Feb
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THE ECONOMIC TIMES

Wed, 17 Feb 2021

118 Arjun Main Battle Tanks, MK-1A, with 71 upgrades will be made for Rs 8,500 crore

Huge orderbook for MBT MK-1A

PM Modi on February 14 handed over to the Indian Army the home-made Arjun Main Battle Tank (MK-1A). According to reports, the Heavy Vehicles Factory (HVF) at Avadi, has been placed with a Rs 8,500 crore order for manufacturing 118 of these tanks. Incidentally, the government recently told the Parliament that a total of 124 Main Battle Tank (MBT) Arjun Mark-1 have been inducted into the Indian Army since 2008 and two armoured regiments are fully operational with these tanks. "The DRDO has further developed an upgraded MBT Arjun Mark-1A tank. This upgraded MBT Arjun Mark-1A tank has cleared validation trials in December, 2018."

Increased mobility

According to an ET report, India has a robust tank force, but all of them are heavy main battle tanks — T72s, T90s and the indigenously developed Arjun — considered more suitable for operations in the plains. While these tanks have been sent to the Himalayan border as well, navigating them on difficult border terrain has been an issue. But V Balaguru, Associate Director of Main Battle tank and Transfer of Technology Department, Combat Vehicles Research and Development Establishment, said there are upgrades over the Arjun Mark 1. "Arjun Mark 1A has 71 major and user-driven upgrades that make it world-class and will immensely benefit the Indian Army. Features like increased mobility, fighting capabilities are added in the MK-1A," Balaguru said.

Creating value chain

G Satheesh Reddy, Secretary of Defence Research and Development and Chairman of Defence Research and Development Organisation (DRDO) has said that "Around 200 industries are working in a chain for the order in different ways, and provide employment for more than 8,000 people, which will boost the industries and the country's economy in a big way."

Ready for trials

The anti-tank guided missile or ATGM for MBT Arjun is a laser-guided PGM (Precision Guided Munition) which is launched from the 120 mm rifled gun of the tank to engage and defeat Explosive Reactive Armour (ERA) protected armoured targets. It was also recently shown at the Republic Day parade on the DRDO tableau.

Multi-agency collaboration

Arjun MK 1 Alpha is a "contemporary tank in the world with battle winning efficacy," officials have said. Fifteen academic institutions, eight labs and several MSMEs were also involved in the Arjun MK 1A.

https://economictimes.indiatimes.com/news/defence/118-arjun-main-battle-tanks-mk-1a-with-71-upgrades-will-be-made-for-rs-8500-crore/multi-agency-collaboration/slideshow/80966817.cms

Wed, 17 Feb 2021

Explained: 'Made in India' Arjun Main Battle Tank MK 1-A handed over to the Indian Army by PM Modi

In the article below know all about Made in India Arjun Battle Tank MK 1-A handed over to Indian Army by PM Modi recently in Chennai

By Tulika Tandon

Fermilab scientists have been conducting experiments to look for quantum fluctuations of space and time at the smallest scale imaginable according to known physics. At this limit, the Planck length, our classical notions of space and time break down.

Why in News?

Prime Minister Narendra Modi has handed over the indigenously developed Arjun Main Battle tank MK-1 to the Indian Army in an official ceremony in Chennai.

About: Arjun Main Battle Tank MK-1A

1. The army would get 118 units of the Main Battle Tank.
2. It has been indigenously designed, developed and manufactured by CVRDE and DRDO.
3. Along with the above mentioned, 15 academic institutions, eight labs and various MSMEs were also involved.
4. The project- Arjun Main Battle Tank was started by DRDO in 1972.
5. It was initiated along with the Combat Vehicles Research and Development Establishment as its lead laboratory

Arjun Battle Tank: Specifications

Dimensions

1. Overall length {with gun forward) : 10.638 m
2. Overall height {with gun rear) : 9.546 m
3. Overall height {with AD gun mount) : 3.03 m(Turret roof: 2.32 m)
4. Overall width : 3.864 m
5. Combat weight : 58.5 tons

Technical Details:

1. Max speed : 70 km/hr
2. Max speed on cross country : 40 km/hr
3. Ground pressure: 0.84 kg/sq. cm.
4. Engine power : 1400 HP at 2400 rpm
5. Engine characteristics: V 90° Turbo charged diesel, 10 cylinder water cooled
6. Power-to-weight ratio :24:1 HP/ton
7. Gear box : 4 forward +2 reverse gears Epicyclic gear train, Torque converter, Mechanical lockup clutch & hydrodynamic retARDEr

Arjun Main Battle Tank MK-1A: Objectives

1. The objective was to create a state of the art tank with superior fire power, high mobility and create an excellence in protection.

2. The mass production of the Arjun Battle Tank began in the year 1996 at Indian Ordnance Factory in Avadi facility.

Arjun Main Battle Tank MK-1A: Special Features

1. Fin Stabilised Armour Piercing Discarding Sabot (FSAPDS) ammunition and 120-mm calibre rifled gun are the major specialities of Arjun tanks.
2. It is also specialised in computer controlled integrated fire control system with stabilised sighting capable to function in all lighting conditions.
3. The secondary weapons are inclusive of a coaxial 7.62-mm machine gun for anti-personnel targets as well as a 12.7-mm machine gun for anti-aircraft and ground targets.
4. The tank is also known as the Hunter Killer. This makes it the most potent tank in India.

Arjun Main Battle Tank MK-1A: Achievements

1. The Arjun MBT has out performed the Russian T-90s in 2010. This exercise took place during a desert trial conducted by the Army.
2. India is now one of the countries in the league of 10 nations worldwide to design and develop their own MBT.
3. The other nations that are in this league are UK, Germany, USA, France, Israel, South Korea, Russia, China and Japan.

