

CONTENTS

S. No.	Title	Source	Page No.
DRDO News			1-2
1	India Bets On Ambitious Laser Defence Revolution To Deliver Unlimited Firepower	<i>Indian Defence News</i>	1
Defence News			3-9
2	INDIAN NAVAL SHIP TRIKAND CONCLUDES PORT CALL AT PORT LOUIS, MAURITIUS	<i>Press Information Bureau</i>	3
3	INDIAN NAVAL SAIL TRAINING SHIP INS SUDARSHINI ARRIVES AT VALLETTA, MALTA, BOLSTERING MEDITERRANEAN MARITIME TIES	<i>Press Information Bureau</i>	3
4	Raksha Mantri calls for enhanced public-private partnership to provide renewed thrust to India's sports economy	<i>Press Information Bureau</i>	4
5	Armed forces should build capabilities to effectively fight future wars: Ex army chief Gen Manoj Pande	<i>The Economic Times</i>	5
6	India Joins Elite Trio With Commissioning of Submarine RAM Test Facility At Karwar	<i>Indian Defence News</i>	5
7	VEM Technologies Advances Indigenous Slingshot Anti-Drone System: Revolutionising India's Counter-Drone Defences	<i>Indian Defence News</i>	7
8	Exercise LAMITIYE-2026: India and Seychelles carry out joint military exercise	<i>The Hindu</i>	8
Science & Technology News			9-13
9	India Moving from Healthcare Follower to Global Leader in Precision Medicine and Biomanufacturing, says Union Minister Dr Jitendra Singh	<i>Press Information Bureau</i>	9
10	TDB-DST SUPPORTS INDO-SINGAPORE COLLABORATIVE PROJECT FOR AI-INTEGRATED PLASMA SYSTEM FOR CLEAN HYDROGEN AND ADVANCED CARBON MATERIALS	<i>Press Information Bureau</i>	11
11	Warfare Becoming Increasingly Technology-Driven; traditional man-to-man combat is gradually reducing : Dr Jitendra Singh	<i>Press Information Bureau</i>	12

DRDO News

India Bets On Ambitious Laser Defence Revolution To Deliver Unlimited Firepower

Source: Indian Defence News, Dt. 16 Mar 2026

India is advancing its directed energy weapons programme with remarkable ambition, placing significant bets on laser systems from the Defence Research and Development Organisation (DRDO).

The 10 kW MK-II(A) and over 100 kW DURGA-II platforms stand out as key developments, offering near-zero cost per shot for intercepting aerial threats. These systems promise to revolutionise air defence, particularly against low-cost unmanned aerial vehicles (UAVs).



DRDO's 10kW MK-II(A) And 100kW+ DURGA-II deliver unlimited firepower at zero-shot cost

The MK-II(A) laser weapon, with its 10 kW output, delivers precise engagement capabilities up to 2 km. In November 2025, the Indian Air Force greenlit plans for 16 such units, underscoring confidence in their operational readiness. This procurement reflects DRDO's success in scaling prototype technologies into deployable assets tailored for modern battlefield needs.

DURGA-II elevates this capability further, boasting power exceeding 100 kW. Visual demonstrations from DRDO highlight its potential against diverse threats, including sophisticated UAVs like the Turkey supplied Bayraktar-TB2 of Pakistan. Integrated with advanced beam control and thermal management, DURGA II expands the spectrum of vulnerable targets, from small drones to larger aerial platforms.

Progress traces back to foundational work in the 2000s, building steadily through rigorous testing milestones. By 2017, DRDO achieved a 1 kW laser with a 250 m engagement range, validating core beam propagation and target acquisition technologies. This laid the groundwork for subsequent power scaling.

Reports from 2022 spotlighted a 25 kW system under active development, incorporating enhanced optics and cooling systems derived from aerospace engineering expertise. These iterations have refined pulse duration, beam quality, and atmospheric compensation, ensuring reliability in diverse environmental conditions.

India's laser program draws on indigenous strengths in photonics and high-energy physics, honed through collaborations with institutions like the Indian Institute of Science and private sector partners. Solid-state

laser architectures, favoured for their compactness, enable integration onto mobile platforms such as trucks or naval vessels.

The near-zero cost per shot advantage stems from electricity as the primary consumable, bypassing expensive interceptors like missiles. A single MK-II(A) engagement could neutralise a swarm of drones at fractions of traditional ammunition costs, enhancing sustainability for prolonged operations.

