

# समाचार पत्रों से चयित अंश Newspapers Clippings

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Sat, 04 Jan 2020

# DRDO young scientist lab dedicated to AI research announced by PM Narendra Modi

*By Sejuti Dass*

Five DRDO Young Scientist Laboratories were announced by Prime Minister Narendra Modi in Bengaluru today which will focus on researches related to artificial intelligence, quantum technologies, and cognitive technologies. The Defence Research and Development Organisation (DRDO) Young Scientist Laboratories (DYSLs) are located in five cities, which are Bengaluru, Mumbai, Chennai, Kolkata and Hyderabad.

PM Modi stated, “In the field of defence manufacturing, DRDO will have to come up with new innovations to make India self-reliant. In promoting a Vibrant Defense Sector in the country, DRDO’s innovations have a huge role in strengthening Make in India.”

He further added, “India cannot be left behind by anyone. Investment on future technology is necessary and innovation is also necessary to protect our citizens, their borders and their interests.”

Narendra Modi also said that these labs would help in shaping the pattern of research and development in the field of emerging technologies in the country. Furthermore, he asked the scientists to prepare a definite roadmap for the new decade where DRDO should be able to set the direction and pace of scientific research in various fields in India.

Addressing the scientists, the Prime Minister said that India’s Missile programme is one of the outstanding programmes in the world. He also appreciated the Indian Space Programme and air defence systems.

## **Where the Five DRDO Young Scientist Labs Will Function**

The establishment of the five DRDO Young Scientist Labs lays down the foundation for research and development of futuristic technologies. Each lab will work on key advanced technologies of importance to the development of futuristic defence systems, which are artificial intelligence, quantum technologies, cognitive technologies, asymmetric technologies and smart materials.

- Research in the area of rapidly evolving Artificial Intelligence will be carried out at Bengaluru.
- The all-important area of Quantum Technology will be based out of IIT Mumbai.
- The future is dependent on Cognitive Technologies and IIT Chennai will house the lab embarking in this area of research.
- New and futuristic area of Asymmetric Technologies, which will change the way wars are fought, will be based out of the campus of Jadavpur University, Kolkata.
- The research in the hot and critical area of Smart Materials and their applications will be based out of Hyderabad.

On behalf of DRDO fraternity, Dr G Satheesh Reddy, Chairman DRDO and Secretary, Department of Defence R&D, Government of India and Director General, Aeronautical Development Agency (ADA), thanked PM Narendra Modi for dedicating the Young Scientist Laboratories to the Nation.

<https://analyticsindiamag.com/drdo-young-scientist-labs-dedicated-to-ai-research-announced-by-pm-narendra-modi/>

# War of future! DRDO gets ready with new labs to work on new emerging technologies

*For future game-changing technologies there has to be a concentrated effort to support both by intellectual capital as well as financial investments*

*By Huma Siddiqui*

The rapidly evolving technology is challenging the traditional norms of technology assessment and forecasting. Today India is emerging as the nation of Startups and the pace of innovation is such that, the modern-day technology needs to be evaluated and its future potential ascertained with unimaginable immediacy.

Inspired by Prime Minister Narendra Modi's speech in 2014, DRDO country's premier research organisation has identified five technology areas for challenging research opportunities that would empower the youth. These included Artificial intelligence, Quantum technologies, Cognitive technologies, Asymmetric technologies and Smart materials for the laboratories.

For future game-changing technologies there has to be a concentrated effort to support both by intellectual capital as well as financial investments. "No longer can we wait to assess technology till maturity for implementation and then plan investment. Speed of assessment, rapid prototyping, the pace of evaluation and focused development is necessary for us to stay relevant within the field of new technologies" explained a DRDO official.

Among the five DRDO Young Scientists Labs (DYSL) dedicated to the country by Prime Minister Modi recently one of the labs has been designated to work designing and developing Quantum Computer using superconducting Qubits. This consistent with DRDO may perhaps be the first attempt from India to create a Quantum Computer using Superconducting Circuit based Qubit and can be hosted on a cloud platform for nation-wide access. This is expected to create major opportunities in developing indigenous Quantum Computing resources within the country and will be within easy reach of the people.

Another area identified is Semiconductor Quantum Dot based Qubit Fabrication, Control and Measurement. Semiconductor-based Qubits have shown the potential to bring in scalability within the development of Quantum processors like the major global technological revolution brought about by the development of silicon electronics of the past few decades.

Algorithm development on Quantum simulator: The Quantum Algorithms can have disruptive advantages in various optimization and other security applications.

Feasibility study and demonstration of Quantum entanglement and Quantum Random Number Generator (QRNG): Entanglement is the property by virtue of which two atomic/sub F atomic particles are highly correlated independent of their distances.