What is different in MK-1A?

1. It has 14 major upgrades than the previous version.
2. It would also be having a missile firing capability as per its design once the final tests are completed.
3. There is 54.3% indigenous content which was only 41% in the previous model.

History

The Indian Army had received the first batch of tanks in 2004. There were 16 tanks accepted during that time. They were inducted as a squadron of the 43 Armoured Regiment. In 2009, first ever Arjun regiment of 45 tanks was inducted in the army and by 2011, more than 100 tanks had been delivered. In 2010, the Indian army ordered another 124 Arjun Tanks.

https://www.jagranjosh.com/general-knowledge/all-about-made-in-india-arjun-main-battle-tank-mk-1a-dedicated-to-indian-army-by-pm-modi-1613378233-1

FINANCIAL EXPRESS
Read to Lead

Wed, 17 Feb 2021

Boost for Make in India in Defence; India gets ready to export military platforms to friendly nations

Besides several countries from Africa, IOR, many countries from ASEAN region as well as South America have been expressing interests in several platforms which have been made in India

By Huma Siddiqui

In an effort to achieve its USD 5 billion target in Defence exports by 2025, a list of 152 indigenous defence platforms to be exported has been released by the Ministry of Defence (MoD). The list has been prepared based on the inputs received from the Defence Attaches in the Indian Missions and Posts in the Indian Ocean Region (IOR), as well as Africa.

According to sources, "The list was prepared in consultations between the Ministry of External Affairs, Ministry of Defence and other agencies. A list of friendly nations has been drawn up and the items identified that can be exported based on the requirement in those countries."

Besides several countries from Africa, IOR, many countries from ASEAN region as well as South America have been expressing interests in several platforms which have been made in India.

What are items on the list?

Items including Indo-Russian BrahMos supersonic cruise missiles; the Advanced Towed Artillery Gun System (ATAGS); Pinaka multi-barrel rocket launchers; the Combat Management System for the navies are part of the long list of items which has been specially curated for exports. And there are items from many private companies which are not being used by the Indian forces but can be exported. And Communication Systems as well.

There are around 85 different equipment and 47 sub-systems.

There has been a lot of interest in the Light Combat Aircraft (LCA) `Tejas', Artillery guns, Missile Systems, and Helicopters, besides the body armour and night vision devices and armoured vehicles.

The idea behind preparing the list, according to sources, is to help in planning the extension of Line of Credits, or different financing options that can be extended to the countries which are interested.

Besides, the private sector companies, the Ministry of Defence is expecting that such a list will make it easier for the DAs to be in touch with the purchasing authorities in those countries and to keep the Industry aware of the tenders being posted.

Financial Express Online has reported earlier that some ASEAN nations, Middle East countries as well as from South America and Africa have expressed interest in the BrahMos and Akash Missile system.

Land Systems

The list has the ATAGS and the K-9 Vajra Howitzer which is already in service, there is the 155mm/52 Caliber towed gun and Garuda 105 lightweight field gun — the latter two have been manufactured by the private sector company Bharat Forge.

There are Mine protected vehicles, multi-mode hand grenades, different kinds of ballistic protection as well as combat helmets and vests manufactured by private firm MKU which are currently being exported to 100 countries across the globe. There are military vehicles being manufactured by Ashok Leyland.

Naval Platforms

In the export list there are patrol and interceptor boats, Landing Craft Utility – these are used in not only transporting troops but also more moving stores and materiel. And also anti-submarine warfare corvettes which are being made by a government owned shipyard.

Other products on the list include rocket launchers, Combat Management Systems, Coastal and Surveillance systems as well as lightweight and heavyweight torpedoes, and naval 30 mm guns.

Air Systems

While the LCA has already attracted a lot of global attraction, the Department of Defence Production list also has the Light Combat Helicopter which is awaiting orders from the Indian Air Force as well as the Indian Army.

Importance of IOR & Africa

Last year, as reported by Financial Express Online earlier, at the DefExpo in Lucknow, the first-ever India-African Defence Ministers' conclave was organized. There were defence ministers as well as top officials who had attended the conference.

This year, India hosted the Indian Ocean Region Defence Ministers' Conclave on the sidelines of the recently concluded Aero India 2021. The theme of the conclave was mainly focused on 'Enhanced Peace, Security and Cooperation within the Indian Ocean'.

Almost 18 countries from the region were physically present — Maldives, Comoros, Iran and Madagascar, Australia, Kenya, Seychelles, Mauritius, Kuwait and Myanmar and others.

https://www.financialexpress.com/defence/boost-for-make-in-india-in-defence-india-gets-ready-to-export-military-platforms-to-friendly-nations/2195788/

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Tue, 16 Feb 2021 2:08PM

Raksha Mantri launches E-Chhawani portal & mobile app that provides online civic services to residents of 62 Cantonment Boards

E-Chhawani is a big step towards good governance, says Shri Rajnath Singh

Raksha Mantri Shri Rajnath Singh launched E-Chhawani portal and mobile app in New Delhi on February 16, 2021. The portal (https://echhawani.gov.in/) has been created to provide online civic services to over 20 lakh residents of 62 Cantonment Boards across the country.

Through the portal, the residents of cantonment areas will be able to avail basic services like renewal of leases, application for birth & death certificates, water & sewerage connections, trade licences, mobile toilet locators and payment of different types of taxes and fees, with just a click of a button. The portal, jointly developed by eGov Foundation, Bharat Electronics Limited (BEL), Directorate General Defence Estates (DGDE) and National Informatics Centre (NIC), provides a platform to the residents to avail these services from the comfort of their home.

