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समाचार पत्रों से चयनित अंश
Newspapers Clippings

डीआरडीओ समुदाय को डीआरडीओ प्रौद्योगिकियों, रक्षा प्रौद्योगिकियों, रक्षा नीतियों, अंतर्राष्ट्रीय संबंधों और विज्ञान एवं प्रौद्योगिकी की नूतन जानकारी से अवगत कराने हेतु दैनिक सेवा

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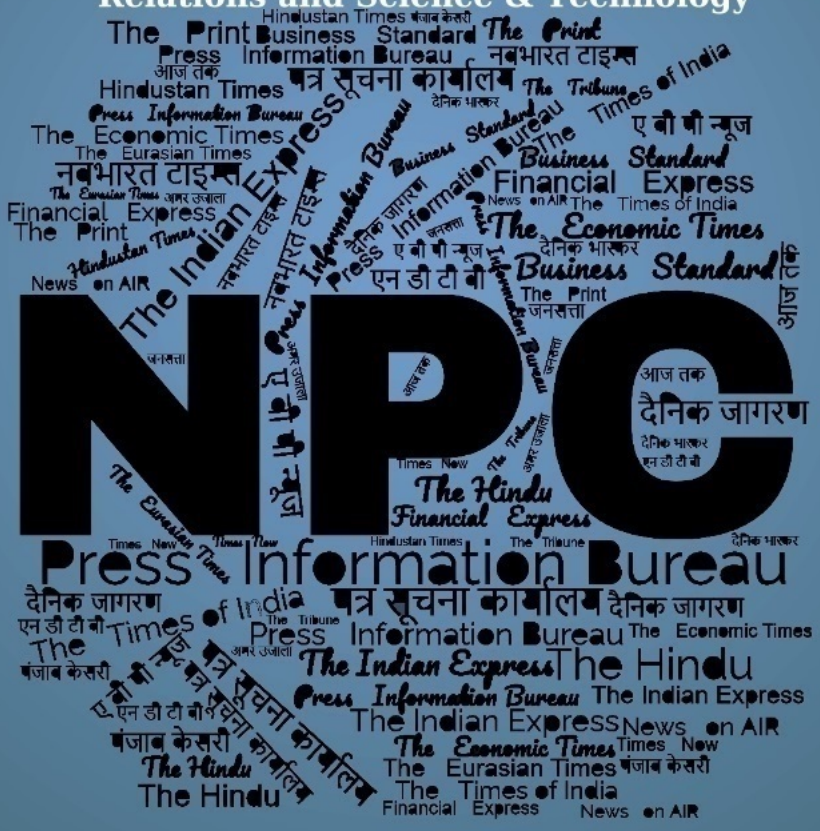

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CONTENTS

DRDO News

DRDO Technology News

THE ECONOMIC TIMES

Tue, 18 Jun 2024

DRDO, Indian firms showcase Made in India weapons, tech at Paris defence show

Indian defence sector firms from both public and private sectors are participating in the EUROSATORY 2024 defence show in France. The exhibition is showcasing Indian products like the Pinaka multi-barrel rocket launcher system and the LCA Tejas fighter aircraft. The India pavilion at the show was inaugurated on Monday, June 17 by Indian Ambassador to France Jawed Ashraf.

Bharat Electronics Limited Directors Manoj Jain and K V Suresh Kumar, Brig Zubin Bhatnagar, Defence Attache of India to France, and senior Defence Public Sector Undertakings and Defence Research and Development Organisation (DRDO) officials were present on the occasion, Bharat Electronics Limited officials said.

A large number of Indian companies are taking part in the show with the DRDO showcasing 11 major defence technologies and products. One of the prime attractions from the Indian side is the Pinaka multi-barrel rocket launcher system which has already been exported by India to a friendly foreign country.

The DRDO is also showcasing its Airborne Early Warning and Control System, LCA Tejas, Astra beyond visual range missiles and the highly successful Akash air defence system. The Arjun main battle tank and the Wheeled Armoured Platform along with the Varunastra heavy-weight torpedo are also on showcase.

A large number of Indian private sector companies like Nibe Defence, Bharat Forge among other small and medium enterprises are also participating in the show. Eurosatory-2024 is being held in Paris, France and is one of the largest defence shows in Europe.

The show is taking place at a time when almost all the countries in that region are looking to expand their defence spending in view of the ongoing RussiaUkraine conflict.

https://economictimes.indiatimes.com/news/defence/drdo-indian-firms-showcase-made-in-india-weapons-tech-at-paris-defence-show/articleshow/111087392.cms

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Tue, 18 Jun 2024

CDS Gen Anil Chauhan releases Joint Doctrine for Cyberspace Operations

Chief of Defence Staff Gen Anil Chauhan released the Joint Doctrine for Cyberspace Operations during the Chiefs of Staff Committee (COSC) meeting held on June 18, 2024, in New Delhi. The Joint Doctrine is a keystone publication that will guide Commanders in conducting Cyberspace Operations in today's complex military operating environment.

Development of Joint Doctrines is an important aspect of Jointness and Integration, a step which is being actively pursued by the Indian Armed Forces. The Joint Doctrine for Cyberspace Operations is a significant step to give impetus to the ongoing process. In addition to the traditional domains of warfare including Land, Sea, and Air, Cyberspace has emerged as a crucial and challenging domain in modern warfare. Unlike territorial limits in the domains of land, sea, and air, cyberspace is a global common and hence has shared sovereignty. Hostile actions in cyberspace can impact the Nation's economy, cohesion, political decision making, and the Nation's ability to defend itself. Operations in cyberspace need to be dovetailed into the National Security fabric, to evolve the 'Ends,' 'Ways' and 'Means' to create advantage and influence events in all other operational environments and across all instruments of power.

This doctrine lays emphasis on understanding military aspects of cyberspace operations and provides conceptual guidance to commanders, staff and practitioners in the planning, and conduct of operations in cyberspace, as also to raise awareness in our warfighters at all levels.

https://pib.gov.in/PressReleasePage.aspx?PRID=2026240

Press Information Bureau
Government of India

Ministry of Defence

Tue, 18 Jun 2024

INS Sunayna In Port Victoria, Seychelles

INS Sunayna, an Offshore Patrol Vessel based at Southern Naval Command, entered Port Victoria, Seychelles on 15 Jun 24 in the company of Seychelles Coast Guard Ship (SCGS) Zoroaster. Zoroaster had recently completed her short refit at Garden Reach Shipbuilders & Engineers Ltd (GRSE), India.

Upon arrival, INS Sunayna was warmly received by officials of Seychelles Coast Guard and Embassy of India. During the ship's visit, personnel from Indian Navy and Seychelles Defence Forces will engage in official & social interactions and cross deck visits. The ship will undertake joint EEZ surveillance with the Seychelles Coast Guard during the deployment. The visit is aimed at further strengthening the camaraderie and mutual cooperation between Indian Navy and Seychelles Coast Guard in line with the vision of SAGAR (Security & Growth for All in the Region).

https://pib.gov.in/PressReleasePage.aspx?PRID=2026190

THE ECONOMIC TIMES

Tue, 18 Jun 2024

ASMI submachine gun from Hyderabad's Lokesh Machines Ltd. poised for Army service

In a new development, Lokesh Machines Ltd., a city-based manufacturer known for CNC machines, has achieved a significant milestone with its debut small arms creation. The company's 9x19 mm calibre submachine gun, named ASMI, has become the first domestically designed, developed, and manufactured weapon to be officially inducted into the Indian Army.