DURGA-II's higher power supports faster dwell times on hardened targets, achieving destructive effects through sustained thermal blooming. Simulations and ground tests confirm its efficacy against fast-moving threats, with adaptive optics mitigating turbulence for extended ranges.

Global parallels bolster India's trajectory. Israel's Iron Beam, a 100 kW system, entered operational service in December 2025 after dedicated refinement, demonstrating layered defence against rockets and mortars. Such achievements validate the maturity of laser technologies now pursued by DRDO.

The program aligns with India's Atmanirbhar Bharat initiative, emphasising self-reliance in defence manufacturing. DRDO's facilities in Hyderabad and Bengaluru drive production, with supply chains leveraging local semiconductor and optics industries.

Future integrations envision lasers in multi-domain networks, pairing with radar and electronic warfare for cueing. For the Indian Air Force, MK-II(A) units will augment Akash and MRSAM systems, providing cost-effective terminal defence.

Naval applications loom large, with DURGA II prototypes eyed for shipboard deployment against anti-ship missiles and UAV swarms. The Indian Navy's carrier groups stand to gain persistent, magazine-unlimited protection.

Army units benefit too, as man-portable or vehicle-mounted variants counter border incursions by loitering munitions. Trials in varied terrains, from deserts to highlands, affirm ruggedised designs suited to India's operational landscape.

Power scaling continues apace, with modular architectures allowing upgrades to higher kilowatt classes. DRDO's expertise in fibre lasers ensures efficiency, minimising size, weight, and power demands for platform versatility.

Safety protocols and human-machine interfaces have evolved, incorporating AI-driven targeting to prevent fratricide. Electromagnetic compatibility testing ensures seamless operation alongside legacy systems.

International partnerships, including technology exchanges with allies, accelerate refinement. India's laser programme positions it among elite developers, contributing to global standards in directed energy.

In summary, DRDO's MK-II(A) and DURGA-II herald a new era of economical, precise air defence. These systems embody India's technological prowess, ready to safeguard skies with unmatched efficiency.

<https://www.indiandefensenews.in/2026/03/india-bets-on-ambitious-laser-defence.html>

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Defence News

INDIAN NAVAL SHIP TRIKAND CONCLUDES PORT CALL AT PORT LOUIS, MAURITIUS

Source: PIB, Dt. 14 Mar 2026

INS Trikand concluded her port call at Port Louis, Mauritius on 13 Mar 26. The ship participated in the 58th Mauritius National Day Parade on 12 Mar 26 with a marching contingent, naval band and integral helicopter for the fly-past, at Champ de Mars, Port Louis. This is in keeping with the tradition of Indian warships and aircraft participating in Mauritius National Day celebrations.

During the port call, Captain Sachin Kulkarni, Commanding Officer of the ship, called on Mr Rampersad Soorojebally, PMSM, Commissioner of Police, and H.E Mr Anurag Srivastava, the High Commissioner of India to Mauritius. The ship also hosted a cultural evening onboard, with Dr Mahend Gungapersad, Minister of Education and Human Resources of Mauritius, as the Chief Guest. The event was attended by senior ministers and officials from the Government of Mauritius.

The ship also progressed several professional interactions, cultural engagements, sports fixtures and community outreach activities to further strengthen the robust bonds between the two nations. Training capsules were also conducted onboard for Mauritius National Coast Guard personnel on practical aspects of harbour and sea watchkeeping, including firefighting and damage control. The ship was open to visitors on 12 Mar 2026 and hosted over 500 visitors.

On departure from Port Louis, INS Trikand undertook a Passage Exercise (PASSEX) and joint Exclusive Economic Zone (EEZ) surveillance with CGS Valiant, and thereafter proceeded for the next phase of her planned operational deployment.

The port call reaffirms the longstanding maritime partnership and strengthening bilateral ties between the two countries, aligned with India's vision of *MAHASAGAR* - Mutual and Holistic Advancement for Security and Growth Across Regions, and reaffirms the strong bilateral ties between India and Mauritius.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2240097®=3&lang=1>

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INDIAN NAVAL SAIL TRAINING SHIP INS SUDARSHINI ARRIVES AT VALLETTA, MALTA, BOLSTERING MEDITERRANEAN MARITIME TIES

Source: PIB, Dt. 14 Mar 2026

The Indian Naval Sail Training Ship INS Sudarshini arrived at the historic port of Valletta, Malta on 12 Mar 2026, marking a significant milestone in her landmark transoceanic expedition Lokayan-26. The visit underscores the deep-rooted maritime ties between India and Malta and represents an important leg of the ship's ambitious 22,000-nautical-mile global voyage. The arrival at Valletta follows a successful transit through the Suez Canal and a recent port call at Alexandria.

