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समाचार पत्रों के 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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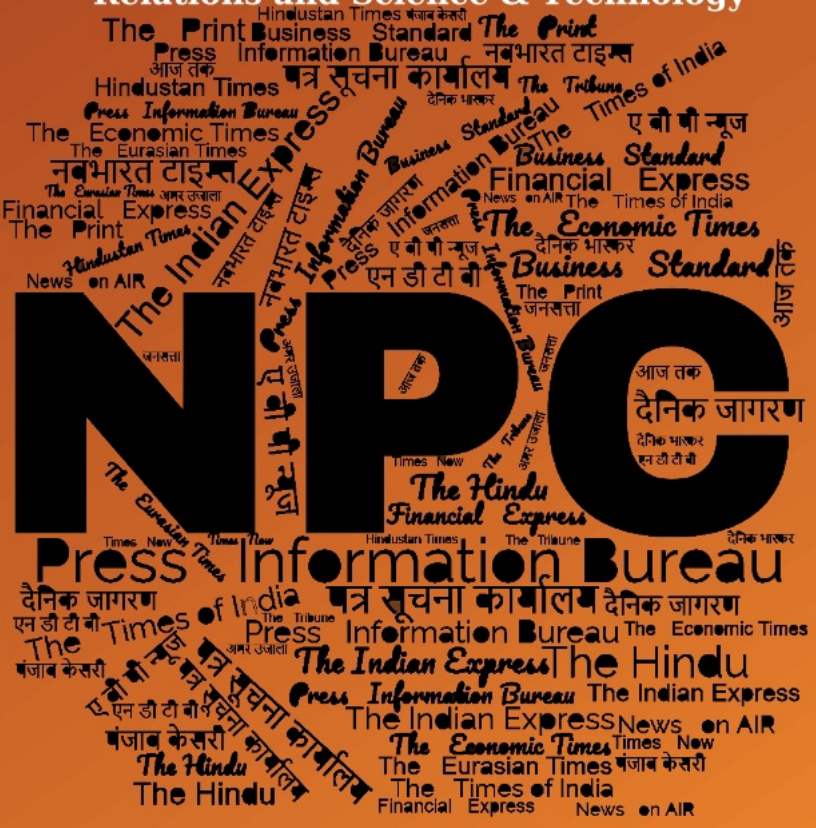

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DRDO News

Press Information Bureau
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Sun, 17 Nov 2024

DRDO Carries Out Successful Flight-Trial Of India's First Long-Range Hypersonic Missile Off The Odisha Coast

Defence Research and Development Organisation (DRDO) conducted a successful flight-trial of India's first long-range hypersonic missile from Dr APJ Abdul Kalam Island off the coast of Odisha late on November 16, 2024. This hypersonic missile is designed to carry various payloads for ranges greater than 1,500 kms for the Armed Forces.

The missile was tracked by various range systems, deployed in multiple domains. The flight data obtained from down range ship stations confirmed the successful terminal maneuvers and impact with high degree of accuracy.

This missile has been indigenously developed by the laboratories of Dr APJ Abdul Kalam Missile complex, Hyderabad along with various other DRDO laboratories and Industry Partners. The flight-trial was carried out in the presence of senior scientists of DRDO and officers of the Armed Forces.

In a post on X, Raksha Mantri Shri Rajnath Singh described the flight-trial as a historic achievement which has put India in the group of select nations having capabilities of such critical and advanced military technologies. He congratulated DRDO, Armed Forces and the Industry for the successful flight trial.

