सितम्बर
Sep
2024

खंड/Vol. : 49 अंक/Issue : 174
19/09/2024

समाचार पत्रों से चयनित अंश
Newspapers Clippings

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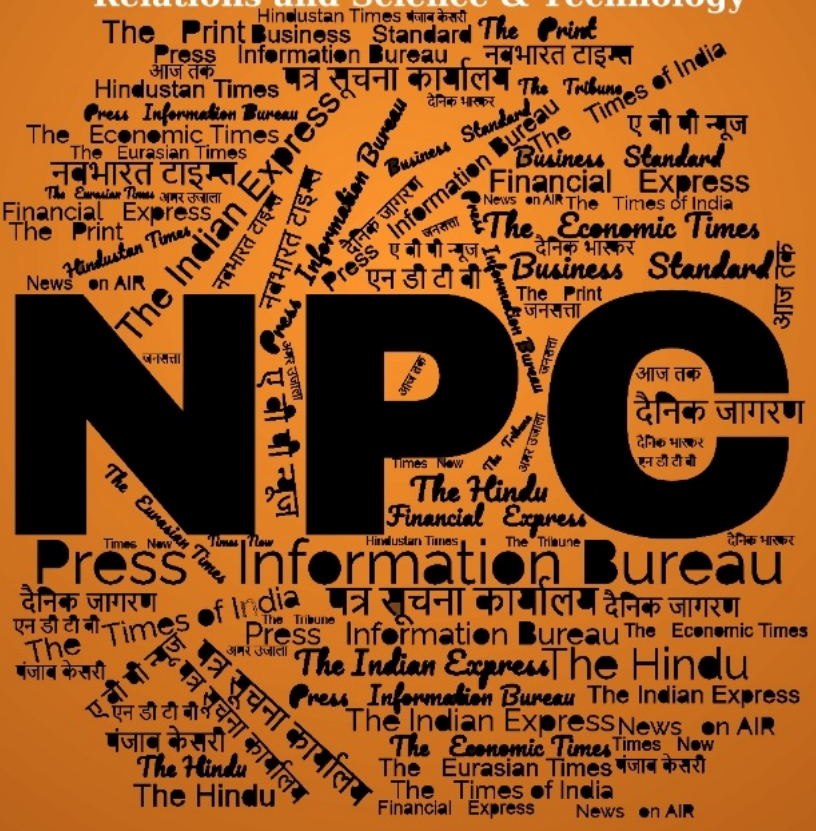

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The Indian EXPRESS

Thu, 19 Sep 2024

Put on fast-track: Psychological test for Agniveers, anti-drone systems

From framing a basic psychological assessment test for selection of Agniveers to the Armed Forces and developing directed energy weapon systems for killing rogue aerial objects to giving statutory status to certification bodies under it, the Defence Research and Development Organisation (DRDO) hopes to complete a set of critical projects this year, The Indian Express has learnt.

Officials said the basic assessment test being developed will aid the psychological evaluation of Agniveers selected by the Army, Navy and the Indian Air Force.

It is expected to be adopted by the Armed Forces this year itself as soon as the DRDO is ready with it.

At present, the eligibility criteria for prospective Agniveers are specified educational qualifications that allow them to take an online common entrance examination. Those who qualify subsequently undergo physical fitness and measurement tests, followed by medical tests before a final merit list is drawn.

No psychological assessment tests were conducted during recruitment, either for Agniveers or regular soldiers recruited prior to the launch of the Agnipath scheme. However, officers undergo a written examination and an interview by the Services Selection Board, where their psychological parameters are assessed.

The Defence Institute of Psychological Research (DIPR) under the DRDO carries out research in psychology for armed forces personnel. Last year, a DIPR-developed psychometric test was tested on a trial basis for Agniveer aspirants at a recruitment rally.

Defence forces personnel serve in difficult terrains for extended periods of time in isolation and work conditions that are highly stressful. A psychological assessment test helps assess the mental fitness and resilience of personnel to be able serve in such conditions.

Since the start of the Agnipath scheme in 2022, an Agniveer in the Army died of a self-inflicted injury. In the Navy, a woman Agniveer died by suicide last year and in July this year, an Agniveer with the IAF died by suicide while on sentry duty.

Aside from the test, granting the Final Operational Clearance of AEW&C- K I for the IAF is also among DRDO’s priority list this year, officials said.

Named Netra, the platforms are used to detect and track enemy aircraft or UAVs, while enabling operators onboard and on ground to identify, assess the threat and guide interceptors to take them out.

Currently, two AEW&C systems are being used by IAF for various operations after they were granted the Initial Operation Clearance (IOC).

The DRDO is also prioritising development of a 30 kW Directed Energy Weapon (DEW) system to target and kill aerial objects. This is a niche technology being tested and employed by a handful of advanced militaries.

In the backdrop of small and advanced unmanned aerial vehicles (UAVs) emerging as a significant security threat, the system uses concentrated electromagnetic energy to combat enemy assets.

Last year, Air Chief Marshal V R Chaudhari had said India's defence industries need to push the development of such advanced weapons and integrate them into its airborne platforms to get the desired range and accuracy. He had said that DEWs, particularly lasers, provide significant advantages over traditional weapons such as precision engagement, low cost per shot, logistical benefits, and low detectability.

The Army has also identified 16 tech clusters comprising subject specialists, each on certain emerging technologies which are at a conceptual stage. One of them is DEW and counter-unmanned aerial systems. In July, IAF Vice Chief, Air Marshal AP Singh, had said that impetus is also being given in the fields of directed energy weapons, close-in weapon systems and modernising India's aerial platforms and surface-to-air guided weapon systems.

Officials said the DRDO also plans to prioritise development of other key systems this year such as standalone 1-km range Anti-drone High Power Microwave System to take out enemy drones and the maiden launch of the Long-Range Land Attack Cruise Missile for the IAF. There are plans to develop the system for all aerial, naval and land platforms.DRDO plans to give statutory status to regulatory and certification bodies such as the Centre for Military Airworthiness and Certification and Centre for Fire Explosive and Environment Safety, officials said.

https://indianexpress.com/article/india/put-on-fast-track-psychological-test-for-agniveers-anti-drone-systems-9575157/

Defence News

Defence Strategic: National/International

Press Information Bureau
Government of India

Ministry of Defence

Wed, 18 Sep 2024

Indian Army Signs MoU With Tiranga Mountain Rescue (TMR)

The Indian Army has signed a Memorandum of Understanding (MoU) with Tiranga Mountain Rescue (TMR) today at Centre for Land Warfare Studies (CLAWS), Delhi Cantt, in the presence of Gen Upendra Dwivedi, Chief of the Army Staff. Maj Gen Manish Luthra, Additional Director General Military Operations (A), signed the MoU on behalf of the Indian Army, while Mr Hemant Sachdev, a dedicated mountaineer and Mt Everest Summiteer, signed it on behalf of the TMR.

This understanding marks a pivotal step in advancing the Indian Army's rescue and survival operations in mountainous terrains. The MoU stipulates that TMR will collaborate with the Indian Army in conducting customised training programs for Army instructors, aimed at improving their ability to mentor troops in avalanche rescue and survival skills.

General Upendra Dwivedi commended the efforts of TMR and appreciated the collaboration between the Indian Army and TMR. He acknowledged their efforts by awarding Chief of Army Staff Commendation Cards to two team members of TMR's Rescue Team.

Lieutenant General Tarun Kumar Aich, Deputy Chief of Army Staff (Strategy), lauded the MoU as a mutually advantageous agreement for both organisations. He further said that for the past nine years, TMR has done yeoman service in saving numerous lives by providing unwavering support in training and rescue efforts. Mr Hemant Sachdev highlighted that 15 Teams of TMR are already deployed in various regions alongside Indian Army. He also mentioned that the rescue teams of TMR have been able to save a large number of precious lives in avalanche-prone areas.

This MoU builds on the initial agreement made with Northern Command in 2016, which established dedicated avalanche and rescue support by the TMR. Subsequent agreements with Eastern and Central Commands in 2021 and 2024 further expanded this collaboration. The latest

MoU will further utilise TMR's expertise to boost the Indian Army's capabilities in executing effective rescue operations under demanding conditions.

This partnership highlights a commitment to further enhance the readiness of personnel operating in mountainous terrain besides enhancing the standards of training and rescue operations in high-altitude environments.

https://pib.gov.in/PressReleasePage.aspx?PRID=2055960

Press Information Bureau
Government of India

Ministry of Defence

Wed, 18 Sep 2024

ICGS Sujay makes port call in Bali for a three-day visit as part of overseas deployment to East Asia

Indian Coast Guard (ICG) Offshore Patrol Vessel Sujay with integral helicopter made a port call at Bali, Indonesia on September 18, 2024, for a three-day visit, as part of its ongoing overseas deployment to East Asia. The crew of ICGS Sujay will engage in professional interactions with Badan Keamanan Laut Republik Indonesia (BAKAMLA), focusing on Operational Turn Around, Marine Pollution Response, Maritime Search & Rescue and Maritime Law Enforcement.

During the visit, the Coast Guards of both the countries will also engage in activities like cross deck training, joint yoga sessions and friendly sports events. Additionally, 10 NCC cadets aboard ICGS Sujay will participate in an environment protection walkathon towards sensitising the community on ill-effects of 'marine pollution' in collaboration with local youth organisations.