<https://www.financialexpress.com/defence/war-of-future-drdo-gets-ready-with-new-labs-to-work-on-new-emerging-technologies/1813014/>

## Two city scientists to head new DRDO labs

Hyderabad: Two scientists working in the city's premier labs - Parvathaneni Shiva Prasad of the Research Centre Imarat (RCI) and Ramakrishnan Raghavan of the Defence Metallurgical Research Laboratory (DMRL) have been chosen to head the newly launched 'Young Scientists Laboratories' or DYSLs formed by the Defence Research & Development Organisation (DRDO) to start focused research in advanced technologies.

Prime Minister Narendra Modi had dedicated these labs to the nation on Thursday. And, as per the norms both the scientists are below 35 years of age and will be wholly independent directors of their respective labs akin to the existing heads of other DRDO labs.

Thirty-four-year-old Mr. Prasad, an alumnus of NIT-Rourkela and hailing from Khammam, has been selected as Director of the Asymmetric Technologies Lab based near IIT-Kharagpur will be specialising in nano-technologies, unmanned aerial vehicles, drones, cyborgs and so on with focus on low cost products. He is currently doing his Ph.D with the Indian Institute of Science, Bengaluru.



Mr. Ramakrishnan Raghavan, an alumnus of NIT-Trichy is also of the same age and has been appointed as Director of the Smart Materials Lab coming in the place of the existing Advanced Technology Centre of the DMRL up at Devathalagutta on the city outskirts and will be specialise in testing of armour piercing material, according to DRDO sources. He is pursuing research at IIT-Chennai.

Other DYSLs are located at Bengaluru - Artificial Intelligence, Quantum Technology - IIT Mumbai and Cognitive Technologies - IIT Chennai with each working on development of futuristic defence systems. The directors have been chosen by a committee chaired by Principal Scientific Advisor to Govt. of India K. Vijayaraghavan.

<https://www.thehindu.com/news/cities/Hyderabad/two-city-scientists-to-head-new-drdo-labs/article30463385.ece>

# India plans high-tech warfare with 5 new DRDO labs focusing AI, Quantum, Cognitive tech & Smart materials

*By Vardaan*

India has set sight over high-tech warfare as state-owned military research & development agency, Defence Research and Development Organisation (DRDO), has announced that it has launched five new laboratories known as Young Scientists laboratories, each focusing core areas of futuristic technologies including Artificial Intelligence (AI), Quantum Technologies, Cognitive Technologies, Asymmetric Technologies and Smart Materials — object which can change shape, size and behavior upon external stimuli.

These five new defence labs under the DRDO, formally launched on Thursday by PM Narendra Modi, are located in Bengaluru, Mumbai, Chennai, Kolkata and Hyderabad. These labs will be led by under-35 directors and young military scientists to drive India's warfare technologies of the future.

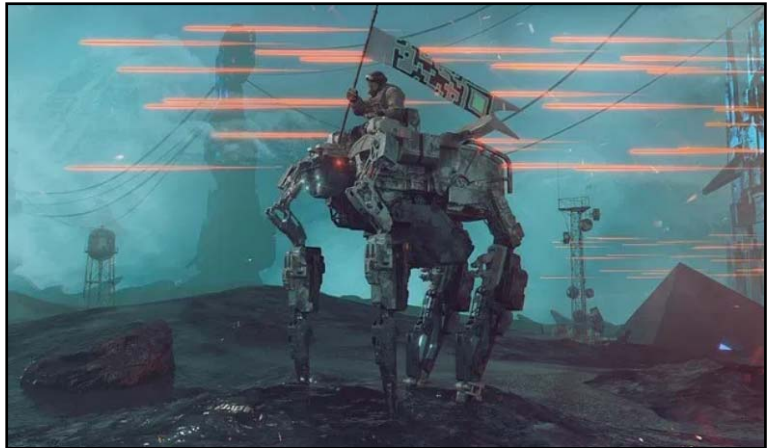
Jadavpur University campus in Kolkata will have research lab of futuristic area of Asymmetric Technologies. While, the research in hot and critical area of Smart Materials and their applications will be based out of Hyderabad. Research in the area of Artificial Intelligence will be carried out at Bengaluru, while the all-important area of Quantum Technology will be based out of IIT Mumbai.

In the area of cognitive technologies research, IIT Madras will house the lab for the same.

To recall, in 2018 a govt. of India initiated task force led by Tata Sons Chairman N. Chandrasekaran handed over the report to the Indian defence minister for implementation of its recommendations on using AI for military superiority. While AI and Quantum computing are familiar to tech enthusiasts, Asymmetric technologies and smart materials are quite new and described in brief as below –

**Asymmetric technologies**, in our understanding, refers to technologies involved in war between enemy or entity that acts in a hostile manner and whose relative military power/strategy/ tactics differs significantly. Asymmetric warfare is a form of irregular warfare and the term is also frequently used to describe what is also called “guerrilla warfare”, “insurgency”, “counterinsurgency”, “rebellion”, “terrorism”, and “counter-terrorism”, essentially violent combat between a formal military and an informal, less equipped and supported, undermanned but resilient and motivated opponent.

