अक्टूबर
Oct
2024

खंड/Vol. : 49 अंक/Issue :188
10 /10/2024

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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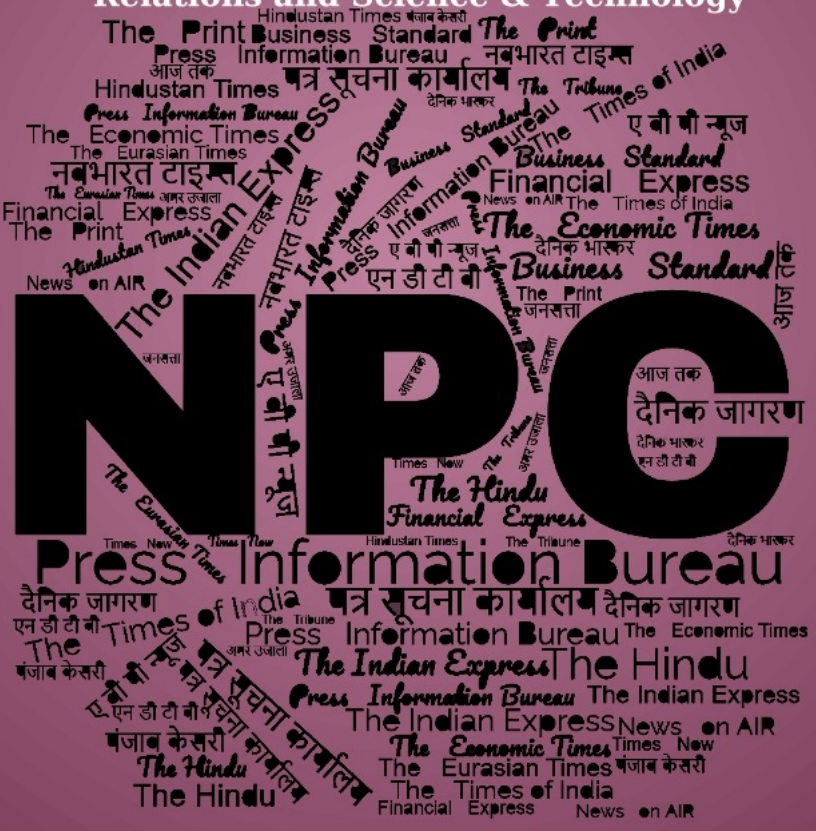

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Wed, 09 Oct 2024

Exercise Malabar 2024 – Opening Ceremony

The Opening Ceremony of MALABAR 2024 under the aegis of Eastern Naval Command was held onboard Indian Naval Ship Satpura at Visakhapatnam on 09 Oct 24. The 28th edition of the multi-national maritime exercise that commenced on 08 Oct 24, would extend till 18 Oct 24. MALABAR, which was initiated in 1992 as a bilateral exercise between India and the US, gained further traction as a significant maritime engagement, with Japan and Australia joining in subsequently.

The ceremony, hosted by Vice Admiral Rajesh Pendharkar, Flag Officer Commanding-in-Chief, Eastern Naval Command, was attended by senior naval and military dignitaries from participating nations. The heads of delegations and other dignitaries participating included General Yoshihide YOSHIDA, Chief of Staff, Joint Staff, Japan, Admiral Stephen Koehler, Commander US Pacific Fleet, VAdm Katsushi OMACHI, C-in-C, Japan Self Defence Fleet and RAdm Chris Smith, Commander Australian Fleet. The crew and planning staff of participating Ships, Aircraft and Special Forces from Australia, India, Japan and the USA were also present. The Commanders of all participating navies acknowledged the importance of Ex MALABAR in enhancing understanding, collaboration and engagement to address common maritime challenges and to create cooperative framework.

The exercise will be conducted in two distinct phases both at Harbour and at Sea. MALABAR 2024 will witness live weapon firings, complex surface, anti-air and anti-submarine warfare drills and joint manoeuvres. The high-tempo event will witness participation by destroyers, frigates, corvettes and fleet support ships along with long range maritime patrol aircraft, jet aircraft, integral helicopters and submarine assets.

The exercise brings together like-minded nations to further enhance the ability to train and operate jointly, towards establishing the synergy critical to achieve shared objectives. The exercise is

aligned with the Indian Government’s vision of Security & Growth for All in the Region (SAGAR) and reflects India's growing engagement with like-minded nations.

https://pib.gov.in/PressReleasePage.aspx?PRID=2063584

Press Information Bureau
Government of India

Ministry of Defence

Wed, 09 Oct 2024

INS Talwar Arrives South Africa To Participate In IBSAMAR VII

Indian Navy’s frontline stealth frigate, INS Talwar, arrived at Simon’s Town, South Africa, on 06 Oct 24 to participate in the eighth edition of IBSAMAR, a joint multinational maritime exercise among Indian, Brazilian, and South African Navy scheduled from 06 to 18 October 2024.

The exercise aims to enhance interoperability and strengthen cohesion between the three navies. The broad concept is based on Blue Water Naval Warfare, encompassing the dimensions of Surface and Anti-Air Warfare.

The harbour phase of IBSAMAR VIII will include professional exchanges, Damage Control & Firefighting drills, Visit, Board, Search, and Seizure drills, cross-boarding, aviation safety lectures, joint diving operations, an Ocean Governance seminar, sports interactions, cross-decks visits, and interaction among Special Forces and Junior Officers.

Multi-lateral interactions are crucial bridges of friendship that increase mutual trust and enhance interoperability among navies of like-minded littoral nations towards the common goal of a peaceful maritime domain and positive maritime environment.

Defence cooperation between India and South Africa is on an upward trajectory. Operational Sea Training and Submarine Rescue Support have been commenced between both navies since the 12th edition of Navy-to-Navy talks held on 26-28 August 2024 at New Delhi. The visit of INS Talwar aims to further strengthen the ties and reaffirm India’s commitment to constructive collaboration and mutual growth.

