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समाचार पत्रों से चयित अंश Newspapers Clippings

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology

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रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
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THE TIMES OF INDIA*Tue, 01 March 2022***HEMRL to build safe exit for staff for emergencies**

Pune: The High Energy Materials Research Laboratory which deals with development of warheads containing high explosives like TNT, RDX, among others, will have a dedicated escape gate for the safe exit of its scientists and employees in case of any accidental explosion or mishap.

“Work on this project will commence in the next few weeks,” HEMRL director KPS Murthy told TOI on Monday. The DRDO headquarters recently cleared the proposal for the gate after a team of experts from the Centre of Fire, Explosives and Environment Safety recommended it.

The HEMRL has 1,400 scientists and employees working on the campus. Over the last two decades, at least five accidental explosions or fires have occurred on this campus. The experts and internal committee of the laboratory carry out safety inspections of critical units to avert any accidental mishap every year, officials said.

“Although the standard operating procedure is in place in each facility of the laboratory, human error or technical errors cannot be ruled out. One needs to have full-proof safety in place to reach fire brigade vehicles to control the damage. The new escape route will be used for that purpose as well,” the official added.

The gate is likely to come up on the Mumbai-Bengaluru highway side. HEMRL is based on 800 acres in Sutarwadi.

<https://timesofindia.indiatimes.com/city/pune/hemrl-to-build-safe-exit-for-staff-for-emergencies/articleshow/89910266.cms>



Press Information Bureau
Government of India

Ministry of Defence

Mon, 28 Feb 2022 9:30PM

National Science Day celebrations at DRDO

DRDO celebrated National Science Day 2022 with the wide participation of Scientists & staff. On this occasion, a special function was organised by Defence Science Forum at DRDO Bhawan. Dr M Ravichandran, Secretary Ministry of Earth Science was the Chief Guest of the event. The function was presided over by Dr G Satheesh Reddy, Secretary DDR&D and Chairman DRDO.

In his keynote address, Dr M Ravichandran, Secretary Ministry of Earth Science stressed the need for integration of science & technology for the exploration of ocean resources for ocean research. Talking about the first manned ocean mission, he highlighted that the aim of the mission is to dive deep into the ocean up to 5000 meters under the Samudrayaan project. He said that the cutting-edge technology will help deep-ocean exploration, clean energy and the blue economy.

Secretary DD R&D and Chairman DRDO in his address congratulated the scientific community for its ongoing quest to achieve excellence and self-reliance. He emphasised that scientific temperament, humanism and the spirit of inquiry are the principles with which we design to equip

our armed forces with indigenous products and technologies. In line with the theme of National Science Day, “Integrated approach in science and technology for a sustainable future”, DRDO shall always provide world-class S&T solutions for the defence of the nation and achieve the mission of an Aatmanirbhar Bharat.

Twenty Nine research papers were received from various DRDO labs/establishments, out of which three research papers were selected & presented at the event as DRDO Science Day Oration. Defence Science Spectrum, a compilation of all the scientific papers received from labs, was also released by dignitaries on the occasion.

On this occasion, Monograph titled ‘Introduction to Explosive Reactive Armour’ authored by Harpal Singh Yadav former Sc-G from HEMRL, DRDO was released. The monograph describes the basic functioning of Explosive Reactive Armour (ERA) and the fundamentals of explosion dynamics and shock waves which are relevant and necessary to understand the basic mechanism of ERA.

National Science Day is celebrated each year on 28 February to commemorate the discovery of the “Raman Effect” in 1928 by Sir Chandrasekhara Venkata Raman, which led to the Nobel Prize being awarded to him in the year 1930. The purpose of celebrating this day is to enhance scientific temper, popularization of science and encourage innovative activities by infusing scientific temperament in the masses and to create a positive scientific research culture.

Defence Science Forum is a platform of DRDO where scientists of various disciplines interact to foster fellowship, exchange of ideas with experts of different disciplines and debate the feasibility of interdisciplinary projects where expert opinions are required.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1801980>



Tue, 01 March 2022

Visakhapatnam: National Science Day celebrations conclude

Highlights

- *The day is observed every year on Feb 28 to mark the discovery of ‘Raman Effect’ by Sir CV Raman*
- *NSTL director says science contests will aid in bringing out scientific temper among students*

Visakhapatnam: National Science Day Celebration (NSDC)-2022 was concluded at Naval Science and Technological Laboratory (NSTL), the premier naval research laboratory of Defence Research & Development Organisation (DRDO) in Visakhapatnam on Monday.

National Science Day is observed every year on February 28, to mark and celebrate the discovery of ‘Raman Effect’ by Sir CV Raman. This year, the celebrations were organised in commemoration of Azadi Ka Amrit Mahotsav.

Director general of Naval Systems and Materials Dr Samir V Kamat, president of Amity Science, Technology & Innovation Foundation W Selvamurthy and Chairman KFRC (KIMS Foundation Research Centre) V Bhujanga Rao, among others took part in the event, that included paying floral tributes to the portrait of Sir CV Raman.



Dignitaries releasing Hindi magazine ‘Manthan’ at NSTL in Visakhapatnam on Monday

Speaking on the occasion, NSTL director Y Sreenivas Rao said that science contests will aid in bringing out scientific temper among students.

Independent Verification and Validation (IV&V) Policy of NSTL and e-version of the organisation's Hindi magazine 'Manthan' were released by the dignitaries.

<https://www.thehansindia.com/news/cities/visakhapatnam/visakhapatnam-national-science-day-celebrations-conclude-731358?infinitescroll=1>



Tue, 01 March 2022

National Science Week 2022 Concludes at KiiT International School

Bhubaneswar: As a part of the Azadi Ka Amrit Mahotsav, grand programmes and exhibitions to showcase indigenous science, technology, and innovations were held at 75 locations across the country, including KiiT International School, Bhubaneswar, from 22nd – 28th February 2022.

The week-long celebrations themed 'Vigyan Sarvatre Pujyate' and jointly organised by the Ministry of Culture, Government of India, Office of the Principal Scientific Officer to the Government of India, and Vigyan Prasar and supported by DST, DBT, CSIR, MoES, DAE, DOS, ICMR, AICTE, and DRDO, concluded on 28th February, on the occasion of National Science Day.

The festival at Bhubaneswar was organised under the aegis of Science and Technology Department, Govt. of Odisha in association with Odisha Bigyan Academy, Bhubaneswar City Knowledge Innovation Cluster, KIIT Deemed to be University and Regional Science Centre, Bhubaneswar.

The valedictory ceremony at KiiT International School was graced by Dr. K. K. Nanda, Director, Institute of Physics; Mr. Laxmi Narayan Padhi, Senior Scientist, Science and Technology Department, Govt. of Odisha; Dr. P. C. Padhi, Chief Manager, CIPET-IPT; Dr. S. Hajra, DRDO Coordinator for ITR, Chandipur; Dr. S. Dutta, Coordinator, "Proof and Experimental Establishment (PXE)" DRDO, Chandipur; Dr. Bibhuti Bhusan Mishra, President, Odisha Bigyan Academy; Dr. Mrutyunjay Suar, Director General-R&D, KIIT-DU and Chairman, BCKIC; Dr. Mona Lisa Bal, Chairperson, KiiT International School and Dr. Sanjay Suar, Principal.



They addressed the students highlighting the capabilities of Indian Science and Technology, achievements and excellent work undertaken by Govt. of Odisha to popularise the science among the students and researchers.

Defence pavilion by DRDO-ITR and DRDO-PXE was a major attraction. It included Arjuna Tank, guns, mortars and different miniaturised missile models, depicting the true missiles. Space on Wheels was an innovative display by ISRO where multiple miniature models of indigenously developed space launched vehicles along with satellite including India's first satellite Aryabhata was showcased.

The festival featured world-class researchers, scientists and technocrats in a variety of talks, panel discussions and expositions. A series of competitions for students were organised including essay writing, poems, debate, drama and poster making. In addition, students presented their ideas, inventions and science projects focused on societal and industrial benefits. The winners of the competitions were awarded on the occasion.

The science week had a participation of more than 15000 students from different schools of the state visiting innovation booths showcased by premier organizations, including CSIR-Institute of Minerals and Materials Technology, DBT-Institute of Life Sciences, Odisha Space Application

Center, National Innovation Foundation, Odisha Vigyan Academy, Experiential Learning Booth by KIIT, Booth on Vaidik Mathematics by Institute of Mathematics and Applications, and innovations by SROSTI to highlight a few.

<https://kalingatv.com/state/national-science-week-2022-concludes-at-kiit-international-school/>



Tue, 01 March 2022

With eye on China, India joins race to weaponise quantum tech in future military conflicts

With the leaps made by China in the quantum domain, there is a fear of Chinese military developing both offensive and neutralising capabilities using this kind of technology.