**Smart Materials** are objects that can change shape or behaviors with hot water, pressure, chemical, light or heat. Essentially, these materials sense and react to environmental conditions or stimuli (e.g., mechanical, chemical, electrical, or magnetic signals). Smart materials are said to be beneficial for industries such as aerospace, medical, textile, construction, and electronics as it improves efficiency and



save resources by responding to corrosion, pH changes, water content, temperature, mechanical forces, and much more.

These smart materials could even self-assemble when one touches them. When a stimulus is applied on such a smart object, it is possible to transform into a brand new shape as these materials are reacting to their external environment.

**Cognitive Technologies**, on other hand, extend the power of information technology to tasks traditionally performed by humans, such technology can mimic functions of the human brain through various means, including natural language processing, data mining and pattern recognition.

### **High-Tech Warfare Programs of US & China**

While DRDO is India's military research body, the analogous of same in the United States is DARPA (Defense Advanced Research Projects Agency), which has developed several futuristic technologies and warfare systems way beyond imaginations to countries in southeast Asia. While cognitive tech research are being done since 2002 by the US agency, asymmetric warfare technologies is said to be first introduced by DARPA in 1960s used for fighting Communist insurgents in Vietnam and Thailand.

DARPA is working on 'Sensor plants' which uses plants to gather intelligence information" through DARPA's Advanced Plant Technologies (APT) program, which aims to control the physiology of plants in order to detect threats including chemical, biological, radiological and nuclear threats.

DARPA is also said to be working on creating a 'black box' for brain, which is much like the black box used in airplanes. The microchip implanted in brain will record every moment and make it possible to obtain information one's final moments.

The Chinese counterpart of DARPA is considered to be COSTIND (Commission for Science, Technology and Industry for National Defense), which aims to facilitate the transfer of technology between the military and civilian sectors and has played an important role in China's space program.

<https://www.indianweb2.com/2020/01/05/india-plans-high-tech-warfare-with-5-new-drdo-labs-focusing-ai-quantum-cognitive-tech-smart-materials/>

## Air Force set to get two more warning systems

*The proposal is now before the Cabinet Committee on Security (CCS) and the entire project is estimated to take three years after the apex committee's clearance*

*By Shishir Gupta*

New Delhi: The Defence Acquisition Council (DAC) last month cleared a Rs 9,000 crore joint proposal of the Defence Research and Development Organization (DRDO) and the Indian Air Force to purchase two Airbus 330s and convert them into 360-degree long-range capability Airborne Warning and Control Systems (AWACS), senior officials familiar with the development said on Saturday.

The proposal is now before the Cabinet Committee on Security (CCS) and the entire project is estimated to take three years after the apex committee's clearance.

“The need for more AWACS was acutely felt post the Balakot air strike, with Pakistan being able to deploy its SAAB AWACS 24x7 in the north and south sectors and India being able to cover the two theatres only for 12 hours each day,” one of the officials cited above said.



The DRDO has also decided to hand over a third Embraer-mounted Airborne Early Warning system to the IAF (Indian Air Force) to further enhance Indian capability in battlefield theatre. The IAF already has two Israeli PHALCON radars mounted on a Russian A-50 platform and two DRDO-developed radars mounted on Embraer platforms.

According to the proposal cleared by the DAC, the Airbus AWACS will be a 50:50 joint venture between the DRDO and the IAF. Once the aircraft are purchased, the DRDO will mount a 360-degree rotor dome radar along with state of the art communication capability to guide the IAF fighters and attack helicopters in future war theatres, one of the officials cited above said.

The AWACS not only tracks the aerial threat, be it a fighter or a missile, but also guides the counter-response. Had it not been for PHALCON AWACS, the Indian response to the February 27 Pakistani counter-strike would have been weak and the IAF would never have known that Wing Commander Abhinandan had downed a Pakistan Air Force fighter code-named Red Mike on the radar. Whether Red Mike was an American F-16 sold by Jordan to Pakistan or any other fighter is still not confirmed.

<https://www.hindustantimes.com/india-news/air-force-set-to-get-two-more-warning-systems/story-KC4gyG7wnY3gfXnl26cqUO.html>

## **DRDO develops escape chute for fire emergencies**

*Fire incidents growing in number in cosmopolitan cities has pressed the defence laboratory in New Delhi to develop a 50-metre emergency escape chute*

*By Pearl Maria D'Souza*

Bengaluru: Fire incidents growing in number in cosmopolitan cities has pressed the defence laboratory in New Delhi to develop a 50-metre emergency escape chute. The prototype of the produce which is awaiting its patent was displayed at the Pride of India Exhibition at the five-day Indian Science Congress in Bengaluru on Friday.