INS Talwar was commissioned on 18 June 2003 and is a part of the Indian Navy’s Western Fleet, based in Mumbai under the Western Naval Command. The ship is commanded by Captain Jithu George.

https://pib.gov.in/PressReleasePage.aspx?PRID=2063543

Press Information Bureau
Government of India

Ministry of Defence

Wed, 09 Oct 2024

Army Commanders Conference October 2024 : Army Commanders To Brainstorm Conceptual Issues, Review And Assess The Overall Security Situation

The Second Army Commanders' Conference for the year 2024 will be organised in a hybrid mode, with the first Phase planned on 10-11 October 2024 in a forward location at Gangtok. In the second phase, the senior hierarchy of Indian Army will congregate at Delhi on 28-29 October 2024. Shri Rajnath Singh, Hon'ble Raksha Mantri will deliver a keynote address to the senior leadership at Gangtok and will be briefed on the emerging security challenges and the response of the Army in the security domain.

As the Nation faces numerous regional security challenges, the upcoming Army Commanders' Conference scheduled to commence in Sikkim tomorrow, assumes significance. Conducting the conference of Senior Commanders at a forward location underlines Indian Army's focus on ground realities. The conference will serve as a forum for Senior Commanders to review current operational preparedness, deliberate on critical strategies and outline future directives.

During the first phase of the conference, discussions will focus on critical national security issues and strategic aspects aimed at sharpening Indian Army's warfighting capabilities. Major issues to be deliberated during the two-day session will include the growing importance of a multi-pronged national security strategy that incorporates integration of Civil Military Fusion & the Diplomatic, Information, Military, and Economic (DIME) pillars to counter contemporary threats besides the need for developing low-cost technologies and alternate strategies to counter the rapidly evolving character of warfare.

Aligned to Indian Army's goal of Technological Absorption, the senior hierarchy will deliberate on various issues including infusion of technology in Professional Military Education and explore the possibilities of recruiting domain specialists in niche domains. Other issues under deliberation will focus on enhancing the overall organisational health and easing the processes of the Field Army to make them more resilient and responsive.

The second phase of the conference will feature a discussion on evolving geopolitical landscape followed by brainstorming on operational matters and meetings of various Board of Governors to deliberate upon welfare measures and schemes for financial security of serving soldiers, veterans and their families. The senior hierarchy of the Army will also be addressed by the Chief of Defence Staff, General Anil Chauhan, the Chief of the Naval Staff, Admiral Dinesh K Tripathi and the Chief of the Air Staff, Air Chief Marshal AP Singh.

This gathering of Indian Army’s senior leadership reinforces the Army’s enduring resolve to stay prepared, adapt swiftly, and defend with precision to ensure the Indian Army remains progressive, forward-looking, adaptive and future-ready.

https://pib.gov.in/PressReleasePage.aspx?PRID=2063481

ANI
South Asia's Leading Multimedia News Agency

Wed, 09 Oct 2024

Argentina's FM Mondino concludes India visit, discusses bilateral ties with EAM Jaishankar on defence, energy, space

Argentina's Foreign Minister, Diana Mondino, concluded her five-day official visit to India during which she co-chaired the 7th India-Argentina Joint Commission Meeting (JCM) alongside External Affairs Minister, Dr. S. Jaishankar.Mondino was on an official visit to India from October 5-9.

At the JCM, the two leaders reviewed the entire spectrum of bilateral relations with a focus on leveraging each country's strengths for mutual benefit.Key sectors discussed included defence, energy, space, nuclear, information technology, railways, infrastructure, healthcare, pharmaceuticals, education, agriculture, and mining, the Ministry of External Affairs said in a press releaseDuring her visit, FM Mondino also met with Minister of Petroleum and Natural Gas Hardeep S Puri and Minister of Commerce and Industry Piyush Goyal.

Notably, FM Mondino was accompanied by a 17-member business delegation representing diverse sectors, including mining, agriculture, pharmaceuticals, biotechnology, and nuclear energy. The Argentine business delegation had an interaction jointly with EAM and FM Mondino.

The delegation also participated in a business event with captains of Indian trade and industry, organised by CII and presided over by FM Mondino and Minister of State for Commerce and Industry and Electronics and Information Technology Jitin Prasada, the release added.

Other engagements of FM Mondino included interaction at Observer Research Foundation and several meetings with Indian companies having trade and economic interest in Argentina.Meanwhile, a day before, Jaishankar had said that during a meeting with Mondino, he took stock of bilateral relations in sectors including health, trade, space, defence and others.

Sharing a post on X, Jaishankar wrote, "Concluded a productive and wide-ranging 7th India-Argentina JCM along with FM @DianaMondino in New Delhi. Took stock of our bilateral ties including in trade, space, nuclear, railways, agriculture, fisheries, health, AYUSH, people-to-people and defence ties."

"Also exchanged views on regional and global issues and our cooperation in multilateral fora," the post added.

The visit of FM Mondino, coinciding with the 75th anniversary of diplomatic relations and the 5th anniversary of strategic partnership between India and Argentina, further deepened and broadened Strategic Partnership between the two friendly and democratic nations.

Notably, India and Argentina share values of mutual respect, understanding, and a commitment to the rule of law.

The two countries have enjoyed close and robust relations across a wide range of sectors, which have strengthened over the decades, according to the Embassy of India in Argentina.

