

अप्रैल

April
2023

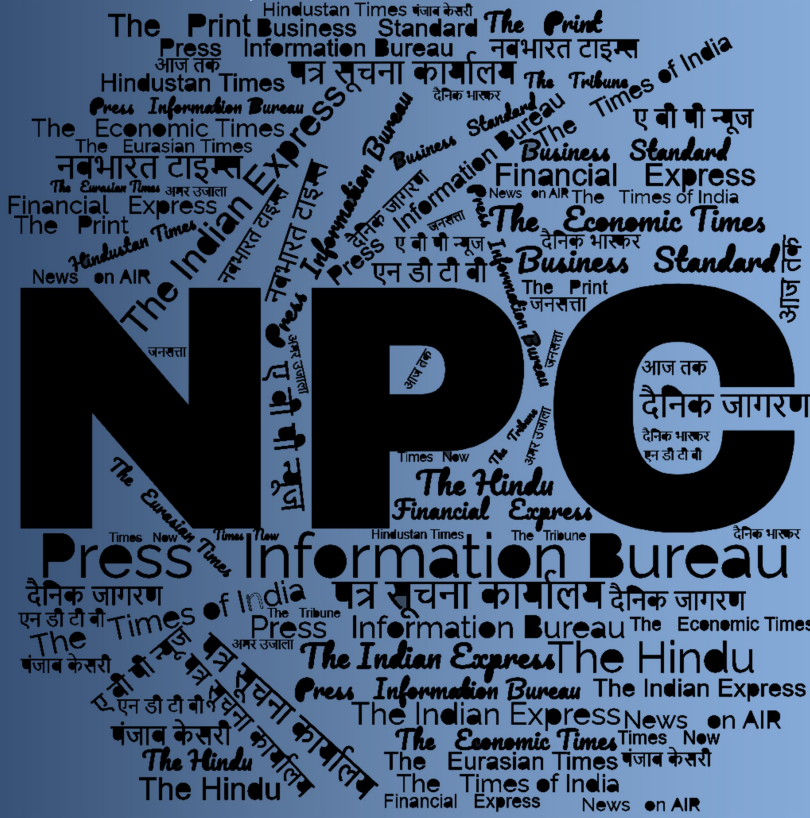
खंड/Vol. : 48 अंक/Issue : 71

18/04/2023

समाचार पत्रों से चयित 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

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



रक्षा विज्ञान पुस्तकालय

Defence Science Library

रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र

Defence Scientific Information & Documentation Centre

मेटकॉफ हाउस, दिल्ली - 110 054

Metcalfe House, Delhi - 110 054

CONTENTS

S. No.	TITLE		Page No.
	DRDO News		1
	DRDO Technology News		1
1.	'Millet Awareness Programme' Organized by Defence Research Laboratory in Tawang	<i>ANI</i>	1
	Defence News		2-15
	Defence Strategic: National/International		2-15
2.	Exercise Orion: Bilateral Military Drill between IAF, French Air and Space Force Starts in France	<i>News on AIR</i>	2
3.	India & UK are 'Natural Partners' in a Contested & Volatile World: UK CDS	<i>The Times of India</i>	2
4.	UK Chief of Defence Staff in India to Explore Enhanced Strategic Ties	<i>The Print</i>	3
5.	India's AMCA not a 5th-Gen Fighter Aircraft; Lacks 3 Defining Features to be in the Same League as F-35, J-20	<i>The EurAsian Times</i>	4
6.	South Korea, US, Japan Hold Missile Defence Drills to Counter North Korea	<i>Hindustan Times</i>	7
7.	Putin Discusses Pacific Fleet Drills with Defence Minister Sergei Shoigu	<i>Deccan Herald</i>	8
8.	Invisible Aircraft: How Russian Radars Busted the Myth of Stealth Fighters & Proved it's all Hype & No Substance	<i>The EurAsian Times</i>	8
9.	US Warship Sails in Taiwan Strait after China's Exercises	<i>Financial Express</i>	12
10.	ताइवान विवाद को लेकर चीन पर बंटा यूरोप, अमेरिका के लिए क्या है संदेश	<i>नवभारत टाइम्स</i>	13
	Science & Technology News		16-20
11.	Union Minister Dr Jitendra Singh says, "YUVA PORTAL", launched today will help in connecting and identifying potential young Start-Ups	<i>Press Information Bureau</i>	16
12.	Need for Cooperation among G20 Nations on Space Technologies: ISRO Chairman	<i>Business Standard</i>	18
13.	ISRO Wants to Send Civilian Scientists, Doctors to Space to Research Microgravity	<i>The Print</i>	19
14.	2052 तक इंसानों की बराबरी कर लेंगी मशीनें	<i>नवभारत टाइम्स</i>	20

DRDO News

DRDO Technology News



Mon, 17 Apr 2023

'Millet Awareness Programme' Organized by Defence Research Laboratory in Tawang

Research & Development Centre Tawang of Defence Research Laboratory (DRL) DRDO on Monday organised a "Millet Awareness Programme (MAP)" under International Year of Millets (IYOM) and Training on Improved Hill Farming Techniques in Arunachal Pradesh's Tawang.

The main mandate of this training is to raise awareness about the modern aspects of improving millet productivity through scientific cultivation technology and the importance of millets in human diet and rural economy.

Lt Col Mahendra Rawat, Defence PRO of Guwahati said that a total of 35 numbers of farmers including locals participated in the training. "The participants were briefed about the status, importance and challenges of Millets in India by Dr. Ankit, Scientist, DRL Tezpur," Lt Col Mahendra Rawat said.

Millets are highly nutritious cereal and have a lower glycemic index compared to other grains, making them an ideal food for people with diabetes and other metabolic disorders. Millets are also an important source of income for many marginal farmers, particularly in developing countries.

"By using these technologies and promoting the consumption of millets, it can improve food security, support marginal farmers, and promote sustainable agriculture. Besides, lectures on Nursery Management, Organic Farming of Millets, Cultivation Practices of Finger Millet and Food processing were also delivered. These topics covered a wide range of areas related to millet cultivation, from the initial stages of seedling production to the final stages of processing and consumption. It is important for farmers to have a comprehensive understanding of all these aspects in order to produce high-quality millets. As an encouragement to adopt the improved hill farming practices, the local farmers were provided with strawberry runners and seed kits," the Defence PRO of Guwahati said.

<https://www.aninews.in/news/national/general-news/millet-awareness-programme-organized-by-defence-research-laboratory-in-tawang20230417224008>



Mon, 17 Apr 2023

Exercise Orion: Bilateral Military Drill between IAF, French Air and Space Force Starts in France

Exercise Orion, a bilateral military drill between the Indian Air Force and the French Air and Space Force (FASF) started at the Mont-de-Marsan airbase in France on Monday. France Ambassador Emmanuel Lenain said, “France warmly welcomes the Indian Air Force (IAF) contingent that will take part in the exercise from today”. The exercise will be conducted from 17 April to 05 May 2023, with the IAF Contingent comprising four Rafale, two C-17, two Il-78 aircraft, and 165 air warriors. This would be the first overseas exercise for the IAF’s Rafale aircraft, according to the statement released by Defence Ministry. “Besides the IAF and the FASF, Air Forces from Germany, Greece, Italy, the Netherlands, the United Kingdom, Spain, and the United States would also be flying in this multilateral exercise. Participation in this exercise would further enrich the employment philosophy of the India Air Force, by imbibing the best practices from other Air Forces,” the statement read.