ICG, on July 06, 2020, signed a MoU with BAKAMLA towards enhanced maritime cooperation and institutionalised its cooperative engagements. Prior to the visit, ICGS Sujay had made port calls to Jakarta, Indonesia and Incheon, South Korea demonstrating a seamless continuation of diplomatic maritime engagements in the region. The ship's deployment to East Asia reflects India's commitment to fostering warm relations with Indo Pacific countries, promoting friendly relations through maritime cooperation.

https://pib.gov.in/PressReleasePage.aspx?PRID=2056067

Press Information Bureau
Government of India

Ministry of Defence

Wed, 18 Sep 2024

India's position is of a 'Vishwa Bandhu' in the global world order, says CDS Gen Anil Chauhan at Foreign Service Attaches Conclave in New Delhi

Chief of Defence Staff General Anil Chauhan has stated that India's position is of a 'Vishwa Mitra' and a 'Vishwa Bandhu' in the global world order. He was addressing a conclave for Foreign Service Attaches (FSAs) hosted by the Defence Intelligence Agency of Headquarters Integrated Defence Staff at New Delhi on 18 Sep 2024. The CDS articulated the importance of Military Diplomacy, wherein the FSAs have a pivotal role to play.

"In the most violent decade since World War II, there is a growing propensity amongst nations to use force to contain conflicts. The growing uncertainty and insecurity is leading nations to renew their National Security Strategy and increase expenditure on Defence", the CDS said while highlighting four distinct areas of India's Defence viz operational preparedness, modernisation, transformation and indigenisation.

He emphasised the significance of Data Centric Warfare and the role of Artificial Intelligence in revolutionising warfare. The CDS gave an insight into India's Atmanirbharta for defence capability development and strategic autonomy.

Director General Defence Intelligence Agency (DG DIA) Lt Gen DS Rana apprised the FSAs that India's Defence Diplomacy was expanding steadily in terms of the nature of activities as well as geographic coverage wherein security cooperation was a key component.

He highlighted the vision of Atmanirbharta and indigenization in Defence and implored upon FSAs to gain first-hand experience in modernisation programmes.

A holistic overview of India's strategic perspective was given to the FSAs by Defence Subject Matter Experts. Lt Gen Raj Shukla (Retd) spoke on 'India's National Security: Challenges & Opportunities', Vice Admiral Pradeep Chauhan (Retd) deliberated upon 'Indo-Pacific Region Competition, Cooperation & Challenges' and Lt Gen Rakesh Sharma (Retd) gave insights on 'Grey Zone Warfare and Impact on Security Dynamics'.

https://pib.gov.in/PressReleasePage.aspx?PRID=2056094

THE ECONOMIC TIMES

Wed, 18 Sep 2024

Indian Navy gives proactive push to Make in India, forms task forces to reach out to desi industry for weapons, equipment requirements

Taking a proactive approach towards promoting indigenous industry, the India Navy has formed two task forces under Rear Admiral-rank officers to reach out to the Indian manufacturers to find solutions for its requirements for weapons systems and equipment. The Naval Headquarters led by Admiral Dinesh K Tripathi has formed two task forces led by Rear Admiralrank officers who are visiting the Indian industry to find out the products and equipment they are making or can make for the Indian Navy and how they can meet the force's requirements, defence officials told ANI.

The officers who are leading the initiative include one from the operational branch, while the other one is from the technical side, they said. Admiral Tripathi has also been visiting the local industry facilities with Navy teams to review their manufacturing facilities. The Indian Navy is leading the indigenisation campaign with all its warships and submarines except for two getting built in the Indian shipyards only.

The Indian Navy has plans of placing orders worth lakhs of crores to the Indian industry and shipyards in the next few years. The immediate orders for the Indigenous industry would be for Rs 1.6 lakh crore worth of submarines of different types for meeting threats posed by China and Pakistan. The Indian Navy is also going to commission the last of the two warships being built in Russia in the near future, with a focus on equipping them with indigenous systems and equipment. The Tushil and Tamal class warships would be commissioned by February next year after delays caused by the COVID-19 pandemic and ongoing conflict between Russia and Ukraine.

https://economictimes.indiatimes.com/news/defence/indian-navy-gives-proactive-push-to-make-in-india-forms-task-forces-to-reach-out-to-desi-industry-for-weapons-equipment-requirements/articleshow/113464227.cms

THE ECONOMIC TIMES

Wed, 18 Sep 2024

On surveillance mission, MQ-9B Sea Guardian drone encounters 'technical failure'

A high-altitude long-endurance MQ-9B Sea Guardian drone that was taken on lease by the Indian Navy encountered a "technicalfailure" on Wednesday while on a surveillance mission, officials said.

The drone was operating from naval air station INS Rajali in Arakkonam near Chennai. In 2020, the Indian Navy had taken on lease two MQ-9B Sea Guardian drones from American defence major General Atomics for a period of one year for surveillance in the Indian Ocean. The lease period has been extended subsequently.

"A high altitude long endurance remotely piloted aircraft leased by the Indian Navy operating from INS Rajali, Arakonnam encountered a technical failure at about 2 pm while on a routine surveillance mission which could not be reset in flight," the Indian Navy said in a statement. "The aircraft was navigated to a safe area over sea and carried out a controlled ditching at sea off Chennai," it said. The Navy has sought a detailed report from the OEM or the original equipment maker.

Controlled ditching generally refers to an emergency landing of an aircraft on water. Since the Navy took two drones on lease, their maintenance was being done by General Atomics. The incident comes as India is in the process of procuring 31 MQ-9B Predator drones.

India is planning to acquire the drones at a cost of nearly USD 3 billion primarily to crank up the surveillance apparatus of the armed forces, especially along the contested frontier with China. In June last year, the Defence Ministry approved the procurement of the MQ9B Predator armed drones from the US under a government-to-government framework.

The MQ-9B drone is a variant of the MQ-9 "Reaper" which was used to launch a modified version of the Hellfire missile that eliminated al-Qaeda leader Ayman al-Zawahiri in the heart of Kabul in July 2022.

https://economictimes.indiatimes.com/news/defence/on-surveillance-mission-mq-9b-sea-guardian-drone-encounters-technical-failure/articleshow/113466021.cms

ThePrint

Wed, 18 Sep 2024

Not just engines, Tejas Mk-1A delivery could be hit over key Danish part, now on export blacklist

The delivery of the Tejas Mk-1A fighter jets to the Indian Air Force (IAF) could be further delayed because a key component of the aircraft—engine charge amplifier—that was meant to be imported from Denmark has been put on an export blacklist by it, ThePrint has learnt.

This would be over and above the ongoing delay of several months because of the non-delivery of engines by American engine maker General Electric (GE) and the time taken for certain iterations (changes) of the Israeli software installed in the aircraft.

About the charge amplifiers, sources in the defence establishment told ThePrint that while the Ministry of Defence has taken up the issue with Denmark via the Indian embassy, state-run

Hindustan Aeronautics Limited (HAL), which manufactures the fighters, has already contracted a local firm to indigenise the product.

Sources also said that while these amplifiers are fitted on board the previous generation of Tejas in service with the IAF, the contract for the 83 LCA (Light Combat Aircraft) Mk-1As remains unfilled.

Asked why, a source said, “Denmark authorities have put export restrictions on this item, which is likely to be due to the ongoing Russia-Ukraine conflict. We have taken up the issue through our Indian mission there.”

According to sources, HAL is working to ensure that the indigenisation is completed.

“It was a small product which was being imported. But now, because of this export blacklisting, HAL has contracted a Bengaluru firm to indigenise it. The firm, we are told, has almost completed it, and then HAL will carry out tests. It can then be mass produced,” a second source said.

HAL expects the process to be completed sooner than expected and is hopeful of delivering the initial lot of aircraft with some charge amplifiers that came in under the previous contract.

Sources explained that although it is a very small item, the engine charge amplifier is an important element which measures the temperature of the engine and acts accordingly.

ThePrint had first reported in March this year that the delivery of the aircraft will be delayed because iterations were needed in the software and a key part, which was to be imported from a foreign country, had not come. The charge amplifier was the part that was referred to in ThePrint’s report, but there was no confirmation about the exact details at that time.

“The engine delay is the larger problem behind which key issues are hiding. Even if GE would have delivered the engine in March, the aircraft would still not have been delivered,” a third source said, describing the seriousness of the issue.

The sources said that it is hoped that the Denmark government will give India a breather or that the indigenisation process and testing phase do not consume time. As reported by ThePrint last week, after Defence Minister Rajnath Singh discussed the issue with the US during his visit to Washington in August, GE has assured India of a fresh delivery schedule, starting November this year, for the F404-IN20 engines.

GE has promised two engines per month and assured that the overall delivery schedule would not be pushed. The firm had explained to the defence ministry that there were global supply chain issues and that it usually takes time for new vendors to be duly certified since parts have to undergo various tests.

According to the contract signed in 2021, HAL was to start the delivery of the aircraft from March this year and has to deliver 16 aircraft per year. No aircraft has been delivered yet and now, the hope is that the first one would be delivered either by the end of October or November.

https://theprint.in/defence/not-just-engines-tejas-mk-1a-delivery-could-be-hit-over-key-danish-part-now-on-export-blacklist/2272527/

Hindustan Times

Wed, 18 Sep 2024

HAL to deliver last four LCA Mk-1 trainers to IAF in 6 months

State-run aircraft maker Hindustan Aeronautics Limited (HAL) will deliver the last four light combat aircraft (LCA Mk-1) trainers to the Indian Air Force by March 31, 2025, with the twin-seater jet filling a key training role and doubling as a fighter if needed, officials aware of the matter said on Wednesday.

These aircraft are part of an earlier order for 40 Mk-1s in the initial operational clearance (IOC) and the more advanced final operational clearance (FOC) configurations -- the first variants of LCA.

Delivering the four remaining trainers at the earliest is a priority for HAL, the officials said. The LCA Mk-1 programme moved at a sluggish pace -- the IOC contract for the aircraft was signed in 2006 for completion by 2011 and the FOC one for another 20 aircraft was inked in 2010 for completion by 2016.

In October 2023, HAL handed over the first trainer version of LCA Mk-1 to IAF chief Air Chief Marshal VR Chaudhari in Bengaluru, and three more trainers were delivered to the air force thus far. To be sure, at the time of delivering the first trainer, HAL said all the remaining seven trainers would join IAF's fleet by March 2024. The first LCA orders were for 32 single-seater jets and eight trainers.