> India has achieved a major milestone by successfully conducting flight trial of long range hypersonic missile from Dr APJ Abdul Kalam Island, off-the-coast of Odisha. This is a historic moment and this significant achievement has put our country in the group of select nations.
>
> — Rajnath Singh (@rajnathsingh)

Secretary, Department of Defence R&D and Chairman DRDO Dr Samir V Kamat congratulated the team of DRDO which has actively contributed to this successful mission.

https://pib.gov.in/PressReleasePage.aspx?PRID=2073994

THE ECONOMIC TIMES

Fri, 15 Nov 2024

Joint Operations, Integration In Areas Like Electronic Warfare Discussed In Key Defence Meeting

Senior officers from the three Services, the DRDO and the industry discussed on subjects such as joint operations and integration in areas like electronic warfare and emerging technologies during a key meeting, the defence ministry said on Thursday. The annual meeting of the Joint Electromagnetic Board (JEMB), a subcommittee of the Chiefs of Staff Committee (COSC), was held on November 13 under the chairmanship of Air Marshal Jeetendra Mishra, Deputy Chief of Integrated Defence Staff (Operations), it said. The meeting was attended by senior officers from the three Services, DRDO, Department of Defence Production (DDP), and the industry.

It covered multiple agenda items on joint operations and integration in areas such as electronic warfare, signature management, emerging technologies, spectrum management and human resource management, the ministry said in a statement.The event featured the launch of the AI-enabled e-Tarang System, which will enable automated, efficient planning and management of defence spectrum, and support development of newer technologies in higher frequency bands, it said

This unique software, developed in collaboration with Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N), will improve planning for interference-free operation of defence equipment during both wartime and peacetime.

https://economictimes.indiatimes.com/news/defence/joint-operations-integration-in-areas-like-electronic-warfare-discussed-in-key-defence-meeting/articleshow/115296769.cms?from=mdr

Business Standard

Fri, 15 Nov 2024

DRDO successfully completes flight tests of guided Pinaka rocket system

One of the Indian Army's most devastating fire support systems, the indigenous guided Pinaka weapon system, has successfully completed its flight tests, the Defence Research and Development Organisation (DRDO) announced on Thursday. The Army first witnessed the havoc caused by the Pinaka multiple-barrel rocket launcher (MBRL) during the Kargil War in 1999, when the system, still under development, caused widespread depredation when fired at Pakistani infiltrators' positions.

Impressed, the Indian Army decided to replace its Soviet-era MBRLs — the venerable GRAD BM-21 — with an indigenous MBRL. The result is the Pinaka. A Pinaka MBRL unit consists of 18 launchers, each of which fires at the enemy from 12 launcher tubes. Firing in rapid succession, these 216 launcher tubes can rain down seven tonnes of high explosive in just 44 seconds on a target 60 kilometres away, catching enemy troops in the open without giving them time to take cover.

The Pinaka MBRL, named after the legendary bow of Lord Shiva, takes just three minutes to come into and out of action. The Pinaka project has been successfully led by two DRDO laboratories in Pune—Armament Research & Development Establishment (ARDE) and High Energy Materials Research Laboratory (HEMRL)—in partnership with two private sector firms, Larsen & Toubro (L&T) and Tata Power Company Ltd (TPCL).

https://www.business-standard.com/external-affairs-defence-security/news/drdo-successfully-completes-flight-tests-of-guided-pinaka-rocket-system-124111501404_1.html

THE ECONOMIC TIMES

Mon, 18 Nov 2024

Why India is developing hypersonic missiles and how it may prove to be a game changer for defence forces?

On November 17, 2024, India's Defence Research and Development Organisation (DRDO) successfully conducted the first flight test of a long-range hypersonic missile. The missile was launched from Dr. APJ Abdul Kalam Island, off the coast of Odisha. It has been designed to carry

various payloads and boasts a range exceeding 1,500 kilometers, making it a critical addition to India's defence arsenal.

What Are Hypersonic Missiles?

Hypersonic missiles are advanced weapons capable of speeds greater than Mach 5—five times the speed of sound, equivalent to over a mile per second. These weapons are distinct from traditional ballistic missiles due to their ability to maneuver during flight.