This historic achievement underscores India's advancement in indigenous defence manufacturing. Indigenous Excellence Recognized Lokesh Machines Ltd. has secured a substantial order worth Rs 4.26 crore from the Northern Command of the Army for 550 ASMI submachine guns. This order highlights the Army's confidence in the ASMI's capabilities. Moreover, the ASMI has already undergone testing and received positive feedback from other security forces.

The National Security Guard (NSG) and the Assam Rifles have received pilot lots of the ASMI and have expressed interest in further deployment, while the Border Security Force (BSF) has placed a pilot order for four guns.

The ASMI has not only been successful in the Indian market but has also garnered international recognition. The weapon, designed in collaboration with the Armament Research & Development Establishment (ARDE) in Pune and the Indian Army, has outperformed renowned international competitors such as the 'Uzi' from Israel Weapon Industries (IWI) and firearms from Heckler & Koch of Germany in terms of accuracy and reliability.

The ASMI's design incorporates advanced materials and manufacturing techniques. It features a single unibody receiver machined from aerospacegrade aluminium, making it lightweight at under 2.4 kg. This weight advantage, combined with its compatibility with both local and NATOstandard imported ammunition, sets it apart from its competitors.

Future Prospects and Market Potential With a price tag of under Rs 1 lakh, the ASMI is nearly 30% cheaper than imported submachine guns, making it a cost-effective choice. Its versatility extends to various applications within the Armed Forces, including roles such as vehicle detachment, commanders, tank and aircraft crews, drivers, dispatch riders, and personnel involved in close-quarters combat (CQB), counterinsurgency (CI), counter-terrorism (CT) operations, VIP protection, and policing duties.

The ASMI's successful development and induction into the Indian Army signal a significant achievement for Lokesh Machines Ltd. and the Indian defence sector as a whole. This milestone underscores India's progress in defence manufacturing and its commitment to self-reliance in this critical area.

The ASMI, with its exceptional performance and competitive pricing, not only meets the needs of domestic security forces but also holds promise for export markets. Its success story reflects India's journey towards defence selfsufficiency and is a testament to the innovative capabilities of Indian manufacturers.

https://economictimes.indiatimes.com/news/defence/asmi-submachine-gun-from-hyderabads-lokesh-machines-ltd-poised-for-army-service/articleshow/111078528.cms

THE ECONOMIC TIMES

Tue, 18 Jun 2024

US, India must stay at tech forefront, says Ajit Doval

India and the US have got to remain at the forefront of technology in case "we need to protect and defend our value systems and it is part of a larger strategic interest", said Ajit Doval, National Security Advisor on Tuesday, in presence of his American counterpart Jake Sullivan.

Both NSAs attended the Initiative for Critical and Emerging Technology (iCET) Industry Roundtable organised by Confederation of Indian Industry (CII) here. Addressing the meeting, Sullivan noted three important buckets for technology partnerships: the first being innovation, the second as production, and the third being deployment.

Doval highlighted the role of industry in technology and the progress of iCET since its inception. He stated, "iCET has achieved more than we could imagine." Doval also highlighted the progress made across the defence innovation roadmap and start-ups, and emphasised the importance of the semiconductor industry.

Sullivan highlighted the importance of innovation and emphasised the need for government support for the private sector. He remarked that there exists bipartisan support for Indian industry in the US.

He further added that building the ecosystem and supply chain manufacturing is the key to production. Sullivan said the core of iCET is about the idea of India and the US being able to support each other and to encourage greater collaboration in the technology ecosystem, jointly innovate and find solutions to challenges.

The (iCET, launched in January 2023, represents a landmark agreement between the two countries on emerging technologies such as AI, semiconductors, biotech, and defence innovation. iCET is a significant development in the India-US relationship, as it elevates the two countries' strategic partnership to new heights.

https://economictimes.indiatimes.com/news/defence/us-india-must-stay-at-tech-forefront-says-ajit-doval/articleshow/111093079.cms

INDIA TODAY

Tue, 18 Jun 2024

The defence agenda: Firepower that’s more Indian

-By Pradip R. Sagar

The challenges facing the government in the defence sector require careful strategic planning, followed by decisive action. In its election manifesto, the BJP promised to expand India’s defence footprint across strategic locations and partner with friendly countries to protect its security interests in the Indian Ocean Region.

On defence manufacturing, it has promised to continue support for start-ups, so that indigenisation can be accelerated. The other emphasis is to increase exports of Made in India defence equipment.

In the 2023–24 financial year, defence exports reached a record high of Rs 21,083 crore (around $2.63 billion).The government has set up a target of Rs 35,000 crore by 2025. Continuing robust

vigilance along the tense Line of Actual Control (LAC) with China is an imperative too, along with managing internal security threats, including insurgencies and terrorism.

Adapting to the military/ security challenges posed by climate change—like the threat rising sea levels pose to naval bases—are on the agenda. Defence strategists point to the need to enhance the frequency of military training exercises with countries in West and Southeast Asia.

The armed forces should also have a greater role in acquiring defence platforms. Visualising future battlefield environments would lead to the formulation of a capability development plan, which would direct acquisitions and indigenisation.

What Needs To Be Done

Indigenous Technology

India is still one of the world's top buyers of foreign armaments. The ministry must ensure the armed forces are equipped with latest technology, while promoting self-reliance through 'Make in India' in defence manufacturing.

Border defence

There is a need to further enhance border infrastructure along the Line of Actual Control (LAC) in the light of the continuing stand-off with China, and increase operational preparedness along the Line of Control with Pakistan.

Theatre commands

The unrealised joint theatre commands for effective military operations must be implemented. Experts say a pilot project is needed to put operational aspects in place.

Agnipath

The recruitment scheme has been a political hot potato. It must be evaluated and refined after getting feedback from the military.

Cyber defence

Strengthening cyber defence capabilities against cyber threats and attacks on military/ critical infrastructure.

https://www.indiatoday.in/india-today-insight/story/the-defence-agenda-firepower-thats-more-indian-2554829-2024-06-18

The EurAsian Times

Wed, 19 Jun 2024

India Invests Massive $14 Billion In Indigenous Aircraft; After LCA Tejas, Now Big LCH Prachand Deal On Cards

In a bid to bolster the military's combat capability, particularly when operating at high altitudes, the Indian Ministry of Defense (MoD) has reportedly sent a Request for Proposal (RFP) to aircraft manufacturer Hindustan Aeronautics Limited (HAL) for the purchase of 156 LCH Prachand.

According to unknown officials who spoke to the Indian media, the projected cost of the new helicopters—90 for the Indian Army and 66 for the Indian Air Force (IAF)—is ₹50,000 crores ($6B). The purchase is anticipated to strengthen India's bid to achieve self-reliance in defense and expand indigenous production of weapon systems.

Until now, the HAL has produced just 15 units of LCH Prachand, including ten for the IAF and five for the Army in a limited series production capacity. However, with the new order, the helicopter will enter serial production. According to the officials, HAL plans to carry out the order in five to six years after the contract for 156 helicopters is inked.

The Light Combat Helicopter 'Prachand' has already been deployed to the Siachen Base Camp and along the eastern border with China. The recent order would boost the Indian military's attempt to establish deterrence with its two adversaries across the northern and western borders: China and Pakistan.

The LCH Prachand is India's first indigenous multi-role combat helicopter with potent ground attack and aerial combat capability. It has been customized to meet the Indian armed forces' requirement to operate in deserts and mountains. The LCH is the only helicopter operating at 5,000 meters with a considerable load of weapons and fuel.

The helicopter was developed by India after its Russian Mi-25 and Mi-35 proved ineffective during the Kargil conflict against Pakistan in 1999. The production and induction of the LCH Prachand are noteworthy, given that the LCH project has had several hiccups since it was launched in the early 2000s.