On arrival, the Commanding Officer called on Ms. Rachita Bhandari, High Commissioner of India to the Republic of Malta. The interaction highlighted the role played by Indian Navy in strengthening bilateral relationship between the two nations. The High Commissioner noted that the presence of INS Sudarshini in Malta serves as a powerful symbol of the vision of *MAHASAGAR*, reinforcing maritime cooperation while fostering people-to-people connections.

During the visit, the ship's crew will engage in professional interactions and courtesy calls with the Armed Forces of Malta, further promoting mutual trust and interoperability. The ship will also host community outreach activities, including a guided "Open Ship" for schoolchildren and members of the Indian diaspora in Malta.

INS Sudarshini is currently in the second month of her voyage, which commenced at Kochi on 20 Jan 2026. Following the visit to Malta, the ship will sail towards the French coast to participate in the Escale à Sète maritime festival, where she will proudly represent India alongside some of the world's most celebrated tall ships.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2240072®=3&lang=1>

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Raksha Mantri calls for enhanced public-private partnership to provide renewed thrust to India's sports economy

Source: PIB, Dt. 14 Mar 2026

"The Government, through a series of initiatives, is fostering a sports culture within the country where athletes and youth have access to opportunities, resources & respect," said Raksha Mantri Shri Rajnath Singh as he called for enhanced public-private partnership in the sector to further elevate India's prestige on the international stage and provide a new direction to the nation's sports economy. He was addressing a gathering during the Final of Aditya Birla Memorial Polo Cup in New Delhi on March 15, 2026.

Raksha Mantri asserted that in the near future, India will carve out a strong global identity for itself in sports, especially Polo, if the government, the private sector, and various social groups work together. He stated that Polo is deeply rooted in the nation's sporting traditions, spanning thousands of years, and can rightfully be designated as a 'Heritage Sport' of India. He noted that the Indian Army has made a significant contribution towards bringing talented players into the sport of Polo and in preserving its rich heritage. "Working in collaboration with the Indian Polo Association, the Indian Army has played a pivotal role in keeping this legacy vibrant and relevant. I am confident that, working together, we will foster a positive culture for Polo as well as other sports in India. This will enable our young talent to come to the fore and bring glory to the nation," he said.

Shri Rajnath Singh stated that initiatives such as 'Khelo India' and the 'Target Olympic Podium Scheme' coupled with the unprecedented development of sports infrastructure have provided the youth with a new platform to excel and move forward. He added that the 'National Sports Governance Act' and the 'Khelo Bharat Policy' are set to yield immense benefits for talented athletes, and these measures will foster greater transparency and accountability within sports organisations.

Raksha Mantri emphasised that just as private participation has infused new energy and momentum into the fields of industrialisation, technology, and education, private players and industry stakeholders would foster the development of a professional approach, a long-term vision, and a sustainable support system. This, he added, would provide athletes with access to superior coaching, world-class facilities, and opportunities for

international-level preparation. Shri Rajnath Singh dubbed Polo as not merely a sport of strength and speed, but a blend of rhythm, strategy, coordination, discipline, and courage.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2240413®=3&lang=1>

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Armed forces should build capabilities to effectively fight future wars: Ex army chief Gen Manoj Pande

Source: The Economic Times, Dt. 15 Mar 2026

New Delhi, Indian armed forces should be able to deal with the current security threat and anticipate challenges ahead, and build capabilities which will enable them to "effectively fight future wars," former Army chief Gen Manoj Pande (retd) said on Saturday.

In his address at an event here, he also said that where national interests are involved, "we see the primacy of military force or military power", and cited examples of the prolonged Russia-Ukraine war and the West Asia conflict involving the US, Israel and Iran. Gen Pande served as the 29th chief of the Army staff from April 2022 to June 2024. His tenure saw the Army's focus on a high state of combat readiness, impetus towards its transformation and a strong push towards initiatives to achieve self-reliance.

The event was hosted by Delhi Marathi Pratishtan at the Dr Ambedkar International Centre in Delhi. The topic of his address was "Nation Building and Leadership: A Soldier's Perspective." He spoke largely in Marathi, mixing it with English occasionally. "You have to have those capabilities which will enable you to effectively fight future wars. So the armed forces have to be future-ready," he asserted.