Speaking on the occasion, Raksha Mantri reiterated the Government's commitment of socio-economic development of the country by providing maximum facilities to the people and making the administration efficient & transparent. He said the government is striving to make the system citizen-friendly and provide services that facilitate 'ease of living' and 'ease of doing' for the people. Initiatives like 'Minimum Government - Maximum Governance', Digital India and E-Governance were launched by Prime Minister Shri Narendra Modi to promote good governance and ease of living for the people, Raksha Mantri said, adding that the launch of the E-Chhawani portal is a big step in that direction.

Shri Rajnath Singh described the E-Chhawani portal as an innovative effort to transform the functioning of Cantonment Boards, in line with the vision of 'New India'. He expressed confidence that the portal will ensure effectiveness and transparency of the services distribution system of the Cantonment Boards and provide time-bound solutions to the residents. Shri Rajnath Singh asked the concerned officers to periodically gather the feedback of beneficiaries in order to make the portal more citizen friendly.

Shri Rajnath Singh also stated that in the last few years, India has emerged as a global powerhouse and a land of opportunities due to its strong presence in the fields of defence, economy, trade, IT, agriculture & investment.

In his address, Defence Secretary Dr Ajay Kumar said, on the portal, the process of availing the services has been simplified for the benefit of the residents of Cantonment areas. He said, more services like filing of property and building tax, collection of rent and booking of community centres will soon be added to the Aadhaar-enabled portal. Dr Ajay Kumar congratulated eGov

Foundation, BEL, DGDE and NIC for completing the E-Chhawani project that encompassed 62 independent portals in a short time.

Chief of Defence Staff General Bipin Rawat, Director General Defence Estates (DGDE) Smt Deepa Bajwa and other senior civil and military officials of Ministry of Defence were present on the occasion.

To download the Echhawani app on your android mobile, click on the link below:-

https://play.google.com/store/apps/details?id=org.egovernment.echhawani.citizen

https://pib.gov.in/PressReleasePage.aspx?PRID=1698398

Press Information Bureau
Government of India

Ministry of Defence

Tue, 16 Feb 2021 5:00PM

Bangladesh Navy Ship Prottoy Visits Mumbai

Bangladesh Navy Ship (BNS) Prottoy is on a two day visit to Mumbai from 14 to 15 Feb 21. The ship commanded by Captain Ahamed Amin Abdullah with a crew of 137 personnel is docked at Mumbai Port Trust.

Due to COVID-19 imposed restrictions, routine courtesy call-ons, social get togethers, exchange visits and other sports fixtures between the visitors and host naval personnel are being avoided.

This visit of BNS Prottoy to Mumbai is significant in the backdrop that the two countries celebrated 50 years of Bangladesh independence recently. To commemorate the occasion, for the first time, a marching contingent and military band from Bangladesh participated in India's Republic Day Parade. Since the formation of Bangladesh, both India and Bangladesh have come a long way in nurturing strategic and defence relationships and these bonds are gradually growing in mutual trust and confidence.

https://pib.gov.in/PressReleasePage.aspx?PRID=1698425

Hindustan Times

Wed, 17 Feb 2021

First joint commands to be launched by May

India gets ready to roll out long-awaited theaterisation plan with Air Defence and Maritime commands

By Rahul Singh

India is set to begin a formal roll-out of its long-awaited theaterisation plan to best utilise its military's resources amid growing security threats, with the Air Defence Command and the Maritime Theatre Command set to be launched by May, people familiar with the developments said on Tuesday.

Chief of Defence Staff (CDS) Bipin Rawat at Parliament after a meeting with Defence Minister Rajnath Singh in New Delhi, Army Chief Gen MM Naravane is also seen.(PTI)

The commands are being set up in the backdrop of border tensions with China on the Line of Actual Control (LAC) in eastern Ladakh and Pakistani hostility along the Line of Control (LoC) in Jammu & Kashmir, with a joint threat from the two nuclear-armed neighbours being acknowledged as a reality by the country's military leadership, and at a time when India is demonstrating a muscular stance in the Indo-Pacific region.

"The final validation exercises to set up the two commands are in full swing. Aspects related to executing authority, command and control structures and budgeting are being fine-tuned," said a senior official, one of the people cited above, who asked not to be named.

The Air Defence Command, which will come up in Prayagraj (Allahabad), will be the first to be set up in April. It will control the air defence resources of all the three services, and will be tasked with protecting military assets from airborne enemies. Its commander-in-chief will be a top three-star Indian Air Force officer. The Maritime Theatre Command, to be headquartered in Karwar on the west coast, will come up the following month and be responsible for securing India from seaborne threats and will have army and air force elements under it. Its commander-in-chief will be a top three-star Indian Navy officer.

Theaterisation refers to placing specific units of the army, the navy and the air force under a theatre commander. Such commands are led by an officer from any of the three services, depending on the roles assigned to them.

"The Air Defence Command will be rolled out first, in April. The Maritime Theatre Command will follow a month later. The commanders-in-chief of the commands will report to the chief of defence staff (CDS) in his role as permanent chairman of the chiefs of staff committee (COSC)," said a second official, also speaking on the condition of anonymity.