The recent order suggests that Indian inventories will be filled with this state-of-the-art chopper that distinguishes itself with a maximum speed of 288 mph, a combat radius of 500 kilometers, and a service ceiling of 21,000 feet.

The LCH can carry out a wide range of tasks, including counter-insurgency operations in urban and jungle settings, destroying high-altitude bunkers, destroying enemy air defenses, and supporting ground forces. It can also target and destroy remotely piloted aircraft and slow-moving aircraft.

More importantly, however, it would stand out as yet another product of India's 'Make in India' or 'Atmanirbhar Bharat' policies calling for indigenization. The recent purchase comes just months after the IAF placed a huge order for the LCA Tejas Mk1A aircraft.

The Indian MoD awarded a tender to HAL in April 2024 for 97 light combat aircraft (LCA Mk-1A). The planes will bolster the IAF's strength amid a fighter squadron shortfall. The aircraft are being purchased at an approximate cost of ₹67,000 crores ($8B).

The IAF is already operating two squadrons of the Tejas Mk1 jets, comprising 20 each of Initial and Final Operational Clearance variants. An order for 83 LCA Mk1A variants was placed in 2021. The first lot of the LCA Mk1A jets is slated for delivery to the IAF in early 2024, but that deadline has been missed.

With another huge Tejas Mk1A order, the indigenously-produced aircraft will form a significant part of India's air fleet. India has taken nearly 40 years to get a self-made functional combat jet inducted into its air force, with at least two squadrons of the Tejas LCA currently flying regular operational missions, including those near the northern and western borders with China and Pakistan in recent months.

The expansion in the production of both these aircraft—the poster children of India's self-reliance in defense—may also be significant, given that neither the LCA Tejas nor the LCH Prachand has debuted in the export market yet.

LCA Tejas& LCH Prachand Await Export Debut

The Indian government has backed the LCA Tejas and has been making concerted pitches and attempts to propel it into the export market—albeit with no success yet.

In a previous interview, CB Ananthakrishnan, HAL CMD, said that the LCA 'Tejas' was the best in its category and had evoked interest from foreign buyers.

"Five countries have shown interest. With Argentina, it is still under discussion. Talks with the Philippines are in advanced stages. With Egypt also, we are in discussion. And talks with Nigeria have gained momentum," Ananthakrishnan said. However, the talks have not moved and there is no word on progress.

Argentina sealed the deal to purchase the second-hand F-16s from Denmark, choosing the US-origin jets over India's LCA Tejas. The Tejas also suffered a defeat when Malaysia chose the South Korean FA-50 over the Indian aircraft.

There were reports that the Philippines was offered the local assembly of the LCA Mk1 Naval variant. However, despite being the first-ever customer of India's BrahMos supersonic cruise missile, the country has shown no further interest.

Similarly, Nigeria indicated its interest in the LCA as part of a $1 billion agreement to boost the defense industry in the African nation. However, the details of Nigerian interest in the LCA—whether to buy it for its armed forces or seek industrial cooperation with Hindustan Aeronautics Limited—have to be seen.

Interestingly, these countries have also shown interest in the LCH Prachand. Argentina signed a letter of intent to purchase 20 Light Combat Helicopters (LCH) Prachand.

Nigeria has shown interest in the Indian-built Light Combat Aircraft (LCA) Tejas, Light Combat Helicopter (LCH) 'Prachand,' Light Utility Helicopter (LUH), and Advanced Light Helicopter (ALH) 'Dhruv.'

India has been reaching out to Latin America, Africa, and Southeast Asia countries, offering the LCA Tejas and the LCH Prachand. However, a sales agreement has yet to be finalized.

https://www.eurasiantimes.com/india-invests-massive-14-billion-in-indigenous/

The Tribune

Wed, 19 Jun 2024

MoD asks UK for 9 Jaguars, spares to help maintain fleet

The Ministry of Defence has approached the UK for the transfer of nine Jaguar aircraft that are now no longer in service with the European country, along with a cache of spares, to make up for attrition in the Indian Air Force (IAF).

The Jaguars, which equip six squadrons, form a crucial element of the IAF's deep penetration strike capability and tactical reconnaissance. Some of these aircraft have also been modified for the maritime role with anti-ship missiles. The IAF is seeking the airframes of five single seater GR-1 version and four twin-seat T-2 variants decommissioned by the Royal Air Force, along with about 150 different types of spare parts, sources said. The sale and transfer of the airframes and spares would be facilitated by UK's Defence Equipment Sales Authority and once the deal is finalised, these would be shipped to the Air Force Station, Ambala, where two Jaguar squadrons, No.5 'Tuskers' and No.16 'Bulls', are based.

Earlier, as an offset of the Rafale fighter jet deal, the IAF had received 31 decommissioned airframes along with a few engines and a large number of critically needed spares from France, which were moved to the Gorakhpur airbase, where two other squadrons are based. Jamnagar is the third operating base for these aircraft. The Jaguars, which equip six squadrons, form a crucial element of the IAF's deep penetration strike capability and tactical reconnaissance. Some of these aircraft have also been modified for the maritime role with anti-ship missiles.

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In 1979, 40 aircraft were imported from the UK followed by licence manufacture of 150 aircraft by Hindustan Aeronautics Limited. At present, the IAF has about 115 Jaguars in service, but according to reports their serviceability is a cause for concern due to obsolescence, non-availability of spares. Over the past decade, the IAF's Jaguar fleet has been undergoing modernisation and upgradation to enhance its operational capability. With this, sources said the fleet is expected to remain in service for another 15 years.

A few years ago, the IAF began re-equipping the Jaguar with the DARIN-III advanced navigation and attack avionics suite, and earlier this year, initiated another project to re-equip the fleet with new generation close combat air-to-air missiles, transport platforms as well as cruise missiles and UAVs.

https://www.tribuneindia.com/news/india/mod-asks-uk-for-9-jaguars-spares-to-help-maintain-fleet-632010

R. REPUBLICWORLD.COM

Wed, *18 Jun 2024*

Indian Navy Set to Conduct Crucial Submarine Trials in Spain for Project 75 India

The Indian Navy is set to conduct trials in Spain for its Project 75 India, aiming to procure six advanced submarines. This initiative, involving Spanish firm Navantia, marks a significant step in enhancing India's naval capabilities. Navantia Chairman Ricardo Dominguez Garcia-Baquero highlighted the Spanish government's keen interest in supporting the P75(I) project. The collaboration aims to ensure expeditious export clearances and comprehensive agreements with the Indian government, similar to the recent Airbus deal for C-295 transport aircraft.

Testing Critical Equipment

Field evaluation trials of Air Independent Propulsion (AIP) by the Indian Navy are scheduled for the last week of June at Navantia's shipyard in Cartagena. Both Navantia and their partner, Larsen & Toubro (L&T), are prepared for these trials, and eager to demonstrate their advanced AIP technology.

India seeks to acquire six conventional submarines with AIP systems, enabling extended underwater endurance compared to previous generations. Besides the L&T and Navantia

collaboration, German ThyssenKrupp Marine Systems and Mazagaon Dockyards Limited are also competing for the ₹60,000 crore project. Submarine Design and Technological Advancements Navantia has proposed its S80 submarine design, already in service with the Spanish Navy since 2023, for the including its AIP system which generates over 300 kW of power.

The S80's design integrates modern features and technologies such as the third-generation BEST AIP (Bioethanol Stealth Technology) and an advanced sensor suite. Navantia and L&T have also partnered to provide proven lithium-ion battery technology for the project. Navantia is committed to fulfilling the Transfer of Technology and Indigenous Content requirements, aligning with India's goal of achieving self-reliance in submarine technology.