India-Argentina diplomatic relations were elevated to the level of a strategic partnership during the state visit of the then-president of Argentina to India in February 2019. Both countries marked 75 years of diplomatic relations on February 3, 2024.

https://www.aninews.in/news/world/asia/argentinas-fm-mondino-concludes-india-visit-discusses-bilateral-ties-with-eam-jaishankar-on-defence-energy-space20241009190324/

Hindustan Times

Wed, 09 Oct 2024

Centre clears crucial plan for submarines, Predator drones

The Cabinet Committee on Security (CCS) headed by Prime Minister Narendra Modi, on Wednesday cleared the indigenous construction of two nuclear-powered conventional strike submarines (SSNs) and the acquisition of 31 Predator missile-firing drones from US-based General Atomics in a big boost to Indian military capability that will deter regional adversaries.

With China already possessing six Shang class nuclear-powered attack submarines and the leasing of the Akula class nuclear attack submarine from Russia being delayed to 2028, the Modi government approved for construction of two SSNs, which will be based on Indian designs. India already has three nuclear-powered ballistic missile-firing submarines (SSBNs) as part of its nuclear triad.

While the SSN project remains classified, the Indian Navy wanted the government to sanction at least two submarines in order to deter India's adversaries in the Indo-Pacific. It is believed to have raised the issue with the Prime Minister in January. SSNs can stay underwater for long periods of time and their endurance is only determined by crew fatigue and supplies; in contrast, diesel-electric submarines have to surface at least once a day to charge their batteries through snorkel. It is during this period that diesel attack submarines are vulnerable to aerial strikes. While diesel submarines equipped with air-independent propulsion can stay underwater for longer periods of time , they have to compromise on the weapons on board as well as speed.

The acquisition of 31 Predator drones armed with Hellfire missiles, GBU-39B precision-guided bombs and high-fire rotary cannon, was once again spearheaded by the Indian Navy. Out of the 31 drones, 16 will be given to the Indian Navy, the remaining will be split between the Indian Army

and the Indian Air Force. The deal must be signed before October 31 or else the price negotiations will have to be commenced afresh as per initial contracts and US approvals, people familiar with the matter said.

While some of the 31 acquired drones will be assembled locally with 30% components sourced from Indian suppliers, the unmanned vehicle will not have any DRDO-developed missile as the cost of integrating a missile is prohibitive; doing so will also mean the lack of guarantees.

The Predator drone will be a game-changer in the region as the platform has high endurance, high altitude and lethal weapons to take the fight to the enemy in the 'hunter-killer' role, experts said. They claimed that surveillance footage from the Predator drone is better than that obtained from Boeing P 8 I aircraft and will raise Indian maritime domain awareness from Gulf of Aden off the coast of Yemen to Sunda Straits in Indonesia to the next level.

While the Indian Air Force and Indian Army will use the drones for taking out critical infrastructure and high-value targets in the worst-case scenario, the Indian Navy will use the armed drones for not only keeping a watch on dark shipping but also destroying vessels carrying arms and drugs on high seas in the Indo-Pacific. The Predator drones will also deter Chinese spy ships, which are in the Indian Ocean virtually round the year.

The people familiar with the matter added that India may have had no option but to go for US drones as DRDO's indigenous project was delayed and China has top-of-the-line armed drones in its inventory apart from passing on the platform to Pakistan.

https://www.hindustantimes.com/india-news/centre-clears-crucial-plan-for-submarines-predator-drones-101728492592380.html

नवभारत टाइम्स

Wed, 09 Oct 2024

चीन की बढ़ने वाली है टेंशन... जापान जाएंगे आर्मी चीफ द्विवेदी, भारत के लिए इस दौरे के क्या मायने?

इंडियन आर्मी चीफ जनरल उपेंद्र द्विवेदी अगले हफ्ते जापान जाएंगे। यह उनका आर्मी चीफ के तौर पर पहला विदेश दौरा होगा। सूत्रों के मुताबिक जनरल द्विवेदी 14 अक्टूबर को 5 दिन के दौरे पर निकलेंगे। चीन से निपटने के लिए भारत और जापान की लगातार बढ़ती साझेदारी को देखते हुए यह दौरा अहम है। इस वक्त बंगाल की खाड़ी में जापान की नेवी भारत की नेवी के साथ मिलकर एक्सरसाइज कर रही है। ये मालाबार एक्सरसाइज है जिसमें क्वॉड देशों (भारत, अमेरिका, जापान, ऑस्ट्रेलिया) की नेवी शामिल हैं।

दो महीने पहले ही जापान के विदेश मंत्री और रक्षा मंत्री टू प्लस टू डायलॉग के लिए भारत आए थे। जिसमें इंडो-पैसिफिक रीजन पर भी बातचीत हुई। भारत और जापान दोनों ही इंडो-पैसिफिक रीजन के अहम देश हैं। दोनों देशों की सरकारें कहती रही हैं कि मौजूदा ग्लोबल एनवायरमेंट में स्वतंत्र, खुला, समावेशी और समृद्ध इंडो पैसेफिक रीजन सुनिश्चित करने के लिए भारत-जापान रक्षा साझेदारी मजबूत करना बहुत अहम है।

चीन के काउंटर में जापान और भारत एकसाथ

भारत और जापान दोनों ही अपने पड़ोसी देश चीन को लेकर चिंतित हैं और दोनों के लिए ही चीन की तरफ से खतरा बढ़ता जा रहा है क्योंकि चीन दोनों देशों के क्षेत्र पर अपना दावा जताता है। चीन को काउंटर करने में जापान और भारत साथ आए हैं और हाल के वक्त में दोनों देशों की मिलिट्री एक्सरसाइज भी लगातार बढ़ी हैं। टू प्लस टू डायलॉग में भी दोनों देशों ने इंडो-पैसिफिक रीजन में चीन के बढ़ते अक्रामक रवैये पर चर्चा की। जापान ने 2014 में अपने संविधान में संशोधन किया, जिससे उसे 'सामूहिक आत्मरक्षा' का अधिकार इस्तेमाल करने की अनुमति मिली। 2022 में, जापान ने कानून पारित किए, जो उसकी सेना को जवाबी हमले की क्षमताओं को विकसित करने की इजाजत देता हैं। जिसके बाद जापान ने अपना रक्षा बजट भी बढ़ाया। जापान का अपने सैन्य क्षमताओं को बढ़ाने का मुख्य मकसद चीन से पैदा हुए खतरे से निपटना है।