Two primary types of hypersonic weapons include:

- Hypersonic Glide Vehicles (HGVs): These are launched on rockets and glide to their targets, using aerodynamic lift for maneuverability.
- Hypersonic Cruise Missiles (HCMs): Powered by air-breathing scramjet engines, these missiles sustain hypersonic speeds throughout their flight.

The key advantage of hypersonic missiles lies in their ability to evade conventional missile defence systems. Unlike ballistic missiles, which follow a fixed trajectory, hypersonic missiles can alter their course, making them significantly harder to detect and intercept.

Strategic Significance and Global Race

Hypersonic weapons are viewed as game-changers in modern warfare. According to General John Hyten, former Commander of US Strategic Command, these weapons enable "responsive, long-range strike options against distant, defended, or time-critical threats (such as road-mobile missiles) when other forces are unavailable, denied access, or not preferred."

Conventional hypersonic weapons rely solely on kinetic energy—generated by their high speed—for impact. They are effective against both surface and underground targets. A 2023 research briefing by the UK Parliament noted, "They fly at lower altitudes than ballistic missiles, which means that they may be harder to track at long distances with some surface-based sensors, such as certain radar."

Globally, countries like the US, Russia, and China are leading in hypersonic missile development. Russia claimed to have deployed hypersonic missiles during its conflict with Ukraine in 2022. "The Kinzhal aviation missile system with hypersonic aeroballistic missiles destroyed a large underground warehouse containing missiles and aviation ammunition in the village of Deliatyn in the Ivano-Frankivsk region," Russian Defence Ministry spokesperson Igor Konashenkov stated.

The US is actively pursuing hypersonic technology under an ambitious program. Earlier this year, Lockheed Martin received a $756 million contract to advance the Long Range Hypersonic Weapon (LRHW) system. Other countries, including France, Germany, Japan, Israel, and Australia, are also working on hypersonic missile systems.

https://economictimes.indiatimes.com/news/defence/why-india-is-developing-hypersonic-missiles-and-how-it-may-prove-to-be-a-game-changer-for-defence-forces/articleshow/115406183.cms?from=mdr

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Sat, 16 Nov 2024

Memorandum Of Implementation Signed With Government Of Japan For Co-Development Of Unicorn Masts For The Indian Navy

A Memorandum of Implementation was signed at the Embassy of India, Tokyo between Govt of India and Govt of Japan, for co-development of UNICORN mast for fitment onboard Ships of Indian Navy. The MOI was signed and exchanged between the Ambassador of India to Japan, H.E. Shri Sibi George and Mr. Ishikawa Takeshi, Commissioner of Acquisition Technology and Logistics Agency (ATLA) under Japan MoD in a ceremony at Tokyo.

The Unified Complex Radio Antenna (UNICORN) is a mast with Integrated Communication systems which will help improve the stealth characteristics of Naval Platforms. The Indian Navy is pursuing the induction of these advanced systems which will be co-developed by Bharat Electronics Limited in India with Japanese collaboration. When implemented, this would be the first case of co-development / co-production of Defence Equipment between India and Japan.

https://pib.gov.in/PressReleasePage.aspx?PRID=2073843

Press Information Bureau
Government of India

Ministry of Defence

Mon, 18 Nov 2024

Launching Of 25th Bollard Pull Tug Yuvan

The contract for construction and delivery of six 25T BP Tugs was concluded with M/s Titagarh Rail Systems Limited (M/s TRSL), in consonance with 'Make in India' and 'Aatmanirbhar Bharat' initiative of the Government of India. The Tugs are being built under the classification rules of Indian Register of Shipping (IRS). M/s TRSL, Kolkata has commenced the delivery of these Tugs progressively for operations by the Indian Navy. These Tugs will be operated by the Indian Navy at the Andaman and Nicobar Command and Eastern Naval Command.***Mon, 18 Nov 2024***

Cmde Ceasar Basu, Group Commander NCC, Kolkata presided over the ceremony for launching of the fourth Tug (Yuvan) of the series and keel laying of the fifth and sixth Tugs (Ojas and Sabal) on 17 Nov 24 at M/s Titagarh Rail Systems Limited, Kolkata. These Tugs will be delivered to the Indian Navy in 2025.