Over the past few months, top-ranking Spanish officials have engaged with their Indian counterparts, reaffirming their commitment to the P75(I) project. Navantia has maintained a constant dialogue with Indian suppliers, sharing technical specifications to assess their capabilities. The partnership with L&T, known for its extensive indigenisation efforts in the defence sector, is expected to comfortably meet the Indigenous content requirements. Navantia Chairman praised L&T's work in submarines and other defence areas, emphasizing the strategic partnership's role in developing the Indian private sector for manufacturing major defence platforms and equipment. He noted that the collaboration with L&T could extend beyond submarines, opening new opportunities in defence manufacturing.

The strategic partnership between Navantia and L&T aims to not only meet the industrial and Indian Navy's requirements but also to explore opportunities beyond submarine manufacturing. The collaboration underscores the mutual benefits of technological exchange and capacity building in defence manufacturing. Navantia's commitment to the project is evident in its proactive engagement with Indian suppliers and adherence to technical requirements. This partnership aligns with India's strategic goals of self-reliance and indigenisation in the defence sector.

https://www.republicworld.com/defence/indian-armed-forces/indian-navy-set-to-conduct-crucial-submarine-trials-in-spain-for-project-75-india/?amp=1

The EurAsian Times

Tue, 18 Jun 2024

French CAESAR, Indian ATAGs To Bolster Armenian Defenses; Paris, Yerevan Sign New Military Deal

France and Armenia signed a contract for the supply of French self-propelled guns (SPG) CAESAR, which has wreaked havoc on Russian troops in the Ukraine War. The French big guns, along with the towed 155/52 Advanced Towed Artillery Guns (ATAGs) and mounted MArG 155/39, were procured from India to fortify against Azerbaijan.

French Defense Minister Sebastien Lecornu broke the news on X.

“We continue to strengthen our defense relations with Armenia. I had a warm and productive conversation with my colleague, Suren Papikyan. The signing of a contract for the purchase of CAESAR guns is a new important milestone,” he wrote.

He did not say how many systems Armenia would acquire. France has a large Armenian diaspora and is traditionally one of Yerevan’s strongest allies in Europe. The Caesar is a self-propelled gun mounted on a Renault Sherpa 10 truck chassis with an armored cab. The Ukraine war showed the vulnerability of artillery guns to drones. The French artillery engineers devised a simple solution—they took the big gun and mounted it on a truck. The self-wheeled guns are low-cost and have high mobility, increasing their survival odds in the face of drones.

Systems like the Caesar can pull into position, fire multiple rounds, and race off in a few minutes – a tactic known in military parlance as “shoot and scoot.”

In Ukraine, the omniscience of drones requires gun operators to hide their positions well and shift positions immediately after firing to avoid retaliatory strikes. Ukraine war has seen an increased leaning of the world’s forces towards wheeled and self-propelled howitzers instead of towed ones. The French have claimed that leaks from Russian soldiers on Telegram indicate that Caesar is well-feared. According to spokesman Guillem Monsonis, Russian military bloggers on Telegram in April 2024 described Caesar’s range, accuracy, and mobility, saying the system killed numerous Russian artillerymen with counter-battery fire.

Caesar’s USP is its agility, which doesn’t give Russian forces enough reaction time to locate and target the Ukrainian crews, an artilleryman told French broadcaster TF1 last year. Russia joined the trend towards wheeled howitzers in 2023, citing greater maneuverability. Another advantage is the lower cost of wheels over tracks.

The French shift in strategy towards Armenia came in 2023 as Yerevan sought to diversify its arms imports after Russia failed to provide the country with ordered weapons worth around US $400 million (it has not yet returned the money). The failed arms deal was an additional trigger in the worsening Russia-Armenia relations, which made Armenia seek to diversify the sources of its arms imports, looking at the West and India. France and Armenia have shared strong diplomatic ties, as the former is home to a large Armenian diaspora. In 2001, Paris was among the first Western capitals to recognize the Armenian genocide, two decades before the United States did. Till 2023, France had backed Armenia only politically in the conflict.

Indian Guns For Armenia

As reported by the EurAsian Times earlier, in March 2024, Armenia placed an order for the ATAGS from India. These guns are considered to be the best in their category and can be deployed at high altitudes. This procurement report has come even as the Indian Army is yet to finalize the contract for these guns that will be deployed along its border with China, an official confirmed to the EurAsian Times.

The guns have been the result of collaboration between the Defense Research and Development Organisation (DRDO), Bharat Forge Limited, and Tata Advanced Systems Limited. Armenia had

ordered an MArG 155 wheeled self-propelled howitzer from Kalyani Forge India. In 2023, Armenia ordered six of these ATAGS. Now, it wants to procure 84 more ATAGS under US $155 million. These ATAGS are designed for high mobility and rapid deployment. They have advanced communication systems and automatic command and control systems.

The ATAGS will replace the obsolete Soviet-vintage D-30 towed 122mm howitzers and 2A65 Msta-B 152 mm towed howitzers. Its high-altitude operability makes it ideal for Armenian forces. Armenia will be the first export customer of the ATAGS. The Indian Army has already field-tested these guns in Pokhran, Balasore, and Sikkim, with temperatures ranging between -15 degrees Celsius and 50 degrees Celsius. The 155/52 mm caliber towed gun is an all-weather and terrain system.

These howitzers can strike targets up to 50 kilometers, making them the best guns in their class. They can fire a burst of 5 rounds in 60 seconds and at a sustained rate of up to 60 rounds in 60 minutes. Armenia has almost doubled its defense investments over the last year. In 2022, the spending was around US$700 million to US$800 million; now, in 2024, it will be US $1.4 billion or US $1.5 billion. The defense contracts with India alone account for a billion dollars.

Armenia has equipped itself with Indian-made Pinaka MBRLS (considered at par with American HIMARS) and an anti-drone system. The Pinaka was delivered to Armenia via Iran in 2023.

Pinaka Mk-1 is a free-flight artillery rocket area bombardment system with a range of 38 kilometers, quick reaction time, and a high rate of fire. A single Pinaka system fires a salvo of 12 rockets from a multi-barrel launcher in 44 seconds, while a battery can fire 72 rockets.

Armenia has also purchased an Indian-built surface-to-air missile (SAM) Akash. Akash is a short-range SAM system manufactured by Bharat Dynamics Limited (BDL) to protect vulnerable areas and points from air attacks. The Akash Weapon System (AWS) can simultaneously engage Multiple Targets in Group Mode or Autonomous Mode.

https://www.eurasiantimes.com/french-caesar-indian-atags-to-bolster-armenian/

The EurAsian Times

Tue, 18 Jun 2024

Nuclear-Armed Rafale Tilts The Scale In IAF's Favor! India Outguns Pakistan In No. Of Nukes, Delivery Platform

"There is an underlying relationship between the will to spend (military expenditure) and the intent to kill," wrote thinker and author Sundeep Waslekar in his book 'A World Without War.' A similar sentiment is reflected in the recently published annual assessment of armaments, disarmament, and international security by the Stockholm International Peace Research Institute (SIPRI).

According to SIPRI's report titled 'World Nuclear Forces 2023,' as of January 2024, a staggering 12,121 warheads populated the global inventory, with a terrifying 9,585 primed for potential deployment. Russia (5580 warheads) and the United States (5044 warheads), nuclear titans locked in an uneasy embrace, commanded a combined 10,624 of these instruments of unspeakable destruction. Ominously, China has now joined the grim ranks, believed to have warheads on high alert for the first time.

