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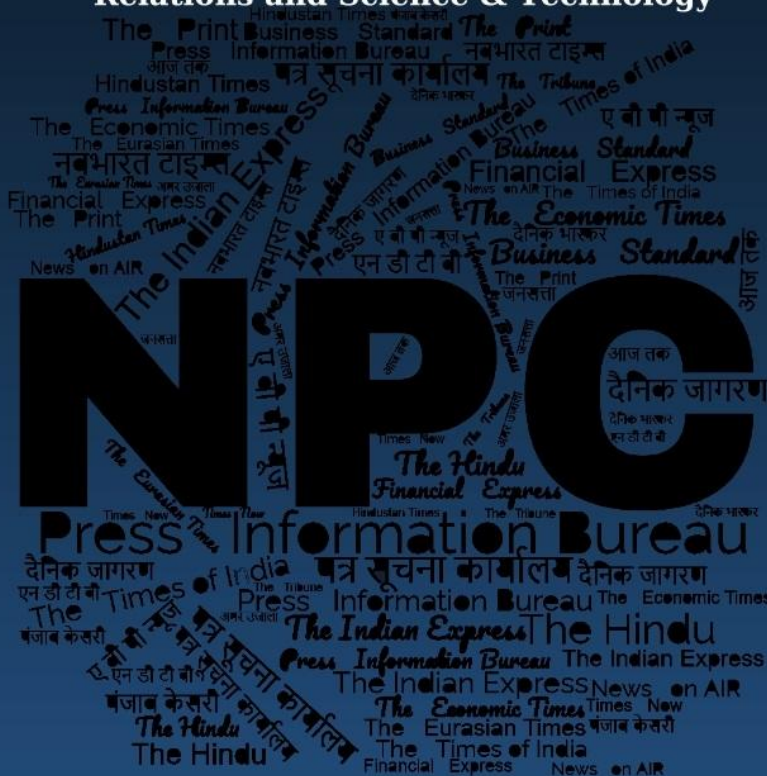
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CONTENTS

S. No.	Title	Source	Page No.
	DRDO News		1-1
1	Indian Navy Expands Its Logistics Fleet With ACTCM Barge For Warship Replenishment	<i>Swarajya</i>	1
	Defence News		2-9
	Defence Strategic: National/International		
2	DELIVERY OF 10th AMMUNITION CUM TORPEDO CUM MISSILE (ACTCM) BARGE, LSAM 24 (YARD 134)	<i>Press Information Bureau</i>	2
3	IAF carries out 'Exercise Aakraman' after Navy tests missile from INS Surat	<i>CNBC TV18</i>	3
4	AI in defence: India must act now, say experts	<i>The Week</i>	3
5	After the NGAD setback, Lockheed Martin regroups to give F-35, F-22 Raptor sixth-gen makeover	<i>The Week</i>	4
6	Fifth-generation fighter AMCA, LCA Tejas Mark-2 priority for govt, says Defence Minister Rajnath Singh	<i>The Week</i>	5
7	Grounded ALH Dhruv back in action briefly after Pahalgam terror attack?	<i>The Week</i>	6
8	Amid heightened tensions with Pakistan, Indian Navy strikes sea skimming target using MRSAM	<i>The Week</i>	6
9	Aerpace Industries Successfully Tests its First Defence Drone 'aerRecon ARM-5'; Strengthens Global Readiness Under Strategic Partnerships	<i>Business Standard</i>	7
10	India Sends Second Batch Of BrahMos Missiles To Philippines Via Sea Under \$375 Million Defence Export Deal	<i>Swarajya</i>	9
	Science & Technology News		10-23
11	Dr Jitendra Singh calls for greater synergy between innovation and industry for a sustainable StartUp ecosystem	<i>Press Information Bureau</i>	10
12	A DST institute, NECTAR showcases Innovative Aerostatic Drone for Enhanced Surveillance and Disaster Management	<i>Press Information Bureau</i>	11
13	International Conference “Shaping the Energy Future: Challenges and Opportunities” (SEFCO-2025) inaugurated at CSIR-Indian Institute of Petroleum, Dehradun	<i>Press Information Bureau</i>	13
14	Union Minister Dr. Jitendra Singh convenes a joint meeting of Department of Biotechnology, AIIMS New Delhi, BIRAC, ICMR and Industry partners to review the indigenously developed HPV test kits for Cervical	<i>Press Information Bureau</i>	14

Cancer screening in India Calls Scientific Review of
Indigenously Developed HPV Test Kits for Cervical
Cancer Screening,

- | | | | |
|-----------|---------------------------------------------------------------------------------------------------------------------|---------------------------------|----|
| 15 | India Achieves Breakthrough in Gene Therapy for Haemophilia, Dr. Jitendra Singh Reviews BRIC-inStem Trials | <i>Press Information Bureau</i> | 17 |
| 16 | “TDB-DST backs Nature-Powered Innovation: Supports ‘uBreathe Life’ for Indigenous Indoor Air Purification Solution” | <i>Press Information Bureau</i> | 18 |
| 17 | Indian A new method to reliably estimate Helium abundance in the Sun | <i>Press Information Bureau</i> | 19 |
| 18 | Indian researcher Dhiraj Sinha proposes new approach to understand photons | <i>News Nine</i> | 21 |
| 19 | One Material, Four Behaviors: Superconductor,Metal, Semiconductor, and Insulator | <i>SciTech Daily</i> | 21 |

DRDO News

Indian Navy Expands Its Logistics Fleet With ACTCM Barge For Warship Replenishment

Source: Swarajya, Dt. 23 April 2025,

URL: <https://swarajyamag.com/news-brief/indian-navy-expands-its-logistics-fleet-with-actcm-barge-for-warship-replenishment>

The Indian Navy on Tuesday (22 April) inducted the tenth Ammunition-Cum-Torpedo-Cum-Missile (ACTCM) Barge, designated LSAM 24 (Yard 134), at a ceremony held at the Naval Dockyard in Mumbai. The event was attended by Commodore A K K Reddy, Assistant General Manager (Production and Repairs), Naval Dockyard, Mumbai, who served as the Chief Guest.

The ACTCM barges are designed to support the Navy's operational requirements by facilitating the transportation, embarkation, and disembarkation of critical supplies such as ammunition, torpedoes, and missiles to naval platforms.

These operations can be conducted both alongside jetties and in outer harbours, thereby enhancing the Navy's logistics flexibility and rapid response capabilities. The contract for the construction and delivery of 11 ACTCM Barges was awarded on 5 March 2021 to Suryadipta Projects Pvt Ltd, an MSME shipyard based in Thane.

The barges have been indigenously designed by the shipyard in collaboration with an Indian ship design firm and were model-tested at the Naval Science and Technological Laboratory (NSTL), Visakhapatnam, to validate their seaworthiness.

Built in accordance with the Indian Register of Shipping's (IRS) Naval Rules and Regulations, these barges exemplify India's strides towards defence self-reliance.

With nine barges already delivered under the contract, the latest induction reflects the Navy's ongoing focus on strengthening its logistical backbone.

The shipyard has also been awarded a contract for construction and delivery of four Sullage Barges to the Indian Navy thereby highlighting the Indian Navy's commitment towards encouraging MSMEs, the Defence Ministry said in a statement.

"Induction of these Barges would provide impetus to operational commitments of Indian Navy by facilitating Transportation, Embarkation and Disembarkation of articles/ ammunition to Indian Navy platforms both alongside jetties and at outer harbours," the ministry said.