Importance of jointmanship

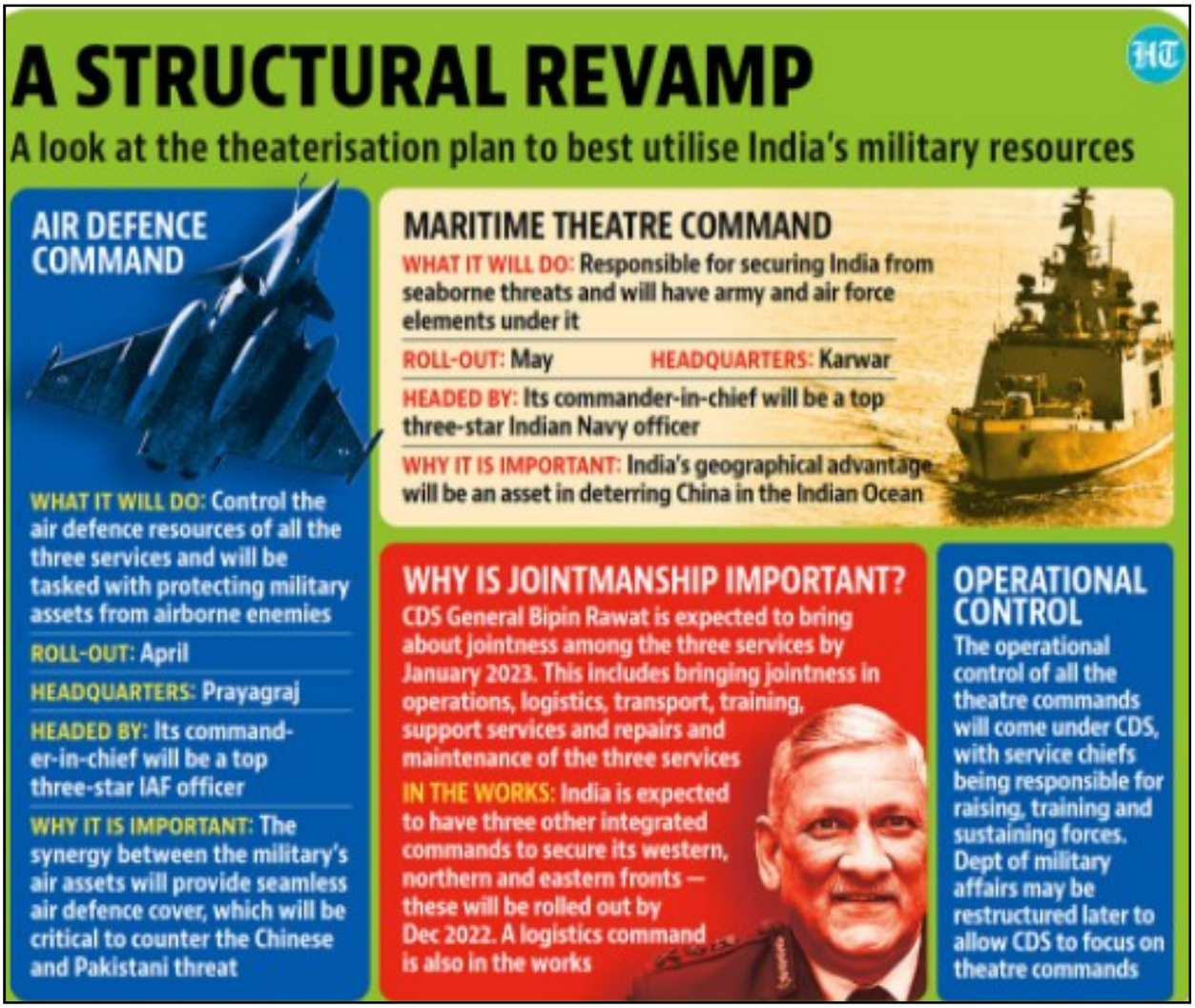
India's CDS General Bipin Rawat wears three hats — he is the permanent chairman of COSC, heads the department of military affairs (DMA), and is the single-point military adviser to the defence minister.

The government expects Rawat, who took charge as India's first CDS on January 1, 2020, to bring about jointness among the three services in a three-year time frame (by January 2023). One of the means to achieve jointness is the setting up of integrated theatre commands for the best use of military resources to fight future battles.

Apart from the Air Defence and Maritime Theatre Commands, India is expected to have three other integrated commands to secure its western, northern and eastern fronts — these will be rolled out by December 2022, and several studies are currently on to finalise the structures of these

commands. In addition, a logistics command is in the works to avoid duplication of efforts and resources. The CDS's mandate includes bringing about jointness in operations, logistics, transport, training, support services and repairs and maintenance of the three services.

The long-overdue integrated theatres will transform the Indian military from a military force to a military power, contributing to India's stature as a global leader, said Lieutenant General Vinod Bhatia (retd), who was heading the Centre for Joint Warfare Studies (CENJOWS) until last month and has worked extensively on aspects related to jointness. "On account of China's aggressive behaviour along the LAC and the Covid-19 pandemic, the armed forces will be tasked, asked and expected to do more with less (resources). Hence, it is imperative that the armed forces roll out the integrated theatre commands fast," said Bhatia, also a former director general of military operations.



The Air Defence Command will bring about the much-needed synergy between air assets of the three services, with their optimal application providing seamless air defence cover, which will be critical to counter the Chinese threat, experts said.

"While the aerospace domain is critical for deterrence, the maritime theatre too needs integration at the earliest as our locational/geographical advantages can deter China's aggressiveness (in the Indian Ocean region). Synergy in application of combat power is essential in new age warfare, which is multi domain and waged in many key battle spaces simultaneously," said Bhatia. India has finally demonstrated politico-military will to address the much-needed theaterisation, he said.

Restructuring in DMA?

The operational control of all the theatre commands will eventually come under CDS, with the service chiefs being responsible for raising, training and sustaining their forces.

"CDS will have operational control over all the integrated commands when they are fully functional. This will be in his role as CDS, and not as permanent chairman, COSC. And whenever that happens, some restructuring will have to be carried out in DMA," said the first official.