The chute, which is designed using fire resistant Kevlar polymer and aluminium alloy rings, can hold up to five tonne weight, and can extend to 50 metres in height, said Mahipal Meena, a scientist and deputy director of Centre for Fire Explosive and Environment Safety of a Defence Research and Development Organisation (DRDO) laboratory based out of New Delhi.



The research and development of the chute began in 2008, he added. The 50-metre tube has smaller cylindrical units. Diagonally placed nets in these cylinders make the landing soft as the person gets bounced from one diagonal net to another. The use of chute requires no training and practice, and can be customised for helicopter-based rescue operations during landslides, floods, etc, according to DRDO.

<https://www.newindianexpress.com/cities/bengaluru/2020/jan/05/drdo-develops-escape-chute-for-fire-emergencies-2085340.html>



## Gaganyaan astronauts to feast on chicken, pulao

**B.R. SRIKANTH**  
BENGALURU, JAN. 3

From dal, aloo parathas, chicken curry, pulao and almonds, the spread will be elaborate for Indian astronauts likely to journey into outer space as part of 'Gaganyaan' late next year or early 2022, but it will match the stringent quality control standards of NASA.

Indian astronauts will

savour a desi breakfast, lunch and dinner with a spread of 22 dishes and fruit juices — in all weighing 60 kg — and 100 litres of water provided by the Defence Food Research Laboratory (DFRL), Mysuru, instead of pasta and pizza. The spread has been chosen to suit the palates of Indian astronauts during their week-long sojourn in outer space.

"We have sent samples

(of all dishes and other eatables) to ISRO for tests with regard to palatability and other factors like zero microbes. Some of them will be tasted by the IAF pilots short-listed by ISRO for space flight, and the flavour will be modified to suit their taste buds," Dr Anil Dutt Semwal, director, DFRL, said on the sidelines of the 107th edition of Indian Science Congress in Bengaluru on

Friday.

He said food will be wrapped in special disposable packaging material to avoid microbes from entering the pouches. The eatables can be warmed using food warmers on board the spacecraft. "Every dish will be mildly spicy but we will provide extra taste makers if the astronauts want to eat highly spicy food," he added.

Dr Semwal said snacks such as nutrition bars, fruit juice powder, almonds and nuts would also be part of the food package.

Asked why the lab followed the standards set by NASA, and not Russia, where the pilots short-listed for the journey will be trained, he said the US space agency follows extremely stringent quality control standards.



*Sat, 04 Jan 2020*

## **Indian-made Agni-V ICBM Intercontinental Ballistic Missile could enter in service in 2020**

The latest generation of Indian-made nuclear-capable ICBM Inter Continental Ballistic Missile Agni-V could enter in service in 2020 after a few additional firing tests. On December 10, 2018, India has successfully test-fired its ICBM Agni-V, according to a statement from the Indian Ministry of Defense (MoD).

The last launch operations of the Agni-V were carried out and monitored by the Strategic Forces Command (SFC) in the presence of Scientists from Defense Research and Development Organization (DRDO) and other associated officials.

Development of the Agni-V began in 2008. The ICBM features indigenously designed navigation and guidance systems including a ring laser gyroscope based inertial navigation system.

According to Indian military sources, the Agni-V ICBM is a three-stage solid-fueled missile with an approximate range of 5,500-5,800 kilometers. The exact range remains classified, but it is assumed that the missile could have a range from 6,000 to 7,500 kilometers, and can carry a 1,500 kg nuclear warhead. India has reportedly also been working on multiple independently targetable reentry vehicles (MIRV) for the Agni-V in order to ensure a credible second-strike capability.

The Agni-V can be mounted on a launcher vehicle which is known as the Transport-cum-Tilting vehicle-5. It is a 140-ton, 30-metre, 7-axle trailer pulled by a 3-axle Volvo truck according to DRDO, Indian Defence Research and Development Organisation.

[https://www.armyrecognition.com/january\\_2020\\_global\\_defense\\_security\\_army\\_news\\_industry/india-n-made-agni-v-icbm-intercontinental-ballistic-missile-could-enter-in-service-in-2020.html](https://www.armyrecognition.com/january_2020_global_defense_security_army_news_industry/india-n-made-agni-v-icbm-intercontinental-ballistic-missile-could-enter-in-service-in-2020.html)

## Army may soon get robot option for recce ops

By Akhil Kadidal

Bengaluru: Robots on wheels, robots on tracks and robots resembling a ball, not unlike a robotic character seen in the new Star Wars films may soon be rolling out to join Indian Army troops.