Orion is reportedly the largest ever multinational exercise being carried out by the French defence forces which have involved their Army, Navy and Air Force along with their allies the US and the UK.

The Rafale aircraft are the latest fighters to have been inducted into the Indian Air Force and are considered to be the most potent in the entire Asian region.

The 36 Rafales have been completely inducted and they have played a significant role in improving the country’s operational preparedness along both the borders with Pakistan and China.

<https://newsonair.com/2023/04/17/exercise-orion-bilateral-military-drill-between-iaf-french-air-and-space-force-starts-in-france/>

THE TIMES OF INDIA

Mon, 17 Apr 2023

India & UK are 'Natural Partners' in a Contested & Volatile World: UK CDS

India and the UK are “natural partners” in a world that is “becoming more contested and volatile”, UK chief of defence staff Admiral Tony Radakin said on Monday, even as the two countries reiterated their commitment to a free, open and secure Indo-Pacific in the face of China’s belligerence in the region.

“As a global trading nation it matters to the UK that the Indo-Pacific is open and free, which is why the British armed forces are establishing the broadest and most integrated presence in the region of any European nation,” Admiral Radakin said, after meeting his Indian counterpart General Anil Chauhan, the Army and Navy chiefs and the defence secretary at South Block.

The Indian Army will be sending a contingent of soldiers to the UK for the combat exercise ‘Ajeya Warrior’ later this month. This comes soon after the IAF dispatched five Mirage-2000 fighters, two C-17 Globemaster-III aircraft, one IL-78 mid-air refueler and 145 personnel for the multi-nation exercise ‘Cobra Warrior’ in the UK from March 6 to 24.

“India and the UK share many of the same democratic instincts and values, and are both committed to the rule of law. We are respected military powers, both undergoing significant investment and modernisation, and exercising together across, land, sea and air,” Admiral Radakin said.

“But we can do more. I value the opportunity to meet with Gen Chauhan to discuss how we can develop our partnership in a way that benefits our mutual security and prosperity,” he added.

Royal Air Force chief Air Chief Marshal Mike Wigston is also currently visiting India, which a British official said exemplifies the importance with which the UK holds its defence and security partnership with India. Apart from boosting military-to-military engagements, India and the UK are also looking to strengthen ties in defence R&D and industrial collaboration, with discussions already underway in the aerospace sector.

<https://timesofindia.indiatimes.com/india/india-uk-are-natural-partners-in-a-contested-volatile-world-uk-cds/articleshow/99561838.cms>

ThePrint

Mon, 17 Apr 2023

UK Chief of Defence Staff in India to Explore Enhanced Strategic Ties

The UK on Monday described India as a “valued defence partner” and noted that both countries are committed to the stability and prosperity of the strategic Indo-Pacific region.

UK Defence Secretary Ben Wallace made the statement to coincide with the visit of the Chief of the Defence Staff, Admiral Sir Tony Radakin, who arrived in New Delhi on Monday at the start of a three-day visit. Admiral Radakin is in India for a series of high-level meetings to build on the momentum towards enhanced strategic ties between the two countries.

Ahead of his meetings in New Delhi, UK Defence Secretary Ben Wallace said: “India is a valued defence partner for the UK and our relationship continues to flourish across our research and industrial sectors.” “Both our nations are committed to the stability and prosperity of the Indo-Pacific and we continue to train and operate alongside our Indian partners to promote security in the region,” he said.

According to the British government’s statement, during Radakin’s visit to New Delhi, he will meet India’s Chief of Defence Staff General Anil Chauhan and also hold discussions with the Chief of the Naval Staff, Admiral Hari Kumar; Chief of the Army Staff, General Manoj Pande; Defence Secretary Giridhar Aramane, and Additional Secretary Defence Production T. Natarajan.

Over the next two days of his visit, Admiral Radakin will be hosted by various establishments of the Indian armed forces across the country, with a view to boost “military-to-military engagement and explore opportunities around the co-creation of future technologies”.

“My visit to India reflects the United Kingdom’s belief that our security is indivisible from that of the wider world. As a global trading nation it matters to the UK that the Indo-Pacific is open and free, which is why the British Armed Forces are establishing the broadest and most integrated presence in the region of any European nation,” said Admiral Radakin.

“India and the UK are natural partners in a world that is becoming more contested and volatile. We share many of the same democratic instincts and values and are both committed to the rule of law. We are respected military powers, both undergoing significant investment and modernisation, and exercising together across, land, sea and air. But we can do more,” he said.

Admiral Radakin added that he valued the opportunity to meet General Chauhan to discuss how to develop the defence partnership in a way that promotes mutual security and prosperity.

The British government said the UK and India share a strong and enduring defence relationship, including research, development and training collaboration.

It noted that discussions around industrial collaboration in the aerospace sector have been progressing following the signing of an updated memorandum of understanding (MoU) in 2019, with the UK’s Minister for Defence Procurement visiting in February and the First Sea Lord visiting in March.

The visit of the UK Chief of Defence Staff also coincides with the visit of the Chief of the Air Staff (CAS) of the Royal Air Force, Air Chief Marshal Sir Mike Wigston.

The visit of two of the senior-most officers of the UK’s armed forces exemplifies the importance with which the UK holds its defence and security partnership with India, the UK government added.

The Royal Navy, British Army, and Royal Air Force are all carrying out exercises with their Indian equivalents this year, developing interoperability and joint tactics.

In recent weeks, HMS Lancaster visited Kochi to train alongside the Indian Navy as part of Exercise Konkan, while five Mirage 2000 fighters were flown by Indian Air Force pilots in the Royal Air Force’s largest aerial exercise in the UK – Exercise Cobra Warrior.

Later this month, soldiers from the Indian Army will deploy to the UK to participate in Exercise Ajeya Warrior, training alongside the British Army.

<https://theprint.in/world/uk-chief-of-defence-staff-in-india-to-explore-enhanced-strategic-ties/1524284/>



Mon, 17 Apr 2023

India’s AMCA not a 5th-Gen Fighter Aircraft; Lacks 3 Defining Features to be in the Same League as F-35, J-20

By Vijaiinder K Thakur

After languishing on the drawing board for 15 years, India’s Advanced Medium Combat Aircraft (AMCA) is now set for its first flight, just four years into the future!

DRDO is poised to get approval from the Cabinet Committee on Security (CCS) for developing the 5th gen fighter based on a timeline that projects the first flight by 2027 and squadron induction by 2035!

Most fighter aviation enthusiasts would find the first flight timeline far-fetched. Indeed, it's likely that everyone involved in the process of seeking CCS approval for the AMCA knows well that the timeline is hopelessly unrealistic.

'Very Tight' Timeline

The timeline was first projected to the Indian Air Force (IAF) in 2019. Despite their enthusiasm and wholesome support for a homegrown stealth fighter, the IAF's top leadership considered the timeline ambitious.

In July 2020, the IAF euphemistically described the timeline as 'very tight.'

However, senior DRDO and HAL officials ignored the IAF's reservations. In January 2021, Chairman & managing director of Hindustan Aeronautics Ltd R Madhavan said, "The prototype of the aircraft is likely to be ready by 2026 & its production could start by 2030!"