He also emphasised that the character of war is changing and underlined the need to prepare for a full-fledged, long-duration war, citing the Russia-Ukraine war. The former Army chief emphasised that if a nation is strong, powerful, and capable, only then a war will not take place, but "if you are weak" then a battle or war could take place.

Talking about the new security threats in various domains, such as cyber, space and information warfare, he said that now there should be a new maxim -- "expect the unexpected."

"What will happen in the future? Geopolitically, who your alliances are, who your friends are, who your adversaries are, it's become difficult to tell," he added. In his address lasting about 40 minutes, he also emphasised that economy and security share a "symbiotic relationship", and said, "when we envision a Viksit Bharat, what do we imagine -- a country that is united, secure, stable, prosperous and Atmanirbhar".

<https://economictimes.indiatimes.com/news/defence/armed-forces-should-build-capabilities-to-effectively-fight-future-wars-ex-army-chief-gen-manoj-pande/articleshow/129584524.cms>

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India Joins Elite Trio With Commissioning of Submarine RAM Test Facility At Karwar

Source: Indian Defence News, Dt. 15 Mar 2026

Naval Group India has marked a pivotal advancement in India's naval capabilities by commissioning a state-of-the-art Pneumatic RAM Test Facility at its technical workshop in Karwar, Karnataka. This inauguration occurred on 13 March 2026, underscoring the nation's growing prowess in submarine maintenance.

RAM stands for Reducer and Actuator Mechanism. This facility is specialised for the maintenance and testing of critical components within the Pneumatic Mast Raising System used in Scorpène-class (Kalvari-class) submarines.

These mechanisms are responsible for the smooth deployment and retraction of masts—such as periscopes, radar, and communication antennae—using high-pressure compressed air.

The facility was officially opened by Vice Admiral B. Sivakumar, AVSM, VSM, Chief of Materiel of the Indian Navy. Its primary purpose is to support the maintenance, repair, and overhaul (MRO) of the Indian Navy's Kalvari-class submarines, which are indigenously built variants of the Scorpène-class.

Located strategically at the Naval Group India Technical Workshop in Karwar—a key naval base on India's western seaboard—the facility enhances logistical efficiency. Karwar's position facilitates rapid response times, minimising downtime for submarines deployed in the region.

This development places India in an elite global cadre. Such Pneumatic RAM Test Facilities, essential for testing and calibrating ram ejection mechanisms in submarines, now exist only in France, Brazil, and India. France, as the originator of Scorpène technology, and Brazil, another operator, previously held this capability exclusively.

The Kalvari-class submarines, comprising six vessels under Project P-75, represent a cornerstone of India's underwater fleet modernisation. Equipped with advanced stealth features, torpedoes, and anti-ship missiles, these boats demand precise pneumatic systems for launcher operations, which the new facility directly addresses.

Under the Atmanirbhar Bharat initiative, this commissioning bolsters India's self-reliance in defence manufacturing and sustainment. It reduces dependency on overseas support for critical subsystems, aligning with the government's push for indigenous MRO infrastructure.

Operationally, the facility promises quicker turnaround times for repairs and overhauls. This translates to higher fleet availability, enhanced combat readiness, and the ability to sustain prolonged deployments in the Indian Ocean Region amid rising maritime tensions.

The Pneumatic RAM Test Facility simulates real-world conditions for ram launchers, vital for deploying weapons without compromising hull integrity. By enabling in-country testing, it mitigates risks associated with transporting sensitive components abroad.

India's journey with the Kalvari class began with the first boat, INS Kalvari, commissioned in 2017. Subsequent vessels—INS Khanderi, Karanj, Vela, Vagir, and Vagsheer—have progressively entered service, with the facility now ensuring their long-term operational viability.

Collaboration with Naval Group France remains integral. While the Karwar setup signifies technology absorption, ongoing partnerships will be crucial for future upgrades, including potential integration of air-independent propulsion (AIP) systems.

Training Indian technicians forms a key pillar of this milestone. Submarine systems involve highly specialised knowledge, from hydraulics to high-pressure pneumatics. Naval Group India's programmes aim to build local expertise, fostering a self-sustaining ecosystem.

Strategic implications extend beyond maintenance. Karwar's enhanced role strengthens India's maritime posture against regional adversaries, supporting operations from the Arabian Sea to the Malacca Strait.

This aligns India with Scorpène operators. France maintains such facilities at its Cherbourg and Brest bases, while Brazil's is at Itaguaí. India's entry elevates its status in submarine technology transfer.

