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समाचार पत्रों से चयित अंश
Newspapers Clippings

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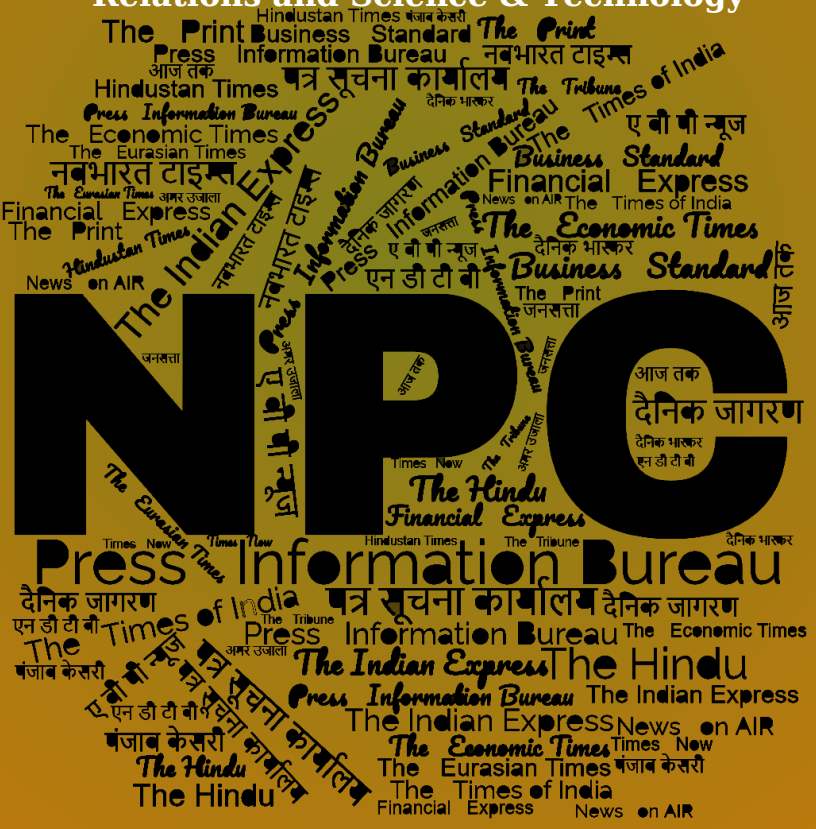

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Mon, 26 Feb 2024

Chief of Army Staff Visits Maharashtra MSME Defence Expo 2024 at Pune

Chief of Army Staff General Manoj Pande, visited the Maharashtra MSME (Micro, Small, and Medium Enterprises) Defence Expo 2024 at International Exhibition Convention Centre, Moshi, Pune on 26th February 2024. The expo, organised by the Government of Maharashtra, showcases the indigenous capabilities and innovations of the MSMEs, private companies, Defence Research and Development Organisation (DRDO) laboratories, and Defence Public Sector Unit (DPSU) setups in Maharashtra.

General Manoj Pande delivered a keynote address to the MSME & students and said that, Maharashtra deserves a mention, for being one of the major contributors to the nation's economy, industrial growth, exports and FDI attractiveness. He noted that the State was the first in India to frame a Defence Manufacturing Policy after private investment was allowed in the defence sector. Maharashtra has also declared Aerospace and Defence manufacturing as a thrust sector in the 'Package Scheme of Incentives'. As a result of these efforts, the State has been contributing more than 20% to the country's output in aircrafts, ships and boats and 30% to the national output in weapons and ammunition. These figures reflect a strategic vision towards promoting the Defence Industrial Sector.

The COAS while highlighting the economic growth made by the India, said that the nation is witnessing an improved consumer affluence, better standards of living, higher literacy quotient and rising aspirations of the citizens. He appreciated the steps taken by the Government agencies and armed forces in policy reforms, skilling initiatives, infrastructure investment, digital potential, frontline entrepreneurship and said that this signifies the commitment to sustainable development and the promise of being a reliable supply chain stakeholder.

He mentioned that, "Leveraging both the MSMEs and the Start Up ecosystem has been a focus area for the Indian Army, as part of the Atmanirbharta pursuit, in meeting our capability development requirements".

The Army Chief elaborated that under the Innovations in Defence Excellence (iDEX) procurement, all projects are mandated to be progressed through Start Ups. "Currently under the iDEX route, 55 Indian Army projects, worth Rs 400 Cr are being pursued, which encompass a total of 65 Start Ups. Four contracts worth Rs 70 Cr have been concluded for procurement of equipment in limited quantity for field exploitation. The iDEX route also follows the Spiral Mode of development of

indigenous technology and platforms, since exploitation of limited quantity in field conditions, enables concurrent development of equipment based on user recommendations", he said.