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Defence Strategic: National/International

DELIVERY OF 10th AMMUNITION CUM TORPEDO CUM MISSILE (ACTCM) BARGE, LSAM 24 (YARD 134)

Source: Press Information Bureau, Dt. 23 April 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2123750>

Induction ceremony of 10th ACTCM Barge, LSAM 24 (Yard 134) was held on 22 Apr 25 at Naval Dockyard, Mumbai. Chief Guest for Induction Ceremony was Cmde AKK Reddy, AGM(PR), ND(Mbi).

The contract for construction and delivery of eleven (11) Ammunition Cum Torpedo Cum Missile (ACTCM) Barges was concluded with M/s Suryadipta Projects Pvt Ltd, Thane on 05 Mar 21, an MSME Shipyard. The Shipyard has indigenously designed these Barges in collaboration with an Indian Ship Design firm and subsequently model tested at Naval Science and Technological Laboratory, Visakhapatnam successfully to ensure seaworthiness. These barges are built in accordance with relevant Naval Rules and Regulations of Indian Register of Shipping (IRS). These Barges are proud flag bearers of “**Make in India**” and “***Aatmanirbhar Bharat***” initiatives of Government of India. Nine ACTCM Barges have already been delivered and the shipyard has also been awarded a contract for construction and delivery of four Sullage Barges to the Indian Navy thereby highlighting the Indian Navy’s commitment towards encouraging MSMEs.



Induction of these Barges would provide impetus to operational commitments of Indian Navy by facilitating Transportation, Embarkation and Disembarkation of articles/ ammunition to Indian Navy platforms both alongside jetties and at outer harbours.

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IAF carries out 'Exercise Aakraman' after Navy tests missile from INS Surat

Source: CNBC TV18, **Dt.** 25 April 2025,

URL: <https://www.cnbctv18.com/india/iaf-carries-out-exercise-aakraman-after-indian-navy-indian-navy-successfully-tests-missile-ins-surat-pahalgam-terror-attack-19594184.htm>

Days after a deadly terror attack on tourists in Pahalgam, Jammu and Kashmir, the Indian defence forces are stepping up their operational posture. The Indian Air Force (IAF) is conducting 'Exercise Aakraman' in the central sector, involving frontline fighter aircraft such as the Rafale, Su-30MKI, and others.

According to sources, the exercise is part of routine preparedness drills. However, its timing—soon after the Pahalgam terror strike—has drawn public and strategic interest.

In a parallel show of strength, the Indian Navy on Thursday, April 24, successfully conducted a missile test from its newest indigenously built guided missile destroyer, INS Surat, in the Arabian Sea.

The warship launched a Medium Range Surface-to-Air Missile (MRSAM) that hit a low-flying, sea-skimming target with precision, showcasing India's advanced targeting capabilities and operational readiness.

The Navy described the test as a “significant milestone” in strengthening national defence. The killing of 26 tourists in the Pahalgam area of Anantnag district by terrorists on April 22 has sharply escalated tensions between India and Pakistan. Army Chief General Upendra Dwivedi is scheduled to visit Jammu and Kashmir on Friday. He is scheduled to meet senior Army commanders deployed in the Kashmir valley, along with officials of other security agencies. He will be reviewing the ongoing security situation in the valley and attempts by the Pakistan Army to violate the ceasefire along the Line of Control there, according to defence officials.

The Indian Army has so far effectively responded to firing by the Pakistan military at some places along the Line of Control in Jammu and Kashmir on Thursday night, PTI said, quoting military sources. No casualties have been reported so far.

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AI in defence: India must act now, say experts

Source: The Week , **Dt.** 24 April 2025,

URL: <https://www.theweek.in/news/defence/2025/04/24/ai-in-defence-india-must-act-now-say-experts.html>

Artificial Intelligence (AI) has permeated every sphere of life. While the debate around its advantages and disadvantages continues, when it comes to the defence of the country, this

technology is certainly a double-edged sword. In light of this, the Artificial Intelligence Law Hub, in collaboration with Pavan Duggal Associates, organised a roundtable discussion on 'Artificial Intelligence and Defence', focusing on the strategic integration of AI technologies into India's defence framework.

The main highlight of the discussion was that India cannot afford to remain a spectator in the global AI arms race. The speakers reiterated that AI will play a larger role in future conflicts.

Despite the growing role of AI globally, India still lacks a dedicated legal framework for AI in defence. "The Indian Information Technology Act is completely inadequate," observed Air Marshal Rajeev Sachdeva, adding, "We need to evolve distinctive legal frameworks because AI in defence is a completely different ballgame."

The experts also explored the dilemma of regulation versus operational freedom. Air Marshal Sachdeva noted, "Make any law you feel like but don't bind the military from doing what they need to do. Don't bring books in front of a soldier being stoned on the streets."

The need for indigenous AI infrastructure was another major topic. India lacks its own homegrown AI model and is heavily dependent on China (DeepSeek) and the US (ChatGPT or Gemini). The larger consequence of this is that when these foreign models are used, personal data is compromised. "There is zero silicon fab capability in the country right now. We use the same hardware as the commercial market," said Air Marshal Sachdeva, adding that while some advancements are expected by the end of the year, India must accelerate self-reliance.

Speakers stressed the importance of developing domestic Large Language Models (LLMs)—a type of AI model specifically designed to process, understand, and generate human language—tailored for defence. SLMs, or Small Language Models—AI models specialised in specific tasks and built with curated, selective data sources—were also highlighted.

The panel also emphasised how laws should be made to ensure that this data is not accessed by India's adversaries and foreign forces.

The roundtable was a powerful reminder that AI isn't just about machines—it is also about sovereignty. "Technology, innovation, and economy together make your militarily strong. When all three align, you become a global power," said one of the speakers.

With global players already advancing AI in warfare, India's defence leadership now faces a critical window to act, legislate, and innovate.

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After the NGAD setback, Lockheed Martin regroups to give F-35, F-22 Raptor sixth-gen makeover

Source: The Week, Dt. 24 April 2025,

URL: <https://www.theweek.in/news/defence/2025/04/24/after-the-ngad-setback-lockheed-martin-regroups-to-give-f-35-f-22-raptor-sixth-gen-makeover.html>

Lockheed Martin may have lost the race for the US Air Force's Next Generation Air Dominance (NGAD) programme to Boeing, but the company has no plans to relent.

The defence and aerospace manufacturer, which does not wish to protest the US Air Force's decision to award the NGAD contract to Boeing, intends to use the technology and knowledge it gained from the investments in NGAD race to enhance the capabilities of its fifth-generation fighter F-35 to make it transform it to fifth-generation-plus capability.

During the company's first-quarter earnings call, CEO Jim Taiclet said he challenged the team that was in the NGAD competition to deliver "80 per cent of sixth-gen capability at 50 per cent of the cost."

While it may be out of the sixth-gen fighter jet programme for the near future, Lockheed Martin will now focus on upgrading its F-35 and F-22 Raptor with sixth-gen technology, and according to Taiclet, they intend to take the F-35 chassis and turn it into a Ferrari.

"Eventually, there will be 3,500 of these (F-35) chassis out there at various stages of technology and capability. We think we can get most of the way to sixth-gen at half the cost."

He said this will provide the customers of the company, including the US Air Force, with the best possible value.

Reports suggest that the company plans to incorporate advanced manned-unmanned teaming (MUM-T) into the upgraded F-35s. MUM-T refers to the collaborative operation of manned and unmanned systems, where piloted aircraft like the fifth-gen F-35 work alongside drones and other autonomous platforms.