One of the 32 fighters crashed near Jaisalmer on March 12, minutes after taking part in a tri-services exercise that sought to demonstrate the strides India has made towards self-reliance in the defence manufacturing sector. That was the first LCA crash.

HAL plans to complete the delivery of the trainers at a time when the LCA Mk-1A (an advanced variant of the Mk-1 aircraft) programme appears to be delayed and IAF is concerned about the possible risks this could pose to its combat effectiveness. The issue has been flagged to HAL, which has been nudged to execute the ₹48,000-crore contract for 83 fighters on time, by 2028-29. The defence ministry could award HAL a contract for 97 more LCA Mk-1As worth ₹67,000 crore by the year-end to strengthen the air force's capabilities.

Many in the air force are sceptical about the LCA Mk-1A deadlines being met, and one of the main reasons for that is the lingering delay in the supply of the F404 engines to HAL by US firm GE Aerospace. But there is a sliver of hope for HAL. GE Aerospace has conveyed to HAL that it will start delivering two engines per month November 2024 onwards for the LCA Mk-1A project, as earlier reported by HT. The single-engine Mk-1A will be a replacement for the IAF's Mikoyan-Gurevich MiG-21 fighter.

https://www.hindustantimes.com/india-news/hal-to-deliver-last-four-lca-mk-1-trainers-to-iaf-in-6-months-101726668335194.html

THE TIMES OF INDIA

Wed, 18 Sep 2024

Who is Squadron leader Mohana Singh? The first woman fighter pilot joins 18 Flying Bullets, highlights 'Tarang Shakti' significance

Squadron Leader Mohana Singh has made history as the first woman fighter pilot to join the Indian Air Force's esteemed 18 Flying Bullets squadron, which operates the indigenously developed LCA Tejas fighter jets.

Her remarkable achievement was highlighted during the recent 'Tarang Shakti' exercise in Jodhpur, where she played a pivotal role by instructing the vice chiefs of the Indian Army and Navy during a flight in the LCA Tejas.

The exercise was a notable demonstration of support for the "Make in India" initiative and featured participation from top air forces worldwide, including the US, Greece, Sri Lanka, and Australia. The Indian Air Force now boasts around 20 women fighter pilots following the 2016 policy change allowing women into the fighter stream.

Who is Mohana Singh?

Mohana Singh is among the first female fighter pilots in India, part of the IAF's historic female fighter stream. She flew MiG-21s and later joined he prestigious "Flying Bullets" squadron at Gujarat's Naliya air base.

Hailing from a military family in Jhunjhunu, Rajasthan, Singh made history by becoming the first female pilot to fly a "Hawk" aircraft by day in 2019. She was honoured with the Naari Shakti Award in 2020, recognizing her achievements alongside fellow pioneers Avani Chaturvedi and Bhawna Kanth.

Mohana Singh family legacy

Mohana Singhinvolvement in aviation follows a distinguished family legacy. Her grandfather was a flight gunner with the Aviation Research Centre (ARC), a specialised wing of the Indian Air Force (IAF) responsible for reconnaissance and surveillance. Her father is a warrant officer in the IAF, continuing the family's connection to aviation and military service.

Mohana Singh achievements

In 2016, Mohana Singh, along with Bhawna Kanth and Avni Chaturvedi, made history by becoming the first women to be inducted into the Indian Air Force as fighter pilots. This was a groundbreaking moment in Indian aviation history, as it marked the official inclusion of women in the role of fighter pilots.

Prior to this, women had been serving as pilots for helicopters and transport aircraft since 1991, but the role of a fighter pilot was still predominantly male. In 2019, Mohana Singh made history as the

first woman in the Indian Air Force to fly a "Hawk" aircraft during daylight hours. She was one of three Flight Lieutenants honoured with the 2020 Naari Shakti Award.

The Indian Air Force shared a post on X, announcing that Air Chief Marshal RKS Bhadauria and Mrs. Asha Bhadauria met and congratulated Flt Lt Avani Chaturvedi, Flt Lt Bhawna Kanth, and Flt Lt Mohana Singh for receiving the award.

Role of Mohana Singh's in the IAF - From MiG-21 to LCA and the impact of women pioneers

As of now, Mohana Singh is stationed at the LCA (Light Combat Aircraft) squadron at the Naliya air base in Gujarat. The LCA is a significant part of the IAF's efforts to enhance its indigenous capabilities and reduce dependence on foreign aircraft.

Singh's role at this base involves flying the LCA, which is a testament to her advanced training and skill in handling high-performance aircraft.

Previously, she flew the MiG-21 aircraft, a venerable and iconic fighter jet known for its role in various military operations. Her transition from the MiG-21 to the LCA signifies her evolving role and the growing complexity of her responsibilities within the IAF.

Mohana Singh's fellow pioneers, Squadron Leaders Bhawna Kanth and Avni Chaturvedi, have also made significant contributions. Kanth and Chaturvedi are now flying the Su-30 MKI fighter jets. The Su-30 MKI is a multirole fighter aircraft developed by Sukhoi and built under licence in India. It is known for its advanced avionics, manoeuvrability, and strike capabilities, making it a crucial asset in the IAF's fleet.

The presence of these three women in prominent roles within the IAF represents a major shift towards gender inclusivity in the Indian military.

Their achievements reflect a broader change in societal attitudes towards women in combat roles and showcase the progress of women in traditionally maledominated fields.

Significance of 'Tarang Shakti' exercise

The recent 'Tarang Shakti' exercise, which featured a historic flight by three vice chiefs of the armed forces, underscored the significance of India's "Make in India" initiative.

While Air Force Vice Chief Air Marshal Amar Preet Singh flew solo in the LCA Tejas, the other two vice chiefs— Lt Gen NS Raja Subramani and Vice Admiral Krishna Swaminathan— flew the trainer variants with two fighter pilots.

https://timesofindia.indiatimes.com/etimes/trending/who-is-squadron-leader-mohana-singh-the-first-woman-fighter-pilot-joins-18-flying-bullets-highlights-tarang-shakti-significance/articleshow/113466316.cms

FINANCIAL EXPRESS
Read to Lead

Wed, 18 Sep 2024

India Defence Conclave 2024: Service Chiefs to shape India's strategic vision

India's top military leaders are set to take center stage at the India Defence Conclave 2024 in New Delhi tomorrow on (September 19). The ninth edition of this event will serve as a pivotal platform for General Anil Chauhan, Chief of Defence Staff, and General Upendra Dwivedi, Chief of the Army Staff, to articulate India's defence strategy amidst growing global uncertainties.

They, alongside other key officials, will address critical aspects of national security, including India's position as a stabilising force in the Indo-Pacific, its push for self-reliance in defence, and the strengthening of strategic international partnerships.

Their insights will underscore the increasing importance of a cohesive military strategy in safeguarding India's interests, particularly as the country strives to enhance its capabilities through the Atmanirbhar Bharat initiative, bolster its ammunition supply chains, and advance its defence exports.

The conclave, organized by the defence news platform Bharatshakti, is expected to shape India's defence landscape for years to come, with service chiefs playing a central role in guiding the nation's approach to both regional and global security challenges.

India as a Stabilising Force in Global Security

A key theme of the conclave will be India's role as a stabilising force in global security, with special attention to the Indo-Pacific region. General Chauhan and General Dwivedi will delve into how India's military capabilities, combined with its diplomatic efforts, are vital for maintaining balance in this increasingly contested region. With rising geopolitical tensions, the service chiefs' perspectives on evolving security threats will be crucial in shaping how India navigates this complex landscape.

The session titled "India and the World" will explore the country's military and strategic role in addressing security challenges not only in the Indo-Pacific but also in broader global contexts. This discussion will place India's growing influence and its strategic vision at the forefront of global defence discourse.

Forging Strategic Defence Partnerships

The conclave will also focus on India's efforts to build strong partnerships with international defence companies. General Dwivedi is expected to highlight the significance of collaborations with foreign Original Equipment Manufacturers (OEMs) as essential to achieving India's defence goals.

The session "Forging Winning Partnerships" will examine how these alliances can enhance India's technological capabilities, contribute to global security, and reduce dependency on imports.

These strategic partnerships are seen as a cornerstone of India's broader efforts to modernize its military while maintaining a self-reliant defence industry. By leveraging global expertise, India aims to both meet its internal defence needs and position itself as a key player in international defence collaborations.

General Chauhan will discuss the military's role in supporting the Ministry of Defence's vision for self-reliance. The session titled "Future Roadmap in Atmanirbharta in Defence" will highlight the steps India is taking to enhance its indigenous manufacturing capabilities and reduce its dependence on foreign arms.

And the focus will be on exploring the integration of local industries and startups into the defence ecosystem, promoting innovation and developing advanced technologies domestically. The presence of industry leaders such as Dr Vivek Lall, Chief Executive of General Atomics, and Kiran Dambala, Director at Lockheed Martin, will further provide insights into how India's defence manufacturing can align with global standards while maintaining its self-reliance goals.

Strengthening Ammunition Supply Chains

In the session titled "Ammunition and Armament Roadmap," General Dwivedi will provide an overview of how the Indian military is tackling current gaps in its supply lines and the steps being taken to ensure long-term sustainability.

With India's growing defence needs, particularly in light of regional tensions, securing a reliable supply of ammunition is essential for operational readiness.

Defence Exports and Strategic Impact

India's rising defence exports will be another highlight, as the country seeks to enhance its global footprint in the arms trade. The conclave will explore the driving factors behind this growth and identify areas where further expansion is possible. General Chauhan will provide insights into how India's growing export capabilities can not only boost the domestic economy but also contribute to international security frameworks.