The COAS mentioned about the Indian Army's in house Ideas & Innovation initiative, and informed the gathering about two innovations and the technology transferred to industry for mass production, namely VIDYUT RAKSHAK – an Internet of Things (IoT) based generator protection system and a bio medical device.

He mentioned that Indian Army's endeavour to promote innovation also entails pursuing of Intellectual Property Rights for the products developed in collaboration with the industry. He highlighted that 66 IPRs have been filed by the Indian Army to date, of which 13 Patents, 05 Copyrights and 05 Design Registrations have been granted.

The Indian Army, during the expo, displayed its indigenous equipment and systems such as Tank T-90, BMP Mk-II, Soltam Gun, Dhanush Howitzer, K-9 Vajra, Pinaka Multi Barrel Rocket Launcher, Sarvatra Bridge System, Schilka Gun and Fly Catcher Radar of Army Air Defence, Tavor, Sig Sauer & M4 Assault Rifles, Ak-47, Sniper Rifles and various other weapons and equipments.

Chief of the Army Staff also interacted with the participating industries and encouraged them to align their products and services with the future requirements of the Indian Army. He urged all to collectively contribute to the aspirations, goals and objectives of a Rising India, through the resolve and commitment to Atmanirbharta.

https://pib.gov.in/PressReleasePage.aspx?PRID=2009039

THE HINDU

Mon, 26 Feb 2024

Indigenous Micro Turbojet Engine Unveiled by Hyderabad-Based Firm in Partnership with IIT-H

A micro turbojet engine designed and developed indigenously by Hyderabad-based firm Raghu Vamsi Machine Tools with support of the IIT Hyderabad has been unveiled.

Aeronautical Society of India president and former Scientific Advisor to Raksha Mantri and DRDO Chairman G. Satheesh Reddy witnessed the live testing of the engine at the company's facility here as well as inaugurated the assembly and test lab, Raghu Vamsi Machine Tools said on Monday.

The unveiling of the first of its kind micro turbojet engine Indra RV25: 240N in the country is in alignment with the Atmanirbhar Bharat and Make in India initiatives and underscores the company's capability to design, manufacture and deploy cutting-edge aerospace and defence technologies on a global scale, it said in a release.

Indigenous development of cutting-edge technologies such as these will make India self-reliant and emerge as an export hub of critical military products and solutions. "This success will pave the way for us to build entire suite of micro turbo jet engines up to 100 kgf for use in UAVs, missile propulsion, auxiliary power units and range extenders amongst myriads of other opportunities," Raghuvamsi Group COO Arvind Mishra said.

The firm said products such as these will reduce reliance on imported technologies, components, and expertise and contribute to India's goal of achieving self-sufficiency in critical sectors, bolstering national security and economic resilience. It will also stimulate growth of the domestic

aerospace and defence manufacturing ecosystem, creating jobs and fostering economic growth, Raghu Vamsi Machine Tools said.

“We are proud to unveil our fully indigenous Micro Turbojet Engine, a testament of India’s ingenuity and determination to become a global hub for aerospace innovation,” managing director Vamsi Vikas said.

https://www.thehindu.com/news/national/telangana/indigenous-micro-turbojet-engine-unveiled-by-hyderabad-based-firm-in-partnership-with-iit-h/article67889499.ece

DECCAN HERALD

Mon, 26 Feb 2024

Adani Opens South Asia's Largest Ammunition, Missiles Complex

The Adani Group on Monday announced opening of two mega facilities to manufacture ammunition and missiles - the largest in South Asia - as it consolidates its presence in defence manufacturing.

Adani Defence Y Aerospace has invested over Rs 3,000 crore in the factories that are spread over 500 acres and will manufacture full spectrum of ammunition.

"These cutting-edge facilities, which are first of their kind in the private sector in India, will provide a significant impetus to the nation’s self-reliance and technological advancement in defence," it said in a statement.

The facilities were inaugurated by Uttar Pradesh Chief Minister Yogi Adityanath, Chief of Army Staff Gen Manoj Pande and GOC-in-C of Central Command Lt Gen N. S. Raja Subramani.

"The unveiling of the facilities coincided with the fifth anniversary of the Balakot airstrike 'Operation Bandar', a historic operation by the Indian Air Force that was a testimony to India's strategic assertiveness over external threats," the statement said.

Spread over 500 acres, the facility in Kanpur is set to become one of the largest integrated ammunition manufacturing complexes. It will produce high-quality small, medium and large-calibre ammunition for the armed forces, paramilitary forces and police. The facility has started rolling out small calibre ammunition, starting with 150 million rounds estimated at 25 per cent of India's annual requirement.