Alarmingly, an estimated 3,904 of these apocalyptic payloads were actively coupled with missiles and aircraft, a 60-warhead increase from the previous year. The remaining warheads lurked menacingly in central storage facilities. In a haunting revelation, approximately 2,100 of these deployed warheads maintained a hair-trigger state of high operational alert, poised on ballistic missiles for potential launch.

Nine countries worldwide possess nuclear arsenals: the United States, Russia, the United Kingdom, France, China, India, Pakistan, North Korea, and Israel. In 2023, all these nuclear-armed states continued to modernize their arsenals, with several deploying new nuclear-armed or nuclear-capable weapon systems.

India Overtakes Pakistan In Nuclear Count

In the volatile nuclear dynamic between India and Pakistan, a sinister shift has occurred. India, once trailing its rival, now possesses 172 nuclear warheads, surpassing Pakistan's 170 for the first time. India's steady accumulation since 2014 has narrowed the gap, fueled by its determination to counter Pakistan's perceived conventional military imbalance. According to SIPRI's report, India potentially added eight nuclear warheads in the past year, increasing from 164 to 172. It also estimates that Pakistan's nuclear stockpile remains unchanged at 170 warheads.

The report notes, "It has long been assumed that India stores its nuclear warheads separately from its deployed launchers during peacetime. However, the country's recent moves towards placing missiles in canisters and conducting sea-based deterrence patrols suggest that India could be shifting towards mating some of its warheads with their launchers during peacetime."

In 2023, both India and Pakistan continued to advance their respective nuclear delivery systems. While Pakistan remains the primary focus of India's nuclear deterrent, India seems to be increasingly prioritizing longer-range weapons capable of reaching targets across China. These weapons contribute to the development of India's mature nuclear triad, comprising aircraft, land-based missiles, and nuclear-powered ballistic missile submarines (SSBNs). India's nuclear arsenal includes aircraft such as Mirage 2000H, Jaguar, and Rafale, land-based missiles like Prithvi and Agni, and sea-based missiles like Dhanush and K-4/K-15.

On the other hand, Pakistan has never publicly disclosed the size of its nuclear arsenal. Limited official data and sensationalized news reports about Pakistan's nuclear capabilities make it difficult to accurately assess the number and types of Pakistani warheads and delivery vehicles.

Pakistan does not adhere to a no-first-use (NFU) doctrine and reserves the right to use nuclear weapons first in wartime, mainly due to what it perceives as an imbalance in the strength of its conventional forces compared to India.

Pakistani nuclear forces comprise aircraft like Mirage and F-16, land-based missiles including Abdali, Ghaznavi, Shaheen, Ghauri, Nasr, Ababeel, and Babur, as well as sea-based missiles like Babur 3 SLCM. India's capability to launch nuclear-tipped missiles through air via its Rafale, Mirage, and Jaguar fighters outscores Pakistan. India can strike, in case of a nuclear war, deep and with pinpoint accuracy. One critical reason India selected the Rafale over the Eurofighter Typhoon was that Paris was accepting of the idea that the Rafale fighters would become part of the air segment of India's nuclear triad that could dramatically shift the balance of power in India's favor.

China Flexes Its Nuclear Supremacy

China, however, stands as the undisputed nuclear heavyweight in the region, boasting a formidable 500 warheads in its military stockpile. Over the past year alone, China's nuclear might has swelled by a staggering 90 warheads (escalating from 410 to 500), with expectations of continued growth. It's important to highlight that China has never officially disclosed the size of its nuclear arsenal. Much of the analysis provided here is based on information sourced from the US Department of Defense (DOD).

Hans M. Kristensen, Associate Senior Fellow at SIPRI's Weapons of Mass Destruction Programme and Director of the Nuclear Information Project at the Federation of American Scientists (FAS), noted, "China is expanding its nuclear arsenal faster than any other country." China is currently undergoing a significant modernization and expansion of its nuclear capabilities, expected to persist over the next decade. Projections indicate that China could potentially match or surpass both Russia and the USA in terms of deployed intercontinental ballistic missiles (ICBMs) in this period. However, while China's ICBM numbers are expected to rise, its overall nuclear warhead stockpile is forecasted to remain smaller compared to these nations.

Moreover, China may now be deploying a limited number of warheads on missiles during peacetime. Its nuclear forces encompass H-6/H-20 bomber aircraft, DF-5/DF-41 land-based missiles, and JL-2/JL-3 sea-based missiles. "China's recent moves towards placing solid-fuelled missiles in silos, conducting sea-based deterrence patrols and, potentially, developing a launch-on-warning (LOW) capability suggest that China might have started mating a small number of its warheads (possibly around 24, corresponding to one missile brigade and one fully loaded ballistic missile submarine) with their launchers", report says.

Recent shifts in China's nuclear strategy, particularly its deployment of rapid-launch solid-fuel missiles and potential development of a Launch on Warning (LOW) capability, have sparked widespread discussions on its nuclear doctrine, including its 'no-first-use' (NFU) policy. Since 2022, the US Department of Defense (DOD) has suggested that China is adopting an 'early warning counter strike' strategy, akin to a LOW posture, utilizing ground- and space-based sensors for swift missile launches before potential threats are neutralized. The US DOD reports that China has deployed at least three early-warning satellites to support this strategy.

Raw Materials: Highly Enriched Uranium (HEU) & Plutonium

But what special raw materials are needed to make these nuclear warheads, and where do they come from? Materials capable of sustaining an explosive fission chain reaction are essential for all

types of nuclear explosives, from basic fission weapons to advanced thermonuclear ones. HEU and plutonium are the most common of these fissile materials.

Both HEU and plutonium are derived from natural uranium, which consists mostly of uranium-238 (U-238) with a small percentage of uranium-235 (U-235). Enrichment, usually achieved through gas centrifuges, raises the concentration of U-235. Low-enriched uranium, containing less than 20% U-235, is suitable for power reactors, while HEU, with at least 20% U-235, is utilized for weapons, typically enriched to over 90% U-235. Plutonium is produced in nuclear reactors when U-238 in the fuel absorbs neutrons.

SIPRI reports Russia (680 tonnes), the USA (483 tonnes), and France (29 tonnes) leading in HEU stocks. Material is typically enriched to 90–93% U-235, which is typically considered weapon-grade. China (14 tonnes), India (5 tonnes), and Pakistan (5 tonnes) also possess HEU. In terms of separated plutonium stocks, Russia (192 tonnes), the UK (119 tonnes), France (98 tonnes), and the USA (87 tonnes) are ahead, while China (3 tonnes), India (10 tonnes), and Pakistan (0.54 tonnes) also have substantial amounts.

Number of Nuclear Warheads Declined, But…

While the overall number of nuclear warheads has declined due to the dismantling of retired weapons by the United States and Russia, the lethality of active warheads continues to escalate. The weaponization of artificial intelligence and the dissolution of arms-control treaties have ushered in a new era of nuclear uncertainty as the nuclear superpowers relentlessly upgrade and modernize their warheads, delivery systems, and production facilities. In this grim landscape of nuclear brinkmanship, the pursuit of destructive might knows no bounds, casting a dark shadow over the future of humanity itself.

https://www.eurasiantimes.com/nuclear-armed-rafale-tilts-the-scale-in-iafs/

Business Standard

Wed, 19 Jun 2024

Brazilian plane maker Embraer sees India, Saudi as strategic defence markets

Brazilian planemaker Embraer sees India, Saudi Arabia, the European Union and the United States as strategic markets for its defence unit as it looks to expand sales of the C-390 Millennium, the head of Embraer Defense said on Tuesday.