The 25T BP Tugs will provide assistance to Naval ships and submarines during berthing, un-berthing, turning and manoeuvring in confined waters thereby aiding operations of the IN platforms directly. The Tugs will also provide afloat firefighting support to IN platforms alongside and at anchorage besides having the capability to conduct limited Search and Rescue Operations.

https://pib.gov.in/PressReleasePage.aspx?PRID=2074149

THE ECONOMIC TIMES

Mon, 18 Nov 2024

Government Considers Rs 6,000 Cr Tunnel To Link Leh With Pangong

The government is weighing options for the construction of a 7-8 km twin tube tunnel through the Kela pass, which has been proposed by the UT administration of Ladakh , as per a TOI report. The tunnel is expected to facilitate smooth movement of travellers and military personnel.

TOI says that the home ministry held meetings on the issue this week. The project is likely to cost around Rs 6,000 crore, sources said. "It's a tough and high-cost project. A call is likely to be taken soon. It's a strategic road and will reduce the travel time from Leh to Pangong substantially. The project is at a very nascent stage," a source said.

Sources said options are being explored whether Border Road Organisation or the National Highway and Infrastructure Development Corporation under the road transport ministry would build the strategic tunnel to provide all-weather connectivity. Kela pass is the highest motorable pass of the country connecting Leh with Pangong lake. Its altitude is 18,600 ft from mean sea level.

Aiming to improve connectivity for tourism, economic activities and smooth movement of defence forces, the Ladakh administration in 2022 had first stressed the need for new tunnels at four passes at Khardung La, Fotu La, Namika La and Kela.

https://economictimes.indiatimes.com/news/defence/government-considers-rs-6000-cr-tunnel-to-link-leh-with-pangong/printarticle/115377802.cms

THE ECONOMIC TIMES

Mon, 18 Nov 2024

Defence Minister Rajnath Singh, Chinese counterpart may hold talks in Laos

Defence minister Rajnath Singh is likely to meet his Chinese counterpart Dong Jun at an event in Laos next week. Following the border patrolling agreement with China that led to disengagement of troops in eastern Ladakh, Singh-Dong meeting would be also the first high-level engagement between the two countries.

Singh will visit Laos to attend ASEAN Defence Ministers Meeting Plus (ADMM Plus), where he is likely to meet his outgoing US counterpart as well. Sources said while the meeting with Dong has not been finalised yet, the interaction could take place on the sidelines of the two-day event.

During a previous meeting with his Chinese counterpart Li Shangfu in April 2023, India had taken a tough line due to faceoff in Ladakh.The meeting is expected to be cordial given that troop disengagement has taken place and patrols have resumed at the last two border flashpoints of Depsang and Demchock.

https://economictimes.indiatimes.com/news/defence/defence-minister-rajnath-singh-chinese-counterpart-may-hold-talks-in-laos/articleshow/115310268.cms

THE WEEK

Sat, 16 Nov 2024

Defence Modernisation In Focus As Army Chief General Upendra Dwivedi Begins His Nepal Visit Next Week

Army Chief General Upendra Dwivedi will be on a four-day visit to Nepal next week to explore ways to further expand the defence and strategic relationship between India and Nepal.The visit will mark another significant chapter in the evolving military diplomacy between the two nations, sources in the defence establishment said, according to news agency PTI.

During his visit, General Dwivedi will hold extensive talks with his Nepalese counterpart General Ashok Raj Sigdel. One of the major focus areas during the interactions with General Ashok Raj Sigdel and other top leaders of the nation is the ongoing defence modernisation in both militaries.

India has been supporting thehe annual meeting of the Joint Electromagnetic Board (JEMB), a subcommittee of the Chiefs of Staff Committee (COSC) was conducted with a singular aim, 'to achieve synergy in joint electronic warfare (EW) operations among the three Services and to establish a roadmap for enhancing capabilities in Spectrum Warfare'.