In September 2021, Girish S Deodhare, Programme Director (Combat Aircraft) & Director, ADA, upped the ante by projecting the first flight in 2025!

He said, "We are moving to a critical design review by the middle of next year with the roll-out planned in 2024 and the first flight planned in 2025."

Dr. AK Ghosh, project director of AMCA, stated during DefExpo-2022, "Once the project sanction is received, the first prototype can be rolled out in three years and the first flight in one to one and half years after that."

The IAF, which has long been associated with DRDO & HAL, remained skeptical.

In November 2022, the Chief of the Air Staff (CAS), Air Chief Marshal VR Chaudhari, advised "prudence." He recommended foreign tie-ups as a fallback for developing "alternative systems & sensors" in case indigenous development slips off the timeline.

What the CAS said may have had an impact because, on February 14, 2023, DRDO chairman Samir Kamat said that the first flight of the AMCA "may take seven years and the induction can be done in ten years from now."

While conceding a slip in the first flight timeline from 2027 to 2030, Kamat stuck to the 2035 induction target.

AMCA Will Be A 4.5 Generation Fighter!

More significant than the rather difficult-to-swallow DRDO/HAL projected timeline is that the AMCA projected to be inducted by 2035 will not be a 5th-generation fighter. It will be a 4.5 gen fighter.

AMCA is proposed to be developed in two phases. Phase 1 development will result in AMCA Mk-1, powered by the US GE-414 engine. Phase 2 development will result in AMCA Mk2, which will feature an advanced, more powerful engine to be developed in collaboration with a yet-to-be-chosen foreign partner.

AMCA Mk-1 will lack at least three defining 5th-generation fighter engines.

Supercruise

Supermaneuverability

Sensor fusion

Additionally, AMCA Mk-1 will feature limited stealth. AMCA is inspired by the F-35, which has no rear aspect radio frequency and stealth but does feature a suppressed IR signature. The AMCA will feature no rear aspect stealth – neither RF nor IR.

Using the 98 kN GE F414 engine instead of a 110 kN engine as planned when designing AMCA rules out supercruise; lacking thrust vectoring rules out supermaneuverability, and; large exhaust nozzles without IR suppression rule out rear-aspect stealth.

Sensor Fusion

Fifth-generation fighters are designed to penetrate heavily contested adversary airspace and locate targets, relaying targeting information and coordinates to other air, land, and sea-based weapon systems. To penetrate heavily contested airspace undetected and ferret out targets, a 5th gen fighter requires good stealth and situational awareness using sensor fusion.

Sensor fusion fuses inputs from various onboard sensors – radar, IR, and optical – into a single coherent display. Upgraded 4th gen fighters, such as Su-30MKI and LCA Mk-1A, feature varying degrees of sensor fusion, but not enough to provide situational awareness.

DRDO aims to field Stage 2 (situation awareness) sensor fusion with MWF LCA Mk.2. Fifth-generation fighters are expected to feature Stage 3 (Decision assist) or Stage 4 (Automated decision) sensor fusion. ‘Decision assist’ situational awareness includes automatic prioritization of threats to assist the pilot. ‘Automated decision’ situational awareness includes prioritizing and automatically engaging threats. DRDO is still grappling with developing capable RF, IR, and Optical sensors. Sensor fusion will follow sensor development. It will be long before it can field Stage 3 and Stage 4 situational awareness. The CAS was likely recommending foreign collaboration for developing sensors and sensor fusion when advising prudence in November 2022.

The Need To Be Realistic

Based on their track records and their proclivity for over-projection, there can be little doubt that DRDO and HAL leadership will be forced to push back timelines and seek performance concessions due to technology shortfalls during the course of the AMCA project.

As stated earlier, DRDO/HAL officials are likely aware of the pitfalls but are driven more by the need to procure funding from the government to safeguard the future of their organizations rather than the need to make the nation stronger in the immediate context.

From the point of view of the IAF, the urgency and importance of acquiring manned stealth fighters mandate CCS approval for the AMCA project. Supercruise, supermaneuverability, and situational awareness can always be added to a stealth platform later, as also evolving technologies such as loyal wingman & drone swarm control.

While giving its go-ahead to the project, it is important that the CCS be aware of the pitfalls and remain alert to the impact of project delays on the combat capability of the IAF. The nation can afford to wait for the AMCA but cannot afford to let its guard down.

To deter adversary adventurism, the IAF needs operational stealth fighters and counter-stealth AD radar systems within the next five years, not when the projected timelines are breached.

<https://eurasianimes.com/indias-amca-not-a-5th-gen-fighter-aircraft-lacks-3-defining/>

South Korea, US, Japan Hold Missile Defence Drills to Counter North Korea

South Korea, the United States and Japan staged joint naval missile defence exercises on Monday in a push to improve security co-operation and respond better to North Korea's evolving missile threats, Seoul's navy said.

The three nations agreed at talks in Washington on Friday to hold regular missile defence and anti-submarine exercises in their efforts to boost diplomatic and military co-operation.

North Korea tested a new solid-fuel intercontinental ballistic missile on Friday that experts say would ease the way for missile launches with little warning, part of an increase in its military activities in recent weeks. Monday's drills in international waters between Korea and Japan bring together South Korea's 7,600-tonne Aegis destroyer Yulgok Yi I, the U.S. guided-missile destroyer Benfold, and Japan's Atago destroyer, also equipped with Aegis radar systems.

The effort focuses on mastering response procedures, from detection and tracking to information sharing, by creating a virtual target in a scenario featuring a North Korean ballistic missile provocation, the South's navy said.

"It is an opportunity to strengthen trilateral security cooperation against North Korea's escalating nuclear and missile threats," Captain Kim Ki-young of the South Korean destroyer said in a statement.

This would solidify the navy's capability and posture to respond to ballistic missiles, he added.

Japan's defence ministry said the exercises promote trilateral cooperation over regional security challenges, and demonstrate the three countries' strong commitment to secure a free and open international order based on the rule of law.

Pyongyang has threatened "more practical and offensive" action as South Korea and U.S. forces have performed annual springtime exercises since March, some involving Japan, which the North has described as a rehearsal for nuclear war.

Separately, the air forces of South Korea and the United States are set to begin drills on Monday for a 12-day run.

Also on Monday, South Korea and Japan resumed "two-plus-two" talks of senior diplomatic and security officials in Seoul after a five-year halt, as ties thaw after a years-long feud over issues of wartime history. They shared views on North Korea and regional issues, while agreeing to improve understanding of each other's policies and foster security co-operation in a "forward-looking" way, Seoul's foreign and defence ministries said in a joint statement after the meeting.

President Yoon Suk Yeol, who has pledged to move ties with Japan beyond the past, visited Tokyo in March for the first time in 12 years as South Korea's leader.

<https://www.hindustantimes.com/world-news/south-korea-us-japan-hold-missile-defence-drills-to-counter-north-korea-101681719538950.html>



Mon, 17 Apr 2023

Putin Discusses Pacific Fleet Drills with Defence Minister Sergei Shoigu

Russian Defence Minister Sergei Shoigu on Monday read a report to President Vladimir Putin about drills conducted by the country's Pacific Fleet.

In footage broadcast on state television, Putin responded by saying that snap checks had shown the Pacific Fleet at a high level of readiness and that Russia's priority was Ukraine.

