the Additional Directorate General of Public Information, Indian Army in a tweet.

General Naravane, on the first day of his maiden visit to Israel on Monday, received the country's guard of honour. Later the same day, he paid a visit to the special operations unit of Israel Defence Forces, where he was briefed on aspects of the conduct of counter-terrorism operations.

The Army Chief on Tuesday visited the northern border of the country, wherein he was briefed by the Israeli forces on terrain and border management. While on Wednesday he visited the Israel Defence Forces headquarters and Indian Soldiers War Memorial in Jerusalem the next day.

The Ministry of Defence, in a statement, said that the Army Chief will take forward the excellent bilateral defence cooperation between Israel and India through multiple meetings with senior officials of the security establishment and exchange views on various defence-related issues.

https://www.ndtv.com/india-news/army-chief-general-mm-naravane-lays-wreath-at-indian-soldiers-war-memorial-in-israel-2616339

THE TIMES OF INDIA

Fri, 19 Nov 2021

SNC begins outreach events as part of Navy Week

Kochi: The Southern Naval Command (SNC) of the Indian Navy announced a slew of activities as part of the Navy Week 2021 celebrations. The SNC will conduct various events including an Operational Demonstration (Op Demo) by naval ships and aircraft in the Ernakulam channel, musical concert/ philharmonic orchestra by the Navy Band at Naval Base, outreach to veer naris and veterans, military photo exhibition, medical camps, environment protection and awareness camp, services to orphanages and old age homes, inter school quiz competition, etc.

Cmde Deepak Kumar, CO of INS Venduruthy (centre), Capt. Ajay Chellappan, executive officer of INS Venduruthy (left) and Kochi defence PRO Cdr Atul Pillai addressing the persons at Ernakulam Press Club on Thursday

This year, the theme of the Navy Week is 'Indian Navy – Combat Ready, Credible and Cohesive'. Navy Day is observed on December 4 every year as on this day during the Indo-Pak War of 1971, in a decisive blow to the enemy, the missile boats of the Indian Navy launched a daring attack on Karachi Harbour, paralyzing the entire coastal defence apparatus of the adversary.

The year marks the 50th anniversary of the Vijay Diwas (December 16), which is India's victory in 1971 Indo-Pak War and the nation observes the year 2021 as 'Swarnim Vijay Varsh'. Concurrently, the nation is also celebrating the 75th anniversary of its Independence.

Commanding Officer of INS Venduruthy and Station Commander, Kochi Area, Commodore Deepak Kumar said the activities has already begun and the Navy Wives Welfare Association and SNC have extended various services to Matruchaya Balabhavan Aluva on Sunday which included social services and medical assistance by specialists to the needy and distribution of aids and medicines.

On November 29, INS Venduruthy will be organizing social services at Nirmala Shishu Bhawan, Kaloor. A multispecialty medical camp by a team of specialists from the Indian Naval Hospital Ship Sanjivani is also being organized for the inhabitants of Cheriya Kadamakudy Village on December 1. INS Dronacharya is organizing services to Good Hope Old Age Home on November 27 which will include cultural programme/ interaction with inmates, minor repairs/ painting assistance to building, pruning of nearby trees/ upkeep of garden, distribution of ration, clothing, etc.

The Op Demo, which is the main attraction of the celebrations, will be held in the backwaters near Rajendra Maidan on December 4. It will showcase Navy ships steaming past in the channel, aircraft operations and marine commando action. Unlike last year, public will be allowed to attend Op Demo.

https://timesofindia.indiatimes.com/city/kochi/snc-begins-outreach-events-as-part-of-navy-week/articleshow/87787549.cms

THE TIMES OF INDIA

Fri, 19 Nov 2021

Second Chinese village along Arunachal border: Satellite images

New Delhi: Fresh satellite images apparently show China to have built a second new village along the disputed border in Arunachal Pradesh, though the Indian Army on Thursday stressed the "location was north of the Line of Actual Control (LAC)" in Chinese-held territory.