The facility generates skilled jobs in Karnataka, stimulating ancillary industries like precision engineering. It also positions Naval Group India as a hub for regional submarine sustainment services.

This infrastructure supports India's ambitious Project P-75I for next-generation submarines. Lessons from Karwar will inform larger MRO complexes, potentially at Visakhapatnam or other sites.

The Pneumatic RAM Test Facility embodies India's maritime ambitions. It not only sustains the Kalvari fleet but also signals a mature phase in Indo-French defence ties, fortifying national security in an era of contested seas.

<https://www.indiandefensenews.in/2026/03/india-joins-elite-trio-with.html>

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VEM Technologies Advances Indigenous Slingshot Anti-Drone System: Revolutionising India's Counter-Drone Defences

Source: Indian Defence News, Dt. 16 Mar 2026

Hyderabad-based VEM Technologies, a key player in India's private defence sector, is spearheading the development of the Slingshot Anti-Drone System. Established in 1988, the firm has evolved into a design and production hub for advanced aerospace, surveillance, and airborne systems, employing over 900 professionals dedicated to research, development, and integration.

This project underscores VEM's commitment to bolstering electronic warfare capabilities against unmanned aerial systems (UAS), aligning seamlessly with India's Aatmanirbhar Bharat initiative for self-reliance in defence manufacturing.

The Slingshot system is engineered to detect, track, and neutralise rogue drones, addressing the escalating threat of low-cost aerial incursions in modern warfare. VEM leverages its expertise in AI-enabled solutions, radars, and electro-optical sensors to create both soft-kill (jamming and disruption) and hard-kill (kinetic interception) options.

As a Hyderabad-headquartered entity, VEM draws on decades of experience in surveillance technologies, positioning Slingshot as a versatile counter-UAS platform tailored for the Indian armed forces.

VEM Technologies' broader portfolio complements the Slingshot effort, showcasing its prowess in missile and air defence innovations. The company has developed the man-portable AsiBal Anti-Tank Guided Missile with fire-and-forget functionality, currently in field trials, alongside the Vismai missile optimised for helicopters, UAVs, and drones. Additionally, the Ajita Air Defence System integrates sensors, missiles, and launchers, while Vidhwams (or Vidhwansh) offers long-range guided rocket capabilities for precision strikes up to 250 km.

At Aero India 2025 in Bengaluru, VEM highlighted its indigenous Ajita-SR and Ajita-LR Surface-to-Air Missile systems, demonstrating integrated search-and-track radars with 360-degree coverage and rapid reaction times under 10 seconds.

These systems excel against low-radar-cross-section threats at ranges up to 150 km, featuring on-the-move operations and a 90 per cent single-shot kill probability. Such advancements reflect VEM's role in fortifying India's layered air defence architecture, protecting critical assets like airbases and naval installations.

Infrastructure investments further empower VEM's growth, with a new Integrated Defence Systems Facility under construction for testing sophisticated weapons and security integrations.

This state-of-the-art setup will streamline end-to-end development, from prototyping to validation, enhancing production scalability. Led by founder and Chairman Mr V. Venkata Raju, VEM collaborates closely with DRDO-linked entities and private partners, contributing to projects like power systems for India's Advanced Medium Combat Aircraft (AMCA).

The Slingshot Anti-Drone System emerges amid rising global demand for cost-effective counter-UAS technologies, akin to systems like Australia's Slinger, but adapted for India's unique geopolitical challenges.

VEM's focus on indigenous components ensures affordability and rapid deployment, with soft-kill measures disrupting drone swarms via electronic warfare and hard-kill options delivering precise neutralisation. Early prototypes emphasise modularity, allowing integration onto mobile platforms for border surveillance and urban defence.

Strategic partnerships and user trials will propel Slingshot towards operational readiness, with VEM optimistic about Indian Army clearance similar to that sought for Vidhwams.

The system's GPS-assisted navigation and multi-target engagement capabilities promise a circular error probable better than 10 metres, vital for runway denial and infrastructure protection. By fusing electro-optical tracking with RF seekers, Slingshot enhances survivability in contested environments.

VEM Technologies' trajectory positions it as a cornerstone of India's defence ecosystem, bridging legacy expertise with cutting-edge AI and hypersonic-adjacent innovations. Participation in Aero India 2025 not only validated Slingshot's potential but also spotlighted VEM's diversification into tactical missiles and stealth technologies. As threats from adversarial drones intensify along borders, Slingshot fortifies national security, embodying ignited minds driving Atmanirbharta.