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Fifth-generation fighter AMCA, LCA Tejas Mark-2 priority for govt, says Defence Minister Rajnath Singh

Source: The Week, Dt. 24 April 2025,

URL: <https://www.theweek.in/news/defence/2025/04/24/fifth-generation-fighter-amca-lca-tejas-mark-2-priority-for-govt-says-defence-minister-rajnath-singh.html>

Defence Minister Rajnath Singh dubbed Light Combat Aircraft (LCA) Tejas, Advanced Light Helicopter Dhruv, Light Utility Helicopter Prachand, Akash and BrahMos Air Defence weapons as shining examples of the capability of Indian designers, engineers and scientists.

Delivering a memorial lecture on the Marshal of the Indian Air Force (IAF) Arjan Singh, the minister said aero-engine development is a priority area of the government in view of the needs of the IAF. The government, according to him, is paying special attention to the development of fifth-generation fighter aircraft (the Advanced Medium Combat Aircraft or AMCA) and LCA Mark-2.

He said the effort is to make the engine in India on the model of co-development and co-production with full intellectual property rights.

The defence minister hailed the self-reliance achieved in the air defence systems, including Astra Mark-2, Pralay, SMART, anti-field weapon, NG Anti-radiation missile, and Very Short Range Air Defence System, that are at various stages of production and development.

Today, not only has there been unparalleled growth in defence manufacturing in the public sector, the private sector is also participating with great enthusiasm, Singh said, adding, "As the field of defence production is becoming technology-oriented, the role of start-ups and MSMEs is also

increasing rapidly. These are proving to be the backbone of defence innovation. In the times to come, the role of the private sector, start-ups and MSMEs in high-tech warfare is going to increase even more."

He emphasised that the government's thrust is on transforming the country's armed forces on the back of a self-reliant defence ecosystem.

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Grounded ALH Dhruv back in action briefly after Pahalgam terror attack?

Source: The Week, Dt. 25 April 2025,

URL: <https://www.theweek.in/news/defence/2025/04/23/grounded-alh-dhruv-back-in-action-briefly-after-pahalgam-terror-attack.html>

In the wake of the dastardly terrorist attack in Pahalgam in Jammu Kashmir which left as many as 26 people dead, a few Advanced Light Helicopter (ALH) Dhruv have been allowed to operate in the areas around Srinagar.

The entire fleet of Dhruv choppers was grounded since January 5, 2025, after a fatal crash of a Coast Guard ALH Mk III at Porbandar airport in Gujarat in which three people were dead. The Indian Army, Navy, Air Force and Coast Guard together operate around 330 ALHs.

It was reported earlier this month that the grounding of the choppers would continue for another three months as the cause of the January accident is yet to be ascertained.

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Amid heightened tensions with Pakistan, Indian Navy strikes sea skimming target using MRSAM

Source: The Week, Dt. 25 April 2025,

URL: <https://theprint.in/defence/day-after-pakistan-issued-notam-for-arabian-sea-indian-navy-strikes-skimming-target-using-mrsam/2602135/>

A day after Pakistan issued a Notice to Airmen/Mariners (NOTAM) warning for the Arabian Sea and launched a naval live fire exercise, Indian Navy Thursday engaged a sea-skimming target using a Medium Range Surface to Air Missile (MRSAM).

"#IndianNavy's latest indigenous guided missile destroyer #INSSurat successfully carried out a precision cooperative engagement of a sea-skimming target, marking another milestone in strengthening our defence capabilities," Indian Navy's official X handle posted.

The previous day, Pakistan had issued the NOTAM with coordinates in the Arabian Sea near its territorial waters for 24 and 25 April, as reported by ThePrint. Pakistan Navy was also reportedly set to conduct a surface-to-surface missile test in the Arabian Sea. But there was no clarity at the time of filing this report whether the test had been conducted or not.

Explaining the nature of the Indian operation, a source in the defence and security establishment told ThePrint, “Precision cooperative engagement against sea-skimming targets involves more than one naval asset sharing real-time data to create an integrated, highly accurate tracking and engagement of an aerial target that could be flying about 10–20 metres above sea level.”

The source added that this approach, known as Cooperative Engagement Capability (CEC), enables a networked system that allows rapid action even if the target is initially detected by only one platform.

Indian Navy, in a press statement, said, “This achievement demonstrates India’s growing prowess in indigenous warship design, development, and operations, and underscores the nation’s commitment to self-reliance in defence manufacturing.” This development comes at a time when India and Pakistan’s already strained relations have taken a further plunge following a terror attack in Kashmir’s Pahalgam, which killed 26 people.

India’s Defence Minister Rajnath Singh said Thursday that India cannot be intimidated by such terrorist activities and that the central government would not only catch hold of those who carried out the attack but also those who were operating from behind the scenes.

In a briefing held later that day, Foreign Secretary Vikram Misri, following the Cabinet Committee on Security meeting, cited “cross-border linkages” of the attackers.

In a diplomatic response, the Centre has put the Indus Water Treaty in abeyance. Additionally, the Integrated Check Post at Attari has been closed with immediate effect. Misri also announced that Pakistani nationals would no longer be permitted to travel to India under the South Asian Association for Regional Cooperation (SAARC) Visa Exemption Scheme (SVES).

Moreover, defence, naval, and air advisers posted at Pakistani High Commission in New Delhi have been declared ‘persona non grata’. They have been given one week to leave the country. India too will withdraw its advisers from the Indian High Commission in Islamabad. The overall strength of both High Commissions will be reduced from 55 to 30 from 1 May, Misri said.

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Aerpace Industries Successfully Tests its First Defence Drone 'aerRecon ARM-5'; Strengthens Global Readiness Under Strategic Partnerships

Source: Business Standard,

Dt. 22 April 2025,

URL: https://www.business-standard.com/content/press-releases-ani/aerpace-industries-successfully-tests-its-first-defence-drone-aerrecon-arm-5-strengthens-global-readiness-under-strategic-partnerships-125042201170_1.html

India's efforts to strengthen its homegrown defence technology quietly took a promising step forward this week, as Mumbai-based Aerpace Industries Limited successfully completed field testing of its latest surveillance drone, aerRecon ARM-5. The test marks an important milestone in

the company's journey to develop intelligent, unmanned systems that can support defence operations both in INDIA and UAE

The drone, developed in collaboration with aerpace Robotics Private Limited, has been built to operate in tough and often unreachable areas--think high-altitude terrains, remote borders, and sensitive regions where sending human troops can be risky or nearly impossible. It's designed to quietly monitor these zones, gather vital intelligence, and return--all without putting lives in danger.



During the recent trial, the aerRecon ARM-5 performed a series of successful manoeuvres. It took off and landed vertically, without the need for a runway and reached speeds of up to 125 km/h while in forward flight. It also carried different types of surveillance equipment, proving it can adapt to a variety of missions. Its smooth transition between vertical and forward flight showed strong promise for real-world deployment in the field.

"This is a defining moment for us," said Ravi Soni, Executive Director at aerpace Industries Limited. "With aerRecon ARM-5, we're proving that India can build world-class drone systems that are not only smart and autonomous, but also ready for international defence use. More importantly, we're building technology that saves lives--by going where humans shouldn't."

The aerRecon ARM-5 is part of aerpace's larger aerShield program, which focuses on defence and tactical drone solutions. This successful test also positions the company to move into the next phase of its agreement with the UAE based prominent defence company, which includes supplying advanced drone systems tailored to specific operational needs.

Aerpace Industries, in recent years has been expanding across verticals, including drones based cargo delivery, solar innovations under the name aerVolt, and now, a growing portfolio of defence solutions.

By combining AI, sustainable engineering, and field-tested design, aerpace says its mission is to build an aerial ecosystem that is safe, smart, and ready to serve both civilian and national security needs.

As countries around the world race to modernise their defence strategies, India's private sector is beginning to show that it, too, can deliver cutting-edge solutions with global relevance. The aerRecon ARM-5 may be just one drone--but for aerpace, it's a sign that the future is airborne.