Speaking on the occasion, Adityanath said it would be a proud moment when ammunition and missiles produced in these facilities will help in securing the nation.

Emphasizing the need for self-reliance in missiles and ammunition, Chief of Army Staff Gen Manoj Pande said, "Recent geopolitical events have reemphasized the need for a reliable supply from internal sources for ammunition in preparedness for a long-drawn conflict. Such large investments and the willingness of Adani Defence & Aerospace to indigenize critical technologies have built confidence in the users to depend on Indian private industry for strategic military supplies. This complex is a major milestone in India's journey towards self-reliance in the defence sector."

Adani Defence & Aerospace is the flagship defence company of the Adani Group. It is also focused on developing and offering unique capabilities across the unmanned segment, counter drones, intelligence, surveillance and reconnaissance technologies and cyber defence.

Ashish Rajvanshi, CEO of Adani Defence & Aerospace, said, "The establishment of these ammunition and missile complexes represents a leap forward in our quest for self-reliance. With a planned investment of over Rs 3,000 crores, its impact extends far beyond the defence sector. It will create over 4,000 jobs, with five times the multiplier effect on MSMEs and the local ecosystem benefiting from it indirectly."

The ammunition complex started operations in less than two years of its announcement by the Adani Group during the Uttar Pradesh Investors' Summit in 2022.

https://www.deccanherald.com/business/adani-opens-south-asias-largest-ammunition-missiles-complex-2911109

FINANCIAL EXPRESS
Read to Lead

Mon, 26 Feb 2024

Indian Navy's Airborne Insertion Operations Safeguarding Arabian Sea

To address the security challenges in the Gulf of Aden & Arabian Sea, the Indian Navy recently carried out special operations. These operations aimed to swiftly respond to any maritime threats and ensure the safety of the region.

The Indian Navy conducted airborne insertions of Special Forces by paradropping inflatable crafts and MARCOs from C-130 aircraft into the Arabian Sea. This deployment is part of the ongoing Anti-Piracy Operations in the area.

The use of paradropping techniques allows for rapid deployment of forces, enhancing the Navy's ability to counter potential threats effectively. By utilizing this method, the Indian Navy demonstrates its commitment to maintaining maritime security and safeguarding merchant shipping and seafarers in the region.

These operations highlight the Indian Navy's readiness to address maritime security challenges promptly and effectively. By conducting such manoeuvres, the Navy aims to deter piracy activities and ensure the safety of vital sea routes in the Arabian Sea.

The Indian Navy's efforts underscore its dedication to protecting maritime interests and promoting stability in the region. Through continued vigilance and strategic operations, the Navy contributes to maintaining peace and security in the maritime domain.

Indian Navy – Always the First responder

Over the weekend Indian Navy's Mission Deployed Destroyer provided critical EOD & medical assistance to Palau Flagged MV Islander which had caught fire after an attack by likely a drone/ missile on Feb 22.

Responding swiftly to the Distress call, the Indian Navy's destroyer, mission deployed in the Gulf of Aden for maritime security operations, arrived in the vicinity of the vessel in the afternoon of Feb 22.

Indian Naval EOD specialists embarked the vessel and sanitised it for any residual risk. The vessel was cleared for onward transit. On Master's request, the Medical team also embarked the ship and provided medical assistance to an injured crew member.

https://www.financialexpress.com/business/defence-indian-navys-airborne-insertion-operations-safeguarding-arabian-sea-3405906/

THE HINDU BusinessLine

SMon, 26 Feb 2024

Army Pursuing ₹400-Crore Projects via iDEX Route, Says Army Chief General Manoj Pande

The Indian Army is leveraging potential of MSMEs and start ups, as 55 projects are being pursued through Innovation in Defence Procurement Excellence (iDEX) route which is worth ₹400 crore, Chief of Army Staff General Manoj Pande said on Monday.

Of that, four contracts have been concluded for procurement of equipment in limited quantity for exploitation, the Ministry of Defence quoted General Manoj Pande as having said at the Maharashtra MSME (Micro, Small, and Medium Enterprises) Defence Expo 2024 in Pune.

"Currently under the iDEX route, 55 Indian Army projects, worth ₹400 crore are being pursued, which encompass a total of 65 start-ups. Four contracts worth ₹70 crore have been concluded for procurement of equipment in limited quantity for field exploitation. The iDEX route also follows the Spiral Mode of development of indigenous technology and platforms, since exploitation of limited quantity in field conditions, enables concurrent development of equipment based on user recommendations", he said in his keynote address to the MSME and students.

On the Indian Army's in house ideas and innovation initiative, the General said technology has been transferred to industry for mass production of two innovations, "VIDYUT RAKSHAK – an Internet of Things (IoT) based generator protection system and a bio medical device.