Navigating Indo-Pacific Security Challenges

The closing sessions, including "Indo-Pacific Futures," will address the evolving security dynamics in the Indo-Pacific. As major powers jostle for influence in this strategic region, India's role in ensuring stability and forming effective alliances will be critically examined.

The presence of Admiral Dinesh Tripathi, Chief of the Naval Staff, who will deliver the keynote address, will bring a naval perspective on the Indo-Pacific's maritime security challenges.

https://www.financialexpress.com/business/defence-india-defence-conclave-2024service-chiefs-to-shape-indias-strategic-vision-3614369/

FINANCIAL EXPRESS
Read to Lead

Wed, 18 Sep 2024

India-Australia Space Cooperation Strengthens Ahead of QUAD Leaders' Summit

As India and Australia deepen their strategic ties, space cooperation between the two nations has emerged as a significant focus, especially with the upcoming QUAD Leaders' Summit in the United States, where leaders from both countries will meet alongside their counterparts from the US and Japan.

Space collaboration is becoming an essential element of their broader partnership, given both nations' ambitions to expand their space capabilities and commercial activities. "Australia, with its rapidly growing space industry, is positioning itself as a key player in the global space economy, and India, through its Indian Space Research Organisation (ISRO), continues to solidify its role as a leader in space technology and exploration," says Dr Srimathy Kesan, Founder, and CEO of SpaceKidz India.

Australia's Rising Space Industry

Australia's space industry is in a period of rapid transformation, marked by significant government investment and a burgeoning startup ecosystem. The Australian government has identified space as a priority sector, with a vision to grow the industry to $12 billion by 2030 and create approximately 20,000 new jobs.

According to Dr Srimathy Kesan, "This ambitious target is supported by initiatives like the Moon to Mars program, which connects Australian businesses with NASA's Artemis program, contributing to the global space supply chain."

The Australian Space Agency (ASA), established in 2018, is at the forefront of this transformation, focusing on key areas such as satellite technologies, earth observation, and space situational awareness. Notably, Australia's geographic position in the southern hemisphere provides a unique advantage for launching satellites into polar and sun-synchronous orbits, with new launch facilities such as the Whalers Way Orbital Launch Complex in South Australia enhancing the country's launch capabilities.

Strengthening India-Australia Space Collaboration

India and Australia have enjoyed a long-standing partnership in space exploration, and their collaboration has been further reinforced in recent years. "In 2021, ISRO and the Australian Space Agency signed an Amendment to the 2012 India-Australia Inter-Governmental MoU on space cooperation. This amendment formalized their joint efforts in earth observation, satellite navigation, and space situational awareness, while also extending cooperation to support India's `Gaganyaan' human spaceflight program."

In a significant milestone, Australia recently signed an $18 million MoU with ISRO's commercial arm, `NewSpace India Limited (NSIL)', to launch an Australian satellite payload on India's Small Satellite Launch Vehicle (SSLV) by 2026.

This mission, named `Space MAITRI', marks Australia's largest satellite launch from Indian soil, and is part of a broader initiative to enhance bilateral space research and technology collaboration. The partnership not only boosts commercial space activities but also reflects the strategic importance both nations place on space cooperation.

Shared Vision Through the QUAD

As members of the QUAD, India and Australia, alongside the US and Japan, have increasingly aligned their space strategies to support regional stability and technological advancement. The upcoming QUAD Leaders' Summit in the United States offers a critical platform for the two nations to advance their space cooperation agenda further, as the QUAD's focus expands to encompass technological and security collaboration in the Indo-Pacific region.

Space situational awareness, satellite navigation, and the use of space for defense and security purposes are expected to feature prominently in discussions. Both nations recognize the strategic role that space plays in ensuring security in the Indo-Pacific, particularly as major powers like China continue to expand their space ambitions.

The Path Ahead

The India-Australia space partnership is set to grow as both nations continue to invest in space technology and innovation. Australia's strategy of attracting international collaborations, combined with India's advanced space capabilities, makes this partnership a vital component of their broader defense and technological cooperation.

Additionally, their shared participation in QUAD provides a framework for fostering multilateral space collaboration, further enhancing their influence in global space governance. As the leaders of India and Australia prepare to meet at the upcoming QUAD Summit, their joint efforts in space will remain a key area of discussion, offering a glimpse into the future of Indo-Pacific security and technological development.

https://www.financialexpress.com/business/defence-india-australia-space-cooperation-strengthens-ahead-of-quad-leaders-summit-3614155/

Business Standard

Wed, 18 Sep 2024

China builds new heliport near LAC, raising security concerns for India

In a strategic development with potential military implications, China is building a new heliport 20 kilometers east of the Line of Actual Control (LAC) in the highly sensitive 'Fishtails' region of

Arunachal Pradesh. The construction is expected to strengthen China’s capacity to swiftly deploy military assets to the remote and underdeveloped Indo-Chinese frontier, heightening security concerns for India in the region, NDTV reported.

The heliport, located on the banks of the Gongrigabu Qu river in the Nyingchi Prefecture of the Tibet Autonomous Region, is within undisputed Chinese territory.

Satellite imagery from EOS Data Analytics confirms that no construction was visible at the site as of December 1, 2023. However, by December 31, land clearance activities had begun, and by September 16, 2024, high-resolution images from Maxar showed that the heliport is nearing completion.

Experts, including geospatial intelligence analyst Damien Symon, emphasise that the heliport could enhance the People’s Liberation Army’s (PLA) intelligence-gathering and surveillance capabilities in the rugged, densely forested region. Although this terrain has historically posed logistical challenges for military operations, the new facility is anticipated to significantly boost troop mobility and patrol efficiency in these remote areas.

Strategic military enhancement

Military sources monitoring the construction suggest that the heliport will serve both military and civilian purposes, facilitating swift troop deployment and enhancing China’s defensive and offensive capabilities along the LAC. “This heliport strengthens their reaction capabilities and enables a rapid build-up of troops during any contingency,” the sources said.

The Fishtails area, comprising Fishtail 1 in the Dibang Valley and Fishtail 2 in the Anjaw district of Arunachal Pradesh, is considered particularly sensitive due to differing perceptions of the LAC between India and China.

Significant threat assessment

Retired Lt General Pravin Bakshi, former commander of the Indian Army’s Eastern Command, voiced concern about the heliport, describing it as a “threat” to India’s interests in the region.

He also urged a robust response in coordination with the Indian Air Force to counter potential Chinese grey-zone warfare — a conflict that falls short of conventional war but aims to alter boundary dynamics through coercive measures.

The heliport’s infrastructure includes a 600-metre runway designed for rolling helicopter take-offs, a critical feature for high-altitude operations. Although the heliport is at a relatively lower altitude than much of the Tibetan plateau, which improves helicopter payload capacity, it still represents a significant strategic asset for China in this region.

Growing military threat along LAC

In addition to the runway, the facility includes hangars, a large apron area for helicopters, and air traffic control infrastructure. The heliport’s construction aligns with China's broader efforts to fortify its frontier with India, including the establishment of ‘Xiaokang’ villages — dual-use settlements that serve both civilian and military purposes. Such developments have raised concerns

about China's long-term strategy of incrementally extending its territorial control, a tactic often referred to as 'salami slicing'.

Brahma Chellaney, a prominent strategic affairs expert, notes that China's growing military infrastructure along the LAC presents a challenge for India. "The ongoing efforts to defuse the military standoff raise questions about what can be achieved in light of the new military realities China has created since 2020," Chellaney said.

Countering infrastructure gaps

India, for its part, has responded to China's aggressive border strategy by launching the Rs 4,800 crore 'Vibrant Villages' project, which aims to develop 3,000 villages across four Northeastern states, including Arunachal Pradesh. The initiative seeks to improve infrastructure and connectivity in these border regions. Additionally, a 2,400-kilometre trans-Arunachal highway is under construction, drastically reducing travel times and improving access to Army posts in Eastern Arunachal Pradesh.

However, despite these efforts, Lt General Bakshi warns that the easternmost parts of Arunachal Pradesh remain underdeveloped, particularly in comparison to China's rapid infrastructure build-up. "The construction of this heliport opens up a new vista of challenges," he said, highlighting the need for India to stay vigilant and prepared.

https://www.business-standard.com/external-affairs-defence-security/news/china-builds-new-heliport-near-lac-raising-security-concerns-for-india-124091800619_1.html

THE WEEK

Wed, 18 Sep 2024

Drone maker Garuda Aerospace eyes defence dominance; aims to make India drone superpower by 2030

DGCA-certified drone company Garuda Aerospace aims to make India a drone hub by 2030, said its CEO Agnishwar Jayaprakash, who recently met Defence Minister Rajnath Singh and discussed in detail the company's role in developing defence drones.

Garuda Aerospace, which was established in 2015 and offers as many as 30 different drone models, claims that it is building advanced drone solutions for the armed forces in collaboration with global giants in the defense and aerospace sectors. The company aims to become a market leader in the defence sector.

During his meeting with the defence minister, Jayaprakash spoke about the new defence drone facility the company set up in Chennai for design, design, and testing. The company plans to develop drones that have ISR (intelligence, surveillance, and reconnaissance) capabilities, underwater drones, and swarm drones.

> Agnishwer Jayaprakash, Founder and CEO of Garuda Aerospace met Defence Minister Rajnath Singh to discuss on the upcoming Defence Drone Facility in Chennai, which will span 30,000 square feet and feature state-of-the-art design, manufacturing, and testing facilities. pic.twitter.com/IRYG2hBMa0
>
> — Garuda Aerospace (@garuda_ops_sale) September 18, 2024

Jayaprakash shared with Singh his vision of making India a drone hub by 2030 and added that the latter greatly appreciated Garuda Aerospace's 'make in India' initiatives.