The event on Wednesday was attended by senior officers from the three Services, the Defence Research and Development Organisation (DRDO), the Department of Defence Production (DDP), and industry.

According to the Ministry of Defence, the meeting was held under the chairmanship of Air Marshal]eetendra Mishra, Deputy Chief of Integrated Defence Staff (Operations).

The meeting covered multiple agenda items on joint operations and integration in areas such as Electronic Warfare, Signature Management, Emerging Technologies, EMI/EMC, Spectrum Management and Human Resource Management.

The event featured the launch of the Al-enabled e-Tarang System, which will enable automated, efficient planning and management of Defence Spectrum, as well as support the development of newer technologies in higher frequency bands.

This unique software, developed in collaboration with Bhaskaracharya National Institute for Space Applications and Geo-informatics (BISAG-N), will improve planning for the interference-free operation of defence equipment during both wartime and peacetime. military modernisation efforts of Nepal by supplying various military hardware, including small arms, vehicles and advanced training simulators.

General Dwivedi is set to be conferred the honorary rank of 'General of the Nepal Army' by Nepalese President Ramchandra Paudel during his visit. Began in 1950, this is a tradition that reflects the strong ties between the two militaries.

The visit of the Army chief to the Himalayan nation is expected to further strengthen the defence ties between the two countries, paving the way for continued collaboration on multiple fronts, including military exercises, training programmes, and strategic discussions on regional security concerns, according to Army sources.

India and Nepal share a special relationship, reinforced by cultural, historical and geographical factors. This bond has evolved into a robust military partnership that plays a key role in enhancing regional security, the sources said, reported PTI. India and Nepal hold an annual joint military exercise, 'Surya Kiran', which focuses on counterterrorism, disaster relief, and humanitarian assistance, with the intention of boosting interoperability between the two armed forces.

https://www.theweek.in/news/defence/2024/11/16/defence-modernisation-in-focus-as-army-chief-general-upendra-dwivedi-begins-his-nepal-visit-next-week.html

ANI
South Asia's Leading Multimedia News Agency

Sat, 16 Nov 2024

Headquarters Integrated Defence Staff conducts JEMB meeting, to achieve synergy in joint EW operations

The annual meeting of the Joint Electromagnetic Board (JEMB), a subcommittee of the Chiefs of Staff Committee (COSC) was conducted with a singular aim, 'to achieve synergy in joint electronic warfare (EW) operations among the three Services and to establish a roadmap for enhancing capabilities in Spectrum Warfare'. The event on Wednesday was attended by senior officers from the three Services, the Defence Research and Development Organisation (DRDO), the Department of Defence Production (DDP), and industry.

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https://www.aninews.in/news/national/general-news/headquarters-integrated-defence-staff-conducts-jemb-meeting-to-achieve-synergy-in-joint-ew-operations20241114231941/

Business Standard

Sun, 17 Nov 2024

Parliamentary Committee Reviews Indian Coast Guard's Role In Security

The delegation of Members of Parliament (MPs) was led by MP Shri Radha Mohan Singh, who chaired the meeting. Senior officials from the Ministry of Defence (MoD) and ICG also attended the meeting. The ICG was represented by Director General S Paramesh, PTM, TM, Director General Indian Coast Guard, who provided a comprehensive overview of the ICG's operational capabilities, strategic initiatives, and preparedness to address the nation's coastal security challenges. According to the release, the discussion focused on ICG's ongoing efforts to safeguard India's maritime interests, improve coordination with various stakeholders, and enhance response mechanisms for ensuring maritime safety and security.

During the review, DG S Paramesh briefed the Committee on the various facets of ICG operations, including its extensive surveillance systems, advanced vessel fleet, and specialized response units. The ICG's role in preventing maritime security threats, such as illegal fishing, smuggling, and human trafficking, was also highlighted.