The MoD stated he mentioned that Indian Army's endeavour to promote innovation also entails pursuing of Intellectual Property Rights for the products developed in collaboration with the industry. According to him, 66 IPRs have been filed by the Indian Army to date, of which 13 patents, 5 copyrights and 5 design registrations have been granted.

The Army Chief praised Maharashtra for being the first State in India to frame a Defence Manufacturing Policy after private investment was allowed in the defence sector. Maharashtra has also declared Aerospace and Defence manufacturing as a thrust sector in the 'Package Scheme of Incentives', he stated. As a result of these efforts, the State has been contributing more than 20 per cent to the country's output in aircrafts, ships and boats and 30 per cent to the national output in weapons and ammunition. These figures reflect a strategic vision towards promoting the Defence Industrial Sector, General Pande pointed out.

https://www.thehindubusinessline.com/news/national/army-pursuing-400-crore-worth-55-projects-through-idex-route-general-pande/article67888429.ece

THE HINDU

Mon, 26 Feb 2024

‘BrahMos will be our Primary Weapon now,’ Says Navy Chief after ₹19,000 Crore Deal Cleared by Centre

Navy Chief Admiral R Hari Kumar on February 26 said that the Brahmos supersonic cruise missile will be the primary weapon of the Indian Navy, replacing the old missile system acquired from other countries.

"BrahMos will be our primary weapon now as the surface-to-surface missile weapon. Probably the Air Force and the air fighters also will have that as the primary air-to-surface weapon. This has evolved in range, in capabilities, in its lethality, and so on. So, this is going to be the mainstay for some time and that is why we are replacing all old missiles with this... and we are installing the BrahMos. Now, we have the expertise to install it in a very quick time," Navy chief told ANI in an interview.

Highlighting the fact that BrahMos is made in India the Navy Chief said that the missile is "a great advantage". "It is a very potent missile, and it has been evolving also, in range capability and so on. So the fact is that it is made in India, so we are not dependent on anybody else. It can be repaired, and spares are available. So it's a great advantage," he said.

The Navy chief remarks come soon after the Cabinet Committee on Security cleared the deal for over 200 BrahMos missiles under a ₹19,000 crore contract set to be signed on March 5.

The Navy Chief said this on the sidelines of the closing ceremony of the Defence expo in Pune.

The Navy Chief visited the Defence expo on February 26 in Pune. During his visit to various stalls of various defence manufacturing MSME industries , the Navy Chief highlighted the significance of MSME in India's mission to become Atmnirbhar Bharat in defence manufacturing.

The Navy Chief said, "This is a unique exhibition. They have been able to bring together several MSMEs... It is very important that we develop the ecosystem and environment for indigenization. Defence Expos facilitate this and encourage indigenous production... MSME expos like this have huge significance.

Over 118 contracts have been signed and around 10-12 products have also been approved. There are a lot of things we are getting from MSMEs and startups."

The Defence expo saw the participation of large number of MSMEs, private companies, Defence Research and Development Oraganisation (DRDO) laboratories and Defence Public Sector Unit (DPSU) setups in Maharashtra. This reflected India's progress towards achieving 'Atmanirbharat' in Defence and integration of Armed Forces requirements, Research and Development and Defence production by public and private players.

https://www.thehindu.com/news/national/brahmos-will-be-our-primary-weapon-now-says-navy-chief-after-19000-crore-deal-cleared-by-centre/article67887690.ece

INDIA TODAY

Mon, 26 Feb 2024

Leveraging MSMEs, Start-up Ecosystem has been Army's Focus Area: General Pande

Army Chief Gen Manoj Pande on Monday said leveraging both the MSMEs and the start-up ecosystem has been a "focus area" for the force as part of the pursuit of "Atmanirbharta" in meeting the capability development requirements.

Gen Pande said this during a visit to the Maharashtra MSME (Micro, Small, and Medium Enterprises) Defence Expo - 2024 in Pune, the defence ministry said in a statement.

The expo, organised by the government of Maharashtra, showcases the indigenous capabilities and innovations of the MSMEs, private companies, Defence Research and Development Organisation (DRDO) laboratories, and Defence Public Sector Unit (DPSU) setups in Maharashtra, it said.

Gen Pande said in his keynote address that Maharashtra deserves a mention for being one of the major contributors to the nation's economy, industrial growth, exports and FDI (Foreign Direct Investment) attractiveness.

The state was the first in India to frame a defence manufacturing policy after private investment was allowed in the sector, the statement quoted him as saying.

"Leveraging both the MSMEs and the start-up ecosystem has been a focus area for the Indian Army, as part of the Atmanirbharta pursuit, in meeting our capability development requirements," he said.