> In a leap for India’s defence technology, Agnishwar Jayprakash, CEO of Garuda Aerospace, held discussions with Defence Minister Rajnath Singh on the future of drone technology in the defence sector #AgnishwarJayprakash #GarudaAerospace #DefenceDrones #RajnathSingh #IndiaDefence pic.twitter.com/iLpq2AMiXR
>
> — Garuda Aerospace (@garuda_ops_sale) September 18, 2024

"The interaction emphasised the crucial role of defence drone technology and Prime Minister Narendra Modi's vision for the world. Garuda Aerospace will be at the forefront of enabling the prime minister and defene minister's vision for its armed forces," news agency ANI quoted Jayaprakash as saying.

https://www.theweek.in/news/defence/2024/09/18/drone-maker-garuda-aerospace-eyes-defence-dominance-aims-to-make-india-drone-superpower-by-2030.html

The EurAsian Times

Wed, 18 Sep 2024

Flustered With Indian Nuclear Submarines & BrahMos Missiles, Pakistan Weaves Elaborate Spy Web To Glean Info

India has been bolstering its nuclear posture by inducting a nuclear-powered attack submarine in its fleet. By 2025, the Indian Navy will have three atomic submarines with a strike range covering the entire Pakistan and a significant portion of China.

Since the submarine-launched ballistic missile first appeared, it has been considered the most survivable delivery system, as ocean depths remain opaque. A nuclear-powered attack submarine or SSBN guarantees survivability of nuclear retaliatory capability. With its long coastlines and peninsula, the SSBNs can remain hidden in ocean depths during the conflict to ensure the survival of second-strike capability. The importance of India operationalizing its nuclear triad has got Pakistan interested, which in 2021 laid down a pan-India espionage project to snoop into the capabilities of one of the deadliest platforms of the Indian Navy.

The espionage ring is so extensive that the National Investigation Agency, India’s specialized counter-terrorism law enforcement agency, is still unraveling the network nodes even in 2024. On

August 29, raids were conducted at 16 locations in seven states in relation to the spy case conducted by operatives with connections to Pakistan's intelligence agency, ISI.

The raids took place in Gujarat, Karnataka, Kerala, Telangana, Uttar Pradesh, Bihar, and Haryana in premises linked to the accused suspected to have received funding from the ISI and its operatives in exchange for sensitive and confidential defense information related to the Indian Navy. The NIA is empowered to investigate terror-related crimes across states without special permission from the states under a written proclamation from the Ministry of Home Affairs. The espionage network was unearthed after the Counter Intelligence Cell of the Andhra Pradesh Police registered a case against one Deepak from Haryana on January 12, 2021.

He was accused of transferring money to individuals in the port city of Visakhapatnam in exchange for confidential information. So far, three suspects have been arrested in the case, three chargesheets have been filed against them, and two alleged ISI-linked operatives who collected classified information about the Indian Navy.

Visakhapatnam is on India's eastern seaboard. Besides being an important naval base, the three nuclear-powered attack submarines INS Arihant, INS Arighaat, and INS Aridaman (under construction) have been built at the Indian Navy's Ship Building Centre (SBC). The project has been shrouded in secrecy, with only one official photograph of INS Arihant being released. Most of the information about the submarines has been gleaned from satellite photos. During the raids the NIA took two contract workers at Cochin Shipyard Limited (CSL) in custody. CSL is where India's indigenous aircraft carrier was constructed.

"A total of 22 mobile phones and a host of sensitive documents were seized during the searches conducted by NIA, which had, in July 2023, taken over the instant case, originally registered in January 2021 by the Counter Intelligence Cell, Andhra Pradesh. The case involved leakage of sensitive vital information about the Indian Navy as part of an anti-India conspiracy hatched from across the border," the NIA stated.

NIA filed a chargesheet against two accused, including an absconding Pakistani national, Meer Balaj Khan, on July 19, 2023. Investigations revealed that Meer Balaj Khan, along with an arrested accused, Akash Solanki, had been involved in the espionage racket. On November 6, 2023, the NIA filed a supplementary chargesheet against two other accused persons, identified as Manmohan Surendra Panda and Alven. While Panda has been arrested, Alven, a Pakistani Intelligence Operative, is absconding. In May 2024, NIA filed its second supplementary chargesheet against one accused, Amaan Salim Shaikh, for conspiring with Pakistan Intelligence Operatives.

Pakistan Keen To Decode BrahMos

The BrahMos is one of the world's few cruise missiles capable of flying at high supersonic speeds. The speed makes it incredibly difficult to engage or avoid the BrahMos missile. Pakistan has doubled its intelligence efforts to unravel the missile. In 2023, a Pakistani spy posed as Zara Dasgupta, ' honey-trapped' senior Indian scientist Pradeep Kurulkar, and spoke extensively about BrahMos—'the dangerous one.'

Kurulkar, the 59-year-old head of DRDO's Research and Development Establishment (Engineers) or R&D (E) laboratory, was arrested on May 3, 2023, by the Maharashtra ATS under sections of the

Official Secrets Act (OSA) related to spying and wrongful communication with the female Pakistan Intelligence Operative (PIO). From October 19 to October 28, 2022, the two individuals discussed BrahMos. In one exchange, Zara asked, “Brahmos was also your invention, babe… the dangerous one.”

“I have an initial design report of some 186 A4 size pages on all BrahMos versions,” Kurulkar replied. Later, Kurulkar allegedly told her, “I cannot send a copy of that report to WA or mail. It is highly classified… I will trace and keep it ready when you are here. Will try and show you here,” Kulkarni added.

As stated in the chargesheet, BrahMos, Kurulkar, and Zara had WhatsApp chats on “Agni 6, Rustom (a medium-altitude long-endurance unmanned air vehicle), Surface-to-Air Missiles (SAM), Unmanned Combat Air Vehicles (UCAV), Drone projects” of DRDO. It also includes chats on “Quadcopter, DRDO duty chart, Meteor missile, Rafael, Akash, and Astra missile.” It refers to a private Indian defense company executive, a DRDO vendor, making “robotic equipment” for Indian forces.

A 27-year-old BrahMos Aerospace Engineer, Nishant Agarwal, was arrested under a joint operation by Uttar Pradesh and Maharashtra for giving technical information to a Pakistan operative. He was in touch with suspected Pakistan intelligence operatives, operating under false names “Neha Sharma” and “Pooja Ranjan.”

The police later said that despite the highly sensitive nature of his job, he made himself an easy target on the internet. In 2020, a probe launched into an espionage case in the Indian Navy opened a pandora’s box. Thirteen Indian navy personnel were arrested from different naval bases and were accused of leaking sensitive information to Pakistani spies. The intelligence operatives had befriended them through social media profiles.

https://www.eurasiantimes.com/flustered-with-indian-nuke-submarines/

Wed, 18 Sep 2024

China’s “70% Grip” On Rare Earth Material Threatens Disruption Of Military Supplies, Undercuts Projects From U.S. To Japan

The US and its allies are grappling with significant challenges in their efforts to reduce dependency on China’s rare earths monopoly. Despite substantial investments and ambitious projects, China’s strong grip on this critical market remains a formidable obstacle. China currently controls approximately 70% of global rare earth output and more than 90% of refining capacity, giving it a substantial foothold in the market.

National security concerns and the need for technology are driving efforts to overcome Chinese dominance. Rare earth elements, despite their name, are not rare but are often found in insufficient concentrations to justify environmentally hazardous extraction processes. These minerals are essential for advanced technologies, including electronics and military equipment. As a result, the US and its allies are investing heavily in projects aimed at reducing this dependency, but the path to success is fraught with difficulties, reported Bloomberg.

One notable effort is the development of a new rare earth processing facility near Houston, Texas, led by Australia-based Lynas Rare Earths. This plant, supported by over $300 million in Pentagon contracts, aims to process rare earth and, once operational, could potentially account for up to 25% of the world's supply of rare earth element oxides.

However, the project faces delays and financial uncertainties exacerbated by a slump in rare earth prices since 2022. James Litinsky, CEO of MP Materials, which operates the only rare earth mine in the US, has expressed skepticism about the viability of these new projects.

"These market conditions have now destroyed most of the hoped-for projects from just a couple of years back," Litinsky noted. He highlighted the persistent challenge posed by China's near-total control over the supply chain. The market dynamics are not favorable for new ventures. Since 2022, a significant drop in rare earth prices has raised doubts about the financial feasibility of many planned projects.

This downturn has led to setbacks and delays, undermining efforts to build a competitive alternative to China's entrenched position. In Australia, similar efforts are encountering hurdles. Arafura Rare Earths, for instance, has secured an AUS $840 million ($560 million) government loan but has yet to commence construction on its Nolans project.

CEO Darryl Cuzzubbo noted the struggle to secure the necessary equity, which is crucial for moving forward. The company aims to raise half of this equity from cornerstone investors and the remainder from broader market sources. Iluka Resources, another key player in Australia's rare earths sector, has encountered hurdles. The firm's AU$1.25 billion loan for developing an integrated rare earth refinery has been overshadowed by escalating costs, with estimates rising to AU$1.8 billion.

CEO Tom O'Leary has accused China of manipulating prices to control the industry, reflecting broader concerns about China's monopolistic influence. Japan's experience highlights the challenges of reducing reliance on Chinese rare earths. Over a decade ago, Japan invested $250 million in Lynas to mitigate its reliance on Chinese rare earths after Beijing briefly cut off supplies.

The process was slow and costly, with Lynas only turning a profit in 2018 despite substantial Japanese support. Lynas CEO Amanda Lacaze underscores the importance of patience and long-term investment in building a resilient supply chain. "Patient capital in mining and also in an area where you're doing something for the first time is really important," Lacaze said. She noted that while progress has been made, the global effort to develop an independent rare earths industry remains a long-term challenge, requiring sustained commitment and strategic investment.