India has an open tender to buy military planes while Saudi Arabia, looking to replace an aging fleet of Lockheed Martin's C-130 Hercules, is currently in "early engagement" with Embraer, Bosco da Costa Junior told reporters at an event.

"They don't have an open tender, but they need to replace their old C-130s. We did a lot of studies and concluded that the (Embraer) C-390 could deliver additional capability in this replacement process," Costa Junior said.

A potential Saudi purchase could reach 25 units, and Embraer expects the country to make a decision in two to four years, the executive added.

In addition to Embraer's home country Brazil, nations such as Portugal, Hungary, the Netherlands, Austria, the Czech Republic and South Korea have selected the planemaker's military transportation aircraft.

Expanding its presence abroad with more C-390 sales has been a key goal of Embraer's defense division, which also sees Sweden as a potential customer. It has partnerships with Mahindra in India and Saab in Sweden to introduce the plane.

Embraer has also been "aggressive on several fronts" in the United States, Costa Junior said, including exploring opportunities for mergers or acquisitions as well as pitching the C-390 to the US Marines, Air Force and special forces.

"We do believe that the C-390 could add additional value to those entities in the US," the executive said. "One thing is clear to us: We would like to become a partner of the US government."

Asked if any potential relationship with China could compromise connections with the US, Costa Junior stressed that Embraer's defense business had no relationship or any kind of discussions with the Asian superpower.

"We are 100 per cent US- and Nato-oriented," he said.

https://www.business-standard.com/external-affairs-defence-security/news/brazilian-planemaker-embraer-sees-india-saudi-as-strategic-defence-markets-124061900045_1.html

The EurAsian Times

Tue, 18 Jun 2024

Another Setback US Hypersonic Program; As Russia, China Advance, LRHWS ‘Dark Eagle’ Delayed To 2025

The US’s efforts to close the technological gap with China and Russia in the hypersonic program have encountered another setback: the fielding of the Long Range Hypersonic Weapon System (LRHWS) has been delayed to fiscal year 2025.

According to a report published by the Government Accountability Office on June 17, the US Army will not be able to field its first LRHW battery until fiscal 2025 due to issues with the launcher and launch sequence of the new Long Range Hypersonic Weapon System.

The LRHW is a trailer-launched, intermediate-range missile with a projected range of more than 1,700 miles. The system seeks to accomplish an incredible “hypersonic” top speed of Mach 17, or 3.6 miles per second. The LRHW also goes by the moniker, ‘Dark Eagle.’

The latest GAO report admits that the US Department of Defense (DoD) is not yet well positioned to field fast systems. However, it categorically mentions that the military intends to resolve the issues with the ambitious LRHW system and test the missile and launcher together by the end of fiscal year 2024. “The Army missed its goal of fielding its first Long-Range Hypersonic Weapon battery — including missiles — by fiscal year 2023 due to integration challenges,” the GAO said. “Based on current test and missile production plans, the Army will not field its first complete battery until the fiscal year 2025.”

The watchdog noted that the service could encounter problems even in the event of a successful launch, pointing to a possibility of further delays. Concerns about missile performance during flight testing could cause additional delays to the program, service officials informed the GAO. Additionally, after a fielding decision, the GAO plans to have the eight missiles required for a battery available within 11 months.

The recently reported delay is not the first for the program. However, it is particularly significant given the current escalation of the hypersonic race. In September 2023, the Army acknowledged that it would not meet its original goal of fielding the first battery by the end of the fiscal year 2023.

At that time, Doug Bush, the head of Army acquisition, said, “It’s a launcher problem.” Bush also assured that the military was working on a new plan and that a potential delivery could be made within the next six months. It seems that the new plan has also not worked out well for the US.

The US Department of Defense (DoD) ‘s efforts to close the hypersonic gap with China and Russia face a significant setback as the schedule to field the weapon has been constantly pushed further.

Since 2021, the LRHW has seen multiple test failures, some ascribed to missile malfunctions. The GAO noted issues with the launcher and launch sequence resulted in the cancellation of two tests in 2023.

While China and Russia have fielded multiple hypersonic weapons, the US hypersonic dream keeps slipping away due to technological hurdles. For instance, the US Air Force (USAF) had to officially cancel the AGM-183A Air-launched Rapid Response Weapon (ARRW) program after a spate of unsuccessful tests. The USAF has placed significant emphasis on developing the Hypersonic Attack Cruise Missile (HACM), yet the weapon is far from deployment.

In June 2022, the Navy conducted the test launch of an Intermediate-Range Conventional Prompt Strike (IRCPS) missile at the Pacific Missile Range Facility. The projectile experienced an in-flight anomaly affecting data collection for specific flight segments. However, the US Navy swiftly pinpointed the problem’s source and implemented corrective action, as detailed in the Pentagon’s Office of Test and Evaluation (DOT&E) report. The fielding, nonetheless, is running behind schedule.

Currently, the US Navy is developing the Hypersonic Air-Launched Offensive Anti-Surface Warfare (HALO) program that will advance its maritime strike capabilities by providing air-launched hypersonic anti-ship cruise missiles to surface and subsurface fleets. The weapon is expected to be ready only by 2029.

The primary US adversary in the world, China, has arguably emerged as the world leader in hypersonic capabilities. At least two additional hypersonic weapons emerged in the last year—the DF-27 and an air-launched variant of the YJ-21—respectively. Meanwhile, Russia has already used two of its hypersonic weapons—the Kinzhal and Zircon—in combat against the Ukrainian forces.

Incidentally, even countries that are considered rogue, like Iran and North Korea, are alleged to have operational hypersonic weapons, whereas a military powerhouse like the United States does not.

The recent GAO report paints a grim picture since the Dark Eagle was intended to become the first hypersonic weapon in the US Army's arsenal. Army spokeswoman Ellen Lovett said on June 17 that "for operational security reasons, we cannot provide the timing of tests in advance." The US hypersonic goalposts continue to shift amid malfunctions.

US Long Range Hypersonic Weapon System

The United States finds itself in a race to deploy hypersonic weapon capabilities and develop systems for defending against hypersonic missiles. The Army and Navy have been collaborating on a shared hypersonic glide body that could serve both the Army's ground-launched Dark Eagle and the Navy's sea-launched Conventional Prompt Strike (CPS) system.

A Dark Eagle battery comprises four trailer-based launchers, each accommodating two canister missiles. These launchers are transported on M870 trailers, towed by eight-wheeled M983A4 HEMTT tractor-trailer trucks. In addition, a command vehicle with six wheels serves as the Battery Operations Center, supervising the Dark Eagle system's operations.

One of the distinctive features of Dark Eagle's design is its unpowered hypersonic boost-glide vehicle sitting atop a rocket booster. Before being unleashed, the rocket booster raises the conical-shaped hypersonic vehicle to the optimum height and speed. It subsequently descends over a concise, atmospheric flight path at hypersonic speeds, defined as anything surpassing Mach 5.

US defense firm Lockheed Martin is integrating the Army's hypersonic capabilities. It will also manage the smooth implementation of this cutting-edge technology using a mobile truck launcher.

The US Army awarded Lockheed Martin a $756 million contract to enhance the capabilities of the Long Range Hypersonic Weapon (LRHW), the country's ground-based hypersonic weapon system.