भारत की जापान से पुरानी दोस्ती

पिछले साल जापान में हुई बाईलेटरल एक्सरसाइज वीर गार्डियन में इंडियन एयरफोर्स ने हिस्सा लिया। ये दोनों देशों की पहली बाईलेटर एयर कॉम्बेट एक्सरसाइज थी। हाल ही में जब इंडियन एयरफोर्स ने पहली मल्टीनैशनल एयर कॉम्बेट एक्सरसाइज होस्ट की तो इसमें बाकी क्वॉड देशों के साथ जापान की एयरफोर्स ने भी हिस्सा लिया। जापान का चीन के साथ ईस्ट चाइना सी में निर्जन सेनकाकू आइलैंड्स को लेकर विवाद है। ये आईलैंड ताइवान से महज 170 किलोमीटर की दूरी पर हैं और अत्यधिक सामरिक महत्व के हैं। अगर ये द्वीप चीन को मिल जाते हैं तो इसका चीन को बहुत सामरिक फायदा होगा। चीन जापान के ट्रेड रूट को बाधित कर सकता है।

https://navbharattimes.indiatimes.com/india/army-chief-general-upendra-dwivedi-will-visit-japan-as-part-of-his-first-foreign-tour/articleshow/114088223.cms

Hindustan Times

Thu, 10 Oct 2024

Rajnath to inaugurate projects worth ₹2,236 cr in infra push along China border

In India’s latest infrastructure push along the China border and other remote areas, defence minister Rajnath Singh will on October 12 dedicate 75 projects worth ₹2,236 crore to the country, including roads and bridges that will significantly boost military mobility and logistics support for deployed forces in forward areas in Ladakh, Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh, officials aware of the matter said on Wednesday.

The development comes amid China’s unrelenting infrastructure push along the India border during the last five years.

Singh, who is visiting Sikkim on October 11-12, will open the strategic Kupup-Sherathang road and virtually inaugurate the remaining 74 projects, including a few in West Bengal, Nagaland, Mizoram, Rajasthan and the Andaman and Nicobar Islands.

This will take the count of the Border Roads Organisation (BRO) infrastructure projects dedicated to the country this year to 111 at a total cost of ₹3,751 crore, the officials said, asking not to be named.

The minister will spend Dussehra (October 12) with frontline soldiers guarding the mountain frontier with the neighbour, where Indian and Chinese soldiers have been involved in faceoffs, as well as address the Army Commanders' conference in Gangtok on October 11, the first time the top meeting is being held near the China border.

This is enormously symbolic as the military standoff between India and China in eastern Ladakh has entered its fifth year, with no indication of a resolution to the outstanding problems along the contested Line of Actual Control (LAC). To be sure, India is hoping that ongoing negotiations with China will help restore the status quo ante of April 2020.

Singh will inaugurate 22 roads, 51 bridges and two other projects constructed by BRO under challenging conditions, including weather and terrain, said one of the officials cited above.

Asked for a breakdown of the figures, he said 19 of the projects were in J&K, 11 in Ladakh (the centre of the current border tensions with China), 18 in Arunachal Pradesh, nine in Uttarakhand, six in Sikkim, five in Himachal Pradesh, two each in West Bengal and Rajasthan, and one each in Nagaland, Mizoram and Andaman and Nicobar Islands.

"BRO completed these strategic projects in record time, and several were executed in a single working season using state-of-the-art technology," said a second official.

The Sela tunnel, inaugurated by Prime Minister Narendra Modi in March, is among the 111 projects completed this year. The Sela tunnel, built by BRO at a cost of ₹825 crore, has put military mobility and logistics support for forward deployed forces in the strategic Tawang sector, where Indian soldiers hold posts close to the contested border with China, in the fast lane. It is the world's longest twin-lane tunnel at a height of more than 13,000 feet.

Last year, 125 BRO projects worth ₹3,611 crore were dedicated to the nation, boosting India's defence preparedness against its adversaries on the northern and western fronts.

BRO, which is at the centre of the India's border infrastructure push, has completed 450 infrastructure projects worth ₹16,000 crore in the last five years, according to official data from the defence ministry. These projects include new roads, bridges, tunnels, airfields and helipads.

The military's readiness, among other things, depends on infrastructure in forward areas --- a landscape dotted with towering mountains, valleys and rivers --- and India is firing on all cylinders to ensure that its deployed forces hold an advantageous position.

As things stand, China has an edge over India border infrastructure, but the country is on the fastest way to bridge the gaps, and the progress is being tracked at the highest levels of the government.

Increased connectivity in forward areas not only has a direct bearing on military mobility and logistics support, but also the movement of civilians in border states.

India lags China in border infrastructure but the country is catching up fast on the back of speedy execution of strategic projects to support military operations, increased spending, and focussed adoption of technology and techniques to fill gaps that came into focus after the standoff with China began in April-May 2020.

India is keeping a close track of border infrastructure development by China. The neighbour's infrastructure push has been confirmed by satellite images, and encompasses the construction of new airbases, missile sites, roads, bridges, reinforced bunkers, underground facilities to protect military assets from aerial strikes, accommodation for soldiers and ammunition depots.

Conducting the first leg of the Army Commanders' conference at a forward location in Sikkim underlines the Indian Army's focus on ground realities, the army said in a statement on Wednesday, a veiled reference to the ongoing tensions with China in the Ladakh theatre.

"The two-day conference (October 10-11) will serve as a forum for senior commanders to review the current operational preparedness, deliberate on critical strategies and outline future directives. Discussions will focus on critical national security issues and strategic aspects aimed at sharpening the army's war fighting capabilities," the army said.