The new enclave of 60 buildings in the Shi Yomi district, which did not exist in 2019, has come up "six km inside" the territory claimed by India "in the region between the LAC and the International Boundary" shown on Indian maps, as per NDTV, which accessed the satellite images.

The new Chinese enclave, as seen in satellite images on March 19, 2019 (left) and on September 20, 2021 (right)

The Army, on being contacted by TOI, however, said the "location in question lies north of the LAC" as per the coordinates. An officer, in turn, added that "there has been no such construction within our perception of the LAC".

The 3,488-km LAC, stretching from eastern Ladakh to Arunachal Pradesh, is the demarcation that separates the Indian-controlled territory from the Chinese, though the two sides have "differing perceptions" of the line with Beijing refusing to "jointly clarify" it till now.

China, of course, continues with its salami-slicing tactics to nibble away territory of its neighbours like India and Bhutan. This is the second such newly-constructed Chinese village that has recently come to light on the disputed territory in Arunachal Pradesh.

The first was the 100-home village constructed on the banks of River Tsari Chu in the Upper Subansiri district last year, which lies 93 km west of the second enclave. The disputed area in the Upper Subansiri district has been under China's "adverse occupation" since the Longju incident in 1959. As reported by TOI earlier, China has been building as many as 628 'xiaokang' model border defence villages to fortify the borders of the Tibetan Autonomous Region with India and Bhutan over the last few years.

Though a lot of these "dual-use" villages lie on the Chinese side of the LAC, some are on disputed territory with India. "After the Doklam face-off in 2017, China has also constructed some new villages on Bhutanese territory," said an official.

Responding to the Chinese village constructed in the Upper Subansiri district, the external affairs ministry on November 11 said, "China has undertaken construction activities in the past several years along the border areas, including those that it has illegally occupied over the decades. India has neither accepted such illegal occupation of our territory nor has it accepted the unjustified Chinese claims."

https://timesofindia.indiatimes.com/india/second-chinese-village-along-arunachal-border-sat-images/articleshow/87788526.cms

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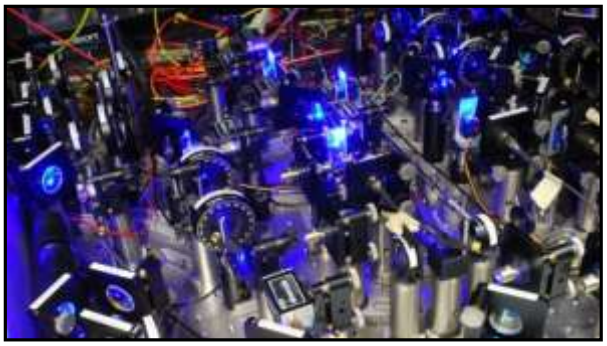
Fri, 19 Nov 2021

Laser cooling for quantum gases

What does it mean when we say that something is extremely cold? A physicist's answer would be: this means that atoms and molecules barely move. For several decades now, physicists have been developing techniques to create such ultracold states of matter, using lasers to bring gasses into the regime where quantum mechanics reigns. In a new 'Insight' issue of *Nature Physics*, UvA-physicists describe the developments in this nearly motionless yet very exciting world.



To cool down gasses of atoms or molecules into the quantum regime, intricate setups of lasers are required. Credit: University of Amsterdam

Slowing down an atom or a molecule so that it becomes part of an extremely cold substance is not straightforward. One cannot simply grab individual moving particles and force them to hold still. In the 1970s and 1980s, techniques were developed that do enable one to cool atoms in vacuum: using carefully tuned beams of laser light, the motion of particles can gradually be eliminated. Using this idea of laser cooling, one can slow down atoms and molecules to form gasses with temperatures close to the lowest possible one, about 273 degrees below zero on the Celsius scale.