By Arjun Gargeyas

On February 23, the Defence Research and Development Organisation (DRDO) made an announcement that went a bit under the radar but can have huge ramifications in the future for developing military technologies. The official statement given by the DRDO stated that a joint team of DRDO and IIT-Delhi successfully demonstrated a Quantum Key Distribution (QKD) link for the very first time in the country between the cities of Prayagraj and Vindhyachal in the state of Uttar Pradesh. An interesting thing to note is that these cities are located at a distance of 100 kilometres from each other. This marks the beginning of the Indian military complex utilising an emerging technology like quantum to enhance domestic defensive capabilities.

The Potential Warfare Applications

The second quantum revolution witnessed in the past decade threw open many possibilities of developing credible commercial applications using quantum technology. It also led to the possibility of using quantum technology in the security and military domain. While military applications using quantum tech are still in the process of development, it is imperative to recognise the ability of this kind of technology to gain an upper hand when it comes to the security aspect.

From a communications perspective, there is a high chance of using state-of-the-art quantum computers to subvert encrypted systems and conduct unlawful surveillance. China's quantum satellites have been touted as potential devices that be used to gain unauthorised access to crucial information. Even modern-day security systems seem to be vulnerable to the emergence of such technologies. Hence, there have been efforts to build secure systems using new technologies like quantum to ensure encryption and privacy remain uncompromised. Such new mechanisms include quantum cryptographic systems and quantum key distribution (QKD) systems. The recent announcement of the DRDO also shows that the Indian military is now looking at developing indigenous technology of secure key transfer for bootstrapping military-grade communication security.

There is now the issue of using sensors, based on quantum technology in the detection of both underwater submarines and aerial military vehicles. The increased use of unmanned aerial vehicles (UAVs) in the military domain has also led to quantum sensing playing a major role in optimising drone movements. Precision guidance and geopositioning remain critical applications that require the use of these quantum-based sensors. Based on the working principle of entangled photons, a pattern is created showcasing the presence or absence of a target object. The advantage of this sensing technology remains high accuracy regardless of the amount of noise in the system.

States Crossing the Quantum Barrier

This begs the question of the potential role played by quantum-based military technology in future wars and conflicts. With leaps made by China in the quantum domain, there is a fear of the

Chinese military developing both offensive and neutralising capabilities using this kind of technology. Reports on the development of quantum radar have been heard from China which can have devastating consequences on current stealth technology. A detection system such as quantum radar is capable of not only determining the type of incoming enemy aircraft but also the type of weapons being carried in the vehicle itself.

The development of a quantum submarine detector (made up of extremely sensitive quantum sensors), named SQUIDS (Superconducting Quantum Interference Devices) has been reported by the Chinese National Academy of Science. This technology is capable of detecting underwater submarines from long distances giving a huge advantage in the maritime domain also. If the reports hold true, then we might have to be prepared for the Chinese military gaining an immense advantage with future warfare capabilities.

Considering the current situation in Ukraine, it is also possible that Russia has been investing in developing high-grade military technology. The comments made by President Vladimir Putin and the deputy Prime Minister in charge of the military-industrial complex, Yuri Borisov, have reiterated Russia's commitments to building state-of-the-art weapons systems utilising the 'principles of new areas of physics'. This was meant to highlight the country's advancements and expertise in areas like plasma and quantum physics to make improved weaponry systems. Recent Department of Defense (DOD) reports by the United States government have also indicated how the Russian military has been focusing on electro-warfare capabilities using dedicated quantum technology.

Other quantum powers such as Australia have also been actively trying to make a mark in the field. Researchers and scientists in the country working on developing quantum technologies have been trying to find applications related to the military itself. There have already been deployments of quantum tech in areas like the cryogenic sapphire oscillator, also called the Sapphire Clock, for improving radar efficiency. The advantages offered across terrains and other conditions have made the country's military scientists look at quantum technology as an alternative solution to military-grade GPS currently in use. The 'Army Quantum Technology Roadmap' by the Australian Army explores the potential solutions across sensing, communications, and computing that quantum tech can offer to the military in the long run.

Finally, even the United States government and armed forces have gotten into the sector. The Defense Science Board (DSB) of the US military and an independent board within the Department of Defense (DOD) have made quantum tech research an important area of focus. The DSB, made of the country's top scientific advisors helps give direction to the military on scientific research of new weapons and technology. The 2019 National Defence Authorization Act (NDAA) directs the Secretary of Defense to set up a quantum technology research and development program to work with the private sector and other government groups. The 2020 NDAA also mentions the need for the DOD to develop certain ethical guidelines for using quantum technology in military applications. This shows how the US military and defense department are not actively involved in providing funds for research in the field but also involved in framing standards and best practices of using said technology.

It is clear that the frontiers of quantum technology in the military domain have already been breached with immense capital being poured into the field by multiple states across the globe. While some have actively demonstrated the effects of such technologies, there still exists questions on how they might actually play out when deployed on the ground in actual conflicts. Military quantum technology is here but do we have the necessary tools and competence to regulate its use is the question that still needs to be answered.

Arjun Gargeyas is a research analyst at Takshashila Institution. The views expressed in this article are those of the author and do not represent the stand of this publication.

<https://www.news18.com/news/opinion/eye-on-china-india-joins-race-to-weaponise-quantum-technology-in-military-conflicts-4818032.html>

India's indigenous 5th-Gen advanced medium combat aircraft to run on engine developed by DRDO & SAFRAN

The production and the manufacturing of AMCA are expected to be under the Special Purpose Vehicle (SPV) and the private sector.

By Huma Siddiqui

For the joint development of a 125kn engine for India's indigenous fifth generation advanced medium combat aircraft (AMCA), Defence Research and Development Organisation is expected to collaborate with French engine maker Safran. According to a senior defence official, "The talks between the officials of DRDO and the French company Safran are going on and the final agreement is expected to be sealed in the next one or two months."

The French Company has already collaborated in making an engine for the Advanced Light Helicopter (ALH) "Dhruv". The Shakti engine, which is powering the ALH and its different variants was jointly developed by Hindustan Aeronautics Limited (HAL) and Safran.

The collaboration for the engine for AMCA was discussed when the external affairs minister Dr S Jaishankar had a meeting with French defence minister Florence Parly when he had visited Paris recently.

Also, the collaboration on the engine for AMCA was discussed last year in December, when the French Defence minister had visited India. Defence minister Rajnath Singh had mentioned about a possible collaboration with a major French company in a speech.

He had said that a major company from France will come to India "for making the engine in strategic partnership with an Indian company."

Last year, at the Aero-India 2021, too, a reference was made by the CMD of HAL about a possible tie up with a foreign company for making engines for AMCA. Later in 2021, the government also informed the Parliament about developing indigenous engines to power not only AMCA but also variants of the Light Combat Aircraft in collaboration with global engine makers.

Stealth Aircraft

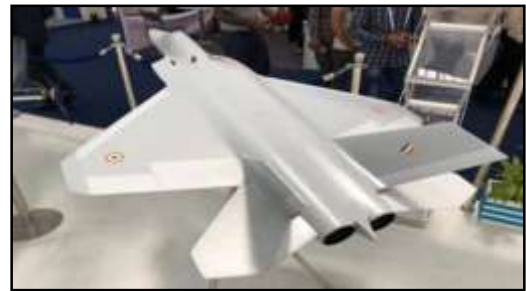
As has been reported earlier, the Aeronautical Development Agency (ADA) is already working with state-owned Hindustan Aeronautics Limited (HAL) on the indigenous LCA-Mk2. The two are also working together on AMCA as well as the twin engine deck based fighter (TEBDF) for the Indian Navy.

Financial Express Online has reported earlier that AMCA is a very critical project for not only DRDO/HAL/ADA but also for the Indian Air Force (IAF).

Once the collaboration with the French company is firmed up and the engine work starts, the development of AMCA will progress parallelly and it will help in meeting the timelines which have been set.

The production and the manufacturing of AMCA are expected to be under the Special Purpose Vehicle (SPV) and the private sector.

Last week, defence Minister Rajnath Singh in his virtual address at a post budget webinar titled 'Aatmanirbharta in Defence – Call to Action', made talked about SPV and expressed confidence that many projects will be undertaken by the private sector companies for design and development



The estimated cost of just developing the prototype of AMCA is expected to touch Rs 15,000 crore. (File)

of military equipment and platforms. And this will be done through SPV and in collaboration with DRDO and other agencies.