The second phase of the top meeting will be held in Delhi on October 28-29 and will involve in-depth discussions on critical areas including the impact of global developments on geopolitics, and operational matters.

On October 1, army chief General Upendra Dwivedi described the situation along LAC in eastern Ladakh as "stable but sensitive," and pointed out that trust between the Indian Army and the Chinese People's Liberation Army (PLA) was "the biggest casualty" of the dragging military standoff.

The two armies have thus far held 21 rounds of corps commander-level talks to cool tensions along LAC.

The talks have thus far resulted in four rounds of disengagement from Galwan Valley, Pangong Tso, Gogra (PP-17A) and Hot Springs (PP-15), but problems at Depsang and Demchok are still unresolved. Both armies still have tens of thousands of troops each and advanced weaponry deployed in the Ladakh theatre.

https://www.hindustantimes.com/india-news/rajnath-to-inaugurate-projects-worth-2-236-cr-in-infra-push-along-china-border-101728532877845.html

THE ECONOMIC TIMES

Wed, 09 Oct 2024

Beyond the politics, China's missile test reflects military need

From a missile discreetly ferried more than 1,000 km (620 miles) to a launch site, to the use of remote bases and satellites to track it from Hainan Island to the South Pacific, China's September ICBM flight marked a test of operational necessity.

Six security analysts and four diplomats evaluating the Sept. 25 launch said that although the rare test carried political messaging amid China's nuclear weapons buildup, it also met a long-overdue

need for the People's Liberation Army's Rocket Force to ensure its nuclear deterrent worked as advertised.

Strategic diplomacy was also part of the drill, with Beijing notifying the United States, France and New Zealand ahead of the launch but some analysts warn more will be needed if China is eyeing a more intense missile testing regime to catch up with rivals.

Australia, advised hours before the launch of a planned activity but given no details, is among Pacific nations raising concerns with China and calling for an end to ballistic missile testing in the region. "This enabled the Chinese to carry out a test with a full attack profile," said Hans Kristensen, the director of the Federation of American Scientists' Nuclear Information Project. "In operational terms, this is inevitably an important step ... the test represents the operational validation of the entire system."

In recent years, the Rocket Force has tested extensively, flying about 135 ballistic missiles in 2021, according to the Pentagon, mostly into China's isolated deserts. But not since 1980 has it fired its longest-range missiles on a more realistic attack trajectory, similar to the tests carried out routinely by the United States, Russia and India. Although Western militaries believe China has boosted the quality and quantity of its warheads, missiles and silos in recent years, only full-range tests can gauge the accuracy and reliability of a ballistic missile and its warhead, given the stresses and distances involved.

Such a test over the ocean would have been monitored by China's evolving network of satellites and space tracking sites and ships, including on its islands in the disputed South China Sea and in Namibia and Argentina, diplomats and analysts said.

Two of China's most advanced "space support" ships, the Yuan-wang 3 and the Yuan-wang 5, were in the Pacific at the time, according to ship tracking data viewed by Reuters. The Yuan-wang 3 was sailing northwest of Nauru while the Yuan-wang 5 was east of the atolls of Tokelau. China's defence ministry has not specified where the missile landed, saying in a statement that the dummy warhead "fell into expected sea areas".

The ministry did not respond to requests for comment. Although some analysts say the U.S. deployed surveillance aircraft to track the missile, the precise launch and landing locations have not been publicly released. Media in French Polynesia reported the missile landed near to the French Pacific territory's exclusive economic zone, more than 11,000 km (6,800 miles) from Hainan.

Timothy Wright, a missile researcher at the London-based International Institute for Strategic Studies, said the test gave the PLA a "great opportunity" to evaluate how well it could track long missile flights. "China's network of satellites, ground stations and tracking ships is still evolving, and there are question marks over just how effective its space-based ISR capabilities are," Wright said, referring to intelligence, surveillance and reconnaissance.

Next Steps

For this test, the PLA relied on its one of its older ICBMs, a DF-31, some analysts noted. Launching it from Hainan allowed a trajectory that mostly avoided other nations, they said. The closest DF-31s to Hainan are based 1,100 km (684 miles) away in Yibin, in Sichuan province on

the Chinese mainland, under the control of a Rocket Force unit linked to one on Hainan, some analysts said.

Tests from hinterland silos over north Asia or over the Arctic to the North Atlantic would be more geographically and diplomatically complex. Japan and the Philippines were notified of possible space debris landing at sea, but some Pacific Island nations closer to the landing zone were not informed by China, two diplomats said.

On Tuesday, Kiribati's president criticised the test, saying the country got no prior notification. A New Zealand foreign ministry spokesperson told Reuters that after they were informed, Wellington reached out to Pacific island partners.

Singapore-based China security scholar James Char said Beijing would most likely be cautious about negative reactions to frequent launches, and would be wary of opening itself up to surveillance from rivals. "We can be dead sure Beijing is more than careful when it comes to guarding the true nature and extent of its military capabilities," said Char, of the S. Rajaratnam School of International Studies.

https://economictimes.indiatimes.com/news/defence/beyond-the-politics-chinas-missile-test-reflects-military-need/articleshow/114079363.cms

Science & Technology News

THE HINDU

Wed, 09 Oct 2024

Study uncovers surprising new ‘spatial grammar’ of gene expression

In his quest to understand how each cell of an organism interprets the same genome in a different way, researcher Sascha Duttke wondered whether there might be any undiscovered rules of biology.

The human genome contains information about our development, functioning, growth, and reproduction, and all of it takes up only about 2 MB of space.

“That led us to wonder: maybe some of the magic is in the CD player, too?” Duttke, an assistant professor at the College of Veterinary Medicine, Washington State University, wrote in an email.

“In this analogy, the CD is our genome and the CD player is the regulatory machinery,” and the transcription factors are important components in the player.