<https://www.deccanherald.com/international/world-news-politics/putin-discusses-pacific-fleet-drills-with-defence-minister-sergei-shoigu-1210452.html>



Mon, 17 Apr 2023

Invisible Aircraft: How Russian Radars Busted the Myth of Stealth Fighters & Proved it's all Hype & No Substance

By Gp Cpt TP Srivastava (Retd)

The word 'stealth' in military parlance conjures up a vision of Hollywood star Kevin Bacon going invisible during a scientific test in the film *Hollow Man* released in 2020, or Hollywood actor Oliver Jackson-Cohen acquires the ability to go invisible in the 2022 film *Invisible Man*.

The invisible man idea is fine for being stealthy as a fiction or entertainment story. But is 'stealth' valid in reality, with specific reference to an aircraft being invisible to the ground or the airborne radar?

Major powers have already spent billions of US dollars, viz China, Russia, and the US, towards R&D in this field and producing operational aircraft. USA took the lead by manufacturing F-117, F-22, F-35, and B-2 and to-be inducted strategic bomber B-21. China and Russia have miles to go.

As of now, neither country has a truly stealthy flying machine. All so-called stealth flying machines fall in the category of 'Low Observables.' J-20 of China and Su-57 of Russia might not be in the low observable category.

While we focus on designing a stealthy airframe, we must not lose sight of advancements in radar technology. Experimental Quantum Radar, if and when it becomes a reality, might change the stealth concept forever.

The pace of development of radars and sensors already incorporated in Surface-to-Air Missiles (SAM) and Air-to-Air Missiles (AAM) is perhaps faster than the stealth design development of modern fighters.

The stealth capability or quality of a flying machine can be divided into the physical attributes of stealth and the technological requirements of a stealthy machine.

An attempt will be made to discuss the entire spectrum of stealth technology, its operational advantage, and the cost of producing a stealthy flying machine without entering into complex technological jargon and principles employed.

Physical Stealth

Physical stealth, as an attribute or a term, is non-existent in the case of flying machines. Physical stealth characteristics can, at best, be minimized; they cannot be eliminated. The same is discussed below;

Noise

(a) Physical Noise: Noise created by the aero-engine and friction caused by air resistance can neither be minimized nor eliminated. The roar of exhaust gases further supplements this noise. Neither source of noise can be eliminated. The presence of a flying machine will create substantial audible noise and indicate its presence and direction of approach to a trained person.

(b) Shock Waves: Whenever a flying machine is flying in trans-sonic/Supersonic range, the creation of shock waves results in a random or constant sonic boom depending on the Mach number indicating the aircraft's speed. Attachment or detachment of shock waves from the airframe results in a bang called a sonic boom audible on the ground.

It is particularly prominent while an aircraft decelerates from a supersonic to a subsonic regime. Due to the separation of the shockwave, which travels to the ground, a loud bang is heard. Sonic booms at a low level can cause the shattering of glass panes.

Trails

(a) Condensation Trails: A turbo-jet and a jet engine produce extremely prominent vapor trails called condensation trails while flying at a specific altitude band. Water vapor in the exhaust condenses instantaneously when a jet engine aircraft is flying above Minimum Trail Level (MINTRA) and below Maximum Trail Level (MAXTRA), leaving a thick white trail. The trail cannot be hidden from sight under clear-sky conditions.

(b) Smoke Trails: Unburnt or partially burnt fuel results in a jet engine leaving a highly visible grey-colored smoke trail, seen from miles depending on light conditions.

Heat Signature

Since jet engines became operational, attempts have been made to keep exhaust gas temperature under control. It became an operational necessity when heat-seeking air-to-air missiles arrived on the scene.

However, irrespective of efforts made, the heat signature of a jet airplane remains the biggest threat to itself. Heat signature can be minimized but not eliminated. Extended jet pipes have been introduced, mixing ambient air with exhaust gases, etc., to reduce the heat signature.

Measures adopted to reduce exhaust gas temperature do achieve marginal reduction. However, extended jet pipe results in reduced stealth characteristics. Similarly, inducting ambient air and mixing it with exhaust results in widening the jet pipe to create additional ducts. Yet again, a wider jet pipe results in a reduction in stealth.

Physical Signature

All non-stealth aircraft with light grey or light blue under the surface inherently merge with blue sky and are extremely difficult to spot despite clearly audible engine noise. All current stealth aircraft being black in color, both on top and bottom, are clearly visible, thus increasing vulnerability to shoulder launch human-sighted missiles.

Design And Technological Stealth

Design Stealth

All flying objects reflect the impinging radar waves back to the emitter, causing the radar to 'see' the flying machine in all three dimensions. The intensity of the reflected signal depends directly on the area and design of the reflecting surface. The stealth attribute of a flying machine is a function of the reflectivity coefficient.

The higher the value of the reflectivity coefficient, the easier it is for radar to 'see.' Design stealth has focused on reducing the reflectivity coefficient by providing inclined surfaces, wing–fuselage blending, internal weapons bay, embedded air intakes and jet pipes, and composite control surfaces.

No wonder that from F-117 onwards, most USAF aircraft resemble overgrown bats. In the case of F-117, it has been claimed that a similar-sized flat plate area flying machine will have nearly a hundred times more radar visibility than F-117.

It is another matter that a SAM shot down at least one F-117. In addition, extensive adapting of wings and control surfaces often results in the reduction of maneuverability.

Technological Stealth

Stealth proponents soon discovered that design stealth was not good enough to provide the degree of stealth sought for near certain protection from being seen by the radar. Numerous technologies or methods have been developed viz 'iron ball paint' etc., termed as Radar Absorbent Material (RAM).

The development of RAM has been going on for decades. One of the first operational use of RAM was in the submarine periscope during the second world war. Broad characteristics of RAM are as follows:

(a) RAM paints are quite susceptible to damage due to moisture, exposure to salt while operating from coastal airfields, use of any abrasive material vis sandpaper for cleaning the surfaces, and random flaking, especially in case of variable thickness of paint. These individually and collectively demand a considerable maintenance cost and penalty in stealth property.

(b) Currently used stealth polymers are susceptible to degradation in temperatures of 250 degrees Celsius and beyond. The supersonic flight wing's leading edge can easily attain temperatures over 250 degrees Celsius.

(c) Ceramics also have excellent radar signal absorbent quality than existing polymers. It is claimed that nearly 90% of radar energy striking a ceramic tile is absorbed. However, ceramics are heavier than RAM paints.

(d) Liquid ceramic solution is sprayed uniformly over the surface. It takes about 48 hours to react slowly with ambient air and transform into solid ceramic material.

(e) Cost is not being discussed by choice.

The existing inventory of genuine stealth-design aircraft is with USAF only. China's J-20 and Russian Su-57 can hardly be termed stealth because of the design and quality of RAM used. The reflectivity coefficient is reduced considerably due to the following:

First, due to the absorption of nearly 70-80% of radar signals (as claimed by the manufacturer, yet to be proven in a hot war scenario).

Second, the intensity of the reflected signal is reduced further due to the design of the control surface, wing, etc., wherein the final reflected signal reaching the radar becomes weak due to multiple reflections by the aircraft surfaces on itself.

Any discussion on 'stealth' is incomplete unless the state of and progress in sensor technology is also discussed.

An event will best describe existing sensor capability during a hot war that took place 22 years ago.