The Army chief noted that under the Innovations in Defence Excellence (iDEX) route for procurement, all projects are mandated to be progressed through start-ps.

"Currently, under the iDEX route, 55 Indian Army projects worth Rs 400 crore are being pursued, which encompass a total of 65 start-ups. Four contracts worth Rs 70 crore have been concluded for procurement of equipment in limited quantities for field exploitation. The iDEX route also follows the spiral mode of development of indigenous technology and platforms, since exploitation of limited quantities in field conditions enables concurrent development of equipment based on user recommendations," he said.

Gen Pande mentioned the Army's in-house Ideas & Innovation initiative and informed the gathering about two innovations and the technology transferred to the industry for mass production, namely VIDYUT RAKSHAK -- an Internet of Things (IoT)-based generator protection system -- and a biomedical device.

He mentioned that the Army's endeavour to promote innovation also entails pursuing Intellectual Property Rights (IPRs) for the products developed in collaboration with the industry.

The Army chief highlighted that 66 IPRs have been filed by the Indian Army to date, of which 13 patents, five copyrights and five design registrations were granted.

Highlighting the economic growth made by India, he said the nation is witnessing "improved consumer affluence", better standards of living, higher literacy quotient and rising aspirations of citizens.

He appreciated the steps taken by government agencies and the Armed Forces in policy reforms, skilling initiatives, infrastructure investment, digital potential, frontline entrepreneurship and said

these signify the commitment to sustainable development and the promise of being a reliable supply-chain stakeholder.

At the expo, the Indian Army displayed its indigenous equipment and systems such as Tank T-90, BMP Mk-II, Soltam Gun, Dhanush Howitzer, K-9 Vajra, Pinaka Multi Barrel Rocket Launcher, Sarvatra Bridge System, Schilka Gun and Fly Catcher Radar of Army Air Defence, Tavor, Sig Sauer & M4 Assault Rifles, AK-47, Sniper Rifles and various other weapons and equipment.

Gen Pande also interacted with members of the participating industries and encouraged them to align their products and services with the Army's future requirements. He urged everyone to collectively contribute to the aspirations, goals and objectives of a rising India, through the resolve and commitment to "Atmanirbharta".

https://www.indiatoday.in/india/story/leveraging-msmes-start-up-ecosystem-has-been-armys-focus-area-general-manoj-pande-2507470-2024-02-26

Science & Technology News

Press Information Bureau
Government of India

Ministry of Science & Technology

Mon, 26 Feb 2024

International Collaboration of Physicists Achieves First Successful Laser Cooled Positronium, a Short-lived Atom Significant for Quantum Studies

For the first time, an international collaboration of researchers has successfully demonstrated the laser cooling of Positronium, a short-lived hydrogen-like atom that provides an ideal testing ground for bound-state quantum electrodynamics.

The Antihydrogen Experiment: Gravity, Interferometry, Spectroscopy (AEgIS) collaboration has performed complex experiments at the European Organization for Nuclear Research (CERN) in order to obtain this breakthrough. The results could pave the way for taking up advanced studies leading to improved understanding of the physical nature, comprising matter and antimatter facilitated through the interactions between light and charged matter.

Positronium is a fundamental atom that comprises an electron (e-) and a positron (e+). Electrons and positrons are leptons, and they interact through electromagnetic and weak forces. A usual atom is made up of a mixture of baryons and leptons. Since Positronium is only made up of electrons and positrons, and no usual nuclear matter, it has the unique distinction of being a purely leptonic atom.

Sadiq Rangwala, Professor, Light and Matter Group at Raman Research Institute (RRI), an autonomous institute of the Department of Science and Technology (DST) of the Government of India, is part of the AEgIS collaboration that comprises physicists from 19 European groups and one Indian group.

Professor Rangwala is leading the Indian effort in the AEgIS collaboration with key contributions in various areas including the design of diagnostics for laser beam alignment deployed in the laser setup at the CERN accelerator.

Even though this field has been under active research since the late 1980s, several technological innovations and manufacturing of cutting-edge lasers finally facilitated the laser cooling of Positronium. Over the past several years, the AEgIS team performed multiple experimental runs at the accelerator hall of CERN. Here physicists had to introduce numerous technological and engineering solutions to achieve this goal.

Describing the challenge of designing the laser diagnostics, Professor Rangwala said, “The lasers were either deep in the ultraviolet or in the infrared frequency bands, thus made the overall laser alignment design a very challenging task.”

In the recently published paper in the Physical Review Letters, the AEgIS team has described the laser cooling of Positronium atoms achieved from ~380 Kelvin (106.85 degrees Celsius) to ~170 Kelvin (minus 103.15 degrees Celsius), using a 70-nanosecond pulsed alexandrite-based laser system.