Inspired by a toddler

Transcription factors are proteins that bind to specific portions of the DNA and control the rate at which the cell transcribes genetic information from DNA to RNA. The cell then makes proteins by ‘reading’ the RNA.

Groundbreaking new work by Duttke and his colleagues has shown that the fate of a gene being transcribed depends on the location of the transcription factor binding site relative to the location where transcription begins. The results, published in the journal Nature, provide insights into how different spatial arrangements of the same transcription factors can have different effects.

The findings can “help filter and refine genomic tools and algorithms that predict gene expression”, which can inform new diagnostic and therapeutic strategies for diseases like cancers caused by mutations in regulatory elements, Meenakshi Ghosh, a structural biologist-turned clinical scientist, said.

“Watching my toddler destroy a puzzle by forcing in the right colour but the wrong shaped piece made me think: maybe we’ve been focusing too much on transcription factor binding sites and protein interactions, and not enough on how everything fits together spatially and in an even bigger picture,” Duttke said.

Before or after?

The team investigated whether the arrangement of transcription factors relative to the transcription start site could influence gene expression. When presented with the DNA, the activator transcription factor binds to it at specific points, the binding sites. These points are different from the transcription start site.

Team members developed tools to help them analyse patterns in the building blocks of the DNA that are typically found at the start sites. They subjected cells specially cultured in the lab to a form of RNA sequencing that could detect these sites in RNA. Then they identified the preferred locations at which transcription factors bound relative to an active start site.

The researchers found the binding sites for activator transcription factor NRF1 were located before the start sites and for factor YY1 it was located after the start site. Curiously, NRF1 is an activator whereas YY1 is both an activator and a repressor, a factor that stops transcription.

Next they checked how the relative position of the start site affected how the transcription factor behaved. When they knocked down the gene that cells used to make NRF1, the cells transcribed less DNA only when NRF1’s binding site was located before the transcription start site. If its binding site was located after, the absence of NRF1 increased the transcription rate.

Natural genetic variations

These results were “surprising,” Duttke said. “If you look in textbooks or even Wikipedia, transcription factors are usually grouped into either activators or repressors. The fact that some factors can do both was considered unusual.”

Organisms often carry natural genetic variations at the binding sites. The researchers assessed how these variations influenced the start of transcription.

They analysed more than 4 million variations and 80,000 start sites in mice cells and found opposing transcription outcomes depending on whether the variations affected the factors before or after the start site.

For instance, only mutations affecting NRF1 binding before the start site reduced the transcription rate. The researchers also synthetically inserted binding sites for six factors at different distances from the start sites in some DNA sequences.

They observed similar position-dependent outcomes. For example, adding an NRF1 binding site ahead of the start increased transcription, consistent with its activator function. Inserting it after the start site reduced transcription.

'Spatial grammar'

Last, the researchers studied the relevance of these effects in human diseases. They identified start sites from genomic sequences from 67 people and combined this information with databases that describe disease risk linked to specific genetic variants. Consistent with previous results, they observed position-dependent effects of disease-associated variants based on the location of the start sites and the binding sites.

"Uncovering this spatial 'grammar' was a true eureka moment for many scientists like us who are working to understand how DNA encodes the instructions for turning genes on and off," Duttke said, adding it would be "exciting" to explore how interactions between different factors affect this spatial grammar.

These results have "vast potential applications", including helping researchers identify and predict disease-associated mutations, called polymorphisms, that occur outside genes and provide a basis for therapeutic interventions.

"How many of those polymorphisms contribute to disease is currently largely unknown," he said. "The discovery of the spatial grammar may help to change that."

The light of evolution

This study is "pretty cool," Ghosh said. "It adds crucial new insights about how positioning and spacing relative to [start sites] can impact the ability of [factors] to either activate or repress gene expression." She added that the results can also improve our understanding of evolution and how organisms regulate gene expression to adapt to environmental changes.

Duttke said he would like to understand more about how this grammar evolved and how it helped create complex organisms like humans. He quoted the title of geneticist Theodosius Dobzhansky's famous 1973 essay to make his point: "Nothing in biology makes sense except in the light of evolution".

https://www.thehindu.com/sci-tech/science/study-uncovers-surprising-new-spatial-grammar-of-gene-expression/article68731915.ece

The Indian EXPRESS

Wed, 09 Oct 2024

Nobel Prize in chemistry awarded to David Baker, Demis Hassabis, John Jumper for work on proteins

Nobel Prize in Chemistry for 2024 was awarded to David Baker "for computational protein design" and jointly to Demis Hassabis and John M. Jumper "for protein structure prediction."

This year's Nobel Prize laureates in chemistry have revealed proteins' secrets through computing and artificial intelligence.

While Hassabis and Jumper successfully utilised artificial intelligence to predict the structure of almost all known proteins, Baker has learned how to master life's building blocks and create entirely new proteins.

The ability to create proteins that are loaded with new functions can lead to new nanomaterials, targeted pharmaceuticals, more rapid development of vaccines, minimal sensors and a greener chemical industry – to name just a few applications that are for the greatest benefit of humankind.

Baker works at the University of Washington in Seattle, while Hassabis and Jumper both work at Google Deepmind in London.

Last year, the chemistry award went to Moungi Bawendi, Louis Brus and Alexei Ekimov for their discovery and development of quantum dots, which are nanoparticles so tiny that their size determines their properties.