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India Sends Second Batch Of BrahMos Missiles To Philippines Via Sea Under \$375 Million Defence Export Deal

Source: Swarajya, Dt. 21 April 2025,

URL: <https://swarajyamag.com/news-brief/india-sends-second-batch-of-brahmos-missiles-to-philippines-via-sea-under-375-million-defence-export-deal>

India has sent the second batch of BrahMos supersonic cruise missile systems to the Philippines, reinforcing its expanding position in the international defence market, *Economic Times* reported.

This transaction, succeeding the initial delivery in April 2024, aligns with India's wider strategy to strengthen its defence capacity and exports, especially in light of escalating security issues in the Indo-Pacific region.

In January 2022, the Philippines entered into an agreement with India to acquire three BrahMos missile batteries. The BrahMos system, globally recognised as one of the most advanced cruise missiles, boasts a range of 290 kilometers and a speed of 2.8 Mach, which is approximately 3,400 km/h or three times the speed of sound.

The versatility of these systems is notable as they can be launched from various platforms including submarines, ships, aircraft, or land. This acquisition significantly bolsters the security of the Philippines amid escalating tensions in the South China Sea.

The second installment of the BrahMos batch, part of a \$375 million agreement between the two countries, has been shipped via sea, unlike the first battery which was transported by an Indian Air Force aircraft with assistance from civil aircraft agencies in April 2024.

India has also taken steps to provide training for military personnel in the Philippines. In February 2023, a group of 21 officers from the Philippine Navy received instruction on how to operate and maintain missile systems. This training equipped them with the crucial skills necessary to effectively manage and utilize this advanced technology.

India's 'Make in India' initiative, which emphasises the country's self-reliance in military production, considers defence exports as a crucial component. The Union Defence Minister Rajnath Singh has outlined a bold aim for this sector.

He states that defence production should exceed Rs 1.60 lakh crore this year, with a goal to manufacture defence equipment worth Rs 3 lakh crore by 2029. The rapid growth of this sector is evident as the value of India's defence production has already escalated from Rs 40,000 crore in 2014 to over Rs 1.27 lakh crore.

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Science & Technology News

Dr Jitendra Singh calls for greater synergy between innovation and industry for a sustainable StartUp ecosystem;

Startup Ecosystem must link all stakeholders together to become globally competitive: Dr. Jitendra Singh

‘Time to Open the Gates’: Union Minister Calls for Science-Industry Synergy at Hyderabad Conclave

Agriculture is India's exclusive and relatively under-explored domain, says Minister

Hyderabad Startup Meet Marks Shift Toward Inclusive Innovation, Says Dr. Jitendra Singh

Source: Press Information Bureau, Dt. 22 April 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2123497>

In a spirited call for greater synergy between innovation and industry for a sustainable StartUp ecosystem, Union Minister of State (Independent Charge) for Science and Technology; Earth Sciences and Minister of State for PMO, Department of Atomic Energy, Department of Space, Personnel, Public Grievances and Pensions, Dr. Jitendra Singh said that the time has come for Indian science to break silos and integrate with stakeholders including industry, investors, and the public.

Speaking at the Startup Conclave jointly organized by CSIR-IICT, CSIR-CCMB, and CSIR-NGRI in Hyderabad, Dr. Jitendra Singh highlighted that India's moment in science and innovation has arrived.

Addressing a gathering of scientists, entrepreneurs, students, and policymakers, Dr. Jitendra Singh lauded the rare joint initiative by the three Hyderabad-based CSIR labs, noting that “such an integrated scene of science and governance under one roof” reflects Prime Minister Narendra Modi's vision of collaborative and inclusive innovation.

The Minister made a strong pitch for dismantling the outdated image of government labs as “ghost-haunted places where frogs are dissected,” narrating how villagers once misunderstood the work of CSIR labs due to lack of public outreach. “Science should not be confined behind gates. If your domain is agriculture, invite the farmers in. Let them see what you're doing,” he asserted.

Dr Jitendra Singh underlined the need for early and deep industry involvement in research and innovation, pointing to the success of CSIR's Aroma Mission, where over 3,000 youth, many of them non-graduates, became successful agri-entrepreneurs with minimum annual earnings of ₹60 lakh. “That's the real transformation—a blend of technology, livelihood, and dignity,” he said.

Referring to India's rapidly growing biotechnology sector, Dr. Jitendra Singh recalled that in 2014, there were only 50 biotech startups. Today, the number exceeds 10,000. “It's not just numbers.

We've moved from \$10 billion to nearly \$170 billion in biotech valuation. This is not just growth, it's a revolution," he said, citing the government's dedicated policies like Bio-E3 and the National Quantum Mission.

Dr. Jitendra Singh expressed concern over internal compartmentalization within CSIR and even within his own Ministry. He revealed that he now holds monthly joint meetings of all science departments including Atomic Energy, Space, and Biotechnology, to ensure overlapping initiatives are integrated rather than duplicated. "How can we compete globally if we don't even know what our neighbouring lab is doing?" he questioned.

The Minister also announced plans to open up the nuclear sector, noting that a new realism has replaced the secrecy that once shrouded scientific endeavours. "When Google can peek into our lives, what's the point of denying access to potential collaborators in the name of confidentiality?" he asked.

The Minister made a compelling case for realistic, demand-driven innovation. "Let the industry do the mapping. Let them invest from day one. If they put in ₹20, they'll make sure your startup doesn't fail," he said, encouraging researchers to see industry not just as a customer but as a co-investor.

In a candid remark, Dr. Jitendra Singh acknowledged that while the government has significantly increased support—CSIR and DSIR budgets have risen over 230% since 2014—true sustainability lies in self-sufficiency and public-private collaboration. "You can start a startup, but sustaining it is the challenge. Social and economic security must match the aspiration," he said.

Concluding his address, Dr. Jitendra Singh emphasized that Hyderabad, with its unique blend of scientific legacy and tech-savvy spirit, is best positioned to lead India's science-led development agenda. "This is not just about Hyderabad or about CSIR. This is about India stepping out of the shadows and leading the global innovation narrative," he said.

The event, held at a time when India's Global Innovation Index has jumped from 81 to 39 in less than a decade, marked a decisive moment in the Centre's mission to democratize science, empower youth, and position India as a global innovation powerhouse.

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A DST institute, NECTAR showcases Innovative Aerostatic Drone for Enhanced Surveillance and Disaster Management

Source: Press Information Bureau, Dt. 22 April 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2123451>

Forest surveillance, wildlife monitoring, border and disaster surveillance in the North East, may soon be much easier -- thanks to the Aerostatic Drone developed with support from North East Centre for Technology Application and Reach (NECTAR).

NECTAR, an autonomous body under Department of Science and Technology, Government of India organized a live demonstration of the technology developed by Airbotix Technologies, Gurgaon.

It is the first of its kind in India, designed with high endurance and aero-statically stable capabilities to deploy for forest surveillance, wildlife monitoring, border and disaster surveillance application. Aerostatic drones are aerial platforms that derive their lift from both buoyancy and aerodynamics.

This makes them very energy efficient making them a better alternative for tethered drones. Aerostatic drones are silent as they do not require constant thrust to stay afloat, making them cost-effective and versatile solution for providing persistent surveillance.



Fig: Aerostatic Drone for Enhanced Surveillance and Disaster Management

The aerostatic drone provides a silent aerial platform that can persistently stay afloat for surveillance with an endurance of over 4 hours. The system is designed to be modular and could be integrated with any ground vehicle or can be installed at any site. The drone can be utilized for a variety of use cases such as wildlife monitoring, forest surveillance, crowd monitoring, border security and disaster surveillance to name a few.