Ongoing R&D at VEM prioritises interoperability with existing platforms like HAL and BEL systems, fostering a unified counter-drone grid. With a workforce skilled in aerospace engineering, the firm anticipates scaling production post-trials, potentially exporting to allies under Make in India frameworks.

Slingshot thus exemplifies how private innovation accelerates India's military modernisation, safeguarding sovereignty in an era of asymmetric aerial warfare.

<https://www.indiandefensenews.in/2026/03/vem-technologies-advances-indigenous.html>

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Exercise LAMITIYE-2026: India and Seychelles carry out joint military exercise

Source: The Hindu, Dt. 14 Mar 2026

The ongoing 11th edition of the India–Seychelles Joint Military Exercise LAMITIYE-2026, being conducted at the Seychelles Defence Academy from March 10 to 22, witnessed extensive professional exchanges and joint training aimed at strengthening defence cooperation between the two countries.

According to Indian Army, this year's exercise marks the first tri-services edition, bringing together personnel from the Indian Army, Navy and Air Force alongside the Seychelles Defence Forces (SDF).

The joint training focuses on enhancing interoperability in sub-conventional operations in semi-urban environments, particularly within the framework of United Nations peacekeeping missions.

The trainings

A series of professional interactions, tactical discussions and practical drills have been conducted as part of the exercise. Training modules have included counter-terrorism operations, with Indian Army officers presenting a detailed case study of a major operation that highlighted operational planning, intelligence-based targeting and inter-agency coordination in complex terrain.

Participants have also undertaken training on cordon and search operations in urban and semi-urban areas, focusing on planning procedures, area domination, search techniques and crowd management while ensuring the safety of civilians.

Operational demonstrations have been a key component of the exercise. Troops from both sides have conducted close-quarter battle and room intervention drills, practising coordinated tactical entry techniques and assault procedures under simulated operational conditions. A specialised drill simulating a hijacked bus scenario showcased rapid response tactics and coordinated decision-making required in hostage situations.

The exercise has also covered emerging operational domains and support capabilities. Sessions on humanitarian assistance and disaster relief highlighted the role of helicopters in casualty evacuation, supply delivery and aerial reconnaissance during disasters. Discussions on the use of artificial intelligence in disaster management and tactical combat casualty care were also conducted.

In addition, personnel were exposed to maritime security operations, with the Seychelles Coast Guard demonstrating Visit, Board, Search and Seizure procedures used to intercept suspicious vessels.

Exercise LAMITIYE-2026 continues to reinforce bilateral defence ties and promote cooperation in addressing regional security challenges in the Indian Ocean Region.

<https://www.thehindu.com/news/national/exercise-lamitiye-2026-india-and-seychelles-carry-out-joint-military-exercise/article70740212.ece>

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Science & Technology News

India Moving from Healthcare Follower to Global Leader in Precision Medicine and Biomanufacturing, says Union Minister Dr Jitendra Singh

Source: PIB, Dt. 13 Mar 2026

Over 11,000 Biotech Startups and BioE3 Policy Powering India's Bioeconomy Expansion: Dr Jitendra Singh

India's Genetic Diversity Positions It to Lead Global Collaboration in Multi-Omics Research: Dr Jitendra Singh

India is entering a transformative phase where cutting-edge biotechnology, genomics and multi-omics research are reshaping the future of healthcare, positioning the country as a global hub for precision medicine, biomanufacturing and medical innovation, said Union Minister of State (Independent Charge) for Science & Technology, Earth Sciences and MoS PMO, Personnel, Public Grievances, Pensions, Atomic Energy and Space Dr. Jitendra Singh.

Delivering the inaugural address at the Multi-Omics Summit 2026, organised by the Proteomics Society, India (PSI) with advocacy partnership of the IHW Council, Dr. Jitendra Singh said India has moved from an era where advanced treatment required travelling abroad to a stage where the country is emerging as a global healthcare destination attracting medical tourism through quality and cost-effective care.

He said India's healthcare ecosystem today integrates modern biotechnology, genomics, and AI-driven research with traditional knowledge systems such as Ayurveda, creating a unique model of integrated medicine. The creation of a dedicated Ministry of AYUSH and the expansion of biotechnology research platforms have enabled India to develop innovative healthcare solutions that combine tradition with advanced science.