“The experiment was done under the very challenging circumstances of an accelerator beam hall, rather than within the confines of a very well controlled laboratory. In every part of the experiment -- be it the input beams, the lasers, laser alignment, timing and control systems, detection techniques, etc. required technological innovations to make the science a reality,” said Professor Rangwala, one of the co-authors of the paper titled ‘Positronium laser cooling via the 13S–23P transition with a broadband laser pulse’.

Laser cooling anti-atoms and their spectroscopic comparison is a critical and vital test for the Quantum Electro Dynamics (QED).

“This now opens doors to creating exotic many particle systems like the Bose Einstein Condensates of this unique system. This is an important precursor experiment to the formation of anti-Hydrogen in the AEgIS experiment, which has a long-standing goal to test the equivalence principle,” he added.

The AEgIS collaboration is composed of several research groups from CERN, Istituto Nazionale di Fisica Nucleare (units of Milano, Pavia and the Trento Institute for Fundamental Physics and Applications), the University of Oslo, the University of Liverpool, the Warsaw University of Technology, the University of Trento, the Jagiellonian University of Krakow, the Raman Research Institute of Bangalore, the University of Innsbruck, the University and the Politecnico of Milan, the University of Brescia, the Nicolaus Copernicus University of Torun, the University of Latvia, the Institute of Physics of the Polish Academy of Sciences and the Czech Technical University of Prague.

https://pib.gov.in/PressReleasePage.aspx?PRID=2008999

THE HINDU

Mon, 26 Feb 2024

PM Modi to Dedicate Three ISRO Facilities to Nation on February 27

Prime Minister Narendra Modi will review the progress on the Gaganyaan human spaceflight programme and dedicate three facilities of the Indian Space Research Organisation (ISRO) to the

nation during a visit to the Vikram Sarabhai Space Centre (VSSC) in Thiruvananthapuram on February 27 (Tuesday).

Mr. Modi is also likely to announce the names of the astronauts of the Gaganyaan programme, which, reportedly, includes a Keralite. Mr. Modi will also bestow the 'mission patches' on them. Gaganyaan, expected to be launched in 2025, envisages demonstration of human spaceflight capability by sending astronauts to orbit and returning them safely to earth.

Mr. Modi, who is scheduled to visit VSSC at 10.45 a.m., will dedicate the Trisonic Wind Tunnel established at the VSSC, integration facilities for the Polar Satellite Launch Vehicle (PSLV) set up at the Satish Dhawan Space Centre, Sriharikota, and the Semi-cryogenic Integrated Engine and Stage Test Facility (SIET) at the ISRO Propulsion Complex in Mahendragiri in Tamil Nadu.

The three facilities have been developed at a cost of ₹1,800 crore.

The Trisonic Wind Tunnel has an overall length of 170 metres. With a test section size of 1.2 metres, it produces a "controlled uniform airflow" over scale models of rockets and aircraft to assess their aerodynamic characteristics for optimal design development. The wind tunnel, which is the first of its kind in the country, has a Mach number range of 0.2 to 4, which means it can generate speeds ranging from subsonic to supersonic up to four times the speed of sound (Mach number 4). The Trisonic Wind Tunnel will provide self-reliance in the end-to-end design of upcoming launch vehicle projects.

The new PSLV Integration Facilities (PIF) at Sriharikota will give the ISRO the capability to increase the number of PSLV missions in a year to 15. At the new facility, the PSLV rocket will be integrated parallelly with the refurbishment of the launch pad, saving time.

SIET will give the ISRO the capability to test the SCE-2000 semi-cryogenic engine which uses refined kerosene (named ISROSENE) and liquid oxygen as propellants and the rocket stage. The facility is at the ISRO Propulsion Complex in Mahendragiri.

ISRO chairman S. Somanath, VSSC director S. Unnikrishnan Nair and directors of various ISRO centre's will be among those present.

https://www.thehindu.com/news/national/kerala/pm-modi-to-dedicate-three-isro-facilities-to-nation-on-feb-27/article67887359.ece

The Indian EXPRESS

Tue, 27 Feb 2024

Indian on the Moon by 2040? ISRO Chief Spells out Hopes, Challenges

Indian Space Research Organisation (ISRO) chairman S Somanath Monday said that the space agency wants to land an Indian on the moon by 2040.

"We need to create a technology science roadmap for a zero-gravity environment in space. When we looked at the type of experiments that we want to do in the Gaganyaan mission… at least five of them have been shortlisted… they are not very exciting experiments for me. Along with this mission, we must have an expanded capability for the moon mission. We must have continuous access to the moon as well. And finally, what we want to have is… a human… an Indian… landing on the moon by 2040," he said.