The flexibility to equip the drone with both day and night camera as well as any other payload such as telecommunication relay and anti-drone payload. The Day and Night Vision Camera cameras further enhances its utility, especially in tracking monitoring forests for illegal activities such as poaching, smuggling and logging, as well as by providing support for security operations along borders.

Participants from various organizations interacted with Airbotix Technology about the drone's technical capabilities. The Drone has features related to surveillance using thermal imaging and detection capabilities.

Officials from the CRPF showing a keen interest in how the drone could enhance their operations, particularly in border surveillance and security in challenging terrains. The ability of the drone to

operate in both daylight and low-visibility conditions using thermal cameras could be a significant asset for security personnel.

The drones could play a crucial role in monitoring forest health and wildlife populations, enabling conservationists to track animal movements and assess habitat conditions without disturbing the ecosystem as they are silent. In military and security contexts, aerostatic drones are employed for ISR missions, providing real-time data and situational awareness, which enhances strategic planning and operational effectiveness. Furthermore, as they have very little metal components, they are practically invisible to the RADAR.

Aerostatic drones can serve as temporary communication relays in remote areas or during emergencies, ensuring connectivity where traditional infrastructure may be lacking or compromised. Aerostatic drones can also be integrated into systems designed to detect unauthorized drone activity, enhancing security measures at sensitive locations such as airports and military bases.

During public events, these drones could assist law enforcement by monitoring crowd behavior, helping to ensure safety and manage potential disturbances effectively. Moreover, they can be utilized to monitor traffic conditions in urban areas, providing valuable data for traffic management systems and aiding in the reduction of congestion through real-time information dissemination.

The officials from Brahmaputra Board expressed their keenness to use the aerostatic drone for disaster management and for monitoring civil construction such as roads.

The Aerostatic Drone is expected to be a game-changer in its field, with its versatility and high-performance features setting a new standard for unmanned aerial vehicle technology in India.

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International Conference “Shaping the Energy Future: Challenges and Opportunities” (SEFCO-2025) inaugurated at CSIR-Indian Institute of Petroleum, Dehradun

Source: Press Information Bureau, Dt. 23 April 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2123894>

CSIR-Indian Institute of Petroleum, Dehradun is organising an International Conference “Shaping the Energy Future: Challenges and Opportunities” (SEFCO-2025) from April 23 to 25, 2025. SEFCO conference is annually organized by students and young scientists at CSIR-IIP, Dehradun which is a platform to facilitate discussions on innovative solutions, explore collaborative opportunities in energy & chemical sector.

1st edition of “SEFCO” Conference was organized in 2017. The present 7th edition is an international conference with a theme of “**Catalysing a Sustainable Future with Affordable Energy and Chemicals.**”

The inauguration ceremony of SEFCO held on 23 April 2025 was graced by Chief Guest Prof. K.K. Pant, Director, IIT Roorkee and Guest of Honour Sh Alok Sharma, Director (R&D), Indian Oil Corporation Ltd. Dr. Manoj Srivastava, Secretary, SEFCO 2025 in his opening remarks gave an overview of genesis and relevance of SEFCO and its journey since inception. Dr. Harender Singh Bisht, Director, CSIR-IIP and Chief Patron of the conference, after paying homage to his holiness Pope Francis, welcomed distinguished guests and delegates and highlighted work done at CSIR-IIP and shared his vision on the way forward.

Sh Alok Sharma in his guest of honour address highlighted the approaches and measures adopted by Indian refineries towards achieving GoI's net-zero goal by 2070.

In his keynote address, Chief guest Prof. K K Pant emphasized various pathways of producing green and sustainable energy and chemicals. He also mentioned that new challenges emerge when the technologies are scale-up from lab to commercial level. He inspired young researchers to think out of box to overcome these challenges.

This 3-day conference will feature talks from various national and international experts, young scientists and research students from universities, research institutes and industries. Notable International speakers include Prof. Paul A. Webley from Monash University, Australia; Dr. Richard Blom from SINTEF, Norway; Prof. Samira Siahrostami, Simon Fraser University, Canada; Prof. Keiichi Tomishige, Tohoku University, Japan, and Prof. Eric van Steen, SARChI Reaction Engineering, University of Cape Town, South Africa.

More than 300 delegates from various national and international organizations are attending the conference. An exhibition showcasing CSIR-IIP's technological achievements is part of this conference. SEFCO-2025 is supported by ONGC, EIL, BPCL, CRISTOL, IOCL, GAIL, AIRBUS, NRL, CPCL & R L Solutions.

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**Union Minister Dr. Jitendra Singh convenes a joint meeting of
Department of Biotechnology, AIIMS New Delhi, BIRAC,
ICMR and Industry partners to review the indigenously
developed HPV test kits for Cervical Cancer screening in
India Calls Scientific Review of Indigenously Developed HPV
Test Kits for Cervical Cancer Screening,**

Describes it as a Milestone in Preventive Healthcare:

**With 1 in every 5 women globally suffering from cervical cancer is from India.
With 25% of global cervical cancer deaths occurring in India— often due to
late diagnosis— Dr. Jitendra Singh stresses the critical need for preventive
screening strategies**

Lauds involvement of the private sector is integral to these success stories, highlighting a "whole-of-science and whole-of-government approach."

Ultimate objective is to enable affordable, accessible, and ideally mass screening for cervical cancer highlights Dr. Jitendra Singh

Dr. Jitendra Singh calls it national responsibility to safeguard our youth and offer them timely prevention of metabolic disorders

Source: Press Information Bureau, Dt. 23 April 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2123856>

Union Minister of State (Independent Charge) for Science and Technology, Minister of State (Independent Charge) for Earth Sciences, MoS PMO, Department of Atomic Energy and Department of Space, MoS Personnel, Public Grievances and Pensions, Dr. Jitendra Singh today convened a joint meeting of Department of Biotechnology, AIIMS New Delhi, BIRAC, ICMR and Industry partners here to review the indigenously developed HPV test kits for Cervical Cancer screening in India and described it as another milestone in preventive healthcare achieved by the Department of Biotechnology (DBT) under the Ministry of Science & Technology.

Dr. Jitendra Singh emphasized that the ultimate goal is to position India as a global leader in preventive healthcare. He said it is now the right time to acknowledge a series of significant milestones accomplished by the team at DBT and BIRAC, including the development of the first-ever DNA vaccine, which brought India international recognition and restored esteem to Indian science in the field of healthcare.

"The DNA vaccine has projected India as a country capable of leading in preventive healthcare—a stark contrast to the outdated perception that India neither prioritized preventive, nor even curative healthcare," said Dr. Jitendra Singh.

He also referred to Nafithromycin, India's first indigenous antibiotic, which has received encouraging feedback. Dr. Jitendra Singh reiterated that the involvement of the private sector is integral to these success stories, highlighting a "whole-of-science and whole-of-government approach."

Another breakthrough cited was the successful gene therapy trial in hemophilia, which earned a spot in the prestigious New England Journal of Medicine (NEJM). Notably, both the British Medical Journal and NEJM, among the world's oldest medical journals, have acknowledged India's pioneering healthcare research.

Dr. Jitendra Singh outlined four pillars of focus namely 1. Preventive Healthcare – As the future of healthcare lies in prevention, this will be the government's primary focus moving forward. 2. Youth-Centric Preventive Measures – Recognizing the prevalence of cervical cancer among adolescents and young women, emphasis will be on early-age interventions. 3. Women's Health – Strengthening government initiatives across ministries, including Health and Women & Child

Development. 4. Private Sector Involvement – Building an ecosystem where government and private players collaborate domestically and globally.