The prize carries a cash award of 11 million Swedish kronor (USD 1 million) from a bequest left by the award's creator, Swedish inventor Alfred Nobel.

https://indianexpress.com/article/technology/science/nobel-prize-chemistry-david-baker-demis-hassabis-john-jumper-proteins-9611728/

news nine

Wed, 09 Oct 2024

ISRO reveals configuration of base module of Bharatiya Antariksh Station

Hanumantray Baluragi, director of ISRO's DHSP (Directorate of Human Space Programme), in a talk on Antariksh Jigyasa, ISRO's outreach platform, has revealed the individual missions in the

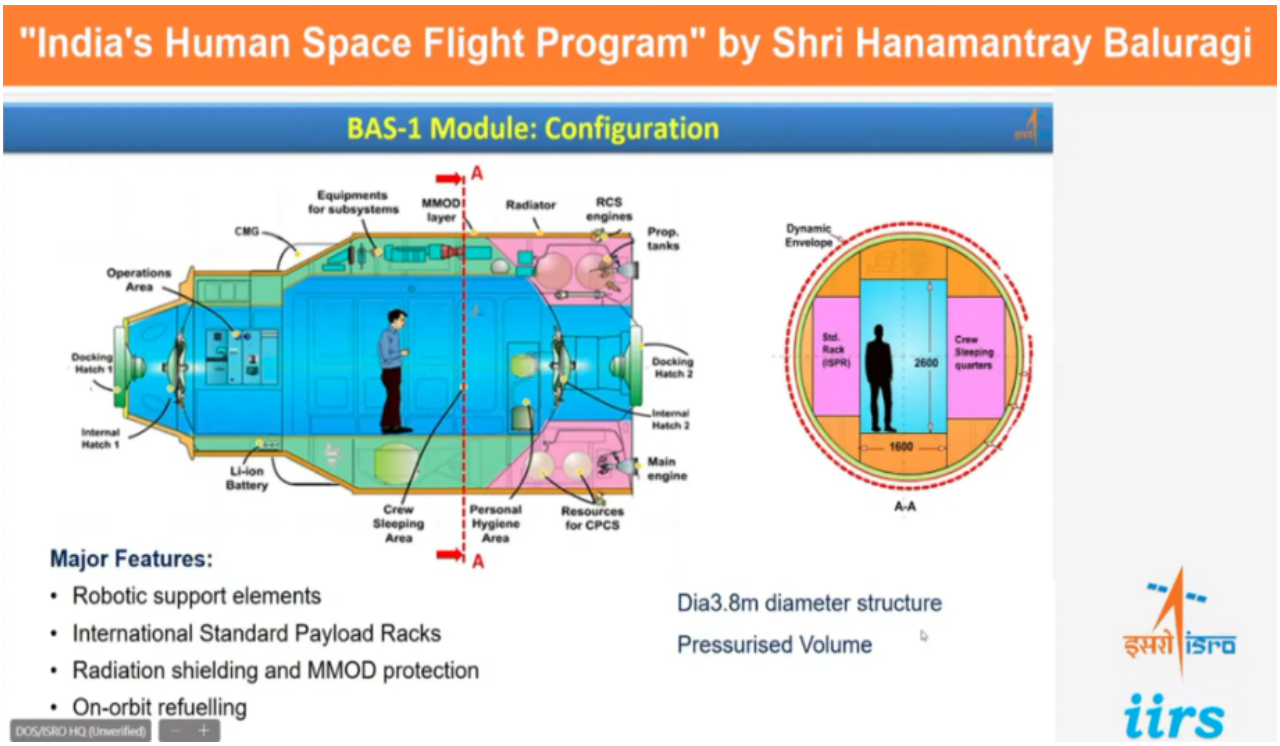
entire Gaganyaan programme, culminating in the deployment of the Base module of the Bharatiya Antariksh Station (BAS-1).

Four of these flights are precursor missions for setting up the BAS, to develop and demonstrate the necessary technologies. These include spacesuits for intravehicular activities, autonomous docking with the ISS and BAS, robotic appendages for transferring cargo, refuelling of the base module in orbit, changing the altitude of the base module, and validating crew habitat systems.

The configuration of the base module of BAS. (Image Credit: ISRO). ISRO has finalised the configuration of the base module, as well as the strategy for assembling all the five planned modules in orbit.

The space station is designed to primarily operate autonomously with minimal human intervention, with docking ports that are compatible with the International Space Station, with a transfer hub that can potentially act as a fuel depot for interplanetary missions.

The BAS can also extend ISRO's plans for space tourism with short suborbital flights, to longer-duration stays on board India's own orbital platform. The fully assembled BAS is expected to weigh around 50 tons. ISRO is aiming for a fully operational BAS by 2035.



Base module to be used for demonstrating critical technologies required for BAS

ISRO plans to execute a series of operations with the base module, including control and orbit raising manoeuvres, crewed and uncrewed dockings, and will essentially be a testbed that paves the way for future long-duration space missions.

Baluragi said, "One important aspect of establishing any space station is to undertake microgravity based research, and that provides opportunities for our academic and research organisations. The

experiments will cater to areas such as space biology, life sciences, advanced materials development, healthcare and medical technologies, pharmaceutical development."

These experiments are expected to benefit all humans on Earth, as well as future human space exploration.

https://www.news9live.com/science/isro-reveals-configuration-of-base-module-of-bharatiya-antariksh-station-2718159

DECCAN HERALD

Thu, 10 Oct 2024

Bellatrix's Orbital Transfer Vehicle to be integrated into NSIL missions

NSIL, Isro's commercial arm, and the Bengaluruheadquartered Bellatrix signed an MoU in this manoeuvring and comes with the flexibility to deploy satellites into various orbits with greater precision and efficiency.

Bellatrix said the partnership would enable "more complex" space missions involving multi-orbit deployment sequences, inclination change, geostationary orbit transfer missions, and future deep space missions.

D Radhakrishnan, CMD of NSIL, said the partnership supported Bellatrix in launching its OTV module to enhance launch options for rideshare customers.

"Due to varied mission requirements, it is challenging to accommodate multiple customer payloads on a single launch vehicle, forcing satellite operators to either wait for a favourable launch opportunity or opt for an expensive dedicated launch," Rohan M Ganapathy, co-founder, CEO and CTO of Bellatrix, said.