For the last three years, Bengaluru-based DRDO lab, the Centre for Artificial Intelligence and Robots (CAIR), has been perfecting four different models of mobile robots designed to infiltrate military and combat zones, map the area and help friendly troops punch their way in.

Two of these models, which were on display at the 107th Indian Science Congress, showed the maturity of the technology. The ‘Sentry’ is a four-wheeled robot which looks almost spider-like with a large central eye and a battery of sensors in front. The unit is designed to probe flat or semi flat landscapes for the military.



“Both of these models are completely autonomous, which means that if you give them a destination, they will create their own waypoints and chart a course to the destination using their inbuilt Artificial Intelligence module,” explained the project director.

He clarified that the ‘Sentry’ is also capable of patrolling a medium-sized perimeter constantly for as long as the battery held a charge. The maximum battery endurance of both machines is about four hours, scientists clarified.

Both systems use a battery of sensors, including GPS, 360-degree cameras and an infrared sensor.

The other model of robot, which was not displayed, is said to be a robot ball (called “ballbot”) which could be dropped by the mini-UGV across the various floors of a terrorist-held building, which would then be controlled by an operator from a remote location.

The operational doctrine has already been formulated for all the robots. “Eight of these various robots are designed to operate as a team. Each robot has something that we call “multi-agent collaboration. ’ This means they can talk to each other,” explained another scientist involved in the project.

“The last class of machine is a larger reconnaissance ground vehicle which again has autonomous capabilities,” the senior scientist said.

The DRDO said both machines have completed testing and are ready to be deployed. DRDO officials, however, would not comment about whether the Indian military had expressed interest in the inventions.

<https://www.deccanherald.com/state/army-may-soon-get-robot-option-for-recce-ops-791664.html>

# Despite schemes, women scientists small in number

*By Akhil Kadidal*

Bengaluru: In spite of the several government programmes intended to elevate women into careers in science, their numbers continue to be low in India, scientists and government officials said.

“We have various schemes to reward and promote women scientists. Nevertheless, we are much behind global developments with regard to women in science,” said Trilochan Mahapatra, secretary, department of agriculture, research and education.

He was speaking at the inauguration of the Women’s Science Congress at the 107th Indian Science Congress. The event was intended to showcase the coming of age of women scientists across all fields, including those at the apex of their professions.

Dr S Rajendra Prasad, the Vice Chancellor of the University of Agricultural Studies, said that the role of women in society is vital for its progress.

“According to recent surveys, the pursuit of women in science rivals that of men. In this forum, we have 25 women who can be counted as high achievers,” he added.

Another speaker, Dr Tessa Thomas, the Director of Aeronautical Systems at the DRDO, said the women of today have made significant studies in science and technology. Speaking broadly of the work being done by DRDO, she credited organisational scientists with having made significant advances in recent years.

“In the medical field, a nano drug-delivery system can potentially help treat cancer. In the next 20-30 years, we could see nanorobots living in our body to keep us healthy,” she predicted.

However, Mahapatra pointed out that many breakthroughs are being done by men, as not many young women enter the realm of higher studies in science, and because women in science are often marginalised. “Though Indian culture celebrates women in religion, this has not translated to giving women their due in science,” he said.

“Women have not been given their place they deserved. This country has woken up very late and now, we have some schemes to elevate women in science,” he added.

<https://www.deccanherald.com/national/despite-schemes-women-scientists-small-in-number-791708.html>

## Soldiers growing microgreens at snowy posts

*Small plants of cabbage, radish, and fenugreek called microgreens, which are grown over 8-10 days in small dishes of soil and nutrients, can be eaten as supplements, according to scientists from the Defence Institute of High Altitude Research (DIHAR)*

*By Anonna Dutt*

Microgreens, which grow fast and provide leaves and shoots of salad plants, are now being used by soldiers at the Indian Army's snow-covered posts in remote areas, with a presentation on the technique attracting attention at the 107th Indian Science Congress's Pride of India exhibition on Saturday.

Small plants of cabbage, radish, and fenugreek called microgreens, which are grown over 8-10 days in small dishes of soil and nutrients, can be eaten as supplements, according to scientists from the Defence Institute of High Altitude Research (DIHAR), a laboratory of the Defence Research and Development Organisation (DRDO).

"Our research has shown that you will get the same amount of nutrients if you consume 100gm of salad and 10gm of these microgreens. They are nutrient-rich and supplement the micronutrients and vitamins that soldiers living off of tinned food miss out on," said Samar Bahadur Maurya, a participant from DIHAR who was present at the Pride of India exhibition.