Highlighting the growing importance of biotechnology in national development, Dr. Jitendra Singh said India is among the first countries to launch a comprehensive BioE3 policy, biotechnology for economy, environment and employment. The policy is designed to accelerate innovation, expand biomanufacturing capacity and generate new opportunities in the bio-economy.

The Minister said India's biotechnology ecosystem has expanded dramatically in the last decade, with more than 11,000 biotech startups today compared to only a few dozen earlier. Government initiatives are strengthening biomanufacturing through dedicated funding, including the Biopharma Shakti scheme with an allocation of ₹10,000 crore, which will support biomanufacturing hubs, biofoundries and advanced research infrastructure.

Referring to India's large and genetically diverse population, Dr. Jitendra Singh said the country has a unique advantage in genomic research. Through flagship initiatives such as the Genome India Project and the upcoming Phenome India initiative, India has already completed sequencing of around 10,000 genomes and aims to scale this effort significantly. Such large-scale genomic data will help researchers identify disease patterns, develop targeted therapies, and design early interventions even before clinical symptoms appear.

He said integrating genomics, transcriptomics, and proteomics through multi-omics platforms, supported by Artificial Intelligence and Machine Learning, will enable scientists to understand complex disease mechanisms and develop personalised treatments suited to diverse populations.

Dr. Jitendra Singh also highlighted several emerging breakthroughs in biomedical research, including advances in gene-based therapies and nuclear medicine. He cited recent progress in the treatment of diseases such as sickle cell disorder and hemophilia, as well as new therapeutic developments in nuclear medicine for acute lymphoblastic leukemia in children at the Tata Memorial Centre.

The Minister said India is increasingly becoming a hub for collaborative global research, particularly in areas such as multi-omics that require interdisciplinary partnerships across institutions, sectors, and countries. The government is encouraging such collaboration through policy reforms and expanded participation from academia, industry, and startups.

He said recent reforms have also opened the nuclear sector to private participation, enabling greater innovation in nuclear medicine research, which will play an important role in future healthcare technologies when integrated with genomics and precision medicine.

Dr. Jitendra Singh said India has also demonstrated global leadership in preventive healthcare through the development of the world's first DNA-based vaccine, reflecting the country's growing scientific capabilities and its commitment to affordable healthcare solutions.

Calling the present period one of the most exciting phases in the evolution of modern medicine, Dr. Jitendra Singh said the convergence of biotechnology, artificial intelligence, genomics, and digital platforms is creating unprecedented opportunities for healthcare innovation.

He expressed confidence that India's scientific talent, research ecosystem and forward-looking policies will enable the country to not only collaborate globally but also lead future advances in biotechnology and precision medicine.

The summit brought together leading scientists, researchers, clinicians, biotechnology innovators, and industry experts to discuss the latest developments in multi-omics research and its potential to transform healthcare, diagnostics, and drug discovery.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2239776®=3&lang=1>

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TDB-DST SUPPORTS INDO-SINGAPORE COLLABORATIVE PROJECT FOR AI-INTEGRATED PLASMA SYSTEM FOR CLEAN HYDROGEN AND ADVANCED CARBON MATERIALS

Source: PIB, Dt. 13 Mar 2026

In line with India's commitment to advancing clean energy technologies and fostering international technology collaborations, the Technology Development Board (TDB), Department of Science & Technology (DST), Government of India, has extended support to APChemi Private Limited under the Indo-Singapore Call for Proposals for the project titled "*AI-Integrated Microwave Plasma System for Controlled Synthesis of Functional Carbon Nanostructures and Diamond-Graphene Hybrid Materials.*" The initiative aims to develop an advanced plasma-based technology platform for the simultaneous production of CO₂-free hydrogen and high-value carbon nanomaterials, supporting the global transition toward sustainable energy systems.

The project focuses on the development of an AI-integrated microwave plasma reactor capable of efficiently converting methane into hydrogen and advanced carbon materials without carbon dioxide emissions. The system incorporates custom-designed swirling vortex nozzles to maximize microwave energy absorption, enabling efficient splitting of methane into hydrogen and carbon radicals. While APChemi Private Limited will lead the development of industrial-scale gas separation, quenching, and carbon collection systems, the Singapore-based partner Commsens will contribute advanced real-time plasma diagnostics and AI-driven control systems to optimize reactor performance.

The pilot-scale facility is designed to produce approximately 4 kg per hour of hydrogen while simultaneously generating around 12 kg per hour of high-value carbon materials, including functional carbon nanostructures and diamond-graphene hybrid materials. This integrated approach enables a dual-revenue model, where the commercialization of premium carbon products helps offset the cost of hydrogen production.