Quantum gasses

When gasses get this cold, they become very 'clean', meaning that heat is only a very weak factor in the physical processes that go on. Instead, the laws of quantum mechanics dominate. In many gasses, the atoms collectively settle down to their lowest energy state, a process known as Bose-Einstein condensation. Only with the advent of laser cooling has it become possible to create and study matter in pure realizations of this very special quantum state, where all particles behave the same.

Over the years, the continued development of laser-cooling methods has allowed more elements to be brought into states of quantum degeneracy, with each additional atomic species offering its own experimental opportunities. For instance, nowadays ultracold atoms are used for the very best atomic clocks that can keep time to within a second over the lifetime of the universe. Bose-Einstein condensates act as sources of coherent atoms and are promising for extremely precise sensing through atom interferometry, similar to how laser interferometry revolutionized optical sensing.

Special issue

At the same time, many avenues for further research and development remain. Presently, to reach a state of Bose-Einstein condensation, several techniques are applied consecutively. Moreover, once such a quantum degenerate state is reached, the extreme circumstances usually—quite literally—evaporate quickly, destroying the quantum gas. Improved methods make it possible to reach a Bose-Einstein condensate purely through laser cooling, while also making it possible to maintain this special state for as long as desired: continuous Bose-Einstein condensation.

With the topic of ultracold gasses being such a hot topic in modern-day quantum physics and technology, leading physics journal *Nature Physics* decided to dedicate a special 'Insight' issue to the subject, titled 'Ultracold quantum gas technologies'. UvA-physicists Florian Schreck and

Klaasjan van Druten wrote a review article describing the current state of laser cooling for quantum gasses and the challenges for and expected progress in the future.

More information: Florian Schreck, Laser cooling for quantum gases, *Nature Physics* (2021). DOI: 10.1038/s41567-021-01379-w. www.nature.com/articles/s41567-021-01379-w

Journal information: *Nature Physics*

https://phys.org/news/2021-11-laser-cooling-quantum-gases.html

Fri, 19 Nov 2021

Iodine successfully tested in satellite ion thrusters

By Bob Yirka

A team of researchers from ThrustMe, working with colleagues from Sorbonne Université, has successfully tested the use of iodine as an ionizing agent in an ion-thrusting spacecraft engine. In their paper published in the journal *Nature*, the group describes their two-year test of the chemical element. The team has also posted a press release describing their work on their site.

Side view of a flight model of the NPT30-I2 iodine electric propulsion system firing in a vacuum chamber. Credit: ThrustMe

Space scientists have long known that the accelerants used to push rockets off launch pads are not ideal for spacecraft once they break free of Earth's gravity. These accelerants are powerful but very inefficient. Orbiting spacecraft do not need such power to remain in orbit—they just need a little push now and then to keep them in the proper orbit. For such craft, ion thrusters have proven to be a better alternative. Ion thrusters provide propulsion by expelling ions out of a port. The ions are created via electricity provided by solar panels to strip electrons off of a neutral atom. Currently, xenon gas is generally used as the neutral atom source. In this new effort, the researchers suggest that iodine is a better choice for the ionizing agent.

Iodine has been suggested as a replacement for xenon before, but the idea has always been discarded because it is so corrosive. The researchers with this new effort have developed a way to prevent corrosion and have tested their ideas in a real spacecraft: a cubesat orbiting the Earth over the past two years.

To overcome the corrosion issue, the researchers used ceramic materials and also stored the chemical in its solid form. One of its advantages is that it sublimates easily. The iodine is heated using power from the cubesat's solar panel and is held in a tank that is directly connected to an ionizing chamber. There, the gas is bombarded with electrons, knocking off other electrons, resulting in a plasma. Positive ions in the plasma are then accelerated by an electrical grid, creating thrust.

Notably, the test craft was small—each side is just 10 centimeters across. And it weighs just 1.2 kilograms. It has been operating in space over the past two years, and the thrusters have been used successfully on multiple occasions. This constitutes proof, the researchers suggest, that iodine is a good choice.