Recently, the Director General of ADA, Girish S Deodhare, at an event said that the configuration of AMCA has been frozen and also the preliminary service quality requirements (PSQR) are finalised. And, the preliminary design review of the aircraft is done and the critical design review (CDR) is expected to take place later this year. The aircraft is expected to be rolled out in 2024 and the first flight is scheduled for 2025.

IAF & AMCA

Financial Express Online has reported earlier that IAF which is facing a shortage of fighters in its fleet has already announced its support for AMCA and has initiated modernization of its fleet accordingly.

The former air chief RKS Bhadauria had in an earlier presser with the media had ruled out import of a fifth-generation aircraft in the near future. He had stated that the IAF will go for indigenous fighters – LCA & AMCA.

Aggressive Timelines

If the DRDO/HAL/ADA sticks to the aggressive times they have set then the IAF will be able to induct AMCA in its fleet by the middle of the next decade.

The estimated cost of just developing the prototype of AMCA is expected to touch Rs 15, 000 crore. And it will roll out by 2025-26.

More about AMCA

This swing role fifth generation aircraft will have advanced stealth features and there will be an internal bay for smart weapons. Also, it will have supercruise capability, as this will help in attaining supersonic cruise speeds without using afterburners and as data fusion and multi-sensor integration with Active Electronically Scanned Array radars.

It will be a 25 tonne aircraft and will have an internal carriage of 1,500 kg of payload. External payload of 5,500 kg external payload internal fuel 6,500 kg.

Another major project ADA is also working on is the development of a twin engine deck-based fighter aircraft. This aircraft is for the Indian Navy's aircraft carriers.

India has not been able to develop and an engine for the LCA – the Kaveri programme which ran for almost three decades has now been shelved.

<https://www.financialexpress.com/defence/indias-indigenous-5th-gen-advanced-medium-combat-aircraft-to-run-on-engine-developed-by-drdo-safran/2446847/>

THE TIMES OF INDIA

Tue, 01 March 2022

957 premier battle tanks to get key upgrade

Bengaluru: India is upgrading 957 T-90s — India's premier battle tank — with a new indigenous Commander Sight further enhancing its efficiency. Defence PSU Bharat Electronics Limited (BEL) on Monday said it has recently signed a contract for the retro-modification of Commander Sight of 957 T90 tanks for the Indian Army with the ministry of defence (MoD). The total value of the contract is Rs 1,075 crore including all taxes and duties, a BEL statement said.

The successful indigenous development of Thermal Imager-based Commander Sight, jointly by Instruments Research & Development Establishment (IRDE), a Defence Research and Development Organisation (DRDO) lab and BEL. "The new sight comes with improved performance than its predecessor, provides a further boost to the 'Make in India' initiative of the government of India. This will provide a fillip to indigenous defence manufacturing and open avenues for export of such advanced technology," BEL said.

According to MoD, the Commander Sight of Battle Tank T-90, India's premier battle tank, is currently fitted with Image Converter (IC) tube-based sight for night viewing. "Based on the requirement projected by the Indian Army, DRDO and BEL have jointly designed and developed an advanced Mid Wave Thermal Image (MWIR) based sight as a replacement for the existing IC-based sight," an MoD press note read.

The new retro-modified Commander Sight, it added, employs a thermal imager capable of detecting the targets at 8km during day and night and a Laser Ranger Finder to find the ranges accurately up to 5km, thereby enhancing its capability to engage target at longer ranges. "With the corrections from ballistic software and LRF, the Commander of T-90 can detect, engage and neutralise the targets with phenomenal accuracy," the MoD statement read.

<https://timesofindia.indiatimes.com/city/bengaluru/957-premier-battle-tanks-to-get-key-upgrade/articleshow/89909556.cms>



Tue, 01 March 2022

रक्षा मंत्रालय ने बीईएल के साथ 1,075 करोड़ रुपये के अनुबंध पर हस्ताक्षर किए

By Arvind

बैंगलोर: रक्षा मंत्रालय ने रेट्रो संशोधन के लिए भारत इलेक्ट्रॉनिक्स के साथ 1,075 करोड़ रुपये के अनुबंध पर हस्ताक्षर किए। भारतीय सेना के लिए युद्धक टैंकों के कमांडर दृष्टि-टी90 के रेट्रो-संशोधन के लिए, रक्षा मंत्रालय ने भारत इलेक्ट्रॉनिक्स लिमिटेड (बीईएल) के साथ 1,075 करोड़ रुपये का अनुबंध किया है।


सोमवार को जारी एक आधिकारिक बयान के अनुसार, "957 टैंक होंगे जिन्हें फिर से लगाया जाएगा। अनुबंध की पूरी कीमत 1,075 करोड़ रुपये (सभी करों और शुल्कों सहित) है।"




आईआरडीई, डीआरडीओ और बीईएल द्वारा थर्मल इमेजर-आधारित कमांडर साइट का सफल घरेलू निर्माण, जिसका अपने पूर्ववर्ती की तुलना में बेहतर प्रदर्शन है, भारत सरकार की 'मेक इन इंडिया' नीति को जोड़ता है। बयान के अनुसार, "इससे घरेलू रक्षा निर्माण को बढ़ावा मिलेगा और ऐसी उन्नत प्रौद्योगिकियों के निर्यात के लिए दरवाजे तैयार होंगे।"

<https://www.newstracklive.com/news/defense-ministry-signs-rs-1075-cr-contract-with-bel-for-retro-modification-sc18-nu318-ta928-1495167-1.html>

DRDO on Twitter

 **DRDO** @DRDO_India · 21h

On [#NationalScienceDay](#), celebrating the spirit of scientific enquiry that led to the discovery of the 'Raman Effect', DRDO is organising science day orations at various labs in line with this year's theme - 'Integrated Approach in Science and Technology for Sustainable Future'



Celebrating the legacy of **scientific research** by legendary physicist Nobel Laureate **Sir C.V. Raman** and the famous '**Raman Effect**'

0-07 8,067 views

28 February 2022



Press Information Bureau
Government of India

Ministry of Defence

Mon, 28 Feb 2022 4:52PM

Raksha Mantri Shri Rajnath Singh reviews the preparations of the largest ever DefExpo 2022 to be held at Gandhinagar, Gujarat

Raksha Mantri, Shri Rajnath Singh, on 28th February 2022, reviewed the preparation for DefExpo-2022 Asia's Largest Exhibition on Land, Naval, Air and Homeland Security Systems. The event has gained significant traction since India relaxed its health protocols on 10 February 2022 due to the reducing cases of COVID19. DefExpo-2022 promises to be the largest event since its inception in 1999. The uncertainty on organizing such events due to the pandemic last year had not deterred India in its resolve to further the business interests of its indigenous Defence manufacturing sector and the Ministry of Defence's decision of 31 July 2021 to go ahead with DefExpo-2022 appears not off mark in hindsight.

DefExpo-2022 is set to resonate India's 'Path To Pride'. To make DefExpo-2022 inclusive for those who can't make it due to restrictions or delays at their end in decision making, the event will be held in hybrid mode, with stalls in both physical and virtual realms. The onboarding process of the virtual event has commenced with Ministry of Defence inviting greater participation from nations with different health protocols and the initiative will result in greater engagement and outreach as exhibitors can cater to those who are not physically present.

DefExpo-2022 is being planned in the largest ever area of approximately one lakh sqm at three venues; Exhibition at the Helipad Exhibition Center (HEC), Events and Seminars at the Mahatma Mandir Convention and Exhibition Center (MMCEC) and Live demonstration for the public at Sabarmati Riverfront.

Raksha Mantri noted that the recent relaxation of health protocols in India has generated greater interest in DefExpo-2022 which has 78 participating nations, 39 Minister Level delegations with other confirmations to be received in the days ahead and 1000+ registered exhibitors. Foreign Defence Ministers confirmations are also being received and as on date are equal to the previous edition at Lucknow in Feb 2020 in the pre-COVID times.

As the countdown for the mega DefExpo-2022 has begun and the attendees reposing their faith in the Ministry of Defence to further their Defence Business interests, Raksha Mantri noted that the extension of DefExpo-2022 by one day will benefit the local students as dedicated trips for them are being planned. DefExpo-2022 on 14th March 2022 will facilitate inclusiveness for young entrepreneurs and college/school millennial of the host state.

DefExpo-2022 is symbolic of India's resolve to further its Business interests and take global initiatives towards furthering peace and security in the region. Raksha Mantri observed the preparedness and efforts and expressed confidence for the conduct of a safe and successful DefExpo-2022.

Raksha Rajya Mantri Shri Ajay Bhatt, Chief of the Army Staff General Manoj Mukund Naravane, Defence Secretary Dr Ajay Kumar, Secretary DDR&D and Chairman DRDO Dr. G Satheesh Reddy, Financial Advisor (Defence Services) Shri Sanjiv Mittal and other senior civil & military officials of MoD were also present on the occasion.