The US must fix the technical issues and field a weapon soon, especially in the face of a burgeoning threat from adversaries (state and non-state actors). Concern continues to mount over the glacial pace at which hypersonic weapon research is moving, particularly in light of the significant advancements achieved by rival states.

https://www.eurasiantimes.com/another-setback-us-dark-eagle-hypersonic/

Business Standard

Wed, 19 Jun 2024

US renews warning to defend the Philippines after latest China clash

The United States renewed a warning Tuesday that it's obligated to defend its close treaty ally a day after Filipino navy personnel were injured and their supply boats damaged in one of the most serious confrontations between the Philippines and China in a disputed shoal in the South China Sea, officials said.

China and the Philippines blamed each other for instigating Monday's hostilities in the Second Thomas Shoal, which has been occupied by a small Filipino navy contingent aboard a grounded warship that's been closely watched by Chinese coast guard, navy and suspected militia ships in a yearslong territorial standoff. There is fear the disputes, long regarded as an Asian flashpoint, could escalate and pit the United States and China in a larger conflict.

US Deputy Secretary of State Kurt Campbell discussed China's actions with Philippine counterpart, Maria Theresa Lazaro, in a telephone call. Both agreed that China's dangerous actions threatened regional peace and stability, State Department spokesperson Matthew Miller said.

Campbell reaffirmed that the 1951 Mutual Defense Treaty, which obligates Washington and Manila to help defend the other in major conflicts, extends to armed attacks on Philippine armed forces, public vessels, or aircraft including those of its coast guard anywhere in the South China Sea, according to Miller.

A Philippine government task force overseeing the territorial disputes condemned what it said were dangerous maneuvers, including ramming and towing, which disrupted a routine effort to transport food, water and other supplies to the Filipinos manning the territorial outpost aboard the BRP Sierra Madre at the shoal.

Despite the illegal, aggressive, and reckless actions by the Chinese maritime forces, our personnel showed restraint and professionalism, refrained from escalating the tension, and carried on with their mission, the Philippine task force said without elaborating. Their actions put at risk the lives of our personnel and damaged our boats in blatant violation of international law.

The Chinese coast guard said the Philippines is entirely responsible for this. It said a Philippine vessel ignored China's repeated solemn warnings and dangerously approached a Chinese vessel in normal navigation in an unprofessional manner, resulting in a collision." Two speedboats attempting to deliver construction materials and other supplies to a military vessel stationed at the shoal accompanied the supply ship, according to China's Foreign Ministry, which described its coast guard's maneuver as professional, restrained, reasonable and lawful." Philippine Defense Secretary Gilberto Teodoro Jr. said Monday night that his country's armed forces would resist China's dangerous and reckless behaviour, which contravenes their statements of good faith and decency."

We will exert our utmost in order to fulfill our sworn mandate to protect our territorial integrity, sovereignty, and sovereign rights, Teodoro said. It should now be clear to the international community that China's actions are the true obstacles to peace and stability in the South China Sea.

Several incidents have happened in recent months near the shoal which lies less than 200 nautical miles (370 kilometers) from the nearest Philippines coast and where it maintains the Sierra Madre, which had become encrusted with rust since it was deliberately grounded in 1999 but remains an actively commissioned military vessel, meaning an attack on it could be considered by the Philippines as an act of war.

China has increasingly become assertive in pressing its claim to virtually the entire South China Sea, which has led to a rising number of direct conflicts with other countries in the region, most notably the Philippines and Vietnam.

A new law by China, which took effect Saturday, authorizes its coast guard to seize foreign ships that illegally enter China's territorial waters and to detain foreign crews for up to 60 days. The law renewed a reference to 2021 legislation that says China's coast guard can fire upon foreign ships if necessary.

At least three coastal governments with claims to the waters the Philippines, Vietnam and Taiwan have said they would not recognize the law. Malaysia and Brunei are also involved in the long-seething territorial disputes, which are regarded as a delicate fault line in the longstanding US-China rivalry in the region.

https://www.business-standard.com/external-affairs-defence-security/news/us-renews-warning-to-defend-the-philippines-after-latest-china-clash-124061800379_1.html

Science & Technology News

THE HINDU

Wed, 19 Jun 2024

Catalytic boost for cheaper biodiesel production

A team of scientists from Assam, Odisha, China, and the United Kingdom have developed a water-repellent catalyst that can cut the cost of producing “environmentally benign” biodiesel substantially from the current levels.

The process of arriving at the “spherical superhydrophobic activated carbon catalyst” to withstand water by-product during the production of biodiesel – pursued as a substitute for diesel, an exhaustible fossil fuel – has been published in the latest issue of the peer-reviewed Advanced Functional Materials, a high impact journal of the international materials science community.

The authors of the study are Arpita Das, Kangkana Saikia, and Samuel Lalthazuala Rokhum of Southern Assam's Department of Chemistry, National Institute of Technology (NIT) in Silchar, Chandrakanta Guchhait and Bimalendu Adhikari of NIT Rourkela in Odisha, Da Shi of the University of Cambridge in the United Kingdom, and Hu Li of the Guizhou University in China.

Superhydrophobic catalysts, imitating the anti-wetting or water-repulsing properties of natural surfaces such as lotus leaves, are deemed crucial for their ability to prevent the poisoning of active sites by water, produced in situ or as a by-product. "Our novel superhydrophobic catalyst can be a game-changer in the field of biodiesel production. It stands out because of unmatched robustness; it can withstand the water by-product during biodiesel production," Dr. Rokhum told The Hindu.

"This means the catalyst remains highly effective and can be reused multiple times, making the catalytic process more efficient and cost-effective," he said. He further said the catalyst, derived from biomass (cellulose), is ecologically benign, abundant, and highly affordable. "This breakthrough has the potential to significantly reduce the cost of biodiesel production, making sustainable energy more accessible," he added. At present, the cost of biodiesel in India is about ₹100 or UD$1.2 per litre.

Using the superhydrophobic activated carbon catalyst can bring down the cost to about 37 cents per litre. A litre of less fuel-efficient diesel costs at least ₹87 in India. "Biodiesel is a key player in the quest for sustainable energy. Our innovative catalyst could pave the way for broader adoption and a greener future because it makes the production process more efficient, cost-effective, and environment friendly," Dr. Rokhum, among the world's top five scientists in the field of biodiesel, said. This green synthesis strategy provides a sustainable method for biomass waste disposal and ultimately expands the utility of biochar as an alternative to graphene andcarbon nanotubes, he explained.

https://www.thehindu.com/sci-tech/science/catalytic-boost-for-cheaper-biodiesel-production/article68304211.ece

the pioneer

Wed, 19 Jun 2024

King Charles III felicitates India-born brain trauma expert

An India-born brain trauma expert and Professor of Anaesthesia at the University of Cambridge has been conferred with one of the high honours by Britain's King Charles III for "services to neurocritical care". Prof David Krishna Menon, Head of Division of Anaesthesia at the University of Cambridge, was conferred with a Commander of the Order of the British Empire (CBE) by the 75-year-old monarch in his annual Birthday Honours list over the weekend.

Menon, who trained in Medicine, Anaesthesia and Intensive Care at the Jawaharlal Institute of Postgraduate Medical Education & Research (JIPMER) in Pondicherry, founded the Neurosciences Critical Care Unit (NCCU) at Addenbrooke's National Health Service (NHS) teaching hospital in Cambridge and is renowned for his global clinical and research leadership in traumatic brain injury.

"I am deeply honoured to be nominated for a CBE and accept it on behalf of all those who have worked with me during what has been – and continues to be – a very rewarding career," said Professor Menon. Menon, the son of P.G.K. Menon – a senior official at All India Radio (AIR) in Delhi, was raised in the city before going on for training in the field of medicine with his research interests focussed on neurocritical care, secondary brain injury, neuroinflammation, and metabolic imaging of acute brain injury.