Dr. Jitendra Singh coined the term “PPP plus PPP”, referring to Public-Private Partnerships both within and beyond national borders, a model successfully adopted by several European nations, particularly in life sciences and healthcare.

Dr. Jitendra Singh drew attention to India ranking fourth globally in cervical cancer-related morbidity, underscoring the urgent need for action. He cautioned, however, that HPV is not the sole cause of cervical cancer, but studies have shown a 90% correlation, supporting the case for targeted prevention.

The Minister said that the ultimate objective is to enable affordable, accessible, and ideally mass screening for cervical cancer. He cited his own example from 1996 of providing free insulin treatment for Type 1 diabetes through charitable collaboration with Novo Nordisk, illustrating how private companies can contribute meaningfully.

Dr. Jitendra Singh also remarked that discussions around vaccines have surged post-COVID, but emphasized the need for holistic prevention, including social, cultural, and hygienic habits—the traditional pillars of public health education.

The GCI-BIRAC-DBT program titled “Validating Indigenous Human Papilloma Virus (HPV) Tests for Cervical Cancer Screening in India” successfully validated rapid, point-of-care, RT-PCR-based HPV diagnostic test kits. These kits were tested at premier R&D laboratories across the country.

According to WHO data, 1 in every 5 women globally suffering from cervical cancer is from India. With 25% of global cervical cancer deaths occurring in India—often due to late diagnosis—Dr. Jitendra Singh stressed the critical need for preventive screening strategies.

The Minister pointed out that current screening methods, including VIA/VILI, Pap smears, and HPV DNA testing, are costly, resource-intensive, and moderately sensitive. The new indigenous kits are expected to significantly reduce the cost and improve accessibility for widespread use.

Tying the initiative to Prime Minister Narendra Modi’s vision of Viksit Bharat 2047, Dr. Jitendra Singh said India is now addressing multiple challenges simultaneously. With over 70% of India’s population below the age of 40, Dr. Singh raised concerns about rising non-communicable diseases, including early-onset Type 2 diabetes, once considered a disease of the middle-aged.

“It becomes a national responsibility to safeguard our youth and offer them timely prevention if we truly aim to harness their energy for building the India of 2047,” Dr. Jitendra Singh asserted.

The Minister concluded by urging continued cross-sector collaboration to ensure that the benefits of science reach the common public, making healthcare not just accessible, but affordable and proactive.

The review meeting was attended by several key dignitaries and domain experts. Dr. V.K. Paul, Member, NITI Aayog; Dr. Rajesh Gokhale, Secretary, Department of Biotechnology (DBT); Jitendra Kumar, Managing Director, BIRAC; and Padma Shri Dr. Neerja Bhatla, a renowned expert in gynecologic oncology, were present and contributed valuable insights to the review proceedings.

Prior to the commencement of the scientific review, a two-minute silence was observed to pay solemn tribute to the lives lost in yesterday's terror attack in Pahalgam. The gathering expressed deep condolences and solidarity with the families of the victims.

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India Achieves Breakthrough in Gene Therapy for Haemophilia, Dr. Jitendra Singh Reviews BRIC-inStem Trials

“Not Just Science, It’s Nation-Building”: Minister Hails Biotech’s Role in Future Economy

From Lab to Life: Bengaluru’s BRIC-inStem Leads India’s Bio-Revolution with Gene Therapy, Regenerative Science

Source: Press Information Bureau, Dt. 24 April 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2124073>

Union Minister of State (Independent Charge) for Science and Technology; Earth Sciences and Minister of State for PMO, Department of Atomic Energy, Department of Space, Personnel, Public Grievances and Pensions, Dr. Jitendra Singh inspected the various facilities at BRIC-inStem and reviewed ongoing clinical trials in collaboration with premier medical institutes and hospitals, including the landmark first-in-human gene therapy trial for Haemophilia conducted with CMC Vellore. Calling it a “milestone in India’s scientific journey,” the Minister hailed the institute’s contributions to preventive and regenerative healthcare.

During his visit, Dr. Jitendra Singh underscored the strategic importance of biotechnology in shaping India’s future economy and public health infrastructure. “This is not just about science—it’s about nation-building,” he said, commending the Department of Biotechnology’s (DBT) recent successes and its emergence from relative obscurity into national relevance.

India’s biotechnology sector has seen an extraordinary leap, growing 16-fold in the past decade to reach \$165.7 billion in 2024, with a vision to touch \$300 billion by 2030. The Minister credited this growth to enabling policy reforms, including the recently approved BIO-E3 Policy that aims to boost economy, employment, and environment through biotechnology. “We now have over 10,000 biotech startups compared to just 50 a decade ago,” he pointed out.

Dr. Jitendra Singh praised the creation of the Biotechnology Research and Innovation Council (BRIC) that unified 14 autonomous institutions under one umbrella. “BRIC-inStem is at the cutting edge of fundamental and translational science,” he said, highlighting innovations like the germicidal anti-viral mask during the COVID-19 pandemic and the ‘Kisan Kavach’ that protects farmers from neurotoxic pesticides.

A highlight of the visit was BRIC-inStem’s Biosafety Level III laboratory, a key national facility for studying high-risk pathogens under India’s One Health Mission. “The recent pandemic taught us that we must always be prepared. Facilities like this will help us stay a step ahead,” Dr. Jitendra Singh stated.

The Minister also praised the newly launched Centre for Research Application and Training in Embryology (CRaTE), which addresses birth defects and infertility by advancing developmental

biology research. “With about 3 to 4 percent of babies born with some form of defect, this centre is vital for improving maternal and neonatal health outcomes,” he said.

Calling for greater collaboration between scientific and medical institutions, he suggested that BRIC-inStem explore MD-PhD programs, integrate more with clinical research, and enhance visibility through coordinated communication strategies. “What’s being done here should echo across the country—not for publicity, but because the nation needs it,” he said.

Dr. Jitendra Singh concluded by noting that India’s economy of the future would be bio-driven, with institutions like BRIC-inStem serving as torchbearers of this transformation. “As Mark Twain said, the economy is too serious a subject to be left to economists alone. Biotechnology is not just a science anymore—it is a pillar of our national strategy.”

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“TDB-DST backs Nature-Powered Innovation: Supports ‘uBreathe Life’ for Indigenous Indoor Air Purification Solution”

“Clean Air, Made in India: TDB-DST Funds Urban Air Labs' Wall-Mounted Plant-Based Air Purifier to Boost Indoor AQI”

Source: Press Information Bureau, Dt. 24 April 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2124065>

The Technology Development Board (TDB), under the Department of Science and Technology (DST), has taken a significant step toward advancing indigenous clean air technologies by extending financial support to M/s Urban Air Labs Private Limited, Gurugram, for their project titled “Development & Commercialization of a Made in India Efficient Wall-Mounted Air-Purification System for Indoor Premises.” This strategic intervention marks a commitment to improve the Air Quality Index (AQI) indoors through innovative, plant-based purification systems that remove both particulate and gaseous contaminants.

TDB’s financial assistance to this promising startup underscores its confidence in the project’s potential to deliver sustainable, science-backed air purification solutions. The support aims to promote innovation in climate-responsive technologies while strengthening India’s self-reliance under the ‘Make in India’ and ‘Atmanirbhar Bharat’ missions.

The core technology harnessed in this product blends natural plant-based filtration with advanced engineering. Based on the ‘**Urban Munnar Effect**’ and a patented innovation called ‘**Breathing Roots**’, the system enhances the natural air-purifying capacity of leafy indoor plants.

Air from the room is pulled toward the plant leaves, then directed into the soil-root zone, where the purification process intensifies. The device features a centrifugal fan that creates suction pressure,

allowing the purified air—processed through the roots—to be released in 360 degrees across the indoor space.