More information: Dmytro Rafalskyi et al, In-orbit demonstration of an iodine electric propulsion system, *Nature* (2021). DOI: 10.1038/s41586-021-04015-y

https://phys.org/news/2021-11-iodine-successfully-satellite-ion-thrusters.html

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Fri, 19 Nov 2021

Efficient photon upconversion at an organic semiconductor interface

Researchers at Institute for Molecular Science in Japan report that novel photon upconversion (UC) system with heterojunctions of organic semiconductors. The solid-state UC system is achieved with an external quantum efficiency of two orders of magnitude higher than those of the conventional systems. Using this result, efficient UC, from near-infrared to visible light, can be realized on flexible organic thin films under a weak light-emitting diode-induced excitation, observable by naked eyes.

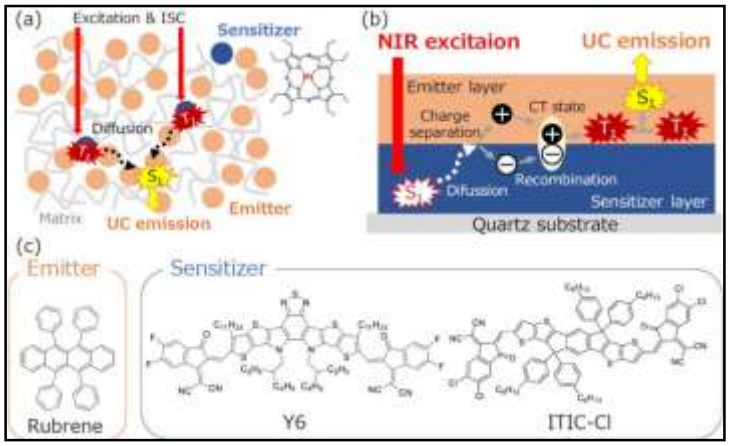

Fig. 1 (a) Schematic illustrations of the conventional UC mechanism in films, and chemical structure of conventional sensitizer. (b) Schematic illustrations of the novel UC mechanism at the organic semiconductor interface. (c) Chemical structures of sensitizer and emitter of the novel UC systems. Credit: NINS/IMS

Photon upconversion (UC) is a process in which a material increases the energy of incident photons, resulting in the emission of photons with higher energies. The potential applications of UC include the recovery of wasted low-energy photons in photovoltaics and photocatalysis. In addition, near-infrared (NIR) to-visible UC, offering the advantage of high penetration in living tissues, is desired for biosensing, optogenetics, and photodynamic therapy. The conventional UC system relies on a triplet formation from an absorbed photon by intersystem crossing (ISC), which is typically facilitated by heavy-atom effect in a sensitizer molecule (Fig. 1a). The two triplet excitons form high energy one singlet by an annihilation process. Finally, the UC emission occurs from an emitter molecule. However, the conventional solid-state UC is still inefficient, exhibiting a highest external quantum efficiency (EQE) of less than 0.1%, which remains the greatest challenge inhibiting its real-life applications.

Group of Assistant Professor Seiichiro Izawa and Professor Masahiro Hiramoto at Institute for Molecular Science in Japan report that novel UC systems with heterojunctions of bilayer films of organic semiconductors (Fig. 1b). The mechanism of the first step involved in the novel UC relies on the charge separation at the sensitizer/emitter interface, thereby converting the photoexcited sensitizer singlet to free charges. This process is the same as the photoconversion at the electron donor/acceptor interface in organic photovoltaics. Subsequently, the free charges recombine to form the triplet at the interface. The UC emission is observable after the triplet-triplet annihilation. The sensitizer/emitter molecules used in the novel UC system (Fig. 1c) do not contain heavy atoms because the mechanism does not rely on ISC. According to the proposed mechanism, the entire pure sensitizer layer can absorb the incident light and contribute to the UC process. As a result, the solid-state UC system is achieved with the EQE of two orders of magnitude higher than those of the conventional systems, with an irradiation intensity about 100 mW/cm^2, which is similar with standard solar fluence. The efficient UC enabled a demonstration of bright yellow emission on a flexible thin film by a NIR light-emitting diode excitation (Fig. 2). The novel UC system does not need strong laser excitation and the expensive platinum-group metals, rare-earth metals, or toxic elements. The finding leads to important applications of UC in flexible solar cells, bioimaging, and optogenetics.