The technology is based on microwave plasma pyrolysis, a process that uses high-temperature plasma discharges to split methane and other hydrocarbons into hydrogen and solid carbon without generating CO₂ emissions. Compared to conventional water electrolysis for hydrogen production, plasma pyrolysis offers significant energy advantages, with well-engineered systems requiring substantially lower energy inputs while producing valuable carbon materials such as graphite, carbon black, and graphene.

By integrating artificial intelligence into plasma reactor control, the system continuously monitors parameters such as microwave power, gas feed rates, electron density, and plasma temperature. Machine learning algorithms dynamically optimize reaction pathways to maximize hydrogen yield, enhance energy

efficiency, and tailor the structure of carbon materials for applications ranging from battery-grade graphite to advanced nanostructures.

Speaking on the occasion, Shri Rajesh Kumar Pathak, Secretary, TDB, highlighted the importance of international technology collaborations in addressing global energy and sustainability challenges. He noted that projects under the Indo–Singapore collaborative framework bring together complementary strengths in advanced manufacturing, artificial intelligence, and clean energy technologies, enabling the development of globally competitive solutions.

Promoters of APChemi Private Limited expressed appreciation for the support extended through the Indo–Singapore partnership and noted that the project will accelerate the commercialization of next-generation plasma technologies for clean hydrogen and advanced carbon materials.

<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2239424®=3&lang=1>

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Warfare Becoming Increasingly Technology-Driven; traditional man-to-man combat is gradually reducing : Dr Jitendra Singh

Source: PIB, Dt. 15 Mar 2026

India's Space Startup Ecosystem Expanding Rapidly following Space Sector Reforms: Dr Jitendra Singh at 'Unstoppable Bharat 2026' Conference

Government Creating Ecosystem to Nurture Scientific Talent from Early Stages; Programmes Like Vigyan Jyoti Encouraging Girls to Pursue Science Careers: Dr Jitendra Singh

India Entering a New Phase of Technology-Led National Development: Union Minister Dr Jitendra Singh

Union Minister of State (Independent Charge) for Science & Technology, Earth Sciences and Minister of State in PMO, Personnel, Public Grievances, Pensions, Atomic Energy and Space, Dr Jitendra Singh said that the nature of warfare is rapidly changing and is increasingly becoming technology-driven, where traditional man-to-man combat is gradually reducing and advanced technologies are playing a decisive role in strategic preparedness and national security.

Speaking during a fire chat session at the Alternate Media Conference, "Unstoppable Bharat 2026" in New Delhi, Dr Jitendra Singh said that sectors such as space, nuclear energy, artificial intelligence, and advanced scientific research will play a decisive role in shaping India's future security architecture and national development.

Referring to recent reforms in the space sector, Dr Jitendra Singh said that opening the sector to private participation and startups has created a vibrant ecosystem of innovation in the country. He said India today has a rapidly expanding space startup ecosystem and the country's space economy is expected to grow significantly in the coming years as industry, research institutions and young innovators increasingly collaborate.

The Minister said India has no shortage of scientific talent and that the government has been working to create an enabling ecosystem to nurture innovation from an early stage. He referred to initiatives aimed at encouraging students at school and university levels to pursue careers in science and technology and said that programmes such as Vigyan Jyoti and other mentoring initiatives are helping young students, particularly girls, to explore opportunities in research and innovation.

Dr Jitendra Singh also spoke about the need to strengthen India's scientific base by encouraging young students to identify their aptitude early and pursue diverse fields of research. He said the National Education Policy has created greater flexibility for students to move across disciplines and explore emerging areas of science and technology.

Highlighting the importance of energy security in the era of digital transformation, Dr Jitendra Singh said nuclear energy will play a critical role in supporting future technologies such as artificial intelligence and large-scale data centres which require uninterrupted and reliable power supply. He said nuclear power provides a clean and dependable source of energy and will be an important component of India's long-term energy strategy.

The Minister also referred to the expanding role of nuclear science in healthcare. He said nuclear medicine is opening new possibilities in the treatment of serious diseases including cancer and blood disorders, and increased research and industry participation will help expand access to advanced medical technologies in the country.

Dr Jitendra Singh said that India is entering a phase where collaboration between government institutions, private industry and the scientific community will accelerate innovation and strengthen national capabilities across sectors such as defence, healthcare, clean energy, and advanced technologies.

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