Fitted within a specially designed planter box, the ‘**uBreathe Life**’ system stands out as a compact, aesthetic, and effective wall-mounted solution tailored for homes, offices, hospitals, and other indoor environments. It directly addresses the growing public health concern over poor indoor air quality and represents a game-changing innovation in the field of sustainable air purification.

Speaking on the occasion, Sh. Rajesh Kumar Pathak, Secretary, TDB, said, “TDB’s support to Urban Air Labs reflects our mission to back indigenous solutions that address pressing environmental challenges. The fusion of biotechnology and engineering in this project offers a scalable, sustainable way to enhance indoor air quality, aligned with the nation’s clean technology goals.”

Commenting on the support, Founders of M/s Urban Air Labs Pvt. Ltd. said, “We are grateful to TDB for their belief in our vision. With this support, we aim to make plant-based, natural air purification a norm in Indian households and public spaces. It’s time we bring nature back indoors, powered by science and innovation.”

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A new method to reliably estimate Helium abundance in the Sun

Source: Press Information Bureau, Dt. 24 April 2025,

URL: <https://pib.gov.in/PressReleasePage.aspx?PRID=2124064>

A new study has accurately estimated the abundance of Helium in our Sun for the first time. This could be a major step in assessing the opacity of the Sun’s photosphere.

Astronomers have traditionally assumed the abundance of Helium in the photosphere of Sun-like stars to be one tenth of that of Hydrogen by extrapolating from hotter stars, or from the outer atmosphere of the Sun (solar corona, solar wind), or from seismology studies of the interior of the Sun. None of these methods are based on direct observations of the photosphere due to the absence of Helium spectral lines.

An accurate and reliable measurement of the abundance of the element Helium in the photosphere of our Sun remains a challenge for astronomers to this day. The abundance of various elements in our Sun, or in any other star, is estimated from their absorption spectral lines. Since Helium does not produce any observable spectral lines from the visible surface, or the photosphere, of the Sun, its abundance has usually been estimated through indirect means.

Indian Institute of Astrophysics (IIA), an autonomous institute of the Department of Science and Technology (DST), has used Magnesium and Carbon features in the observed high-resolution spectrum of the Sun to accurately calculate the abundance of Helium in our Sun, in a recent study. This study published as a paper in “Astrophysical Journal, has been carried out by Satyajeeet Moharana, B.P. Hema, and Gajendra Pandey, all from the Indian Institute of Astrophysics, based on an earlier novel method developed by the latter two authors. Moharana is also a student at IISER Berhampur.

“Using a novel and consistent technique, whereby the spectral lines of neutral Magnesium and Carbon atoms in conjunction with the lines from the Hydrogenated molecules of these two elements are carefully modelled, we are able to constrain the relative abundance of Helium in the Sun’s photosphere now”, said Satyajeet Moharana, the first author of the published study and currently a PhD scholar at KASI, South Korea.

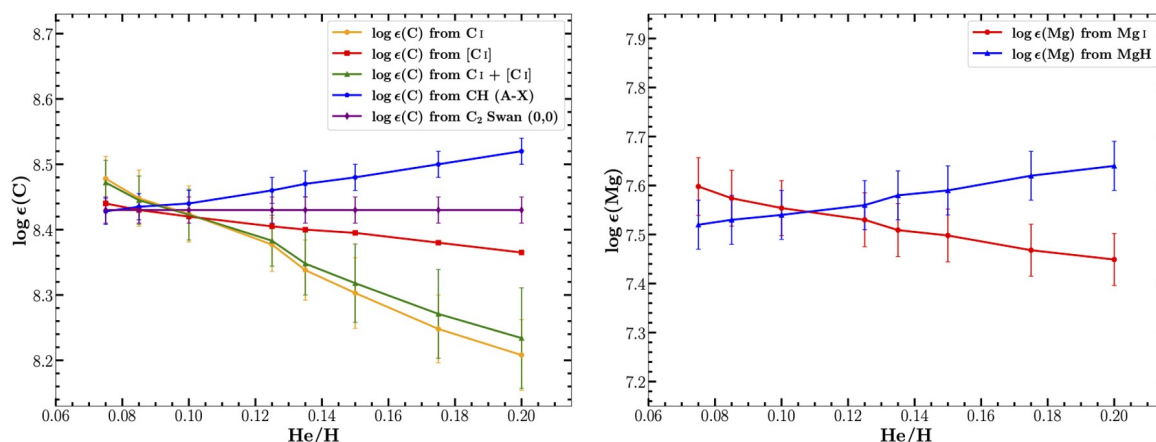


Fig: Abundance of carbon (from C I, CH and C₂ lines) and magnesium (from Mg I and MgH lines) for different Helium/Hydrogen ratios.

“We analysed the lines of neutral Magnesium and the subordinate lines of MgH molecule, and the neutral Carbon and the subordinate lines of CH and C₂ molecules, from the photospheric spectrum of the Sun”, said B.P. Hema. This was done by a careful calculation of the various parameters involved in the formation of the spectral lines. They then subjected the data to Equivalent Width analyses and spectrum syntheses.

“The abundance of Magnesium derived from its neutral atomic line must necessarily agree with the abundance derived from its hydrogenated molecular line”, she explained. Similarly, the abundance of Carbon derived from its neutral atomic line must agree with that derived from its molecular lines. The estimate of the abundance of these two elements from each of their lines depends, in turn, on the abundance of Hydrogen. Since Helium is the second most abundant element in the Sun after Hydrogen, the abundance of Helium is linked to the abundance of Hydrogen. This is the basic principle of this method.

“For example,”, explains Moharana, “if Helium was assumed to be slightly more abundant, this would proportionately decrease the abundance of Hydrogen, which will decrease the opacity of the Sun’s photosphere and decrease the availability of Hydrogen to form molecules with Magnesium and Carbon”. For a metal hydride (e.g. MgH or CH) line, a combined effect of the reduced continuum absorption and the line’s reduced absorption strength demands an increased metal abundance to fit the same observed line strength.

“In our analysis, we calculated the expected abundance of Mg and C for various values of the relative abundance of Helium to Hydrogen, from the atomic and molecular lines”, said Gajendra Pandey. For the Mg and C abundances to match their respective atomic and molecular features, the Helium to Hydrogen ratio that we infer are consistent with a value of 0.1.

“Our derived He/H ratios are in fair agreement with the results obtained through various helioseismological studies, signifying the reliability and accuracy of our novel technique in

determining the solar helium-to-hydrogen ratio. This study also confirms that the widely assumed and adopted (He/H) ratio of 0.1 is in fair agreement with our measurements.”, said B.P. Hema.

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Indian researcher Dhiraj Sinha proposes new approach to understand photons

Source: News Nine, Dt. 23 April 2025,

URL: <https://www.news9live.com/science/indian-researcher-dhiraj-sinha-proposes-new-approach-to-understand-photons-2842199>

An Indian researcher, Dhiraj Sinha from Plaksha university has proposed a totally new concept of what a photon, or a particle of light is. Scientists have struggled to define and understand the nature of light, which is now considered to be simultaneously a wave and a particle. Sinha suggests that the quantization of magnetic flux results in light behaving like a particle, or a photon, challenging the traditional view of light as inherently quantized particles. The research attempts to bridge classical mechanics and quantum physics, and can potentially lead to new theoretical frameworks that can unify classical and quantum perspectives.

The research explores the interaction between light and matter, focusing on the photoelectric effect and the concept of photon energy. Rather than relying purely on quantum mechanics, the energy of the photon is derived using classical electromagnetism, using Planck's constant and Faraday's Law of Electromagnetic Induction. The photoelectric effect is explained by the coupling of the electromagnetic field, where the magnetic field, that varies over time induces an electric potential that excites electrons. The photoelectric effect is a phenomena where electrons are ejected from a material on exposure to electromagnetic radiation.