Lieutenant Colonel Dale Zelko was on a night mission in Serbia on March 27, 1999. To his utter surprise and disbelief, Radar tracking suddenly flashed in the cockpit, followed by a missile lock warning lamp.

He was in the famous but unproven (for stealthy qualities) F-117. Zelko and his presumed undetectable aircraft F-117 were vital to the NATO-led Operation Allied Force. The mission involved a strike on a Serbian target. Missile lock warning indicated that F-117 was, after all, not invisible to the Serbian Air Defence network equipped with Russian radar and SAMs.

The missile struck F-117, and Zelko pulled the ejection handle and survived to tell the tale. S-125 'Pechora/Neva' missile had scored the first-ever kill of a stealth machine. Yet again, on April 20, 1999, another F-117 was struck by a SAM, but the pilot was able to bring the crippled aircraft back to base.

The relevance of the above operational event is that the most 'invisible' aircraft was still visible to tracking radar and a missile head.

Existing Sensor Capability

Extremely sketchy details are available, for obvious reasons, about sensor capability concerning tracking of 'so-called' stealth aircraft. However 'Almaz-Antey,' the Russian defense giant, has claimed that ground-based sensors have been produced which can detect the USAF stealth aircraft.

'Nebo-M' Radar is believed to be capable of detecting stealthy flying machines. No technical details are available from open source. But it is believed that the faintest of the reflected signal received is amplified many times over, and based on the 'speed' parameter, it distinguishes the stealth aircraft from slow-flying drones, birds, etc.

Nebo-M Radars entered operational service in Russia in 2017 and are believed to belong to the family of VHF radar systems.

Ground-Based Radar Vs AWACS And Capability To Track A Stealth Aircraft

Currently, operational stealth flying machines have achieved a high degree of stealth when ground-based Radars are used for tracking because a flying machine presents a side view of a rather small area resulting in a marked reduction in the reflected signal reaching the radar.

However, an AWACS will or should be able to see the same aircraft more successfully. It is entirely because even the best-designed stealth aircraft with a thick coating of RAM presents a 'flat plate' perspective to the airborne radar. Hence the reflectivity coefficient increases considerably, enabling the radar to identify the aircraft.

However, no operational data is available because of the extremely sensitive nature of critical operating parameters. The ability of AWACS to see a stealth aircraft better is based on the assumption that the reflected signal would be of higher intensity in the case of AWACS illuminating from the top.

Quantum Improvement In Missile Technology

Missile technology with specific reference to the killing range and the ability to track the target autonomously after launch has increased the threat to all aircraft, irrespective of their design.

Fully active missiles carry integral radar, which tracks and locks onto the target. This attribute is further enhanced by making a missile head heat sensitive, which enables the missile head to lock on to the target based on heat signature strength.

A twin combination is lethal. Hence it sought an aircraft to escape if the missile had locked on despite other countermeasures, viz chaff, etc.

Space-Based Sensors

No space-based sensors can track a fighter aircraft to intercept the machine. However, space-based Infra Red Sensors (SBIRS) technology has made considerable progress in monitoring ballistic missile launches.

USA has already launched the most modern satellite carrying SBIRS. However, in the foreseeable future development of SBIRS for aircraft tracking might become a reality. Operational anti-satellite weapons may also be a step toward producing SBIRS systems for aircraft tracking.

The Future

Currently, stealth design has created enormous hype and interest. However, the efficacy of this hugely expensive technology is yet to be proven under operational conditions, especially in highly dense air defense environments.

While discussing stealth, we must confine our discussion to a single aircraft. What will happen to the stealth quality or capability of a large formation? Strike missions invariably are multi-aircraft missions flying in close proximity. Critical operational issues, such as the presence of jammers with strike formation, have not been discussed by choice.

<https://eurasianimes.com/invisible-aircraft-how-russian-radars-busted-the-myth-of-stealth/>



Mon, 17 Apr 2023

US Warship Sails in Taiwan Strait after China's Exercises

The US Navy has sailed a warship through the Taiwan Strait in its first known transit since China carried out a large encirclement exercise around self-ruled Taiwan. The US 7th Fleet said the transit through the strait by the USS Milius on Sunday was routine.

The cruisers “transited through a corridor in the Strait that is beyond the territorial sea of any coastal State,” the statement said. China conducted many military drills in the strait in retaliation for Taiwan’s

President Tsai Ing-wen meeting with US House Speaker Kevin McCarthy on a visit to the US earlier this month.

China said Wednesday that the air and sea drills simulating an encirclement of Taiwan were intended as a “serious warning” to pro-independence politicians on the self-governing island and their foreign supporters.

China also sanctioned the organisations involved with Tsai’s visit in the US, including the Ronald Reagan Presidential Library, where her meeting with McCarthy and other members of Congress were held.

On Sunday, China launched a rocket carrying a satellite that dropped debris into waters north of the capital Taipei. While the satellite launch had no obvious military purpose, it disrupted travel, delaying flights.

<https://www.financialexpress.com/world-news/us-warship-sails-in-taiwan-strait-after-chinas-exercises/3049874/>

नवभारत टाइम्स

Tue, 18 Apr 2023

ताइवान विवाद को लेकर चीन पर बंटा यूरोप, अमेरिका के लिए क्या है संदेश

रहीस सिंह

अप्रैल 2023 के पहले सप्ताह में फिनलैंड 31वें सदस्य के रूप में उत्तर अटलांटिक संधि संगठन यानी नैटो का हिस्सा बन गया। इसके साथ ही नैटो की रूस के साथ साझा सीमा की लंबाई दोगुनी हो गई। अब नैटो के सदस्य देश पहले के मुकाबले रूस के चारों तरफ दोगुना बड़ा घेरा बनाने में कामयाब हो गए। ऐसे में एक सवाल यह है कि नैटो का उद्देश्य क्या है?

नैटो का संदेश

वैसे ब्रसेल्स से नैटो फिनलैंड को लेकर जो संदेश देना चाहता था, वह नहीं दिखा। उल्टे सदस्य देश इसे लेकर उलझन में थे। इसकी झलक जर्मन विदेश मंत्री की ताइवान यात्रा और फ्रांसीसी राष्ट्रपति मैक्रों की पेइचिंग यात्रा में दिखी।

मैक्रों की चीन-ताइवान के मुद्दे से यूरोप को दूर रहने की सलाह का यूरोपीय कमिशन के निर्णय से अलग होना जर्मन पहल के विरुद्ध कुछ तो संदेश देता है। संदेश यही है कि चीन-ताइवान पर न केवल जर्मनी और फ्रांस की दिशाएं अलग-अलग हैं बल्कि यूरोपीय एकता भी दिखावे की ही नजर आ रही है।

क्या इसका मतलब यह है कि यूरोपीय एकता के पैमाने देश और क्षेत्र सापेक्ष हैं? यानी किसी छोटे देश के लिए अलग, रूस के लिए कुछ और अलग तथा चीन के लिए पूरी तरह से अलग।

एक सवाल यह भी है कि बर्लिन की दीवार के गिरने और सोवियत संघ के बिखरने के बाद ग्लोबलाइजेशन के नाम पर अमेरिकी नेतृत्व में बाजारवादी पूंजीवाद के थोपे जाने के पश्चात भी क्या नैटो की प्रासंगिकता शेष थी? क्या नैटो के बने रहने तक शीत युद्ध को पूरी तरह से समाप्त माना जाना तकनीकी रूप से उचित था?