The restructuring, he said, could involve the chief of integrated defence staff to COSC, or CISC, being appointed as the secretary of DMA in due course to allow CDS to focus on the theatre commands. CISC is a three-star officer and the number 2 man in DMA. DMA is one of the five verticals in the defence ministry, apart from the departments of defence, defence production, defence research and development and ex-service welfare.

"The armed forces will also have to ensure that the transformation also factors in transition management, as we have to be present-relevant and effective as also future ready," Bhatia said.

The government is clear about one thing — the setting up of the integrated commands will not entail creating new infrastructure. "If you take that route, it not only adds to the financial burden but also becomes a five-year plan. The integrated commands will be created using existing infrastructure," said the second official.

The Indian military is pushing ahead with theaterisation at a time when the country faces a collusive threat from China and Pakistan. The threat isn't just something that is a part of some strategic paper or loud thought process, but it manifests itself on the ground, army chief General Manoj Mukund Naravane said on January 12.

https://www.hindustantimes.com/india-news/first-joint-commands-to-be-launched-by-may-101613500932277.html

Wed, 17 Feb 2021

Indian Navy receives third Scorpene Submarine, to be commissioned as INS Karanj

With the delivery of INS Karanj, India has been able to cement its position as a submarine-building nation

By Shailaja Tripathi

The Indian Navy on February 15, 2021, got its third Scorpene Submarine, which will be commissioned as INS Karanj in March, of Project P-75. With the delivery of INS Karanj, India has been able to cement its position as a submarine-building nation.

The acceptance document was signed by the Chairman and Managing Director of Mazagaon Dock Shipbuilders Limited, Vice Admiral (Retd) Narayan Prasad, and the Chief of Staff officer (Tech) of Western Naval Command, Rear Admiral B Sivakumar.

Submarine Karanj

Total 6 submarines of the Indian Navy are being constructed under Project 75. The number 75 refers to the unique identifier which was assigned for a program for the productions of the submarines. The three submarines that are delivered by Mazagaon Dock Shipbuilders Limited- MDL including Karanj, are Khanderi and Kalvari.

Submarines of Indian Navy:

Apart from the three submarines Karanj, Khanderi, and Kalvari, the fourth submarine Vela was launched on May 6, 2019, and has already commenced the sea trials.

The fifth submarine which was launched on November 12, 2020, has also started the harbour sea trials. While on the other hand, the sixth submarine is currently in an advanced stage of outfitting.

Two SSK submarines that were built by MDL in 1992 and 1994 are still in the service today, even after more than 25 years.

MDL achieves expertise in submarines:

Mazagaon Dock Shipbuilders Limited- MDL is one the leading shipyards of India with the capability and capacity of meeting the aspirations and requirements of the Indian Navy.

MDL has now achieved expertise in submarine refits by successfully executing the medium-refit-cum up-gradation of the Indian Navy's 4 SSK class submarines.

MDL is currently carrying out the Medium Refit and Life Certification of the first SSK submarine, INS Shishumar.

With the construction of the Khukri Class Corvettes, Leander and Godavari Class frigates, Delhi and Kolkata Class destroyers, Missile Boats, the SSK Submarines, Shivalik Class Stealth Frigates, and the Scorpene Submarine under its belt, Mazagaon Dock Shipbuilders Limited has almost mapped the history of India's indigenous warship building.

https://www.jagranjosh.com/current-affairs/indian-navy-receives-third-scorpene-submarine-to-be-commissioned-as-ins-karanj-1613475700-1

ThePrint

Wed, 17 Feb 2021

Indian & Chinese infantry soldiers begin moving back from Kailash Range south of Pangong Tso

New visuals released by Indian Army show Chinese dismantling tents and camps, and a large number of vehicles moving back with troops and equipment

By Snehesh Alex Philip

New Delhi: After armoured and mechanised columns, Indian and Chinese infantry soldiers have begun disengaging from the Kailash Range south of the Pangong Tso. The process is set to be completed by Friday.

Chinese PLA troops march back from the Pangong Tso area in eastern Ladakh | Photo released by Indian Army

The Indian Army has released visuals of the ongoing pull-back, showing soldiers of the People's Liberation Army dismantling their tents and camps and carrying loads to light vehicles. Large groups of soldiers can be seen 'de-inducting', and vehicles moving towards the rear with troops and equipment.

The visuals also show the Chinese using earth-movers or 'JCBs' to restore soil that was dug up to set up various pieces of infrastructure on the north and south bank of the Pangong lake. According to the disengagement deal agreed to by the two countries, all landforms are to be restored by both the sides.

Sources in the defence and security establishment said the disengagement process is "on the right track", and as part of the agreement, soldiers have started withdrawing from the heights on the southern bank, which were occupied in an operation on the night of 29-30 August.

The withdrawal is taking place from the Gurung and Magar Hills, besides Rechin La and Rezang La on the southern bank, and from the 'Finger Area' on the northern bank.

"Both India and China are pulling back according to the agreement. The first focus on the south bank was the armoured and mechanised columns. China has, in total, withdrawn about 200 such vehicles. India has pulled back too. Now the focus is on infantry elements," a source said.

As reported by ThePrint on Monday, the Chinese have already dismantled their jetty at Finger 5 and a helipad, and are in the process of taking down tents and observation posts.

Where both sides' troops are headed

China has pulled back its armoured and mechanised columns and troops from the southern bank to the Rutog military base, where the PLA had developed a lot of infrastructure during the stand-off. After nine months of stand-off, India and China had finally agreed to disengage from the Pangong Tso, and the withdrawal was initiated last Wednesday.

According to the disengagement agreement, the troops around the lake will go back to pre-April 2020 locations.