According to the Cambridge University Hospitals (CUH) NHS Foundation Trust, as the first director of NCCU, he pioneered the first recognised training programme for specialist neurocritical care in the UK. Protocols developed improved clinical outcomes in severe head injury and the management of acute intracranial haemorrhage. Menon has been an intensive care consultant on the NCCU since 1993, and remains active as a full member of the neurocritical care clinical team.

He is also a director of research, principal investigator in the Wolfson Brain Imaging Centre, and principal investigator in the van Geest Centre for Brain Repair, at the University of Cambridge. Following two terms as a senior Investigator in the National Institute for Health and Care Research (NIHR), he was appointed emeritus NIHR Senior Investigator in 2019. He is a founding fellow of the Academy of Medical Sciences, and a professorial fellow in the medical sciences at Queens' College, Cambridge University.

Listing his many achievements, CUH said the respected medic jointly leads the European Union funded EURO 30-million CENTER-TBI Consortium, the International Initiative on TBI Research, and the multi-funder UK national Traumatic Brain Injury (TBI) Research Platform. He jointly led the "Lancet Neurology Commissions on TBI" in 2017 and 2022 and was executive editor of the UK All Party Parliamentary Group Report on Acquired Brain Injury 2019.

Menon has been an applicant or co-applicant on awarded grants totalling over GBP 50 million. He has over 650 peer-reviewed publications and since 2021 has been continuously rated as a Highly Cited Researcher by Clarivate, a global leader in providing trusted insights and analytics. The Acute Brain Injury Program at Cambridge, which he founded, has supported over 50 PhD studentships, and nurtured several senior investigators across clinical and basic neuroscience.

His CBE from the King this year comes alongside that of another Indian-origin professional, recognised for "services to transport". Dipesh Jayantilal Shah is Chair of National Highways, England, and formerly CEO of the UK Atomic Energy Authority and of large businesses at BP. A graduate of the Universities of London and Warwick, and the Harvard Business School management programme, Shah was previously conferred an OBE for his illustrious career in the public and private sectors.

https://www.dailypioneer.com/2024/world/king-charles-iii-felicitates-india-born-brain-trauma-expert.html#:~:text=An%20India%2Dborn%20brain%20trauma,%E2%80%9Cservices%20to%20neurocritical%20care%E2%80%9D.

The Indian EXPRESS

Wed, 19 Jun 2024

ISRO's rocket body re-enters earth's atmosphere, complies with international guidelines

ISRO on Tuesday said the cryogenic upper stage of the LVM3 M3/OneWeb India- 2 mission has re-entered the Earth's atmosphere. The nearly 3-ton rocket body was left in an orbit of 450 km altitude after injecting 36 OneWeb satellites on March 26, 2023, the space agency said. In its sixth consecutive successful flight of LVM3, the vehicle placed 36 satellites belonging to the UK-headquartered OneWeb in their intended orbit, it was noted. "The upper stage was passivated by depleting excess fuel as per the standard practice to minimise any potential risk for an accidental break-up.", ISRO said.

"The re-entry was estimated to occur within a window from 14:35 UTC to 15:05 UTC, the most probable impact being at 14:55 UTC in the Indian Ocean," ISRO said giving an update on the June 14 re-entry. Only certain elements like gas bottles, nozzle, and tanks which comprise materials of very high melting points were expected to survive the aerothermal heating during the re-entry for this rocket body, it said. According to ISRO, the object was tracked by its Multi-object Tracking Radar (MOTR) at Sriharikota over the orbits before the atmospheric re-entry, and the tracking data was utilised in the re-entry prediction process. The re-entry of this object was continuously monitored by ISRO's facility, ISRO System for Safe and Sustainable Space Operations Management (IS4OM), ISTRAC, here.

The LVM3-M3 rocket body was disposed of through natural orbital decay within two years of the orbital injection, the space agency said, adding, therefore, it complied with international guidelines such as UN space debris mitigation guidelines. The LVM3-M3 rocket stage also complied with the directives of India's Debris Free Space Missions (DFSM) initiative which requires the space objects operating in the Low Earth Orbital region to be in orbit for less than five years after the end of the mission, it said.

https://indianexpress.com/article/technology/science/isros-rocket-body-enters-earth-atmosphere-international-guidelines-9400313/

THE ECONOMIC TIMES

Tue, 18 Jun 2024

IISc physicists find a new way to represent 'pi'

Scientists at the Indian Institute of Science (IISc) have stumbled upon a new series representation for the irrational number pi during their research on how string theory can be used to explain certain physical phenomena. The representation provides an easier way to extract pi from

calculations involved in deciphering processes like the quantum scattering of high-energy particles, IISc said in a press statement. The new formula under a certain limit closely matches the representation of pi suggested by Indian mathematician Sangamagrama Madhava in the 15th century, which was the first ever series for pi recorded in history.

The study was carried out by Arnab Saha, a post-doc and Aninda Sinha, professor at Centre for High Energy Physics (CHEP), and published in Physical Review Letters. “Our efforts, initially, were never to find a way to look at pi. All we were doing was studying high-energy physics in quantum theory and trying to develop a model with fewer and more accurate parameters to understand how particles interact. We were excited when we got a new way to look at pi,” Sinha said.

Sinha’s group is interested in string theory – the theoretical framework that presumes that all quantum processes in nature simply use different modes of vibrations plucked on a string. Their work focuses on how high energy particles interact with each other – such as protons smashing together in the Large Hadron Collider – and in what ways we can look at them using as few and as simple factors as possible.

This way of representing complex interactions belongs to the category of “optimisation problems.” Modelling such processes is not easy because there are several parameters that need to be taken into account for each moving particle – its mass, its vibrations, the degrees of freedom available for its movement, and so on, the statement said. Saha, who has been working on the optimization problem, was looking for ways to efficiently represent these particle interactions.

To develop an efficient model, he and Sinha decided to club two mathematical tools: the Euler-Beta Function and the Feynman Diagram. Euler-Beta functions are mathematical functions used to solve problems in diverse areas of physics and engineering, including machine learning. The Feynman Diagram is a mathematical representation that explains the energy exchange that happens while two particles interact and scatter.

What the team found, the IISc statement added, was not only an efficient model that could explain particle interaction, but also a series representation of pi. In mathematics, a series is used to represent a parameter such as pi in its component form. If pi is the “dish” then the series is the “recipe”. Pi can be represented as a combination of many numbers of parameters (or ingredients). Finding the correct number and combination of these parameters to reach close to the exact value of pi rapidly has been a challenge.

The series that Sinha and Saha have stumbled upon combines specific parameters in such a way that scientists can rapidly arrive at the value of pi, which can then be incorporated in calculations, like those involved in deciphering scattering of high-energy particles. “Physicists (and mathematicians) have missed this so far since they did not have the right tools, which were only found through work we have been doing with collaborators over the last three years or so,” Sinha said. “In the early 1970s, scientists briefly examined this line of research but quickly abandoned it since it was too complicated.”

Although the findings are theoretical at this stage, it is not impossible that they may lead to practical applications in the future. Sinha points to how Paul Dirac worked on the mathematics of

the motion and existence of electrons in 1928, but never thought that his findings would later provide clues to the discovery of the positron, and then to the design of Positron Emission Tomography (PET) used to scan the body for diseases and abnormalities. “Doing this kind of work, although it may not see an immediate application in daily life, gives the pure pleasure of doing theory for the sake of doing it,” Sinha added.

https://economictimes.indiatimes.com/news/science/iisc-physicists-find-a-new-way-to-represent-pi/articleshow/111082189.cms