जो भी हो, फिनलैंड को शामिल कर यह संदेश देने की कोशिश हुई कि नैटो फौज में और 2,80,000 सिपाहियों के आने से रूस को और ज्यादा डरना शुरू कर देना चाहिए, लेकिन क्या ऐसा हुआ?

सच तो यह है कि उसी समय क्रेमलिन में शी चिनफिंग की उपस्थिति ने कुछ और ही संदेश दिया। परिणाम यह हुआ कि दुनिया इसके बाद यूरोप की तरफ कम और माँस्को-पेइचिंग की तरफ ज्यादा उत्सुकता से देखने लगी। इसका कारण भी है। पिछले एक साल से जो टकराव रूस और यूक्रेन के बीच चल रहा है, वह सही अर्थों में रूस-चीन बनाम अमेरिका और पश्चिम है। यूक्रेन तो केवल युद्ध का मैदान भर है।

हिंद-प्रशांत पर असर

देखना यह है कि इससे एशिया और इंडो-पैसिफिक (हिंद-प्रशांत) किस तरह से प्रभावित होंगे।

सच तो यह है कि यूरोप हो या रूस, वहां संपन्न होने वाली प्रत्येक गतिविधि हिंद-प्रशांत को प्रभावित करेगी।

वहीं, अगर रूस-चीन और पश्चिम के बीच टकराव यूक्रेन से बाहर निकलकर कुछ अन्य क्षेत्रों तक पहुंचता है, तो टारगेट कौन होगा? चीन और रूस या पेरिस और लंदन तो नहीं ही होंगे। फिर यूक्रेन जैसा कोई दूसरा देश होगा। अभी यह देश ताइवान ही लग रहा है।

एक बात और, वैश्विक अर्थव्यवस्था जब सुस्त पड़ी हो, तब यूरोप में बैठकर फिनलैंड के नैटो में शामिल होने का जश्न मनाना और सदस्य देशों पर जीडीपी का 2 प्रतिशत रक्षा खर्च करने का दबाव बनाना, कहां तक प्रासंगिक है। किसी की चिंता यूरोप में ऊर्जा संकट, लड़खड़ा रही सप्लाई लाइन, कोविड के खिलाफ अधूरी लड़ाई, बेरोजगारी और इन्फ्लेशन को लेकर क्यों नहीं दिख रही? आखिर नैटो देश कैसी विश्व व्यवस्था चाहते हैं? आज जर्मनी, इटली, तुर्किये, फ्रांस, ब्रिटेन आदि की अर्थव्यवस्थाएं अत्यधिक दबाव में हैं, जिससे यूरोपीय एकता दरकती हुई दिख रही है। लेकिन इन देशों का ध्यान युद्ध पर है।

चीन पर उलझन

अंतिम बात यह कि वुहान वायरस थिअरी के उभार और चीन की जीरो कोविड नीति की असफलता के बावजूद यूरोपीय देश चीन पर विश्वास को लेकर भ्रम की स्थिति में रहे। उन्होंने चीन से सामान की सप्लाई बेधड़क होने दी।

इसी की झलक है कि यूरोप में बैठकर नैटो के सदस्य देश चीन पर फोकस कर रहे हैं, जबकि उसी संगठन के कुछ देश चीन जाकर चिनफिंग के गले मिल रहे हैं।

अप्रैल की शुरुआत में यूरोपीय आयोग की प्रमुख उर्सुला फोन डेय लायन और मैक्रों तीन दिन की पेइचिंग यात्रा पर थे।

चीन से लौटने के बाद मैक्रों ने एक फ्रांसीसी अखबार से बातचीत में कहा कि ताइवान के मुद्दे पर यूरोपीय संघ को किसी ब्लॉक का हिस्सा नहीं बनना चाहिए। ब्लॉक से उनका अर्थ अमेरिका और चीन से था।

इसका मतलब साफ है कि अमेरिका अब यूरोप में दूसरे विश्वयुद्ध के ठीक बाद वाली स्थिति में नहीं है, नहीं तो चीन के मुद्दे पर यूरोप बंटा हुआ क्यों दिखता?

यदि यूरोप में अमेरिका को लेकर इतना रूखापन है तो फिर नैटो के विस्तार का अर्थ क्या है? क्या फ्रांस जैसा देश अमेरिका को यह बताना चाहता है कि बीते दो दशकों में चीन, यूरोपीय संघ की अर्थव्यवस्थाओं के लिए इंजन साबित हुआ है, जबकि अमेरिकी अर्थव्यवस्था डि-कपल्ड होकर अपने ही बोझ के नीचे दब चुकी है?

अब यदि यूरोप, चीनी अर्थव्यवस्था के साथ बेहतर बॉन्डिंग में (कपल्ड) है, तो वह चिनफिंग की रूस के साथ 'नो-लिमिट्स फ्रेंडशिप' को किस तरह देखना चाहेगा? ऐसा लगता है कि चीन-रूस की 'नो लिमिट्स' वाली मित्रता को जानने के बाद भी यूरोप चीन के लिए 'रेड लाइन' खींचने की हैसियत में नहीं है।

फिलहाल रूसी विरोध के जुनून ने अमेरिका और यूरोप को वहां लाकर खड़ा कर दिया है, जिसे एक नए शीत युद्ध का प्रस्थान बिंदु कह सकते हैं। इसके लिए दोषी केवल रूस नहीं है, अमेरिका, जर्मनी और ब्रिटेन भी हैं। है तो चीन भी, लेकिन वह यूरोप पर इतना भारी पड़ता दिख रहा है कि उसकी एकता भी उसके खिलाफ आदर्श के टोटके करती दिख रही है।

<https://blogs.navbharattimes.indiatimes.com/nbteditpage/europe-divided-on-china-over-taiwan-dispute-what-is-the-message-for-america/>

Science & Technology News



Press Information Bureau
Government of India

Ministry of Science & Technology

Mon, 17 Apr 2023

Union Minister Dr Jitendra Singh says, “YUVA PORTAL”, launched today will help in connecting and identifying potential young Start-Ups

While launching the NPL’s “One Week -One Lab” program in New Delhi, Dr Jitendra Singh again underlined that unless the Stakeholders' Participation is broad-based, particularly the Industry, the StartUps may not remain sustainable for want of proper industry mapping and right aptitude.

Hails the launching of the astronomy lab in Haryana’s Karnal and said it will provide level-playing field to all and even Divyangs can excel in various forms of skill, art and craft; Says, facility in different languages to start with will enable hearing impaired students to learn about sun, moon and stars apart from simple to complex concepts of space.

Union Minister of State (Independent Charge) Science & Technology; Minister of State (Independent Charge) Earth Sciences; MoS PMO, Personnel, Public Grievances, Pensions, Atomic Energy and Space, Dr. Jitendra Singh today launched “YUVA PORTAL”, which will help in connecting and identifying potential young Start-Ups.

While launching the NPL’s “One Week -One Lab” program in New Delhi, Dr Jitendra Singh again underlined that unless the stakeholders' participation is broad-based, particularly the Industry, the StartUps may not remain sustainable for want of proper industry mapping and right aptitude, he cautioned.