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पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

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रक्षा मंत्री श्री राजनाथ सिंह ने गुजरात के गांधीनगर में आयोजित होने वाली अब तक के सबसे बड़ी रक्षा प्रदर्शनी- 2022 की तैयारियों की समीक्षा की

रक्षा मंत्री श्री राजनाथ सिंह ने 28 फरवरी 2022 को थल, नौसेना, वायु और होमलैंड सिक्वोरिटी प्रणालियों पर एशिया की सबसे बड़ी प्रदर्शनी- रक्षा प्रदर्शनी 2022 की तैयारियों की समीक्षा की। कोविड- 19 के मामलों की संख्या में कमी को देखते हुए भारत ने 10 फरवरी, 2022 को अपने स्वास्थ्य प्रोटोकॉल में ढील दी थी, जिसके बाद इस आयोजन ने लोगों का ध्यान अपनी ओर खींचा है। 1999 में शुरू होने के बाद से रक्षा प्रदर्शनी- 2022 को अब तक का सबसे बड़ा आयोजन बनाने का संकल्प है। पिछले साल महामारी के कारण इस तरह के आयोजनों की अनिश्चितता के बावजूद यह भारत के लिए अपने स्वदेशी रक्षा विनिर्माण क्षेत्र के व्यावसायिक हितों को आगे बढ़ाने के अपने संकल्प में बाधा नहीं बन पाया। 31 जुलाई, 2021 को रक्षा मंत्रालय का रक्षा प्रदर्शनी- 2022 के आयोजन को लेकर आगे बढ़ने का निर्णय दूरदर्शी प्रतीत होता है।

रक्षा प्रदर्शनी- 2022 भारत के 'गौरव का मार्ग' को प्रतिध्वनित करने के लिए तैयार है। रक्षा प्रदर्शनी- 2022 को समावेशी बनाने के संबंध में उन प्रतिभागियों, जो प्रतिबंधों या अपनी ओर से देरी से लिए गए निर्णय के चलते इसमें उपस्थित नहीं हो सकते हैं, उनके लिए यह आयोजन हाइब्रिड मोड में आयोजित किया जाएगा। यानी इसमें शारीरिक और वर्चुअल, दोनों रूपों में हिस्सा लिया जा सकता है। रक्षा मंत्रालय ने वर्चुअल कार्यक्रम की ऑनबोर्डिंग प्रक्रिया शुरू की है। इसमें भागीदारी के लिए विभिन्न स्वास्थ्य प्रोटोकॉल वाले देशों से को अधिक से अधिक संख्या में आमंत्रित किया गया है। इस पहल के परिणामस्वरूप अधिक संख्या में प्रतिभागी इससे जुड़ पाएंगे और इसकी पहुंच में बढ़ोतरी होगी, क्योंकि इस पहल के माध्यम से प्रदर्शक उन लोगों को भी इसमें शामिल कर सकते हैं, जो शारीरिक रूप से उपस्थित नहीं होंगे।

रक्षा प्रदर्शनी- 2022 की योजना लगभग एक लाख वर्गमीटर के क्षेत्र में तीन स्थलों पर बनाई जा रही है। यह अब तक का सबसे बड़ा आयोजन क्षेत्र है। इनमें हेलीपैड प्रदर्शनी केंद्र (एचईसी) में प्रदर्शनी, महात्मा मंदिर सम्मेलन व प्रदर्शनी केंद्र (एमएमसीईसी) में कार्यक्रम व सेमिनार और साबरमती रिवरफ्रंट पर जनता के लिए इसका सीधा प्रदर्शन शामिल हैं।

रक्षा मंत्री ने इसका उल्लेख किया कि भारत में हाल ही में स्वास्थ्य प्रोटोकॉल में ढील दी थी, जिसने रक्षा प्रदर्शनी- 2022 में अधिक रुचि उत्पन्न की है। इसमें 78 देश और 39 मंत्रीस्तरीय प्रतिनिधिमंडल हिस्सा लेंगे। आने वाले दिनों में और भी मंत्रीस्तरीय प्रतिनिधिमंडल के इसमें भाग लेने की पुष्टि हो सकती

है। इसके अलावा 1000 से अधिक पंजीकृत प्रदर्शक शामिल होंगे। वहीं, विदेशों के रक्षा मंत्रियों की पुष्टियां भी प्राप्त हो रही हैं। अब तक प्राप्त पुष्टियों की मानें तो यह संख्या फरवरी, 2020 में यानी कोविड महामारी से पहले लखनऊ में आयोजित रक्षा प्रदर्शनी के बराबर है।

जैसा कि अब विशाल रक्षा प्रदर्शनी- 2022 की उलटी गिनती शुरू हो गई है और इसमें हिस्सा लेने वाले प्रतिभागी अपने रक्षा व्यापार से संबंधित हितों को आगे बढ़ाने के लिए रक्षा मंत्रालय में अपना विश्वास व्यक्त कर रहे हैं। रक्षा मंत्री ने इसका उल्लेख किया रक्षा प्रदर्शनी- 2022 के आयोजन को एक दिन बढ़ाए जाने से स्थानीय छात्रों को इसका लाभ होगा, क्योंकि उनके लिए समर्पित दौरे की योजना बनाई जा रही है। 14 मार्च 2022 को रक्षा प्रदर्शनी- 2022 में मेजबान राज्य के युवा उद्यमियों और कॉलेज/विद्यालय के छात्रों को शामिल होने की सुविधा प्रदान की जाएगी।

रक्षा प्रदर्शनी- 2022 अपने व्यावसायिक हितों को आगे बढ़ाने और क्षेत्र में शांति व सुरक्षा को आगे बढ़ाने की दिशा में वैश्विक पहल करने के भारत के संकल्प का प्रतीक है। रक्षा मंत्री ने इसकी तैयारियों व प्रयासों का अवलोकन किया। साथ ही, उन्होंने एक सुरक्षित व सफल रक्षा प्रदर्शनी- 2022 के संचालन को लेकर अपना विश्वास व्यक्त किया है।

इस अवसर पर रक्षा राज्य मंत्री श्री अजय भट्ट, थल सेनाध्यक्ष जनरल मनोज मुकुंद नरवणे, रक्षा सचिव डॉ. अजय कुमार, रक्षा अनुसंधान व विकास निदेशालय (डीडीआरएंडडी) के सचिव और डीआरडीओ के अध्यक्ष डॉ. जी सतीश रेड्डी, वित्तीय सलाहकार (रक्षा सेवाएं) श्री संजीव मित्तल और रक्षा मंत्रालय के अन्य वरिष्ठ नागरिक व सैन्य अधिकारी भी उपस्थित थे।

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Press Information Bureau
Government of India

Ministry of Defence

Mon, 28 Feb 2022 5:11PM

Invest4iDEX and Manthan 2022 to be key highlights in upcoming Defence Expo 2022

Innovations for Defence Excellence (iDEX), launched by Prime Minister Shri Narendra Modi in 2018, essentially provides a unified platform for various stakeholders in the defence and aerospace sector. It acts like an umbrella organisation to oversee technology development and potential collaborations in the field.

Innovation is gradually becoming the most important factor in determining the effective power of a nation in modern military warfare. Platforms like iDEX enable the military to find disruptive solutions to complex challenges through its flagship programs like Defence India Startup Challenges (DISC) and Open Challenges (OC), which shall be the key components for future of military technology. In line with this, the Indian Navy has successfully placed a Supply Order with an iDEX winner, Saif Automations Services LLP.

Till date, iDEX has launched five rounds DISC, and three rounds of OC, receiving more than 2,000 applications from individual innovators and startups. Furthermore, iDEX has been able to fund projects in numerous technological areas through its Grant-in-Aid framework, Support for Prototype and Research Kickstart (SPARK), which entail provisioning of grant up to Rs 1.50 crore to the budding entrepreneurs.

As most awaited biennial event, Defence Expo 2022, is round the corner, the iDEX is ready to showcase its startups and award its winner during its flagship event Manthan. This year iDEX will

also be signing the Memorandum of Understanding (MoUs) with three new partner incubators, who are leaders in venture development and science and technology.

As iDEX is growing in family and spirit, it shall also be launching a distinctive event, Invest4iDEX, inviting reputed investors and venture capitalists, while providing the startups to pitch in front of the live audience and leverage the opportunity to generate investments and leads for future.

Innovation has become the key driver of the pace of societal evolution and it redefines social parameters with unique outputs. The iDEX has always been at the forefront of innovation in defence and internal security, and most of its projects also have tremendous civilian applications: quantum computation, AI/predictive maintenance/logistics/data analytics, security/encryption, communication, etc. To take this further, the iDEX will be launching the sixth edition of DISC with 29 new problem statements from Defence Public Sector Undertakings (DPSUs), Ministry of Home Affairs (MHA) and Indian Coast Guard (ICG).