The Committee members expressed their satisfaction with the Indian Coast Guard's recent achievements, acknowledging the force's significant progress in strengthening coastal security infrastructure, enhancing inter-agency coordination, and implementing cutting-edge technologies. They commended the ICG's proactive role in safeguarding India's 11,098 km coastline and ensuring the security of vital maritime trade routes.

A meeting of the Parliamentary Standing Committee on Defence was held in Chennai yesterday to review the working of the Indian Coast Guard (ICG) in ensuring coastal security along India's vast maritime boundaries. The delegation of Members of Parliament (MPs) was led by MP Radha Mohan Singh, who chaired the meeting. Senior officials from the Ministry of Defence (MoD) and ICG also attended the meeting, the release said.

https://www.business-standard.com/external-affairs-defence-security/news/parliamentary-committee-reviews-indian-coast-guard-s-role-in-security-124111700235_1.html

The Indian EXPRESS

Sun, 17 Nov 2024

'Disengagement Is Disengagement, Nothing More, Nothing Less': Jaishankar On India-China Lac Deal

The disengagement part of the "problem" with China along the Line of Actual Control (LAC) in eastern Ladakh has been addressed with last month's understanding and the next focus would be on de-escalation, External Affairs Minister S Jaishankar said on Saturday.

He described it a "reasonable supposition" to expect some improvement in the India-China ties following the last round of disengagement, even as he hesitated to say that there could be a reset of the ties.

"I see disengagement as disengagement; nothing more, nothing less. If you look at our current situation with China, we have an issue where our troops are uncomfortably close along the LAC which required us to disengage," he said at the Hindustan Times Leadership Summit. "And this last understanding of October 21 is the last one of the disengagement agreements. So with its implementation the disengagement part of the problem is addressed," he said.

Jaishankar's remarks came in response to a question on whether the disengagement of troops by the two sides last month was the beginning of a reset of ties between India and China. The minister said the current situation of the relationship does not warrant such a conclusion.

https://indianexpress.com/article/india/disengagement-china-addressed-next-focus-de-escalation-s-jaishankar-ht-summit-9673135/

INDIA TODAY

Mon, 18 Nov 2024

Air Force to maintain deployment at LAC post India-China border truce: Sources

The Indian Air Force (IAF) biannual commanders' conference commenced at Air Headquarters, Delhi, marking the first such gathering since the disengagement of troops from the friction areas of Demchok and Depsang in eastern Ladakh along the Line of Actual Control (LAC) with China. Sources told India Today TV that there will be no immediate changes to the present IAF deployment along the LAC.

The biannual conference began on Sunday and is slated to continue till Wednesday, November 20. The Commanders' Conference serves as a platform for reviewing the operational capabilities and preparedness of the IAF, especially considering the ongoing security challenges along the Northern Borders.

Defence Minister Rajnath Singh will address the conference tomorrow.The conference will hold discussions on the integration within the armed forces, aimed at improving interoperability and coordinated operations. Additionally, the conference will focus on winter operational strategies to maintain security and readiness during the harsh conditions of the season. Sources confirmed that apart from the emphasis on current deployments, discussions will also cover the IAF's modernisation plans, aimed at bolstering its capabilities in the face of evolving regional threats.

The IAF's decision to maintain its deployment comes amid a recent border disengagement with China. The move underscores India's focus on protecting its borders and maintaining operations along the Line of Actual Control. A meeting of senior commanders will focus on planning for future challenges and the Air Force's role in defending the country.

https://www.indiatoday.in/india/story/indian-air-force-iaf-deployment-lac-india-china-border-truce-biannual-commanders-conference-rajnath-singh-2635008-2024-11-18

#SWARAJYA

Sat, 17 Nov 2024

India, Japan Ink Pact To Jointly Develop Stealth-Enhancing UNICORN Mast For Indian Navy Ships

India and Japan have signed a Memorandum of Implementation (MoI) for the joint development and production of the Unified Complex Radio Antenna (UNICORN) mast, a state-of-the-art integrated communication system. The MoI was formally signed and exchanged in Tokyo on Friday (15 November) during a ceremony attended by Sibi George, India's Ambassador to Japan, and Ishikawa Takeshi, Commissioner of Acquisition Technology and Logistics Agency under the Japanese Ministry of Defence (MoD).