On the northern bank, Indian soldiers will move back to their last permanent base in the Finger area, the Dhan Singh Thapa post of the Indo-Tibetan Border Police (ITBP), near Finger 3. Chinese troops will go back to their permanent Sirijap post beyond Finger 8, a location that they captured in the 1962 war.

However, disengagement from the strategic Depsang Plains, Gogra Post and Hot Spring area is yet to be finalised.

https://theprint.in/defence/indian-chinese-infantry-soldiers-begin-moving-back-from-kailash-range-south-of-pangong-tso/605998/

Business Standard

Wed, 17 Feb 2021

Iran-Russia Maritime Security Belt 2021: India joins two-day navy exercise

The Indian Navy has also joined the exercise with a select group of vessels, Admiral Gholamreza Tahani, spokesman of the drill, was quoted as saying

India has joined Iran and Russia in a two-day navy exercise dubbed "Iran-Russia Maritime Security Belt 2021" in the northern part of the Indian Ocean.

According to a report by Al Jazeera, forces and vessels from the navy divisions of both the Iranian army and the Islamic Revolutionary Guard Corps (IRGC) participated in the drill, which kicked off on Tuesday, alongside several vessels from the Russian navy.

The drill will cover an area of 17,000 square kilometres (6,500 square miles). Representative Image

The Indian Navy has also joined the exercise with a select group of vessels, Admiral Gholamreza Tahani, spokesman of the drill, was quoted as saying.

"The exercise we are conducting with Russia is so flexible that not only one other country, but several others could join in later if they wish to do so," he said.

Meanwhile, Hossein Khanzadi, commander of the Iranian Navy, has said that the Chinese Navy will also be participating in the exercise.

The drill will cover an area of 17,000 square kilometres (6,500 square miles). It will include shooting at sea and air targets and liberating hijacked ships, as well as search and rescue and anti-piracy operations, Al Jazeera reported.

"It means that global arrogance which until today dominated the region must realise that it needs to leave it," Khanzadi was quoted as saying by the Iranian Army's website.

(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/iran-russia-maritime-security-belt-2021-india-joins-two-day-navy-exercise-121021700109_1.html

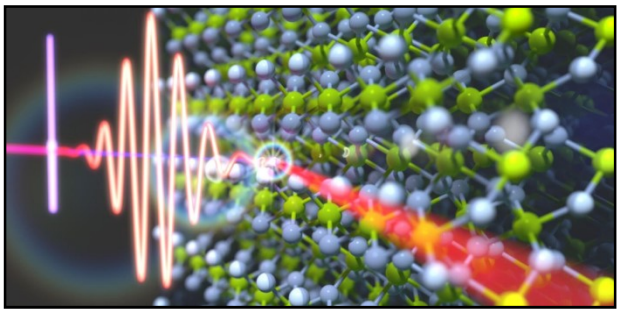
Science & Technology News

PHYS.ORG

Wed, 17 Feb 2021

Dual character of excitons in the ultrafast regime: Atomic-like or solid-like?

Excitons are quasiparticles which can transport energy through solid substances. This makes them important for the development of future materials and devices—but more research is needed to understand their fundamental behavior and how to manipulate it. Researchers at Politecnico di Milano in collaboration with the Institute of Photonics and Nanotechnologies IFN-CNR and a theory group from the Tsukuba University (Japan) and the Max Plank Institute for the Structure and Dynamics of matter (Hamburg, Germany), have discovered that an exciton can simultaneously adopt two radically different characters when it is stimulated by light. Their work, now published in *Nature Communications*, yields crucial new insights for current and future excitonics research.



Attosecond measurement of an exciton in an MgF2 crystal. Credit: Polimi

Excitons consist of a negatively charged electron and a positively charged hole in solids. They are a so-called many-body-effect, produced by the interaction of many particles, especially when a strong light pulse hits the solid material. In the past decade, researchers have observed many-body-effects down to the unimaginably short attosecond time scale, in other words billionths of a billionth of a second.

However, scientists have still not reached a fundamental understanding of excitons and other many-body effects due to the complexity of the ultrafast electron dynamics when many particles interact. The research team from Politecnico di Milano, the University of Tsukuba and the Max Planck Institute for the Structure and Dynamics (MPSD) wanted to explore the light-induced ultrafast exciton dynamics in MgF_2 single crystals by employing state-of-the-art attosecond transient reflection spectroscopy and microscopic theoretical simulations.

By combining these methods, the team discovered an entirely new property of excitons: The fact that they can simultaneously show atomic-like and solid-like characteristics. In excitons displaying an atomic character, the electrons and holes are tightly bound together by their Coulomb attraction—just like the electrons in atoms are bound by the nucleus. In excitons with a solid-like character, on the other hand, the electrons move more freely in solids, not unlike waves in the ocean.

"These are significant findings—says lead author Matteo Lucchini from the Politecnico di Milano—because understanding how excitons interact with light on these extreme time scales allows us to envision how to exploit their unique characteristics, fostering the establishment of a new class of electro-optical devices."

During their attosecond experiment performed at the Attosecond Research Center, the researchers managed to observe the sub-femtosecond dynamics of excitons for the first time, with signals consisting of slow and fast components. This phenomenon was explained with advanced theoretical simulations, adds co-author Shunsuke Sato from the MPSD and the University of Tsukuba: "Our calculations clarified that the slower component of the signal originates from the atomic-like character of the exciton while the faster component originates from the solid-like character—a ground-breaking discovery, which demonstrates the co-existence of the dual characters of excitons!"

This work opens up an important new avenue for the manipulation of excitonic as well as materials' properties by light. It represents a major step towards the deep understanding of non-equilibrium electron dynamics in matter and provides the fundamental knowledge for the development of future ultrafast optoelectronic devices, electronics, optics, spintronics, and excitonics.