China's Dominant Position in Rare Earth Elements

China currently holds a dominant position in the global production of rare earth elements (REE). China controls rare earth alloys and magnets, which are essential for various advanced technologies, including missiles, firearms, radars, and stealth aircraft. In 2019, China threatened to include certain rare earth-containing products in its technology-export restrictions as a countermeasure to the Trump administration's pressure on Huawei.

Fearing that Beijing might actively and frequently deny access to these critical materials, the US and its allies started working to cultivate alternative sources and develop refining techniques that align with more environmentally sensitive standards. However, Beijing has started implementing various measures to control the supply of rare earths. In July, China introduced new regulations aimed at improving traceability within its rare earth sector to prevent sanctioned American firms from accessing these valuable resources.

The State Council announced new rules, effective October 1. which prohibit any organization or individual from misappropriating or destroying rare earth deposits, as these resources are deemed state property. These regulations are intended to enhance supply-side reform, ensure the stability of the strategic resource industry, and bolster China's bargaining position in international high-tech competition.

In February 2022, the Chinese Ministry of Commerce banned Lockheed Martin and Raytheon Technologies from purchasing Chinese rare earths after accusing them of selling arms to Taiwan. China has also accused some foreign institutions of using legal fronts to covertly recruit numerous Chinese technical experts via third countries. This, according to China, facilitates the transfer of rare-earth mining, separation, and other export control technologies and industrial processes. The country claims that the problem of core technology leakage in these areas remains severe.

Moreover, China is preparing to bolster its rare earth element reserves by approximately 5 million tonnes amid growing international competition, particularly with the United States. This move follows the discovery of a significant deposit in the southwestern Sichuan province. At a symposium organized by China Rare Earth Group last week, experts revealed that 4.96 million tonnes of rare earths were found in the Liangshan Yi autonomous prefecture, one of China's most impoverished regions.

https://www.eurasiantimes.com/chinas-grip-on-rare-earths-challenges-global-efforts/

Press Information Bureau
Government of India

Ministry of Science & Technology

Wed, 18 Sep 2024

New paper-based device can simplify sensing of the contaminants

Scientists have developed a novel and cost-effective technique for fabricating paper-based devices using an Advanced PAP (A-PAP) pen, which offers a practical alternative to conventional sensing methods that necessitate specialized equipment and expertise making it suitable for resource-limited settings.

In recent years, paper-based devices have gained more consideration as promising platforms for point-of-care diagnostics owing to the factors such as simplicity, cost-effectiveness, disposability, and mobility. There are various methods for fabricating paper-based devices such as inkjet printing, wax printing, laser treatment and correction pens. However, these fabrication processes typically entail the use of complex instruments, machinery or may require heating/drying steps which limits their accessibility in resource-limited settings.

Research group led by Dr. Bhanu Prakash at Institute of Nano Science and Technology (INST), Mohali, an institute of Department of Science and Technology, explored a new fabrication technique using a PAP pen that does not require any machinery or heating/drying steps and adopts a DIY approach.

Using the A-PAP pen, they have fabricated two-dimensional (2D) paper-based devices for chemical detection of heavy metal and nitrite. They have also demonstrated the versatility of fabrication technique for biological sensing using 2D lateral flow paper-based devices for the detection of dopamine. Furthermore, the technique is also validated for fabricating complex three-dimensional (3D) paper-based devices using a paper origami technique for heavy metals sensing. The ready-to-use devices can be fabricated in seconds, making them convenient for on-the-spot testing. Overall, this technique provides a valuable tool for creating affordable, efficient, and accessible chemical and biological testing solutions.

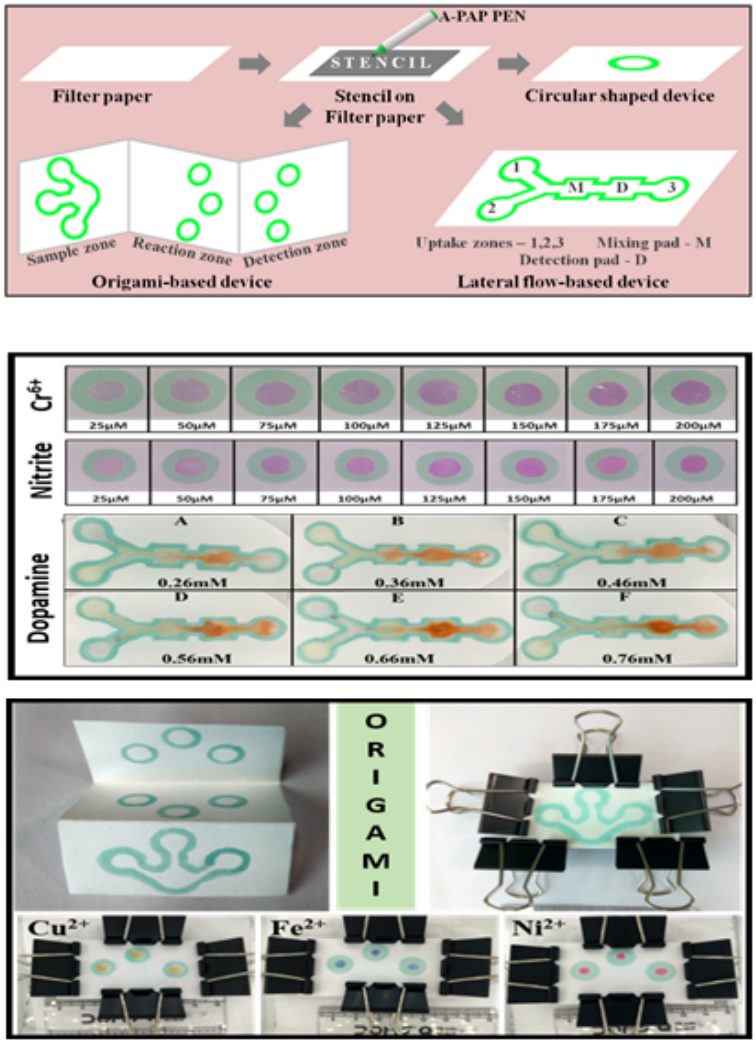
The device does not require any sophisticated instrumentation or a heating step, making it a promising technology for resource-limited settings.

The paper-based devices fabricated are distinguished by rapid, simple, and cost-effective fabrication and the DIY approach offers a low-cost solution particularly beneficial for developing countries and remote areas.

The fabrication using A-PAP pen is advantageous when compared to other techniques because of the omission of the heating/drying step thereby enabling the rapid fabrication in around 10 seconds with superior contact angle suitable for testing and sensing applications. Its versatility extends to fabricating simple and complex devices like lateral-flow-based and 3D origami devices. The fabricated paper-based devices represent a cost-effective and user-friendly technique for identifying and quantifying contaminants in diverse matrices such as water and food.

The method offers a promising solution for affordable and accessible sensing applications, particularly in resource-limited settings where sophisticated laboratory equipment is scarce.

Publication Link: https://doi.org/10.1016/j.talo.2024.100325



https://pib.gov.in/PressReleasePage.aspx?PRID=2055953

Press Information Bureau
Government of India

Ministry of Science & Technology

Wed, 18 Sep 2024

Cabinet approves ‘Bio-RIDE’ scheme to support cutting edge research and development in Biotechnology

The Union Cabinet, chaired by the Prime Minister Shri Narendra Modi, today approved continuation of the two umbrella schemes of Department of Biotechnology (DBT), merged as one scheme-‘Biotechnology Research Innovation and Entrepreneurship Development (Bio- RIDE)’ with a new component namely Biomanufacturing and Biofoundry.

The scheme has three broad components:

a) Biotechnology Research and Development (R&D);

b) Industrial & Entrepreneurship Development (I&ED)

c) Biomanufacturing and Biofoundry

The proposed outlay for the implementation of the unified scheme ‘Bio-RIDE’ is Rs.9197 crore during the 15th finance Commission period from 2021-22 to 2025-26.

Bio-RIDE scheme is designed to foster innovation, promote bio-entrepreneurship, and strengthen India’s position as a global leader in biomanufacturing and biotechnology. It aims to accelerate research, enhance product development, and bridge the gap between academic research and industrial applications. The scheme is part of the Government of India’s mission to harness the potential of bio-innovation to tackle national and global challenges such as healthcare, agriculture, environmental sustainability, and clean energy. Implementation of Bio-RIDE Scheme will -

- Promote Bio-Entrepreneurship: Bio-RIDE will nurture a thriving ecosystem for startups by providing seed funding, incubation support, and mentorship to bio-entrepreneurs.
- Advance Innovation: The scheme will offer grants and incentives for cutting-edge research and development in areas like synthetic biology, biopharmaceuticals, bioenergy, and bioplastics.
- Facilitate Industry-Academia Collaboration: Bio-RIDE will create synergies between academic institutions, research organizations, and industry to accelerate the commercialization of bio-based products and technologies.
- Encourage Sustainable Biomanufacturing: A significant focus will be placed on promoting environmentally sustainable practices in biomanufacturing, aligned with India’s green goals.
- Support researchers through Extramural funding: Bio-RIDE will play critical role in advancing scientific research, innovation, and technological development across diverse

fields of biotechnology by supporting extramural funding to research institutions, universities, and individual researchers in areas such as agriculture, healthcare, bioenergy, and environmental sustainability.

- Nurturing Human Resource in Biotechnology sector: Bio-RIDE will provide holistic development and support to students, young researchers and scientists working in the multidisciplinary areas of Biotechnology. The integrated programme of Human Resource Development will contribute towards the capacity building and skilling of the manpower and make them competent to leverage the newer horizon of technological advancements.

Further, to enable Circular-Bioeconomy in the country a component on Biomanufacturing and Biofoundry is being initiated in alignment with 'Lifestyle for the Environment (LiFE)' launched by the Hon'ble PM to propel mitigation of global climate change by incorporating green and friendly environmental solutions in every aspect of life.