Yashas Karanam, co-founder and COO of Bellatrix, said the company offered two models as part of its OTV solutions — deployment as a service and hosting as a service.

While the deployment model accelerates the launch process and enables the satellite operators to generate revenue faster, the hosting service caters to those who can't afford an entire satellite bus for scientific or technology experiments.

https://www.deccanherald.com/india/karnataka/bengaluru/bellatrixs-orbital-transfer-vehicle-to-be-integrated-into-nsil-missions-3226533

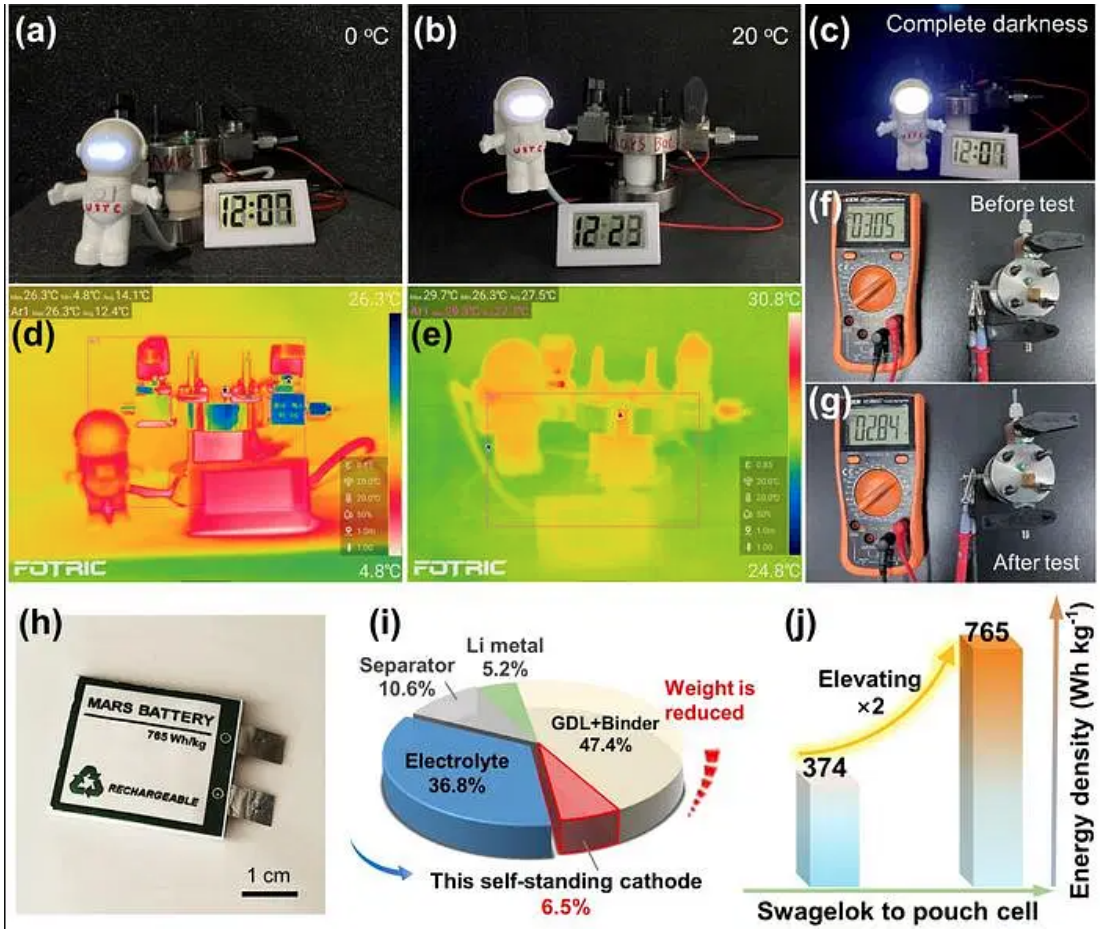
DECCAN HERALD

Wed, 09 Oct 2024

China now has a battery that can generate power from Mars' atmosphere

It was back in 1969 when humans first set foot on the Moon, but more than half a century has passed since we have managed to progress beyond it.

Humans have been sending missions to our nearest planet Mars for many years now, and some like SpaceX CEO Elon Musk have even gone so far as to suggest that humanity should consider Mars as their next home if the Earth becomes inhabitable in the future and must take steps to colonise the planet.



(a-c) The battery outputs electric energy at light and complete darkness conditions. (d, e) Synchronous IR images. (f, g) The open-circuit voltages before and after test. (h) A photograph of pouch battery. (i) Pie chart of weight distribution in pouch battery. (j) The energy density of the Mars battery.

Now some scientists from China are claiming that they have found a way to generate power from Mars' atmosphere itself, and this could prove to be one of the key breakthroughs that could make Musk's dream of colonising Mars a reality.Scientists from the University of Science and Technology of China have claimed that their new battery will be able to harness Mars' atmosphere to use as its fuel during discharge.

A press release by the researchers said, “This approach significantly reduces the battery’s weight, making it more suitable for space missions.”"Once depleted, the battery can be recharged using solar energy harvested from the Martian surface, enabling it to be prepared for subsequent discharges," the press release further added.

What is Mars' atmosphere made of?

Mars has a harsh atmosphere, 95.32 per cent of which is carbon dioxide along with 2.7 per cent nitrogen, 1.6 per cent argon, and a mere 0.13 per cent oxygen. It also has 0.08 per cent of carbon monoxide.Moreover, Mars goes through extreme temperature changes during the course of one Martian day. Sometimes the temperatures differ by 60-degrees Celsius in the course of a single day.

https://www.deccanherald.com/science/space/china-now-has-a-battery-that-can-generate-power-from-mars-atmosphere-3225745