More information: Lucchini, M., Sato, S.A., Lucarelli, G.D. et al. Unravelling the intertwined atomic and bulk nature of localised excitons by attosecond spectroscopy. *Nat Commun* 12, 1021 (2021). doi.org/10.1038/s41467-021-21345-7

Journal information: Nature Communications

https://phys.org/news/2021-02-dual-character-excitons-ultrafast-regime.html

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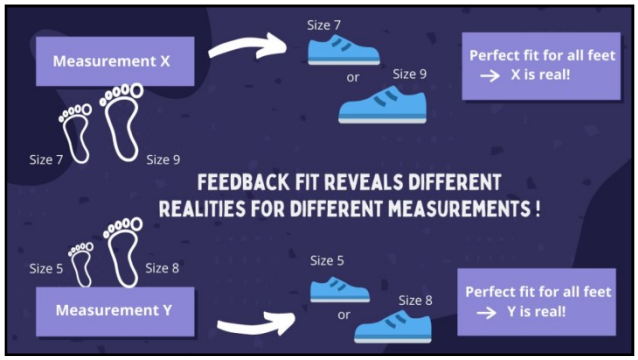
Wed, 17 Feb 2021

Experimental demonstration of measurement-dependent realities possible, researcher says

Shoe shops sell a variety of shoe sizes to accommodate a variety of foot sizes—but what if both the shoe and foot size depended on how it was measured? Recent developments in quantum theory suggest that the available values of a physical quantity, such as a foot size, can depend on the type of measurement used to determine them. If feet were governed by the laws of quantum mechanics, foot size would depend on the markings on a foot measure to find the best fit—at the time of measurement—and even if the markings were changed, the measurement could still be precise.



Feedback compensation tests whether measurement results fit their physical reality. Image caption: It is hard to know whether a quantum measurement is precise or not. Feedback compensation directly compares the measurement result with an "imprint" of the original left in a weak interaction. It is a bit like trying on shoes - you can tell whether the shoe fits or not, and a good fit confirms the result of your measurement. In quantum mechanics, it is possible to get a good fit from completely different measurements. The newly reported results show that the dependence of reality on the measurement is an experimentally testable fact. Credit: Holger Friedrich Hofmann, Hiroshima University

In quantum mechanics, the "size" of a physical quantity is more elusive than foot length because unavoidable uncertainties in the history of a quantum system make it difficult to confirm the measurement due to what's called the uncertainty principle. Essentially, it is impossible to know the real properties that a quantum system had before the measurement. There isn't a way to try on the

shoe after the measurement—until now. A researcher at Hiroshima University may have found a solution to the problem, with possible implications for emerging quantum information technologies, such as quantum communication and quantum computing.

Holger F. Hofmann, professor in the Graduate School of Advanced Science and Engineering, Hiroshima University, published his approach on Feb. 3 in *Physical Review Research*.

According to Hofmann, a qubit—the basic unit of quantum information—can be used as an external probe to test the precision of a measurement of a physical property in its original quantum system. The probe interacts weakly, creating a memory of the physical property that is automatically encrypted by the qubit. The quantum encrypted one qubit memory can be used to evaluate the precision of a subsequent measurement. A feedback design allows the later measurement value to erase the quantum memory encoded on the probe qubit. If the memory is perfectly erased without any leftover traces, Hofmann said, the measurement outcomes must have been precise each and every time the measurement was performed.

This experimental procedure to probe the amount of uncertainty in a measurement result allows researchers to demonstrate that different measurements can accurately determine the same physical property of a quantum system before the measurement happened—even when the values of the physical property change based on the measurement procedure, according to Hofmann.

"Quantum mechanics describes physical systems as mysterious 'super positions' of possibilities that seemingly 'collapse' into reality only when a measurement distinguishes the different possibilities," Hofmann said, referring to the idea that mere observation fundamentally changes a system. "There have been many attempts to find out what is there when nobody is looking, and my work builds on these previous attempts."

Hofmann noted that these attempts involve unmeasurable, unobservable uncertainties, making it difficult to answer any questions about the fundamental nature of reality.

"There is still a lot to do, and I hope that many members of the quantum measurement community will join in to develop the necessary theoretical framework," Hofmann said. "Physics should be grounded in observable phenomena, but, strangely enough, the concepts used in quantum mechanics are not."

More information: Holger F. Hofmann. Direct evaluation of measurement uncertainties by feedback compensation of decoherence, *Physical Review Research* (2021). DOI: 10.1103/PhysRevResearch.3.L012011

https://phys.org/news/2021-02-experimental-measurement-dependent-realities.html

Wed, 17 Feb 2021

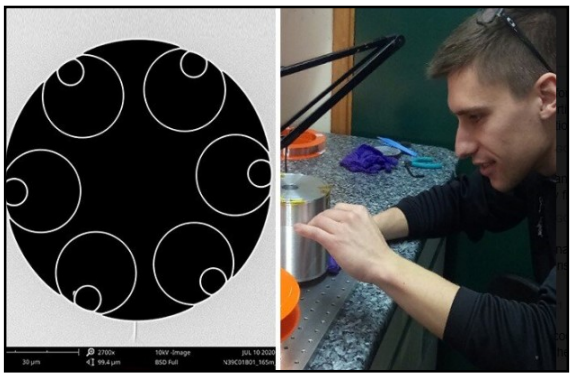
International study reveals exceptional property of next generation optical fibres

Researchers from the University of Southampton and Université Laval, Canada, have successfully measured for the first time back reflection in cutting-edge hollow-core fibres that is around 10,000 times lower than conventional optical fibres.