More information: Seiichiro Izawa, Efficient solid-state photon upconversion enabled by triplet formation at an organic semiconductor interface, *Nature Photonics* (2021). DOI: 10.1038/s41566-021-00904-w. www.nature.com/articles/s41566-021-00904-w

Journal information: *Nature Photonics*

https://phys.org/news/2021-11-efficient-photon-upconversion-semiconductor-interface.html

COVID-19 Research News

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Fri, 19 Nov 2021

Air pollution linked to increased risk of getting sick from COVID-19: Study

The research, published in the journal Environment Health Perspectives on Wednesday, provides further evidence on the health benefits of reducing air pollution, and highlights the influence of environmental factors on infectious diseases.

Long-term exposure to air pollution is associated with an increased risk of developing COVID-19 among people who get infected with the SARS-CoV-2 virus, according to a study conducted in Spain.

Delhi air pollution. (Image: ANI)

The research, published in the journal Environment Health Perspectives on Wednesday, provides further evidence on the health benefits of reducing air pollution, and highlights the influence of environmental factors on infectious diseases.

The researchers said previous studies have suggested that regions with higher pre-pandemic levels of air pollution had a higher incidence of COVID-19 cases and deaths.

However, the reasons for this associations are not yet clear, they said.

According to the researchers, air pollution could favour airborne transmission of the virus, or it could increase an individual's susceptibility to infection or disease.

"The problem is that previous studies were based on reported cases, which had been diagnosed, but missed all the asymptomatic or undiagnosed cases," said study first-author Manolis Kogevinas from Barcelona Institute of Global Health (ISGlobal) in Spain.

The researchers measured a series of virus-specific antibodies in a group of adults living in Catalonia with information on the long-term exposure of such individuals to air pollutants such as nitrogen dioxide (NO2), small particulate matter (PM2.5), black carbon and ozone.

"This is the first study to perform mass screening of SARS-CoV-2 specific antibodies in an adult cohort to examine the association between their residential exposure to air pollution before the pandemic, SARS-CoV-2 infection, and disease," said Cathryn Tonne, a co-senior author of the study, from ISGlobal.

The research included 9,605 participants including 481 confirmed COVID-19 cases (5 per cent).

Blood samples from over 4,000 participants were also taken to determine the presence and quantity of IgM, IgA and IgG antibodies to five viral antigens, that cause the body to make an immune response against it.

Of these, 18 per cent had virus-specific antibodies, but no association was found between infection and exposure to air pollutants, the researchers said.

However, among those who got infected, an association was found between higher exposure to NO2 and PM2.5 and increased levels of IgG specific for the five viral antigens, which is an indication of higher viral burden and symptom severity.

For the total study population consisting of 9,605 participants, an association was found between higher exposure to NO2 and PM2.5 and disease, particularly for severe cases that ended in the hospital or in intensive care.

The association with PM2.5 was stronger for men over 60 years of age and people living in socioeconomically deprived areas, the researchers said.

"Our study provides the strongest evidence globally on the association of ambient air pollution and COVID-19," said Kogevinas.

"These results are in line with the association between air pollution and hospitalisation described for other respiratory diseases such as influenza or pneumonia," he said.

Air pollution could also contribute by favouring the development of cardiovascular, respiratory or other chronic conditions, which in turn increase the risk of severe COVID-19, the researchers said.

The results provide additional support for the public health benefits of reducing air pollution levels, they added.

https://www.moneycontrol.com/news/trends/features/storyboard18-how-auto-brands-should-emphasize-their-electric-ambitions-7737291.html