Ishi Khosla, who practises as a clinical nutritionist in the national capital, said: "Micro greens are indeed more nutritious than many vegetables. Especially so when people are consuming processed or tinned foods as it fills the nutrient gaps. Processed and cooked foods lose a lot of enzymes and nutrients needed by the body. There is also the functional issue of pH; processed foods are acidic whereas fresh greens are basic in nature, helping in maintaining the balance."

The exhibition comprised displays from about 150 public and private scientific organisations at the University of Agricultural Sciences in Bangalore.

The pavilion set up by the DRDO was inaugurated on Saturday by Union science minister Harsh Vardhan. The outdoor display at the pavilion also showcased long-range surface-to-air missiles and quick reaction surface-to-air missile system among other technologies.

The microgreens do not have to be taken out for sunlight and flourish in the army's barracks, which are warmer than the outdoors at high altitudes. They cannot grow into full-size vegetables as they are planted intensively in soil of very little depth. It is essential that the seeds and the soil are both chemical-free for the plants to grow.

"Since the plants are being consumed so early on in their life cycle, we need to ensure that the seeds and the soil have not been treated chemically. Everything here is organic. Soldiers who stay in the remote outposts usually carry their food once a year and most of it is tinned. This can help balance the sodium levels from the tinned food and provide something fresh," said Maurya, who is a technical officer at DIHAR. The project is headed by Narendra Singh, a scientist at the institute.

A senior army officer familiar with the developments, who spoke on condition of anonymity, said microgreens are being experimented with and could emerge as a good supplement with tinned food in forward areas, provided they are available in good quantities.

The army conducted a pilot programme at some outposts in Ladakh in 2015, followed by several acceptability studies at various locations in the region. “Now, the final kits are being designed in preparation for a mass rollout,” Maurya said.

Microgreens are used across the world usually by chefs at fine-dining restaurants or by nutrition enthusiasts. They first showed up in chefs’ menus in the 1980s in San Francisco, according to the United States Department of Agriculture.

The plants raised by DIHAR researchers are grown indoors, ideally at temperatures between 15° and 20° Celsius. “It can survive even at 10 degrees Celsius but will take a couple of days longer to grow. This temperature is suitably found within the barracks that are kept heated in cold regions. And, as these are indoor plants, they do not need to be taken outdoors for sunlight,” said Maurya.

To grow microgreens, a multipurpose medium made of coconut husk is mixed with inorganic soil additives along with water and other media. “After that, the plant has to be only occasionally watered if it starts drying out. Tending to the plants and having some greenery around also helps with the morale,” he added.

<https://www.hindustantimes.com/india-news/soldiers-growing-microgreens-at-snowy-posts/story-GuDWu3W94qWfjPateksYcO.html>



Sat, 04 Jan 2020

## DRDO at 107th Indian Science Congress

Bangaluru: The Defence Research and Development Organization (DRDO) is participating in “Pride of India-Science Expo-2020” being held from 3-7 January at the 107th Indian Science Congress (ISC) at University of Agricultural Sciences, Bengaluru. The five-day mega science expo has been organized as part of 107th Indian Science Congress (ISC-2020) inaugurated by the Prime Minister Shri Narendra Modi. The DRDO pavilion at the expo was inaugurated today by the Union Minister of Science and Technology Dr Harsh Vardhan. He also visited various DRDO stalls and took a keen interest in the products and technologies displayed there. 31 DRDO laboratories with more than 150 exhibits and models are participating in the expo showcasing many cutting-edge indigenous defence technologies, which narrate the saga of Self-reliance & National Pride with the “Make in India” spirit. Star attractions of outdoor exhibits at DRDO Pavilion include the Long Range Surface-to-Air Missile (LRSAM), Quick Reaction Surface to Air Missile system (QRSAM), ASTRA Missile, Radars including Battle Field Surveillance Radar (BFSR), ASLESHA and BHARANI, MINI-UGV Autonomous Surveillance Robot, Sentry Autonomous Surveillance Robot etc.

Indoor exhibits include models from each technology cluster of DRDO. Some of them are AEW&C, UAV Rustom-I and Tapas, Nirbhay Missile, Akash Missile System, Prithvi missile, Nag missile, HELINA, Maareech – Advanced Torpedo Defence System, Bukhari-the heating system, Ready-to-Eat Packaged Foods, Juices etc. DRDO is the R&D wing of Ministry of Defence, with more than 52 laboratories and establishments mainly engaged in the development of weapon systems, platforms and equipment for the Armed Forces. DRDO pavilion at the Pride of India Expo has always been a major attraction amongst visitors & students. The visitors also get a chance to interact with DRDO scientists manning the stalls. DRDO welcomes one and all to its pavilion to get a first-hand account of capabilities of our nation in the area of advanced defence technologies and opportunity to share the pride of the vibrant DRDO community.