The recently announced allocation of 25 per cent of Defence R&D budget for startups, academia and private industry have encouraged innovators to innovate and develop state-of-the-art products and revolutionising technology solution. Keeping in line with the common aspirations, the iDEX is organising various knowledge sessions.

The iDEX is able to utilise India's strong science, technology and research talent base to develop new capabilities in defence innovation. The understanding of the budding entrepreneurs in the direction of the need of sensitising the audience towards defence innovation is being further complemented by the support provided through this scheme.

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पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Mon, 28 Feb 2022 5:11PM

आगामी डिफेंस एक्सपो 2022 में इन्वेस्ट4आईडेक्स और मंथन 2022 कार्यक्रम के मुख्य आकर्षण होंगे

वर्ष 2018 में प्रधानमंत्री श्री नरेन्द्र मोदी के द्वारा शुरू किया गया रक्षा उत्कृष्टता के लिए नवाचार (आईडेक्स) अनिवार्य रूप से रक्षा एवं एयरोस्पेस क्षेत्र में विभिन्न हितधारकों के लिए एकीकृत मंच प्रदान करता है। यह नवाचार रक्षा क्षेत्र में प्रौद्योगिकी विकास और संभावित सहयोग की निगरानी के लिए एक प्रमुख संगठन की तरह कार्य करता है।

आधुनिक सैन्य युद्ध में एक राष्ट्र की प्रभावी शक्ति का निर्धारण करने में नवाचार धीरे-धीरे सबसे महत्वपूर्ण कारक बनता जा रहा है। आईडेक्स जैसे प्लेटफॉर्म सेना को अपने प्रमुख कार्यक्रमों जैसे डिफेंस इंडिया स्टार्टअप चैलेंज (डीआईएससी) और ओपन चैलेंज (ओसी) के माध्यम से जटिल चुनौतियों का विघटनकारी समाधान खोजने में सक्षम बनाते हैं, जो कि सैन्य प्रौद्योगिकी के भविष्य के लिए प्रमुख कारक होंगे। इसी के तहत, भारतीय नौसेना ने आईडेक्स विजेता सैफ ऑटोमेशन सर्विसेज एलएलपी के लिए सफलतापूर्वक आपूर्ति का आदेश पारित किया है।

अब तक, आईडेक्स ने डीआईएससी के पांच राउंड और ओसी के तीन सत्र आयोजित किए हैं, जिसमें अलग-अलग इनोवेटर्स और स्टार्टअप्स से 2,000 से अधिक आवेदन प्राप्त हुए हैं। इसके अलावा, आईडेक्स अपने ग्रांट-इन-एड फ्रेमवर्क, सपोर्ट फॉर प्रोटोटाइप एंड रिसर्च किक स्टार्ट (स्पार्क) के माध्यम से कई

तकनीकी क्षेत्रों में परियोजनाओं को वित्तपोषित करने में सक्षम है, जिसमें नवोदित उद्यमियों को 1.50 करोड़ रुपये तक का अनुदान देने का प्रावधान भी शामिल है।

बहुप्रतीक्षित द्विवार्षिक कार्यक्रम डिफेंस एक्सपो 2022 का आयोजन अब काफी नजदीक है, और आईडेक्स अपने स्टार्टअप्स को प्रदर्शित करने तथा अपने प्रमुख कार्यक्रम मंथन के दौरान अपने विजेता को पुरस्कृत करने के लिए तैयार है। इस वर्ष आईडेक्स तीन नए सहयोगी इन्क्यूबेटर्स के साथ समझौता ज्ञापन (एमओयू) पर भी हस्ताक्षर करेगा, जो उद्यम विकास एवं विज्ञान व प्रौद्योगिकी में अग्रणी हैं।

देखा जा रहा है कि आईडेक्स साहस के साथ आगे बढ़ रहा है, ऐसे में यह एक विशिष्ट कार्यक्रम इन्वेस्ट4आईडेक्स भी शुरू करेगा, जिसमें प्रतिष्ठित निवेशकों और उद्यम पूंजीपतियों को आमंत्रित किया जाएगा, जबकि स्टार्टअप्स को सीधे दर्शकों के सामने स्थापित करने के लिए और भविष्य में निवेश आकर्षित करने तथा अधिक बढ़त बनाने के अवसर का लाभ उठाया जाएगा।

नवाचार सामाजिक विकास की गति का प्रमुख चालक बन गया है और यह अद्वितीय आउटपुट के साथ सामाजिक मानकों को फिर से परिभाषित करता है। आईडेक्स हमेशा से रक्षा एवं आंतरिक सुरक्षा के नवाचार में सबसे आगे रहा है, और इसकी अधिकांश परियोजनाओं में जबरदस्त नागरिक अनुप्रयोग भी शामिल हैं: क्वांटम गणना, एआई/भविष्य सूचक रखरखाव/लॉजिस्टिक्स/डेटा एनालिटिक्स, सुरक्षा/एन्क्रिप्शन, संचार, आदि। इसे और आगे ले जाने के लिए, आईडेक्स रक्षा सार्वजनिक क्षेत्र के उपक्रमों (डीपीएसयू), गृह मंत्रालय (एमएचए) तथा भारतीय तटरक्षक (आईसीजी) के 29 नए व्यावहारिक कथनों के साथ डीआईएससी का छठा संस्करण लॉन्च करेगा।

स्टार्टअप, अकादमिक और निजी उद्योग के लिए रक्षा अनुसंधान एवं विकास बजट के 25 प्रतिशत के आवंटन की हाल ही में घोषणा ने नवप्रवर्तन कर्ताओं को अत्याधुनिक उत्पादों को विकसित करने और विकसित करने तथा व्यावहारिक समाधान में क्रांतिकारी बदलाव के लिए प्रोत्साहित किया है। सामान्य आकांक्षाओं को ध्यान में रखते हुए आईडेक्स विभिन्न ज्ञान सत्रों का आयोजन कर रहा है।

आईडेक्स रक्षा नवाचार में नई क्षमताओं को विकसित करने के लिए भारत के मजबूत विज्ञान, प्रौद्योगिकी एवं अनुसंधान प्रतिभा आधार का उपयोग करने में सक्षम है। रक्षा नवाचार के प्रति दर्शकों को संवेदनशील बनाने की आवश्यकता की दिशा में नवोदित उद्यमियों की समझ को इस योजना के माध्यम से प्रदान की गई सहायता के द्वारा और भी पूरक बनाया जा रहा है।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1801869>



Press Information Bureau

Government of India

Ministry of Defence

Mon, 28 Feb 2022 5:51PM

Shri Jagan Mohan Reddy, Hon'ble Chief Minister Formally Dedicates INS Visakhapatnam to the City of Destiny

Shri Jagan Mohan Reddy Hon'ble CM of Andhra Pradesh dedicated INS Visakhapatnam, the indigenously designed and constructed guided-missile stealth destroyer named after the City of Destiny – Visakhapatnam, in a formal ceremony held at Naval Dockyard on 27 Feb 22. The ship is on her maiden visit to the port for participating in the PFR and MILAN 2022.

INS Visakhapatnam is the lead ship of P15B class of guided missile stealth destroyers and was commissioned on 21 Nov 21. The ship symbolises India's matured shipbuilding capability and quest for the Make in India initiative towards achieving 'Atmanirbhar Bharat'. The crew of the ship abides by her motto 'Yasho Labhasva' - a Sanskrit phrase that translates to 'Attain Glory'. It embodies the indomitable spirit and capability of this mighty ship to achieve success and glory in every endeavour. The motto inspires her crew to surmount all odds and uphold the glory of the Ship, Service and Nation always.