The UNICORN mast is a next-generation naval mast system that integrates multiple communication systems and enhances the stealth characteristics of naval platforms by reducing the radar cross-section (RCS) of antennas. By stacking antennas and enclosing them within a radome, the system makes naval vessels more difficult to detect, improving their operational effectiveness in sensitive environments.

"The Indian Navy is pursuing the induction of these advanced systems which will be co-developed by Bharat Electronics Limited in India with Japanese collaboration," the Navy said in a statement.

It also highlighted that this project marks the first-ever case of co-development and co-production of defence equipment between the two nations. The technology was previously discussed during the India-Japan 2+2 dialogue in August 2024, where both nations appreciated the progress made for the transfer of UNICORN and related technologies and early signing of related arrangements.

Although Japan has sought to boost defence exports in recent years, strict conditions under its pacifist constitution have often posed challenges. This agreement could pave the way for the first export of Japanese defence technology under the 2015 bilateral agreement on defence equipment and technology transfer.

Earlier negotiations between India and Japan for the procurement of amphibious planes for the Indian Navy stalled due to high costs and other priorities. However, the UNICORN project signals renewed momentum in defence collaboration between the two nations.

https://swarajyamag.com/news-brief/india-japan-ink-pact-to-jointly-develop-stealth-enhancing-unicorn-mast-for-indian-navy-ships

Science & Technology News

Mon, 18 Nov 2024

ISRO's GSAT-20: Expanding communication horizons with SpaceX's Falcon 9 rocket

India is preparing to launch its largest communication satellite, GSAT-20, with the help of the SpaceX's Falcon 9 rocket. Weighing 4,700 kg, GSAT-20 is too heavy for India's current launch vehicles. ISRO's heavy-lift rocket, the LVM-3, also known as "Bahubali" or "Fat Boy," can only carry satellites weighing up to 4 tonnes into Geostationary Transfer Orbit (GTO).

ISRO turned to SpaceX, whose Falcon 9 rocket can handle payloads of up to 8.3 tonnes in GTO, making it ideal for mission. SpaceX was chosen for the task after other options became

unavailable. Arianespace, part of the ArianeGroup, was not accessible, and the ongoing conflict with Russia further limited alternatives.

GSAT-20 will play a critical role in enhancing India's communication infrastructure, supporting initiatives like smart cities, and providing in-flight internet access. By leveraging SpaceX's Falcon 9, ISRO ensures that GSAT-20 can be successfully deployed, marking a significant step forward for India's satellite capabilities.

In the past, ISRO depended on Arianespace to launch its larger satellites. However, Arianespace could not offer a slot for the GSAT-20 launch this time.

This is because the available commercial slots for the upcoming launches of their new rocket, Ariane 6, are already booked, and their previous rocket, Ariane 5, was retired last year. As a result ISRO had to look for other options, eventually turning to SpaceX.

The Ariane 5 rocket can carry payloads of up to 10 tonnes to Geostationary Transfer Orbit (GTO), while the newer Ariane 6 has two variants, namely Ariane 62 (with two boosters) that can carry up to 4.5 tons to GTO, and Ariane 64 (with four boosters) that can carry up to 11 tonnes to GTO.

https://www.theweek.in/news/sci-tech/2024/11/18/isros-gsat-20-expanding-communication-horizons-with-spacexs-falcon-9-rocket.html

ThePrint

Mon, 18 Nov 2024

Science once drove technology, now the reverse is true. Here’s how to harness it

For centuries, science and technology have propelled each other forward in a dance of progress. Traditionally, scientific discoveries led the way, with breakthroughs like Newton’s laws enabling the Industrial Revolution, and quantum mechanics paving the path for the digital age. In this paradigm, science predominantly fueled technological advancements.