This new component of Bio-RIDE aspires to nurture the immense potential of 'Biomanufacturing' to facilitate development of indigenous innovative solutions to improve healthcare outcomes, enhance agriculture productivity, foster growth of the bioeconomy, scale-up and commercialization of bio-based products, expanding India's cohort of highly skilled workforce, and intensifying entrepreneurial momentum.

The DBT's ongoing efforts align with its vision of harnessing the potential of Biotechnology as a precision tool for national development and well-being of society to fulfill its mission to make India globally competitive in Biotechnology research, innovation, translation, entrepreneurship, and industrial growth and be a US$300 billion Bioeconomy by 2030. The Bio-RIDE Scheme will contribute significantly towards realizing the vision of 'Viksit Bharat 2047'.

Background:

Department of Biotechnology (DBT), Ministry of Science and Technology, promotes excellence and innovation-driven discovery research and entrepreneurship in biotechnology and modern biology.

https://pib.gov.in/PressReleasePage.aspx?PRID=2056004

Hindustan Times

Thu, 19 Sep 2024

Cabinet approves funds for four space missions, including Chandrayaan-4, Venus orbiter mission

The Union Cabinet on Wednesday green-lit four important space endeavours for launches by the Indian Space Research Organisation (Isro) in the near future – the first of which is the fourth iteration of India's lunar mission Chandrayaan-4; the second, the development of Venus Orbiter Mission (VOM); the third, the building of first unit of India's indigenous space station, dubbed

Bharatiya Anatriksh Station (BAS), by extending the scope of Gaganyaan programme; and finally, the development of Next Generation Launch Vehicle (NGLV).

In total, the Cabinet cleared funds of more than ₹22,750 crore for the developmental costs of these four programmes.

India's fourth mission to the Moon, for which a budget of ₹2,104.06 crore was cleared, will build on the success of Chandrayaan-3 , with which India became the first country to land a probe on the lunar south pole, and till date remains the standout mission among all of Isro's achievements on the global stage.

Chandrayaan-4 will be a remote mission seeking to retrieve samples of the lunar surface. The mission, which will aim to bring rock samples from the lunar surface back to Earth after a soft landing, is slated for launch in 2027 and will expand on the technology developed in Chandrayaan-3 by adding elements like lunar docking, precision landing, sample collection and a safe journey back to Earth.

"It would make everyone proud that Chandrayaan-4 has been cleared by the Cabinet! This would have multiple benefits, including making India even more self-reliant in space technologies, boosting innovation and supporting academia," Prime Minister Narendra Modi wrote on X.

"This mission will achieve the foundational technologies capabilities eventually for an Indian landing on the Moon (planned by year 2040) and return safely back to Earth," according to a government statement, which added that the mission is expected to be completed in 36 months of approval.

The approved cost for the mission includes spacecraft development and realisation, two launches of Launch Vehicle Mark-3 (LVM-3), external deep space network support, and conducting special tests for design validation, finally the mission of landing on Moon and safe return to Earth along with the collected lunar sample.

The second major approval of ₹1,236 crore was for VOM – India's first scientific mission to Venus, which aims to enable scientists to better understand the Venusian atmosphere, and geology and generate data that gives information into the planet's thick atmosphere.

The mission, which has set a target of March 2028, involves sending an orbital spacecraft to study the planet closest to Earth. Venus is believed to have formed in conditions similar to Earth, but the planet deviated due to a runaway greenhouse effect, making it uninhabitable for life. It offers a "unique opportunity to understand how planetary environments can evolve very differently", the statement said.

The third approval was for the Gaganyaan follow-on missions and the building of Bharatiya Antariksh Station, or BAS.

Perhaps India's most ambitious space project, BAS, aims to establish an Indian space station that will orbit 400km above the Earth's surface. The 52-tonne behemoth will serve as a research platform for Indian astronauts and scientists to conduct experiments in microgravity, astronomy, and Earth observation, and will allow astronauts to stay in orbit for 15-20 days. Wednesday's

approval was for the first module of the project (dubbed BAS-1), which targets a launch in 2028. The target to complete the entire project is for 2035, according to Isro.

The project, which saw a net additional funding of ₹11,170 crore, expands the coverage of the Gaganyaan mission (slated to kick off next year).

“Revision in Gaganyaan programme to include the scope of development and precursor missions for BAS, and factoring one additional uncrewed mission and additional hardware requirement for the developments of ongoing Gaganyaan programme. Now the human spaceflight programme… is through eight missions to be completed by December 2028 by launching the first unit of BAS-1,” the statement said.

Also approved by the Union Cabinet was the development of the NGLV , a new launch vehicle that is capable of high payload, and will be cost-effective, reusable, and has the potential to be commercially viable.

According to the government, NGLV will have three times the present payload capability with 1.5 times the cost compared to LVM-3. It will also have reusability resulting in low-cost access to space and modular green propulsion systems. In total, ₹8,240 crore was approved for NGLV, which includes development costs, three developmental flights, essential facility establishment, programme management and launch campaign, the statement said.

https://www.hindustantimes.com/india-news/cabinet-approves-funds-for-four-space-missions-including-chandrayaan-4-venus-orbiter-mission-101726686658363.html

Press Information Bureau
Government of India

Ministry of Science & Technology

Wed, 18 Sep 2024

CSIR, APCTT-UN ESCAP and WAITRO jointly organized Conclave on Policy Deliberations for Strengthening South-South Cooperation

CSIR in partnership with APCTT-UN ESCAP (Asian and Pacific Centre for Transfer of Technology), and WAITRO (World Association of Industrial & Technological Research) organized a Conclave on Policy Deliberations for Strengthening South-South Cooperation on 11th September 2024 in online mode. The programme was designed and coordinated by CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR) with CSIR-International International S&T Affairs Directorate (CSIR-ISTAD) and hosted by NIScPR.

The Conclave brought together several global institutions and eminent scholars from South countries. Head/Senior experts of major global institutions focusing on South countries: APCTT, WAITRO, ISTIC-UNESCO International Science– Framework for Ethical and Responsible

Governance, West Asia North Africa Institute Jorden, UN Technology Bank for Least Developed Countries gave presentation in this conclave.

Experts from various research institutions included National Research and Innovation Agency Indonesia, CSIR-NIScPR, CSIR-ISTAD, CSIR-IMD (Innovation Management Directorate), Wits Business School South Africa, National Research and Innovation Agency Indonesia, Computer Science Department-Delhi University, Indian Institute of Technology-Delhi, University of Nebraska –Lincoln USA, Institute for Studies in Industrial Development, Indian Institute of Science, Department of Science and Technology, Tshwanae Univ of Technology South Africa.

Conclave deliberated on how South countries through cooperative partnership can create Responsible governance for science and innovation for achieving Sustainable Development Goals, especially Goal 5 (Gender equality and empower all women and girls) and 17 (Partnerships for Sustainable Development Goals). The potential partnerships among South countries and possibilities that can be created were highlighted to determine how challenges can be addressed more effectively and how the south-south connect can leverage the existing efforts of individual nations. The Conclave followed by the inaugural session, had three technical sessions.

Session 1 was on the topic 'Responsible Governance for Research and Innovation', Session 2 discussed 'Diversity, Equity, and Inclusion in Science', and Session 3 addressed 'Funding Mechanisms and Capacity-Building for R&D Cooperation.'

In the inaugural session, Prof Ranjana Aggarwal, Director CSIR-NIScPR shared a broad overview of the Conclave and its significance. She stressed the need to explore new models and mechanisms that can lead to responsible research and innovation in science, Open science, access to resources, gender equity, diversity and inclusion. She highlighted that the conclave's outcome will be presented on 19th September at the Science Summit at the 79 UN General Assembly CSIR Science Session on 'Strengthening South-South Cooperation for Achieving SDGs'.

Dr Rama Bansal, Head CSIR-ISTAD highlighted the role of CSIR in strengthening India's scientific and technological capacity. Dr. Preeti Soni, Head, APCTT- UN ESCAP, and Ms. Theresia Ningsi Astuti, Regional Representative for WAITRO and National Research and Innovation Agency (BRIN) in Indonesia highlighted the role played by their organizations in enhancing the scientific and technology capacity of South countries and in supporting them for achieving Sustainable Development Goals.

Session 1 was chaired by Prof. Mammo Muchie, DST-NRF SARChI Chair Rated Research Professor in Innovation Studies at Tshwane University of Technology, South Africa. This session focused on responsible governance in the context of research and innovation, emphasizing the need for an open science framework that bridges gaps between North and South countries. The session was moderated by Dr. Yatendra Kumar Satija, Senior Scientist at ISTAD-CSIR. Panellists were Prof. Ravinder Rena from Durban University of Technology, South Africa; Dr. Diran Soumonni from Wits Business School, South Africa; Prof. John Kalu Osiri from the University of Nebraska-Lincoln, USA; Prof. Vivek Singh from the University of Delhi; and Prof. ChM Dr. Mohd Basyaruddin Abdul Rahman from ISTIC-UNESCO.

The following topics were discussed: Creating enabling policies for an open science framework, Bridging the North-South divide in scientific knowledge and resources, Responsible governance

practices that foster inclusion, resource sharing, and sustainability, Developing frameworks for ethically acceptable and socially desirable research in South countries.

Session 2 was chaired by Prof. Rohini Godbole from the Centre for High Energy Physics, Indian Institute of Science (IISc), Bangalore. The session was moderated by Dr. Naresh Kumar, Chief Scientist at CSIR-NIScPR. Panelists were Prof. Vivek Kumar from IIT Delhi's Center for Rural Development and Technology; Dr. Yara Shaban, Head of the WANA Office and Senior Researcher at the West Asia-North Africa (WANA) Institute in Amman, Jordan; and Prof. Ranjana Aggarwal, Director CSIR-NIScPR. The panelists drew attention to the need for developing the policies that promote diversity, equity, and inclusion in science, with emphasis on empowering women in STEM and addressing rural development. Some important examples from Indian policy and implementation in this direction were highlighted.