The Hon'ble CM took a short tour of the ship and interacted with crew after the Dedication ceremony.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1801844>



पत्र सूचना कार्यालय
भारत सरकार

रक्षा मंत्रालय

Mon, 28 Feb 2022 5:51PM

माननीय मुख्यमंत्री श्री जगन मोहन रेड्डी ने आईएनएस विशाखापत्तनम को औपचारिक रूप से भाग्य के शहर- विशाखापत्तनम को समर्पित किया

आंध्र प्रदेश के माननीय मुख्यमंत्री श्री जगन मोहन रेड्डी ने 27 फरवरी 2022 को नौसेना गोदी में आयोजित एक औपचारिक समारोह में विशाखापत्तनम शहर के नाम पर आईएनएस विशाखापत्तनम को समर्पित किया। यह पोत स्वदेश में ही डिजाइन और निर्मित, रेडार से बचने में सक्षम और निर्देशित मिसाइल विध्वंसक जहाज है। इसका नाम भाग्य के शहर विशाखापत्तनम के नाम पर ही रखा गया है। यह नौसैनिक पोत पीएफआर और मिलन 2022 में भाग लेने के लिए बंदरगाह की अपनी पहली यात्रा पर है।

आईएनएस विशाखापत्तनम रेडार से बचने में सक्षम निर्देशित मिसाइल विध्वंसक श्रेणी के पी15बी वर्ग का प्रमुख जहाज है और इसे 21 नवंबर 2021 को कमीशन किया गया था। यह भारत की परिपक्व पोत निर्माण क्षमता और 'आत्मनिर्भर भारत' का लक्ष्य प्राप्त करने की दिशा में मेक इन इंडिया पहल की खोज का प्रतीक है। पोत का चालक दल इसके आदर्श वाक्य 'यशो लाभवा' का पालन करता है - इस संस्कृत वाक्यांश का अनुवाद है- 'प्रतिष्ठा प्राप्त करना'। यह अपने हर प्रयास में सफलता और गौरव प्राप्त करने के लिए इस शक्तिशाली पोत के अदम्य साहस एवं क्षमता का प्रतीक है। आदर्श वाक्य जहाज के चालक दल को सभी बाधाओं को पार करने और पोत, सेवा तथा राष्ट्र की महिमा को हमेशा बनाए रखने के लिए प्रेरित करता है। माननीय मुख्यमंत्री ने जहाज का एक संक्षिप्त दौरा किया और समर्पण समारोह के बाद चालक दल के साथ बातचीत की।

<https://pib.gov.in/PressReleasePage.aspx?PRID=1801907>



Press Information Bureau
Government of India

Ministry of Defence

Mon, 28 Feb 2022 5:50PM

OP DEMO and international city parade

Visakhapatnam witnessed an enthralling Operational Demonstration by the Indian Navy and a colourful International City Parade on Sunday evening at RK Beach. The event conducted as part of the ongoing Multilateral Exercise MILAN 22 saw an overwhelming response from the people of the city. Hon'ble Chief Minister of Andhra Pradesh Shri YS Jagan Mohan Reddy was the Chief Guest for the event.

The Operational Demonstration showcased various operations by the Indian Navy including special operations and sky diving by Marine Commandos, rescue operations by naval helicopters and fly-past by naval aircraft. The sky diving demonstration was the show stealer, where six divers landed next to the dais and presented a memento to the Chief Minister. The Chief Minister addressed the audience on completion of Operational Demonstration and extended a warm welcome to all the international participants from the visiting Friendly Foreign Countries and lauded the Indian Navy for selfless service to the nation.

The International City Parade included smart marching contingents from the Indian Navy, Coast Guard, visiting navies, NCC, SCC, Sainik School Korukonda, AP Police Department, AP Fire Services and Veterans. The dazzling dance performances by cultural troupes and tableaux by AP Tourism Dept, celebrating 'Azadi ka Amrut Mahotsav', kept the audience captivated throughout the event. The spectacular Horn Pipe Dance Show by the Cadets from Sea Cadet Corps, dance on the theme 'Global Peace' by students of Navy Children School, Tattoo Ceremony by the Indian Naval Band and a grand Dance Finale by artists showcased the cultural vibrancy of India and added colour to the City Parade. The event culminated with a spectacular laser show, fireworks and illumination by naval ships at anchorage including INS Visakhapatnam, which was dedicated to the 'City of Destiny' by the Chief Minister earlier in the day. The Operational Demonstration and International City Parade left the local populace mesmerised.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1801843>



Mon, 28 Feb 2022 9:40PM

Visit of Admiral Samuel J Paparo, CDR PACFLT, US Navy, to India 25 – 28 Feb 22

Adm Samuel J Paparo, Cdr PACFLT, US Navy visited India from 25 – 28 Feb 22. During the visit, the Admiral interacted with Adm R Hari Kumar, Chief of the Naval Staff, in addition to other high ranking GoI officials. Among issues discussed during the interaction were avenues to strengthen the growing cooperation between the two navies, deal with challenges emerging on the maritime front, and enhance collaboration and interoperability to ensure maritime security in the Indian Ocean Region (IOR).

Earlier, Adm Samuel J Paparo, Cdr PACFLT, US Navy, visited Headquarters, Eastern Naval Command (HQENC) at Visakhapatnam from 25 – 28 Feb 22 to participate in Indian Navy's biennial multilateral naval exercise MILAN 22. The Admiral was also a Guest Speaker during the International Maritime Seminar of MILAN 22.

India and USA have traditionally maintained close and friendly relations. The Defence relationship between the two countries has been one of mutual trust and confidence, which has transformed after the accord of major 'Defence Partner Status' to India in Jun 16.

The Indian Navy closely cooperates with the US Navy on numerous issues, which include operational interactions such as the MALABAR and RIMPAC series of exercises, training exchanges, exchange of White Shipping Information and Subject Matter Experts in various fields, all of which are coordinated through the medium of Executive Steering Group (ESG) meetings conducted annually. In addition, warships from both Navies regularly make port calls at each other's ports. Both Navies have also been cooperating towards exploring new avenues for collaboration with a shared aim of a 'Free, Open and inclusive Indo-Pacific.

Cdr PACFLT's visit was an important event in the continued and regular dialogue between India and the US to cement and strengthen their comprehensive global strategic partnership further. Previously, Adm John C Aquilino, Cdr USINDOPACOM and Adm Michael Gilday, CNO US Navy had visited India in Aug and Oct 21.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1801951>



Mon, 28 Feb 2022 9:40PM

Visit of Vice Admiral Michael Noonan, Chief of Navy, Royal Australian Navy to India 25 – 28 Feb 22

VAdm Michael Noonan, Chief of Navy, Royal Australian Navy visited India from 25 – 28 Feb 22. The Admiral called on Adm R Hari Kumar, Chief of Naval Staff on 28 Feb 22 at New Delhi. CoN RAN had earlier visited Headquarters, Eastern Naval Command (HQENC) at Visakhapatnam from 25 – 28 Feb 22 to participate in Indian Navy's biennial multilateral naval exercise MILAN 22. The Admiral was also a Guest Speaker during the International Maritime Seminar of MILAN 22.

Among issues discussed during the interaction were avenues to strengthen the growing cooperation between the two nations and navies, deal with challenges emerging on the maritime front, and enhance collaboration and interoperability to ensure maritime security in the Indian Ocean Region (IOR).

The Admiral was provided a broad overview of regional security dynamics and the operational aspects in recent times, particularly those related to delivering Humanitarian Assistance and Disaster Relief (HADR) to Friendly Foreign Countries, conducting counter piracy operations, enhancing maritime safety and security in the region, and strengthening foreign cooperation, with special emphasis on IN – RAN cooperation.

CoN RAN's visit was an important event in the continued and regular dialogue between Indian Navy and the Royal Australian Navy to cement and strengthen their comprehensive global strategic partnership further. Previsouly, the respective Principals had signed 'Joint Guidance for Australia – India Navy to Navy Relationship' in Aug 21. Terms of Reference for the Conduct of Navy to Navy Talks between the two Navies were signed in Sep 21.



<https://pib.gov.in/PressReleasePage.aspx?PRID=1801950>

Sukhoi Su-30MKI: Know all about the fighter jet tailor-made for Indian specifications

- *NATO name for Sukhoi Su-30 MKI is Flanker-H.*
- *It is a variant of the Sukhoi Su-30.*
- *It is a heavy, all-weather and long-range fighter.*

New Delhi: Sukhoi Su-30MKI is a twinjet multi-role air superiority fighter developed by Russia's Sukhoi and built by India's Hindustan Aeronautics Limited (HAL) for the Indian Air Force (IAF). The NATO name for Sukhoi Su-30MKI is Flanker-H. It is a variant of the Sukhoi Su-30. It is a heavy, all-weather and long-range fighter. The fighter jet is tailor-made for Indian specifications and integrates Indian systems and avionics as well as French and Israeli sub-systems. The development of the jet began in 2000 after India and Russia signed a deal to manufacture 140 Su-30 fighter jets. The first Su-30MKI was accepted to the IAF in the year 2002, while the first fighter jet was assembled in India was in 2004. As of January 2020, the IAF has nearly 260 Sukhoi-30MKI jets.