Today, we’re witnessing a fascinating role reversal. While scientific insights still drive technological innovation, we’re increasingly seeing technology, particularly artificial intelligence and machine learning, catalyzing scientific breakthroughs. AI algorithms are predicting protein structures faster than traditional lab methods, machine learning models are accelerating drug discovery, and advanced computing is enabling scientific simulations of unprecedented complexity.

In this new paradigm, emerging technological capabilities open doors to deeper scientific understanding, which in turn drives new opportunities for furthering technological enrichment.This virtuous flywheel of science and technology has tremendous potential to translate into tangible improvements in our daily lives, from more effective medications to smarter devices and cleaner energy solutions.

AI is dramatically shrinking research and experimentation cycles, making discoveries that once took decades to unfold possible within mere years.In chemistry and biology, AI-driven algorithms are transforming the way we approach complex challenges, such as predicting molecular structures and interactions. A notable example is DeepMind's AlphaFold, which has revolutionized protein folding by predicting protein structures with unprecedented accuracy.

In the same fields, consider the realm of personalized medicine and disease control, where AI-driven platforms are identifying potential treatments in a fraction of the time it once took. A prime example of this is the integration of AI with CRISPR gene editing technology. AI models help predict potential off-target effects of CRISPR, making gene editing safer and more precise. This accelerates the development of new therapies, pushing the boundaries of what's possible in genetic modifications and personalized treatments.

Another area that benefits greatly from accelerated tech-driven innovation is material sciences. This field is undergoing a transformation through the integration of advanced technologies. New materials, from sustainable alternatives to stronger alloys, are being developed at unprecedented rates thanks to innovative research and technology.For industries ranging from aerospace to renewable energy, the implications are vast: faster innovation cycles, reduced R&D costs and a competitive edge in developing materials that meet the demands of tomorrow's markets.

https://theprint.in/science/science-once-drove-technology-now-the-reverse-is-true-heres-how-to-harness-it/2360927/

THE NEW INDIAN EXPRESS

Sat, 17 Nov 2024

Volcanoes erupted on moon's far side billions of years ago: Report

Scientists have discovered evidence of ancient volcanic activity on the far side of the moon, a region vastly different in geology from the side visible from Earth. US and Chinese researchers analysed samples collected by China's Chang'e-6 mission, revealing volcanic basalt fragments dating back more than 4.2 billion years.

The findings, published in Nature and Science on Friday, shed new light on the moon's volcanic history. While volcanic activity on the near side has been well-documented, the far side, often called the "dark side," remains less understood.

Radiometric dating of the samples, led by the Chinese Academy of Sciences, also uncovered evidence of a "surprisingly young" eruption about 2.83 billion years ago—much younger than any volcanic activity previously identified on the near side. "This is an incredibly exciting study,"

wrote Professor Qiuli Li from the Institute of Geology and Geophysics in a peer review. “It will be of immense importance to the lunar and planetary science community.”

The samples, the first ever retrieved from the far side, were collected during the nearly two-month-long Chang’e-6 mission, which included deploying a small rover to photograph the rocky surface. Although called the “dark side,” this region receives sunlight but remains hidden from Earth’s view due to the moon’s tidally locked orbit. The moon takes approximately 27 days to rotate and orbit Earth, ensuring the same side always faces us.

The far side was first photographed in 1959 by the Soviet spacecraft Luna 3. Since then, higher-quality images and videos, including a NASA video showing Earth in the background, have provided more detailed views of the region.The Chang’e-6 mission marks another milestone in lunar exploration, offering unprecedented insights into the moon’s volcanic and geological history.

https://indianexpress.com/article/technology/science/volcanoes-erupted-moon-far-side-billions-years-ago-study-9673389/