<https://www.5dariyanews.com/news/279714-DRDO-at-107th-Indian-Science-Congress>

## **Services work on cyber defence and attack strategies**

The Indian armed forces operate among the largest and functionally most diverse communication and data networks involving voice, text and video transmission, surveillance, monitoring, signal analysis, remote control equipment control, direction-finding and jamming through landlines, radio links, microwaves and satellites.

Given the plethora of classified and extremely sensitive information that flows across such networks, these are priority targets for infiltration and disruption by nation-states as well as non-state operators, both in peace time and war.

The Ministry of Defence has claimed that though attempts of cyber hacking is an ongoing activity, there has been no report of cyber attacks inflicting significant damage. There have been cases of websites being defaced.

The proliferation of cellular smart phones, with social media platforms and other web-based applications, among the rank and file, civilian cadres and support staff and auxiliary workers in defence establishments, along with their family members, makes them susceptible to activities such as phishing, spoofing and honey trapping. Fake or doctored documents, misleading messages and deceptive videos are now common on the social media.

Advisories have been issued identifying certain websites and apps as malicious and also cautioning against posting service-related information on social media sites.

As the services strive for network-centric operations, seamlessly interlinking formations and battlefield platforms for command, control, coordination, communications, intelligence and assist decision-making at all hierarchical levels, a Defence Cyber Agency has been set up to control and coordinate the joint cyber operations. The tri-service agency will have both offensive and defensive capability.

All the three services have also established Cyber Emergency Response Teams (CERT). Safeguards have been instituted in the form of cyber audits, physical checks and policy guidelines to ensure a robust cyber posture. A cyber warfare doctrine and security strategy are also expected to be released this year.

<https://www.tribuneindia.com/news/services-work-on-cyber-defence-and-attack-strategies-21639>

## Students bring armed forces to exhibit defence prowess in IIT

Chennai: For the first time a defence expo was organised at Shastra, the Indian Institute of Technology Madras' annual technical festival.

The four-day tech fest that began on Friday had many contests - from drone racing to programming competitions and four spotlight lectures, two of them by defence experts. There was also a lecture by economist Lord Megnad Desai and another by Minister for Aviation and Commerce Suresh Prabhu.

As many as a dozen stalls had been devoted to defence expo. Students had a glimpse of some of the equipment used by the armed forces such as granade and missile launchers, rifles and radars.

There was a miniature version of the Brahmos missile which attracted much attention. A start up incubated at the institute's research park has developed a drone that could be used by the armed forces. "It is a drone that uses GPS location to force other drones that are not allowed to be in the area to either land or move," explained Vasu Gupta, an aerospace engineer manning the stall that displayed a model.

Apart from Indian Armed forces and the Defence Research and Development Organisation (DRDO) companies such as Boeing and Tata Advanced Systems Ltd. (TASL) have put up stalls.

Socure, a New York-based company, working on preventing identity theft in insurance companies, has a set of competitions. Alexandre Agular, vice president, engineering, said his interest was in finding if students could come up with solutions using data science to prevent insurance identity frauds.

Some of the events to look forward to tomorrow are the finals of building hovercrafts and the moot court sessions.

<https://www.thehindu.com/news/cities/chennai/students-bring-armed-forces-to-exhibit-defence-prowess-in-iit/article30474315.ece>



## पूर्व वायु सेना प्रमुख ने कहा- एस-400 है गेमचेंजर, रक्षा खरीद पर न हो राजनीति

**मुंबई:** रिटायरमेंट के बाद लगातार महत्वपूर्ण बयान दे रहे पूर्व वायुसेना अध्यक्ष बीएस धनोआ ने कहा है कि एस-400 एयर डिफेंस सिस्टम गेमचेंजर है। जरूरत है कि सरकार रक्षा खरीद प्रक्रिया को तेज बनाए।

कार्यक्रम में शामिल धनोआ ने कहा, वह हमेशा कहते रहे हैं कि एस-400 गेमचेंजर (मुकाबले की तस्वीर बदलने वाला) हथियार है। सरकार ने इसे खरीदने का बहुत अच्छा फैसला किया है। भारत ने 5.43 अरब डॉलर (करीब 40 हजार करोड़ रुपये) में एस-400 सिस्टम की पांच बैटरी खरीदने का सौदा रूस से किया है। इसे दुनिया का सर्वोत्कृष्ट एयर डिफेंस सिस्टम माना जाता है। अमेरिका की कड़ी आपत्ति के बावजूद भारत ने रूस के साथ यह सौदा किया है। सौदे के तहत 2021 में भारत को सिस्टम मिलने शुरू हो जाएंगे।