Sukhoi Su-30MKI is armed with 30mm Gsh-30-1 cannon with 150 rounds of ammunition. (Photo credit: PTI)

Features of Su-30MKI:

- It is armed with 30mm Gsh-30-1 cannon with 150 rounds of ammunition. It has 12 hardpoints for missiles and bombs, which can be further augmented to 14 using multiple ejector racks.
- The BrahMos ALCM that weighs 2.5 tonnes is the heaviest weapon to be deployed on the Su-30 fighter aircraft and has been modified by HAL to carry weapons.
- The aircraft is able to launch a range of air-to-surface missiles and carries Vympel-built air-to-air missiles, and rocket pods, KAB-500 and KAB-1500 laser-guided bombs.
- The airframe is constructed of titanium and high-strength aluminium alloys.
- The resultant control signals are coupled to the high-speed electro-hydraulic actuators of the elevators, rudders and the canard.
- The output signals are compared and, if the difference is significant, the faulty channel is disconnected.
- The Su-30MKI has a range of 3,000 km with internal fuel which ensures a 3.75 hour combat mission. Also, it has an in-flight refueling (IFR) probe that retracts beside the cockpit during normal operation.
- The Su-30MKI's radar cross-section (RCS) is reportedly from 4 to 20 square metres.
- The crew is provided with zero-zero NPP Zvezda K-36DM ejection seats.
- The forward-facing NIIP N011M Bars (Panther) is a powerful integrated passive electronically scanned array radar.
- N011M has a 400 km search range and a maximum 200 km tracking range, and 60 km in the rear hemisphere.
- The aircraft is fitted with a satellite navigation system (A-737 GPS compatible), which permits it to make flights in all weather, day and night.

- The Su-30MKI is powered by two Lyulka-Saturn AL-31FP turbofans, each rated at 12,500 kgf (27,550 lbf) of full after-burning thrust, which enable speeds of up to Mach 2 in horizontal flight and a rate of climb of 230 m/s.

General characteristics:

- Crew: 2
- Length: 21.935 m (72 ft 0 in)
- Wingspan: 14.7 m (48 ft 3 in)
- Height: 6.36 m (20 ft 10 in)
- Wing area: 62 m² (670 sq ft)
- Empty weight: 18,400 kg (40,565 lb)
- Gross weight: 26,090 kg (57,519 lb) (typical mission weight)
- Max take-off weight: 38,800 kg (85,539 lb)

<https://www.news9live.com/knowledge/sukhoi-su-30mki-know-all-about-the-fighter-jet-tailor-made-for-indian-specifications-156312?infinitemscroll=1>



Tue, 01 March 2022

Indian Navy's advanced diving support ship on training mission in Sri Lanka

Colombo: Indian Naval ship 'Nireekshak', an advanced diving support ship, arrived at Sri Lanka's Trincomalee port on Monday for facilitating diving training for the Sri Lankan Navy, the Indian High Commission here said.

The deployment of the naval ship for 10 days in Sri Lanka is part of the Indian government's capacity building initiative under its 'Neighbourhood First' policy, it said.

During its deployment in the island nation, the ship will facilitate "Mixed Gas Diving training for the Sri Lanka Navy," the mission said in a press release.

The vessel has two six-men recompression chambers and one three-man diving bell, it said.

The Commanding Officer of the Indian Naval ship, Commander Mohammad Ikram called on Commander of Eastern Naval Area, Rear Admiral PDS Dias, and held discussions on the training.

"The ship is fully capable to undertake rescue operations from a submarine in distress and training of saturation divers," the High Commission said.

The ship had earlier visited Trincomalee in September 2019 for a similar training deployment for Sri Lankan Navy divers.

"Such continued engagement of Indian Naval ships with the Sri Lanka Navy is in keeping with the Government of India's capacity building initiative as part of its 'Neighbourhood First' policy," the release said.

<https://www.theweek.in/wire-updates/international/2022/02/28/fgn78-lanka-india-navy-ship.html>

Why India cannot afford to delink from Russia for its defence needs

According to Stockholm International Peace Research Institute (SIPRI), Russia is the most important suppliers of defence equipment to India, commanding nearly two-thirds share of the latter's total arms imports.

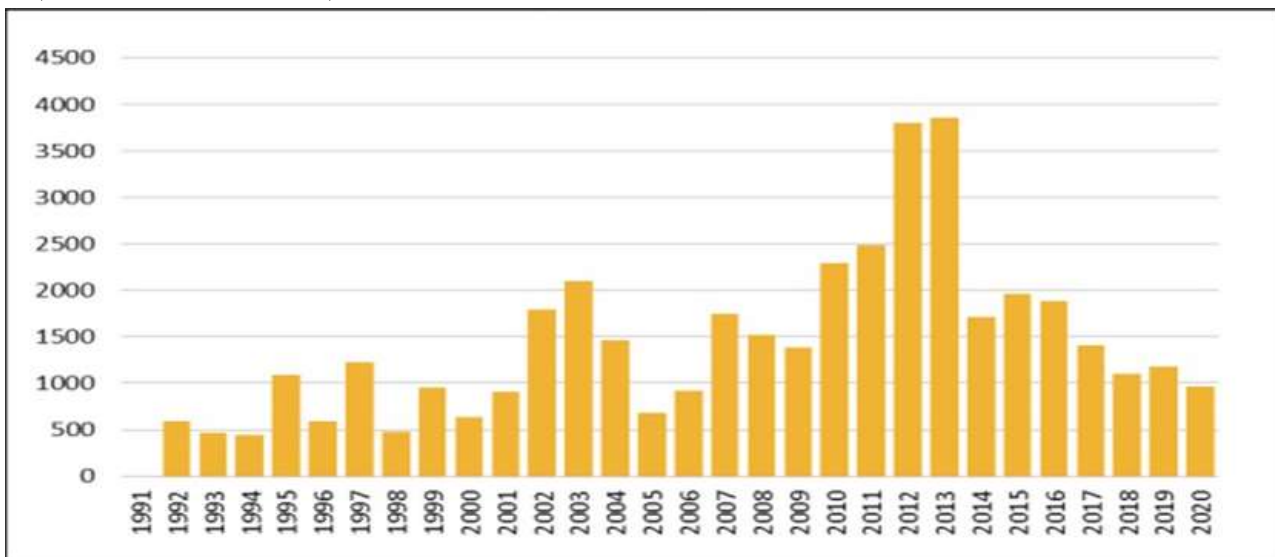
By Maj Gen (Dr) GG Dwivedi, retd

New Delhi: India has a time-tested relationship with Russia since the Soviet days. Under the spirit of “India-Russia Strategic Partnership” signed in October 2000, India has consolidated defence and military-technical cooperation with Russia in a long-term perspective. Currently, around 70 percent of India's military arsenal is of Russian origin. According to Stockholm International Peace Research Institute (SIPRI), Russia is the most important suppliers of defence equipment to India, commanding nearly two-thirds share of the latter's total arms imports.

Indian Army's ‘Main Battle Tank’ (MBT) force comprises predominantly of Russian T-72M1 and T-90S tanks. Indian Navy's sole operational aircraft carrier INS Vikramaditya is a refurbished Soviet-era ship and its fighter fleet comprises of 43 MiG-29K. Of the 10 guided-missile destroyers, four are Russian Kashin class and six of its 17 frigates are Russian Talwar class. Indian Navy's sole nuclear-powered submarine is on lease from Russia; besides eight of the 14 other submarines are of Russian origin-Kilo Class. The Indian Air Force 667 FGA (Fighter Ground Attack) fleet is 71 percent of Russian-origin. All the six air refueling tankers are Russian-made Il-78.

Value of Arms Import from Russia 1991-2020

(Value in US Million \$)

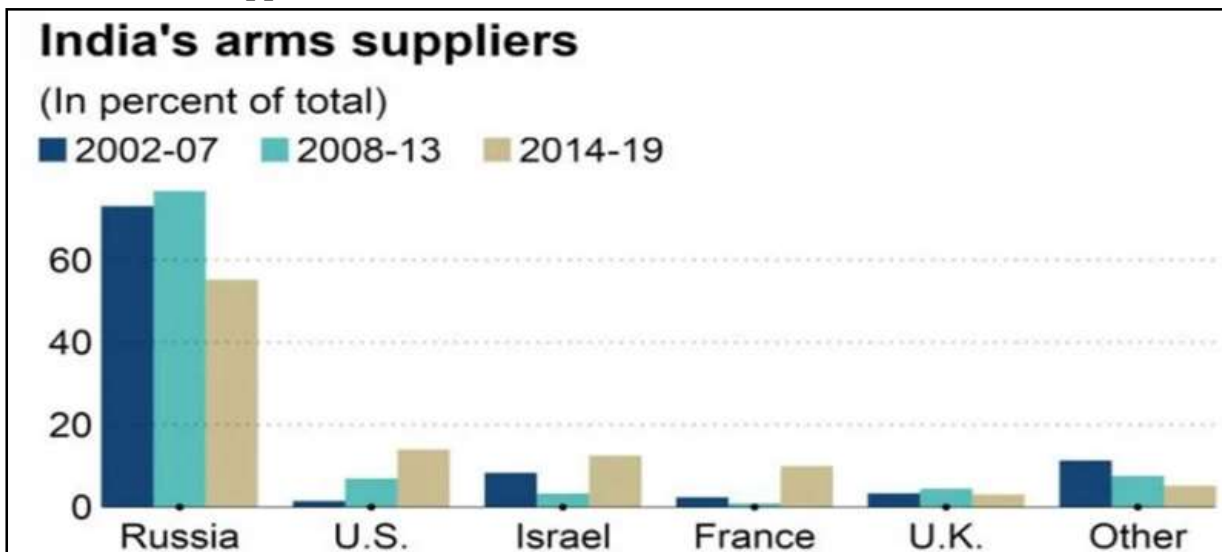


Source: Andrew S. Bowen, “Russian Arms Sales and Defense Industry” Congressional Research Service, October 14, 2021