It may be recalled that Union Minister, Dr Jitendra Singh had launched “One Week- One Lab” campaign on 6th Jan 2023. Highlighting India's global excellence in technology, innovation and Start-Ups, Dr Jitendra Singh said each of the 37 CSIR (Council of Scientific & Industrial Research) Labs spread across the country is dedicated to a different exclusive area of work and the "on week, one lab" campaign will offer an opportunity to each one of them to showcase the work being done by it so that others can avail of it and stakeholders learn about it

Dr Jitendra Singh referred to PM’s address at 108th Indian Science Congress held in Nagpur this Tuesday, when he said, “We are also seeing the results of the scientific approach with which today's India is moving forward. India is fast becoming one of the top countries of the world in the field of science.

Dr Jitendra Singh also hailed the launching of the astronomy lab that has come up in Haryana’s Karnal and said it will provide level-playing field to all and even Divyangs can excel in various forms of skill,

art and craft. He said, the facility in different languages to start with will enable hearing impaired students to learn about sun, moon and stars, apart from simple to complex concepts of space.

It may be informed that the Indian Sign Language AstroLab has 65 pieces of equipment, including a large telescope, interactive models, audio visual aids, and fun fact posters and a 24 X 7 virtual access to stream over 90 videos, including biopics, hands-on demonstrations, fun facts, and explanatory videos about simple to complex concepts of space and science in Indian sign language.

Dr Jitendra Singh said, with today's program, in which all labs of Council of Scientific and Industrial Research (CSIR) will reach out to public to not only showcase their technologies but also to ignite the minds of young innovators, students, start-ups, academia, and industry to look for opportunities through deep tech ventures. In the "One Week, One Lab" campaign, in successive weeks, each of the CSIR labs is showcasing their exclusive innovations and technological breakthroughs to the people of India. The CSIR laboratories are unique and specialise in the specific areas which span from genome to geology, food to fuel, minerals to materials, and so on.

Dr Jitendra Singh recalled that CSIR-NPL is the custodian of Indian Standard Time (IST), generated using an atomic time scale consisting of Cesium atomic clocks and Hydrogen masers. Not just that, IST is kept traceable within a few nanoseconds to the international reference time UTC (coordinated Universal Time) using ultra-precise satellite links. Come and witness how CSIR-NPL keeps the nation's time ticking!

Did you know that the CSIR-NPL standardised the measurements of gas and airborne particles for monitoring atmospheric pollution?

CSIR-NPL Director, Prof Venugopal Achanta said, "CSIR-National Physical Laboratory (NPL) is going to organise the One Week- One Lab program from 17-21 April, 2023. The aim of this program is to create awareness about the available technologies and services present at NPL among potential stakeholders, to provide solutions to societal problems, to sensitise the masses about the importance of precise measurements and to develop the scientific temperament among masses especially amongst students who are the future of the country".

Dr Achanta said 180 schools of Delhi -NCR were exposed to NPL to labs for different activities and more and more schools will be thrown open for such open interactions in future.

It preserves and maintains the measurement standards of length, mass, temperature etc including the task of dissemination of the Indian Standard Time (IST). NPL is conducting multidisciplinary R&D with a mission to establish the futuristic quantum standards and upcoming technologies so that India remains on par with international measurement laboratories. It is developing sophisticated analytical equipment (i.e. import substitutes) under "Make in India" programme to cater the ever increasing demands of emerging India and training of young scientists and industry personnel in the area of measurements under "Skill India" programme.

From April 18-20, there will be three days of Start-up/MSME/Industry Meet. The aim of this event is to showcase various services extended by NPL to industries. In this event, all stakeholders have been invited whom NPL has helped/connected/provided technological support/ consultancy/ services. During this event each day, more than 20 industries will be joining where they will not only showcase their technologies/services (where NPL has contributed) but also talk about NPL's scientific and technological help they have received. Several other crucial issues will be discussed related to the innovation framework and ecosystem. MoUs with 4 new industry partners will be signed for technology transfer and development.

On 19th April, the Metrology Conclave will be organised where a Handbook on Advances in Metrology at CSIR-NPL will be released. CSIR-NPL's Role and Efforts in the field of Metrology, CSIR-NPL Road Map for Future and Developing National and International Collaborations, panel discussion are the other attributes of the metrology conclave.

On 20th April, R&D Conclave & Women in STEM is planned where eminent scientists of the NPL family and alumni will share their vision and showcase the role of CSIR-NPL in recent advancements in science and technology. The focus of this one-day event will be on Women's empowerment during the above-said event and a series of activities will be conducted by women scientists to discuss the recent trend in Research and Development, Challenges, and Opportunities for Women in STEM Careers. Also, there will be a documentary film to showcase renowned Women Scientists in India.

On 21st April, a one-day Skill Conclave will be held. The prime focus of the conclave is to sensitise/educate masses about CSIR-NPL's skill program and inspire locals by hosting various expert lectures and skill demonstrations in the fields related to all aspects of our lives. To train skilled manpower needed in the country by different industries, academia, and society, CSIR-NPL is carrying out, from time to time, many events.

For more details about CSIR-NPL and its "One Week One Lab" program, one can visit NPL website:

<https://www.nplindia.org/>. To participate, the interested may register for the event.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1917367>

Business Standard

Mon, 17 Apr 2023

Need for Cooperation among G20 Nations on Space Technologies: ISRO Chairman

ISRO chairman S Somanath on Monday said there was a need for cooperation among the G20 nations on space technologies.

Addressing the precursor meeting of the G20 Space Economy Leaders Meeting (SELM) in Shillong, he said the bilateral relationships between the countries on space technologies also need to be strengthened.

"There is a need for cooperation among the G20 nations for the development of space technology and its applications," he said.

Twenty-eight delegates from the G20 nations and guest countries attended the meeting. Global experts in the field were also present in the meeting.

Somanath said space applications for the benefit of mankind will increase many folds in the future, and it will play the role of an economic contributor and help the global economy.

He expressed optimism that the deliberations at the meeting will result in a fruitful outcome, and assist the space community at different levels. He also lauded the Northeastern Space Applications Centre for handling issues faced by the people of the region. During the technical session, the delegates discussed the perspectives of their countries on space economy.

Efforts by the different countries to promote space economy and the challenges were also discussed.

The Department of Space will organised the Space Economy Leaders Meeting in Bengaluru in July, and the precursor event to that was held in Shillong.

https://www.business-standard.com/technology/tech-news/need-for-cooperation-among-g20-nations-on-space-technologies-isro-chairman-123041700838_1.html

ThePrint

Tue, 18 Apr 2023

ISRO Wants to Send Civilian Scientists, Doctors to Space to Research Microgravity

India's first attempt to send human beings to space – the ambitious Gaganyaan mission – will be the first of many such crewed missions to space. The Indian Space Research Organisation is now drawing up a new criteria to recruit astronauts from outside the defence staff for its future missions.

According to Imtiaz Ali Khan, director of ISRO's Directorate of Human Spaceflight Programme, the government has given ISRO the approval for a sustained human spaceflight programme.

Khan was speaking at the 'Be Inspired: Festival of Ideas' held at the India International Centre in New Delhi Sunday.

"In follow-up missions, there will be women, there will be civilians from non-defence backgrounds, there will be doctors and scientists flying out to space," Khan said.

Khan added that other countries with space programmes are already doing this.

"If you see examples from other human space flight programmes, the people who fly are very diverse. If you notice, even age is not a very strict criterion today—people as old as 70 years old also go to space," he added.