A novel understanding of photons

The research attempts to explain why light can knock electrons off materials using classical theories of electricity and magnetism as against quantum mechanics. The research explains why only high-frequency light can knock out electrons, irrespective of how bright the light is. Sinha argues that there is no requirement to think of light as particles or photons to explain the photoelectric effect, which can be explained by how the magnetic field of the light interacts with the electron, and suggests that the quantized nature of light emerges from the structuring of the magnetic fields, not because light is inherently made up of particles. A paper describing the research has been published in the Annals of Physics.

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One Material, Four Behaviors: Superconductor, Metal, Semiconductor, and Insulator

Source: SciTech Daily, Dt. 24 April 2025,

URL: <https://scitechdaily.com/one-material-four-behaviors-superconductor-metal-semiconductor-and-insulator/>

Riken scientists have discovered how to manipulate molybdenum disulfide into acting as a superconductor, metal, semiconductor, or insulator using a specialized transistor technique. By inserting potassium ions and adjusting conditions, they could trigger dramatic changes in the material's electronic state—unexpectedly even turning it into a superconductor or insulator. This new level of control over a single 2D material could unlock exciting breakthroughs in next-gen electronics and superconductivity research.

Unlocking Versatility in a Single Material

A team of physicists at RIKEN has developed a transistor-based technique that allows a single-layered material to take on a wide range of electronic behaviors, functioning as a superconductor, metal, semiconductor, or insulator. This approach could lead to the discovery of new superconducting materials.

“The variety of electronic properties based on a single material is highly intriguing to us from a materials science perspective,” says Yoshihiro Iwasa of the RIKEN Center for Emergent Matter Science, who led the study.

The material in question is molybdenum disulfide (MoS_2), which can be isolated into atomically thin layers. Each layer consists of molybdenum atoms sandwiched between layers of sulfur atoms. Depending on how these sulfur atoms are arranged, MoS_2 can exist in two different structural phases: the 2H phase, which behaves as a semiconductor, and the 1T phase, which acts like a metal.

“2H molybdenum disulfide is highly promising for use in next-generation semiconductor devices,” notes Iwasa.

Guiding Phase Shifts with Potassium Ions

To explore how the material shifts between phases, the researchers built a field-effect transistor and connected it to a sample of 2H-phase molybdenum disulfide. By adjusting the voltage applied to the transistor, they were able to control the insertion of potassium ions into the material with high precision.

As the potassium concentration increased, the material abruptly transitioned from the 2H phase to the 1T phase. This change occurred when there were approximately two potassium ions for every five molybdenum atoms, highlighting a clear link between ion concentration and phase behavior.

Triggering Superconductivity

Then, by inserting the right amount of potassium and cooling the sample to -268°C , the researchers found that the 1T phase became a superconductor.

Although superconductivity had previously been seen in the 2H phase, this was unexpected for the 1T phase, and it occurred at a different temperature. “The biggest surprise for us is that we observed superconductivity when we introduced potassium ions,” says Iwasa.

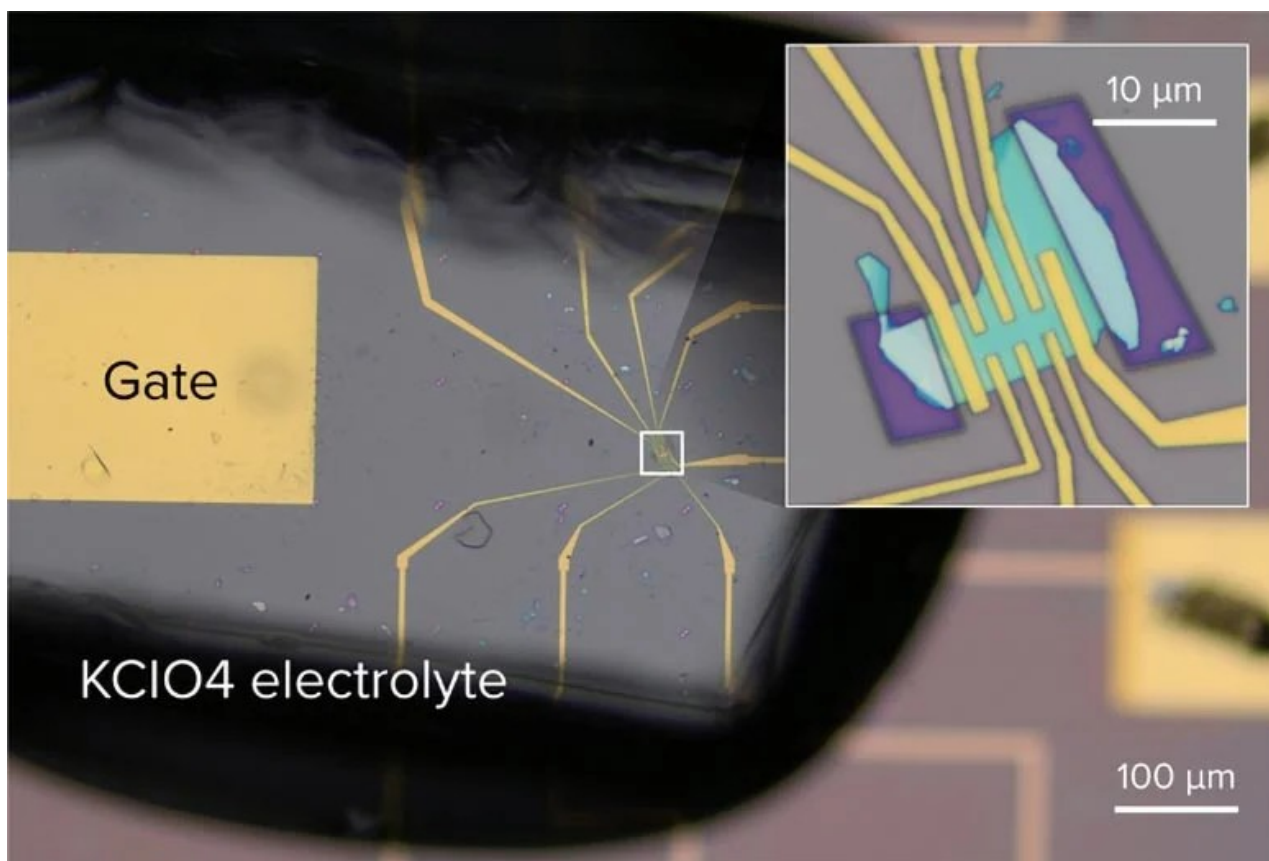


Figure : A photograph of the field-effect transistor. The turquoise area in the center of the inset is a flake of molybdenum disulfide, which can be a superconductor, metal, semiconductor or insulator. Reprinted, with permission, from Ref. 1. Credit: Copyright 2025 American Chemical Society.

Unexpected Transitions to Insulation

More surprises were in store. The material switched from being a metal to an insulator when the researchers allowed potassium to leak out of 1T molybdenum disulfide until it contained relatively low levels of the ions, and set its temperature at -193°C .

“We found this interesting because we didn’t expect this phenomenon to occur,” says Iwasa.

These results demonstrate that introducing potassium ions in this way is a powerful method for controlling the structure and properties of two-dimensional materials like molybdenum disulfide.

Decade-Long Methodology and Future Discoveries

“We’ve been developing this method over the past decade,” says Iwasa. “And we’ve shown that it is useful not only for exploring novel properties of superconductors and related electronic phases, but also for discovering new superconductors.”

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