He added that a mission to the moon would not "just happen by an accident", and would require "a continuous exercise of missions to the moon and then expanding knowledge on the moon in a substantial manner".

"It is not going to be a low-cost exercise. Sending humans to the moon… we need to develop launcher capabilities, laboratories and simulation systems. It cannot be done just once. It needs to be done multiple times. Only then it will be possible to have a human mission from India to the moon," he said. The ISRO chief said there had been a resurgence of moon exploration across the globe. "All this must be well understood in the context of others doing it, because many other nations are also going to the moon. I think you know (there is) renewed interest in the US, in China and various other nations," he said.

Stressing on a long-term vision for space exploration, he said that human access to space must be enhanced substantially. "We must have the space station (Bharatiya Antariksha Station)… We should be placed in orbit by 2028 in the first module and the full module should be completed by 2035, which has capability to have human habitation and stay for a longer duration," he said.

He also said plans were being discussed and debated for "interplanetary missions" such as the Venus Orbiter Mission and the Mars Lander. "When you look at Venus, its atmosphere, surface topography, the dust, volcanism, huge clouds and lightning – I think all these are worth exploring. Similar is the possibility of landing on Mars…," he said.

He said the space agency was also discussing a lunar sample return mission, where the aim would be to collect samples from the lunar surface (permanently shadowed region in lunar South Pole) and return the samples safely to Earth for scientific studies.

On the Chandrayaan 3 mission, he said, "This mission was very uniquely placed after the debacle we had during Chandrayaan 2… The real cause of the problem came out in a strange random experiment… an anomaly, and if we had not corrected that, it would have caused problems in Chandrayaan 3."

Somanath was speaking on 'Scientific and Exploration Missions: Opportunities for Scientific Communities in India' at the National Space Science Symposium' in Goa.

https://indianexpress.com/article/india/indian-moon-2040-isro-chief-hopes-challenges-9182334/

Hindustan Times

Tue, 27 Feb 2024

Scientists Make Important Progress towards Developing Antibody Against most Snake Venoms

One of the challenges in treating snakebite, especially in India which has as many as 62 species of venomous snakes, lies in first identifying what kind of snake has bitten a person, which is crucial to identifying the right antivenom that would need to be administered. Since the species is often difficult to identify, could the answer lie in developing a universal antivenom, a one-shot solution that could neutralise the venom from a variety of snake species?

Scientists from the Scripps Research Institute in California and the Indian Institute of Science (IISc) Bangalore have taken a step in that direction. They have developed an antibody that can block the effects of toxins in the venoms from a wide variety of snakes, and published their findings from trials in mice in Science Translational Medicine last week.

It is important to underline here that this breakthrough is still a long way from a universal antivenom. The antibody works against a family of toxins that is secreted by a large group of snakes, but not all snakes. Specifically, the toxins it neutralises are present in the venom of "elapids", or members of the Elapidae family that includes cobras, the king cobra and kraits (all of which populate India) besides mambas. The antibody does not target the venom from vipers, which claim many lives in India. Besides, even cobra venom contains additional lethal toxins beyond those that the antibody targets.

Nevertheless, a leading expert on snake venom, who was not involved in the study, acknowledged its significance. Professor Ashis K Mukherjee, a microbiologist with Tezpur University and currently on deputation to the Institute of Advanced Study in Science and Technology in Guwahati as its director, is an expert member on WHO's Strategic Plan for Control and Prevention of Snakebite.

"Yes, this synthetic antibody against a particular neurotoxin may not show any benefit against envenomation by the Viperidae family of snakes such as Russell's viper and saw-scale viper," Mukherjee said. "Despite this limitation, I can see that this study has a great future that can pave the way for developing several other toxin-neutralising antibodies. A cocktail of such antibodies may protect better against snakebite than commercial antivenom," he said. He called for clinical trials to validate the new findings.

Snakebite accounts for 58,000 deaths in India annually, according to estimates cited by the study's corresponding author, Kartik Sunagar, an evolutionary geneticist whose lab at IISc investigates venomous animals and their venom. No countrywide figures from a government source are available, because snakebite is not a notifiable disease in India. In fact, it is notifiable in only one state, Karnataka, which made that decision only last week.

How the antibody works

Researchers first identified which molecular region of venom toxins to target. Separately, they created a large library of artificial human antibodies and tested how they responded to these toxins. Their observations narrowed the hunt down to a single antibody, which they tested on mice, with encouraging results.

Among the deadliest toxins present in the venom of elapid snakes are a group called three-finger toxins (3FTx), which disrupt neurotransmission in the victim and cause paralysis. These are proteins whose structure differs between one elapid snake species and another, but some regions are similar across species. The researchers targeted one of these conserved regions.