Khan said the sustained crewed missions to space open up opportunities to study previously untapped fields of science in India — such as space chemistry and biology.

He noted that there are some kinds of drugs that can be perfected in microgravity environments.

"The astronauts will not only conduct experiments in space but will be subjects (of experiments) themselves," said Khan.

A sustained crewed mission will help researchers study the effects of microgravity on the human body, and subsequently help develop therapies that can be used to treat astronauts in the future who go on long-term, deep space missions.

"We need to develop new technologies like inflatable habitats and docking capsules. We are also having discussions with other space agencies to learn if we can dock to the existing space station," Khan added. He noted that the first uncrewed test mission is slated for January next year. The Gaganyaan mission will carry two to three astronauts aboard a space capsule some 400 kilometres above the Earth's surface. The capsule will stay in space for three days – during which the astronauts will carry out a set of planned experiments. Currently, a team in DRDO is working on developing food for the astronauts.

ISRO has also decided that the crew will not be referred to as 'astronauts'. They will be given a new moniker that suits Indian sensibilities.

<https://theprint.in/ground-reports/isro-wants-to-send-civilian-scientists-doctors-to-space-to-research-microgravity/1524270/>

Tue, 18 Apr 2023

नवभारत टाइम्स

2052 तक इंसानों की बराबरी कर लेंगी मशीनें

आज आर्टिफिशियल इंटेलिजेंस (AI) समाज में बदलाव ला रहा है। कई लोग इसके खतरों को लेकर बहस कर रहे हैं। टेस्ला के संस्थापक इलॉन मस्क और एपल कंप्यूटर्स के सह-संस्थापक स्टीव वॉजिनियाक जैसे टेक्नॉलजी की दुनिया के दिग्गज कह रहे हैं कि AI रिसर्च पर फिलहाल रोक लगा देनी चाहिए। वहीं, इटली ने ChatGPT पर बैन लगा दिया है। AI के जानकार टोबी वॉल्स ने हाल में 'मशीन बिहेविंग बैडली: द मोरैलिटी ऑफ AI' नाम की किताब लिखी है। उनसे AI को चल रही बहस और उन्हें रेग्युलेट करने की जरूरत पर बात की स्नेहा भुरा ने। पेश है इस इंटरव्यू के खास अंश:

■ आज टेक्नॉलजी को लेकर जो भी विमर्श चल रहा है, उसके केंद्र में ChatGPT जैसे जेनरेटिव AI मॉडल हैं। इस बारे में आप क्या सोचते हैं?

जिस तरह से पर्सनल कंप्यूटर और स्मार्टफोन की वजह से बड़े बदलाव हुए, ChatGPT भी वैसी ही क्रांतिकारी तकनीक है। डिजिटल डिवाइसेज के साथ हमारे संबंधों को लेकर इससे एक नई शुरुआत हुई है। इस क्रांति का मतलब यह है कि हम जो भी डिजिटल उपकरण इस्तेमाल कर रहे हैं, उन सबमें AI किसी न किसी रूप में आ रहा है या आएगा। हम जब इन उपकरणों से बात करेंगे तो वे हमें

जवाब देंगे। यह तकनीक हमारे कहने पर ऐसे काम भी करेगी, जिसमें इंसानी दिमाग लगता है। यह भी समझना होगा कि यह जेनरेटिव AI से कहीं आगे की चीज है। अभी हम ऐसा पहला उदाहरण देख रहे हैं, जहां AI से हमारी डिजिटल जिंदगी बेहतर हो रही है। क्या आपको याद है कि पर्सनल कंप्यूटर कैसे हमारे काम आ सकता है, यह हमने सीखा था। लेकिन AI की वजह से मशीनें यह सीखेंगी कि वह हमारे अधिक काम आ सकती हैं।

■ सैकड़ों जानकारों और साइंटिस्टों ने दुनियाभर की AI लैबोरेटरीज से तुरंत AI सिस्टम की ट्रेनिंग रोकने की अपील की है। उन्होंने कहा है कि GPT-4 से अधिक ताकतवर टेक्नॉलजी की ट्रेनिंग बंद की जाए। क्या इसका कुछ असर होगा?

मुझे भी इस चिट्ठी पर दस्तखत करने को कहा गया था, लेकिन मैंने मना कर दिया। इसमें 6 महीने तक स्वेच्छा से ट्रेनिंग रोकने की अपील की गई है, लेकिन इसे लोग नहीं मानेंगे। सच पूछिए तो हमें इस बारे में अधिक रिसर्च की जरूरत है। इसके साथ मैं यह भी कहना चाहूंगा कि टेक्नॉलजी कंपनियों को अधिक जवाबदेही के साथ AI का इस्तेमाल करना चाहिए। अगर आप AI तकनीक से लैस उपकरण लोगों को दें, फिर उनसे नुकसान पहुंचने के डर से वापस लें, यह ठीक नहीं होगा। अगर हम इस मामले



इंटरव्यू : टोबी वॉल्स

में सावधान नहीं रहेंगे तो यह वही गलती होगी, जो सोशल मीडिया को लेकर हुई। प्राइवैसी, लोकतंत्र और समाज पर सोशल मीडिया के असर को समझे बगैर लोगों के बीच लाया गया, जिसकी कीमत हम चुका रहे हैं। ■ आपने अपनी एक किताब में लिखा है कि 2062 तक इंसान (होमो सेपियंस), मशीन रूपी इंसान (होमो डिजिटलिस) में बदल जाएंगे। आज जब AI से लैस चैटबॉट जिस तरह से बेहतर हो रहे हैं, उसे देखते हुए क्या आप अपनी लिखी बात में कोई संशोधन करना चाहेंगे?

मैंने यह बात इस अर्थ में कही थी कि कब

तक कंप्यूटर, इंसानी बुद्धिमता की बराबरी कर लेंगे। इधर तकनीक में जो प्रगति हुई है, उसे देखते हुए लगता है कि 2052 में ही ऐसा हो जाएगा। मैं क्या इस बात से AI के क्षेत्र में काम करने वाले दूसरे कई जानकार भी सहमत होंगे। इसके साथ यह भी सही है कि इंसानों की बराबरी करने के लिए मशीनों को अभी कई अहम चीजें सीखनी हैं।

■ ChatGPT पर बैन लगाने वाला इटली दुनिया का पहला देश है। दूसरे देश भी इसे लेकर नियम तय करने में जुटे हैं। अगर बैन लगाना मुनासिब कदम नहीं है तो आने वाले वक्त में AI को किस तरह से सुरक्षित और फायदेमंद बनाया जा सकता है?

AI के जिम्मेदारी के साथ इस्तेमाल के लिए हमें नियम बनाने होंगे। OpenAI, माइक्रोसॉफ्ट और अल्फाबेट जैसी कंपनियां AI से लैस प्रोडक्ट्स लोगों के हाथ में दे रही हैं, जबकि उन्हें पता है कि इससे नुकसान हो सकता है। इस मामले में मैं सरकारों के रुख से हैरान हूँ। हम ऐसे नुकसान के कुछ उदाहरण देख चुके हैं। मिसाल के लिए, इन चैटबॉट्स ने लोगों पर अपराध के गलत इल्जाम लगाए। यही नहीं, हेट स्पीच और झूठी खबरों को फैलाने के लिए भी इनका बखूबी इस्तेमाल किया जा सकता है।