In 1991, about 70 percent of Indian Army armaments, 80 percent of its Air Force systems and 85 percent of its Navy platforms were of Soviet origin. However, of late India's dependency on Russian arms has reduced because of diversification of defense procurement from countries like the USA, Israel, France and Italy. Besides, under the “Make in India” initiative, the nation is moving towards self-reliance in the field of defence. According to SIPRI, India's arms import fell by 33 percent between 2011-15 and 2016-20. During 2016-20, Russia accounted for nearly 49 percent of India's imports while French and Israeli share was 18 percent and 13 percent,

respectively. Purchase of Russian arms by India has dropped significantly, although there is planned defence procurement from Moscow by Delhi in the coming years.

Indian arms suppliers since 2002 to 2019



Source: Kapil Kajal, “India’s arms import embargo hits makers in Russia, US and Israel” Nikkei Asia August 14, 2020

Over the years, Indio-Russian military-technical cooperation has evolved from a ‘buyer-seller’ framework to one involving joint research, development and production of advanced defence technologies and systems. There are number of joint projects that are underway, key ones being:-

- Four Grigorivich-class stealth frigates, of which two are to be built in India for around \$4 billion.
- Joint production of 200 Kamov-226T light utility helicopters of which 140 would be built in India at a cost \$1 billion.
- Of the five S-400 Triumf air defence systems part of \$ 5.5 billion deal, only one has been delivered and remaining four are in the pipeline..
- Four Admiral Grigorivich Project 1135.6M Frigates,
- Leasing of one more Project 971 ‘Akula’ (Schuka-B)-class nuclear powered submarine (SSN)
- Provisioning of 20,000 Kalashnikov AK 203-7.62x39mm assault rifles; 601,427 to be locally built under license at Amethi arms factory.

Additionally, India had concluded assorted deals with Russia to provide varied missiles, including man-portable ‘Very Short Range Defence Systems’ (VSHORADS), ammunition and ordnance stores. India was also in advanced stage of discussions with Russia to procure 464 Russian T-90MS-MBTs and 12 Sukhoi Su-30MKI to be built locally at HAL.

Wide array of sanctions has been imposed by the USA and NATO partners on Russia in the wake of war in Ukraine. This will adversely affect Russia’s domestic defence industry, seriously constraining its capacity to meet the export orders; in turn will have far reaching implications for India, given its heavy dependence on Russia. India also faces the prospects of sanctions under CAATSA (Countering America’s Adversary Through Sanctions) in case it goes ahead with procurements from Russia as highlighted above. Although so far USA has not invoked CAATSA against India with respect to S 400 Triumf air defence systems procurement deal, the situation could drastically change in view of Ukraine crisis. India’s export order of \$375 million BrahMos to Philippines would also be affected as it is joint venture between Russian NPO Mashinostroyeniya (NPOM) and Indian Defence Research and Development Organization (DRDO).

Keeping in view the security imperatives, Delhi cannot afford to delink from Russia for its defence requirements. Going in for alternate sources of procurement of critical weapons equipment is unthinkable in view of the current tense situation on the borders, with hostile neighborhood.

Political astuteness and deft diplomacy will be required to navigate through the emerging complex situation that has serious security ramifications for India.

(The author is a War Veteran, former Assistant Chief Integrated Staff; currently Professor Strategic and International Relations)

<https://www.indiatoday.in/news-analysis/story/russia-ukraine-war-india-cannot-afford-to-delink-from-moscow-1918878-2022-02-28>

Science & Technology News



Tue, 01 March 2022

Physicists report on 'quantum boomerang' effect in disordered systems

By Sonia Fernandez

Physicists at UC Santa Barbara have become the first to experimentally observe a quirky behavior of the quantum world: a "quantum boomerang" effect that occurs when particles in a disordered system are kicked out of their locations. Instead of landing elsewhere as one might expect, they turn around and come back to where they started and stop there.

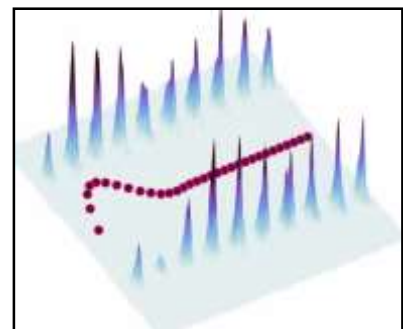
"It's really a fundamentally quantum mechanical effect," said atomic physicist David Weld, whose lab produced the effect and documented it in a paper published in *Physical Review X*. "There's no classical explanation for this phenomenon."

The boomerang effect has its roots in a phenomenon that physicist Philip Anderson predicted roughly 60 years ago, a disorder-induced behavior called Anderson localization that inhibits transport of electrons. The disorder, according to the paper's lead author Roshan Sajjad, can be the result of imperfections in a material's atomic lattice, whether they be impurities, defects, misalignments or other disturbances.

"This type of disorder will keep them from basically dispersing anywhere," Sajjad said. As a result, the electrons localize instead of zipping along the lattice, turning what would otherwise be a conducting material into an insulator. From this rather sticky quantum condition, the quantum boomerang effect was predicted a few years ago to arise.

Launching disordered electrons away from their localized position and following them to observe their behavior is extremely difficult, if not currently impossible, but the Weld Lab had a few tricks up its sleeve. Using a gas of 100,000 ultracold lithium atoms suspended in a standing wave of light and "kicking" them, emulating a so-called quantum kicked rotor ("similar to a periodically kicked pendulum," both Weld and Sajjad said), the researchers were able to create the lattice and the disorder, and observe the launch and return of the boomerang. They worked in momentum space, a method that evades some experimental difficulties without changing the underlying physics of the boomerang effect.

"In normal, position space, if you're looking for the boomerang effect, you'd give your electron some finite velocity and then look for whether it came back to the same spot," Sajjad explained. "Because we're in momentum space, we start with a system that is at zero average momentum, and we look for some departure followed by a return to zero average momentum."



The Weld Lab's quantum boomerang showed a lithium atom's initial departure and return to average zero momentum despite periodic energy "kicks" from their quantum kicked rotor. Credit: Roshan Sajjad

Using their quantum kicked rotor, they pulsed the lattice a few dozen times, noting an initial shift in average momentum. Over time and despite repeated kicks, however, average momentum returned to zero.

"It's just a really very fundamentally different behavior," Weld said. In a classical system, he explained, a rotor kicked in this way would respond by constantly absorbing energy from the kicks. "Take a quantum version of the same thing, and what you see is that it starts gaining energy at short times, but at some point it just stops and it never absorbs any more energy. It becomes what's called a dynamically localized state."

This behavior, he said, is due to the wave-like nature of quantum systems.

"That chunk of stuff that you're pushing away is not only a particle, but it's also a wave, and that's a central concept of quantum mechanics," Weld explained. "Because of that wave-like nature, it's subject to interference, and that interference in this system turns out to stabilize a return and dwelling at the origin." In their experiment, the researchers showed that periodic kicks exhibiting time-reversal symmetry would produce the boomerang effect, but randomly timed kicks would destroy both the symmetry, and as a result, the boomerang effect.

Up next for the Weld Lab: If individual boomerang effects are cool, how much more of a party would it be to have several interacting boomerang effects?

"There are a lot of theories and questions about what should happen—would interactions destroy the boomerang? Are there interesting many-body effects?" Sajjad said. "The other exciting thing is that we can actually use the system to study the boomerang in higher dimensions."

Research on this project was also conducted by Jeremy L. Tanlimco, Hector Mas, Eber Nolasco-Martinez and Ethan Q. Simmons at UCSB; Tommaso Macrì at Universidade Federal do Rio Grande do Norte and Patrizia Vignolo at Université Côte d'Azur.

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