This discovery, published this week in the Optical Society's flagship *Optica* journal, highlights yet another optical property in which hollow-core fibres are capable of outperforming standard optical fibres.

Research into improved optical fibres is key to enable progress in numerous photonic applications. Most notably, these would improve Internet performance that heavily relies on optical fibres for data transmission where current technology is starting to reach its limits.

A small portion of the light that is launched into an optical fibre is reflected backwards as it propagates, in a process known as backscattering. This backscattering is often highly undesirable as it causes attenuation of signals propagating down the optical fibre and limits the performance of many fibre-based devices, such as fibre optic gyroscopes that navigate airliners, submarines and spacecrafts.



Left: Light propagates through a central hole of the hollow-core fibre. Right: co-author Vincent Michaud-Belleau from COPL, Université Laval. Credit: University of Southampton

However, the ability to reliably and accurately measure backscattering can be beneficial in other instances, such as the characterisation of installed fibre cables where the backscatter is used to monitor the condition of a cable and identify the location of any breaks along its length.

The latest generation of hollow-core Nested Antiresonant Nodeless Fibres (NANFs), which have been pioneered in the Southampton-led LightPipe research programme and applied to novel application fields within the Airguide Photonics programme, exhibit backscattering that is so low that up until this point it remained unmeasurable.

To resolve this challenge, Optoelectronics Research Centre (ORC) researchers at the University of Southampton teamed up with colleagues from the Centre for Optics, Photonics and Lasers (COPL) at Université Laval, Québec, who specialise in research into highly-sensitive optical instrumentation.

They developed an instrument that enabled the team to reliably measure the extremely weak signals back-scattered in the latest ORC-fabricated hollow-core fibres—confirming that scattering is over four orders of magnitude lower than in standard fibres, in line with theoretical expectations.

Professor Radan Slavik, Head of the ORC's Coherent Optical Signals Group, says: "I am very fortunate to work in the ORC, where the long-term, world-leading research of my design and fabrication colleagues has led to the lowest-loss and longest-length hollow-core fibres ever made. My work has focussed on measuring the unique properties of these fibres, which is often challenging and requires collaborations with world-leading groups in measurement, such as the UK's National Physical Laboratory and instrumentation, such as Université Laval."

Dr. Eric Numkam Fokoua, who carried out the theoretical analysis at the ORC to support these findings, says: "The experimental confirmation of our theoretical prediction that backscattering is 10,000 times less in our latest hollow-core fibres than in standard all-glass fibres demonstrates their superiority for many fibre optic applications.

"Moreover, the ability to measure such low backscattered signal levels is also critical in the development of hollow-core fibre technology itself, in providing a critical route to distributed fault-finding in fabricated hollow-core fibres and cables as needed to drive forward improvements in their manufacturing processes. Existing technology is simply not sensitive enough to work with these radical new fibres and this work demonstrates a solution to this problem."

More information: V. Michaud-Belleau et al. Backscattering in antiresonant hollow-core fibers: over 40 dB lower than in standard optical fibers, *Optica* (2021). DOI: 10.1364/OPTICA.403087

Journal information: Optica

https://phys.org/news/2021-02-international-reveals-exceptional-property-optical.html

THE HINDU

Wed, 17 Feb 2021

Zinc, vitamin C supplements does not decrease duration of COVID-19 symptoms: study

The study showed no significant difference between the usual care, vitamin C, zinc gluconate or the group receiving both vitamin C and zinc gluconate

Taking zinc or vitamin C supplements does not significantly decrease the severity or duration of symptoms in COVID-19 patients, when compared to standard care, according to a study.

Researchers at Cleveland Clinic in the U.S. noted that zinc is known to be important for immune function, with a role in antibody and white blood cell production and fighting infections. Vitamin C, an antioxidant, can help reduce damage to cells, and has shown to be immune-boosting, they said.

The COVID AtoZ clinical trial enrolled 214 adult patients with a confirmed COVID-19 infection. The participants either received 10 days of zinc gluconate (50 mg), vitamin C (8000 mg), both agents, or standard of care from April 2020 to October 2020.

The study, published in the journal *JAMA Open Network*, found no significant difference among the four groups.

Image for representative purposes only | Photo Credit: REUTERS

At 50% reduction in symptoms, the study showed no significant difference between the usual care, vitamin C, zinc gluconate or the group receiving both vitamin C and zinc gluconate.

"When we began this trial, there was no research to support supplemental therapy for the prevention or treatment of patients with COVID-19," said Milind Desai, from Cleveland Clinic's Heart Vascular & Thoracic Institute and co-principal investigator of the study. "As we watched the pandemic spread across the globe, infecting and killing millions, the medical community and consumers alike scrambled to try supplements that they believed could possibly prevent infection, or ease COVID-19 symptoms, but the research is just now catching up."

"While vitamin C and zinc proved ineffective as a treatment when clinically compared to standard care, the study of other therapeutics continues," he said. The patients enrolled in this study were not hospitalised, but rather managed on an outpatient basis.

"We know that not all patients with COVID-19 require hospital admission, and compared to those being treated in a hospital setting, they are more likely to be seeking out supplements that could help them, so it was an important population to study," said Suma Thomas, from Cleveland Clinic's Heart Vascular & Thoracic Institute and co-principal investigator of the study.

The researchers said a total of four safety events were observed during the trial, including three deaths. However, the data safety monitoring board did not believe that any of the adverse events were caused by individual treatments that patients received as a part of the study.

https://www.thehindu.com/sci-tech/science/zinc-vitamin-c-supplements-does-not-decrease-duration-of-covid-19-symptoms-study/article33850019.ece