Session 3 was chaired by Prof. Nagesh Kumar, Director and Chief Executive of the Institute for Studies in Industrial Development (ISID) and Formerly Director at UNESCAP. Dr. Mahesh Kumar, Senior Principal Scientist at the Innovation Management Directorate (IMD), CSIR, moderated the session. The Panelists were Prof. Mammo Muchie from Tshwane University of Technology; Dr. Preeti Soni from APCTT; Dr. S. K. Varshney, Former Adviser and Head of International Cooperation at the Department of Science and Technology (DST) and Dr Rama Bansal of CSIR-ISTAD.

This session addressed the funding mechanisms and capacity-building for R&D cooperation, exploring various funding instruments and schemes that support science and technology initiatives aligned with SDGs. Examples of successful interventions and capacity building in South countries were highlighted by APCTT, CSIR, and DST.

The conclave concluded with a detailed analytical summary of key issues discussed and promising pathways that South countries have shown in meeting challenges by Dr. Sujit Bhattacharya, Chief Scientist at CSIR-NIScPR. The Conclave underscored the need for South countries to create mechanisms that can promote learning and sharing which is a collective endeavor to create Science-Technology-Innovation ecosystem in South countries for meeting developmental challenges and addressing Sustainable Development Goals.

https://pib.gov.in/PressReleasePage.aspx?PRID=2056010

Hindustan Times

Wed, 18 Sep 2024

IIT Guwahati researcher unlocks quantum secrets of gravity in a joint study

Researchers from the Indian Institute of Technology Guwahati (IIT Guwahati) and the University of Stellenbosch, South Africa, in a collaboration, made some interesting findings on the quantum nature of gravity.

The research, led by Dr Bibhas Ranjan Majhi, Associate Professor, Department of Physics at IIT Guwahati, and Dr Partha Nandi of the University of Stellenbosch, South Africa, focuses on gravity-induced entanglement (GIE). The findings of this research have been published in the Physics Letters B journal.

The research aims to understand how gravity behaves at incredibly small scales, such as those of atoms and subatomic particles, where existing theories start to unravel.

Dr Majhi and Dr Nandi's research takes an approach of studying how gravity might lead to entanglement, a phenomenon in quantum mechanics where two particles become linked, such that the state of one affects the other, regardless of the distance between them. The concept of gravity-induced entanglement proposes that under certain conditions, gravitational forces may create this quantum connection, revealing a quantum aspect of gravity, mentioned the press release.

"We have developed a theoretical framework that connects a two-dimensional quantum harmonic oscillator with gravitational waves—ripples in space-time caused by massive objects like black holes. This approach bypasses the limitations of classical communication methods and explores whether quantized gravitational waves can induce entanglement. Our findings show that while classical gravitational waves do not generate entanglement, the quantum version of these waves does, at the second order of gravitational perturbation," said Dr Majhi.

If gravity-induced entanglement can be detected using gravitational wave detectors, it could provide the first evidence that gravity operates at a quantum level. Such a discovery could unlock other cosmic mysteries, such as the nature of dark matter and dark energy — two enigmatic components that make up most of the universe but are still poorly understood, informed IIT Guwahati.

https://www.hindustantimes.com/education/features/iit-guwahati-researcher-unlocks-quantum-secrets-of-gravity-in-a-joint-study-101726576880739.html

DECCAN HERALD

Wed, 18 Sep 2024

Soil from Moon brought by Chinese probe has 'distinct properties' compared to other lunar samples: Study

Lunar samples brought back by China's Chang'e-6 mission from the little explored far side of the moon have exhibited "distinct characteristics" compared to previously obtained lunar samples, a paper published by the Chinese scientists has said.

A team of scientists in their first research paper published on the lunar samples from the far side of the moon said on Tuesday the Chang'e-6 soil samples have a lower density than previous samples from other parts of the moon, indicating a more porous and loosely structured composition.

The study also revealed the Chang'e-6 lithic fragment samples are primarily composed of basalt, breccia, agglutinate, glasses and leucocrate. Geochemical analysis of the Chang'e-6 lunar samples has shown that their concentration of trace elements such as thorium, uranium and potassium is markedly different from the samples retrieved by the Apollo missions and the Chang'e-5 mission, state-run Xinhua news agency reported. China in May this year launched a 53-day lunar probe mission to collect samples for the first time from the far side of the moon and bring them to the Earth for scientific studies, the first endeavour of its kind in the history of human lunar exploration, according to China National Space Administration (CNSA).

Chang'e 6 consists of four components: an orbiter, a lander, an ascender and a re-entry module. The returner of the Chang'e-6 in June brought back 1,935.3 grams of samples from the far side of the moon.

The study was carried out jointly by members from the National Astronomical Observatories of the Chinese Academy of Sciences, the Lunar Exploration and Space Engineering Centre, and the Beijing Institute of Spacecraft System Engineering.

In July this year, Chinese scientists studying soil samples of the moon brought by China's Chang'e-5 mission in 2020 found water molecules in lunar soil. Based on lunar soil samples returned by China's Chang'e-5 mission in 2020, Chinese scientists have found a hydrated mineral "enriched" with molecular water, according to the Chinese Academy of Sciences (CAS).

In 2009, India's Chandrayaan-1 spacecraft detected signs of hydrated minerals in the form of oxygen and hydrogen molecules in sunlit areas of the moon.

https://www.deccanherald.com/science/soil-from-moon-brought-by-chinese-probe-has-distinct-properties-compared-to-other-lunar-samples-study-3195763

THE HINDU

Wed, 18 Sep 2024

India to have 56 new Doppler weather radars soon, says Ministry of Earth Sciences

Union Ministry of Earth Sciences (MoES) Secretary M. Ravichandran revealed that the country is expected to have 56 additional Doppler weather radars in the next few years.

The MoES has also developed various Apps to bring weather forecast at the fingertips of general public and farmers in particular. The Centre is very supportive on the newly introduced Mission Mausam, he said while speaking to reporters on the sidelines of the event of Platinum Jubilee Celebrations of department of Meteorology & Oceanography, Andhra University on Wednesday (September 18, 2024).

Meanwhile, India Meteorological Department MD Director General M. Mohapatra said that Mission Mausam plays a key role in providing effective solutions and better forecasting system in the country. "We are able to provide forecast before six hours in urban areas now. Rainfall rate is

increasing due to climatic conditions. By next monsoon, IMD will be able to provide a village-wise weather forecast system at Gram Panchayat level". He also said that IMD is taking proactive measures to improve the weather observational network in the country. The rainfall monitoring stations have also been increased to around 7000 in number till date.

https://www.thehindu.com/news/national/india-to-have-56-new-doppler-weather-radars-soon-says-ministry-of-earth-sciences/article68655135.ece

Hindustan Times

Wed, 18 Sep 2024

Earth to get 'mini-moon' 2024 PT5, orbiting for 2 months | All you need to know

Earth is set to witness a 'mini-moon' called 2024 PT5, a small asteroid that will not collide with Earth but will orbit around it, similar to the Moon, for a brief period of around two months by the end of this month.

According to a paper published in the Research Notes of the American Astronomical Society, the asteroid will be temporarily captured by Earth's gravity until around November. Detected by the Asteroid Terrestrial-Impact Last Alert System (ATLAS) on August 7, it will orbit Earth from September 29 to November 25 before breaking free from the planet's gravitational pull.

Astronomers refer to it as a "temporarily captured flyby" since it won't complete a full orbit. In contrast, mini-moons that do complete a full orbit are known as "temporarily captured orbiters".

A report by Live Science mentioned a study suggesting that 2024 PT5 likely originated from the Arjuna asteroid belt, which contains space rocks that orbit the sun near Earth. Due to its orbit being similar to Earth's, calculations show that the asteroid will return to orbit Earth in January 2025 and again in 2055.

Is it normal for Earth to attract asteroids like this?

The research paper explained that Earth can periodically capture asteroids from the Near-Earth Object (NEO) population, pulling them into orbit and turning them into 'mini-moons'. The researchers noted that the recently discovered Apollo-class NEO 2024 PT5 follows a path similar to that of 2022 NX1 and may soon become a mini-moon.

NASA considers any space object within about 120 million miles (190 million kilometres) of Earth as a "near-Earth object" and classifies larger objects within 4.7 million miles (7.5 million kilometres) as "potentially hazardous".

NASA monitors around 28,000 asteroids through ATLAS, a system of four telescopes that scans the entire night sky every 24 hours.

Previous instances of Earth getting 'mini-moons'

- In 2020, a mini-moon was discovered, later identified as random space junk – a rocket booster from the 1966 Surveyor 2 Centaur launch.

- Many asteroids frequently return to Earth's vicinity. For example, the asteroid 2022 NX1 became a mini-moon in 1981 and again in 2022, with another return expected in 2051.

- The asteroid 2006 RH120 orbited Earth for an entire year, from July 2006 to July 2007.

- Some researchers believe this phenomenon is so consistent that Earth may always have a mini-moon orbiting somewhere nearby.

Can we witness 2024 PT5 with our naked eye?

Despite its 57-day close flyby of Earth, the asteroid will be difficult to spot due to its small size, measuring just 33 feet (10 meters) wide. According to NASA, 2024 PT5 has an absolute magnitude of 27.593, making it too dim to see, even with a telescope.

For comparison, the dimmest objects visible to the naked eye at night have a magnitude of around 6.5, and a 12-inch telescope can detect objects with a magnitude of about 16 or 17. This means amateur astronomers won't be able to observe 2024 PT5, as it would require a much more powerful telescope.

https://www.hindustantimes.com/world-news/what-do-we-know-about-new-covid-variant-xec-spreading-fast-across-europe-us-101726652583198.html