With a library of artificial antibodies on one hand, and 149 variants of 3FTx from various elapid snakes on the other, the reporters examined their interactions. One antibody was found to bind strongly to 99 of the 149 3FTx variants.

Researchers mixed this antibody separately with venom taken from the Indian monocled cobra, the Taiwanese banded krait, and the African black mamba. Mice injected with the mix survived and looked healthy. When they injected the venom first and the antibody after a delay (0, 10 or 20 minutes), the mice again survived.

The researchers also tested a conventional product on mice, and found that it worked well only when it was injected alongside the venom; a delay of even 10 minutes reduced its efficacy. The new antibody was found to have an efficacy 15 times higher than that of the conventional antivenom.

Why it matters

Sunagar of IISc dwelt on the challenges associated with treating snakebite in India. "Antivenoms are made by collecting venom from just one or two districts in Tamil Nadu. And this is used for

treating snakebite all across India and neighboring countries," he said. "We have shown that these antivenoms don't work very effectively in several pockets of India including, for example, in the northern parts of India. Even here in Karnataka, the antivenoms are not very effective because we either find very different snakes here or the same species of snakes produce very different toxins."

If the snake species could be identified after a bite, the treatment could have been specific to that species. However, if the snake has gone away, there is no diagnostic kit that could detect the snake venom in the patient's body fluid, Mukherjee of IASST said. "Due to the lack of venom detection kits, administering polyvalent antivenom against the venoms of the 'Big Four' snakes (spectacled cobra, common krait, Russell's viper and saw-scaled viper) is India's only treatment choice. However, this therapy is associated with several adverse reactions," he said.

Studies by Mukherjee and colleagues have found toxins of the 3FTx group account for 30-75% of cobra venom. The conventional source of antibodies is by generating them in horses, but not enough antibodies against 3FTx are produced this way. "Therefore, commercial polyvalent antivenoms contain a lower proportion of neutralising antibodies against [such toxins]. As a result, commercial antivenom is ineffective in neutralising these toxins, a hurdle for effective therapy against snakebites."

As such, the first significance of the new antibody is that it can neutralise the toxicity of this clinically important neurotoxin, he said.

The road ahead

While Mukherjee stressed the need for clinical trials, Sunagar believes the antibody is not yet ready for these; given its limitations, it is not yet something clinicians can rely on.

Sunagar's lab at IISc and that of immunologist and microbiologist Joseph Jardine at Scripps are looking to identify antibodies against other toxins.

So, what is the future? Like Mukherjee, Sunagar too suggests a potential cocktail of antibodies. A universal antivenom would consist of a couple of synthetic antibodies that "would hopefully neutralise venoms of most snakes in various parts of the world".

https://www.hindustantimes.com/india-news/scientists-make-important-progress-towards-developing-antibody-against-most-snake-venoms-101708970881852.html

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Japan's Moon Lander SLIM Revives after Two-week Lunar Night

The Japan Aerospace Exploration Agency (JAXA) on Monday announced that its Moon lander, SLIM, has revived after a two-week lunar night. SLIM had landed on the Moon in January at an angle that caused its solar panels to face the wrong direction. However, as the angle of the Sun shifted, SLIM came back to life for two days and conducted scientific observations of a crater using its high-spec camera.

Due to its design limitations for the harsh lunar nights, JAXA was uncertain whether SLIM would wake up again. However, a command was sent to the lander, and it responded, confirming that it had successfully made it through the lunar night and maintained communication capabilities.

"Last night, a command was sent to SLIM and a response received, confirming that the spacecraft has made it through the lunar night and maintained communication capabilities!" the space agency said.

Although communication had to be terminated due to the high temperature of the communication equipment during lunar midday, preparations are underway to resume operations once the instrument temperatures have cooled down.

"Communication with SLIM was terminated after a short time, as it was still lunar midday and the temperature of the communication equipment was very high. Preparations are being made to resume operations when instrument temperatures have sufficiently cooled," the post added.

On January 19, SLIM made a precise touchdown on the moon, making Japan the fifth country to successfully place a probe on the lunar surface. However, the lander experienced engine problems during its descent and ended up on its side, resulting in the solar panels facing west instead of upwards.

Japan, last week, achieved another milestone as it successfully launched its new flagship rocket, the H3. The H3 lifted off on February 17, releasing a small satellite as well as a microsatellite and a dummy satellite during its nearly two-hour flight. JAXA project manager Masashi Okada, who has been leading the development of the new rocket for a decade, expressed his excitement, stating, "The newborn H3 has just made its first cry."

https://timesofindia.indiatimes.com/world/rest-of-world/japans-moon-lander-slim-revives-after-two-week-lunar-night/articleshow/108008897.cms