पूर्व वायुसेना अध्यक्ष ने कहा कि रक्षा खरीद सौदों को लेकर राजनीति नहीं होनी चाहिए। इससे खरीद प्रक्रिया लंबित होती है जिसका असर देश की सुरक्षा व्यवस्था पर पड़ता है और सुरक्षा बल हतोत्साहित होते हैं। इस सिलसिले में उन्होंने बोफोर्स तोप सौदे का उदाहरण दिया। कहा कि वह तोप बहुत अच्छी है लेकिन उसका सौदा विवादों में उलझ गया और अतिरिक्त खरीद के रास्ते भी बंद हो गए।

धनोआ का इशारा राफेल लड़ाकू विमान सौदे को लेकर उत्पन्न विवाद की ओर भी था। उन्होंने कहा, विंग कमांडर अभिनंदन वर्तमान पाकिस्तानी विमानों के साथ डॉग फाइटिंग में मिग-21 की जगह राफेल में होते तो निश्चित रूप से परिणाम अलग होता। पूर्व वायुसेना अध्यक्ष ने कहा, देश में हथियार खरीद प्रक्रिया बहुत लंबी होने से सेनाओं का आधुनिकीकरण प्रभावित हो रहा है। इस प्रक्रिया को छोटा किए जाने की जरूरत है।

गौरतलब है कि इससे पहले धनोआ ने कहा था कि 2001 में संसद पर हमला (Parliament Attacks) और 2008 में मुंबई में हुए आतंकी हमले (Mumbai Terror Attack) के बाद भी पाकिस्तान (Pakistan) के आतंकी शिविरों पर हवाई हमला (Air Strike) करने के लिए वायु सेना (Air Force) तैयार थी। लेकिन तत्कालीन सरकारों ने उसकी अनुमति नहीं दी।

<https://www.jagran.com/news/national-former-air-chief-bs-dhanoa-says-s-400-missile-system-game-changer-19906379.html>

## National Aerospace Laboratory wants govt. push for Saras Mk2 takeoff

*It says Centre should buy at least 50-60 Saras Mk2 aircraft to make production commercially viable*

*By Sobhana K. Nair*

New Delhi: The government needs to be the “launch customer” to make Saras Mk2 commercially viable, the National Aerospace Laboratory (NAL), which has developed the first indigenous light transport aircraft, told the Parliamentary Standing Committee on Science and Technology.

The 19-seater aircraft, developed with a target cost of ₹ 50 crore, is at least 20-25% lower in cost than other aircraft in the similar category.

The aircraft has been in the making for long. The first prototype flew in 2004. But without the initial push from the government, the manufacturing capacity required for commercial production could not be set up, the NAL said.

On a five-day tour of ISRO facilities from December 25 to 30, the committee members visited the NAL on December 28 and were briefed about the aircraft. Later, NAL Director Jitendra J. Jadhav sent a report on the plan for commercial production. Committee chairperson and Congress leader Jairam Ramesh forwarded the report to Rajya Sabha Chairman Venkaiah Naidu.

“Our job is to study and recommend. We cannot and should not step into the domain of the executive,” Mr. Ramesh said, explaining why he forwarded the report to Mr. Naidu.

Presently, the NAL has only one order from the Indian Air Force for 15 aircraft.

### **Connectivity plans**

The NAL has been pitching SARAS Mk-2 for the government’s UDAN (Ude Desh Ka Aam Nagrik), since it has the capacity to operate in “ill-equipped”, “semi-prepared” and “unpaved airstrips”. The scheme, launched in October 2016, is aimed at linking up areas that have no air connectivity.

The NAL has said in its report to Mr. Ramesh that the government should be the “launch customer” and place an order for at least 50-60 aircraft, which can be used for VIP services or tackling emergencies in times of natural calamities.

“With the firm commitment for procurement from the government, industries will come forward to set up manufacturing infrastructure. This will also push the growth of the micro, small and medium enterprises and allied service sector,” Mr. Jadhav said in his report.

<https://www.thehindu.com/news/national/national-aerospace-laboratory-wants-govt-push-for-saras-mk2-takeoff/article30487826.ece>

## **Army to sign MoU for AK-203 assault rifles in a month**

*They are to be manufactured locally by an Indo-Russian joint venture*

*By Dinakar Peri*

New Delhi: The Army is likely to sign a Memorandum of Understanding (MoU) in a month for the procurement of over 7.5 lakh AK-203 assault rifles, which are to be manufactured locally by an India-Russia joint venture (JV), a Defence source said.

“About 1 lakh rifles will come directly from Russia and the remaining will be manufactured by the JV in India. The MoU should be signed in a month,” a Defence official said.

### **Inter-governmental**

The rifles will be manufactured by the Indo-Russian Rifles Private Limited (IRRPL) at Korwa in Uttar Pradesh. The facility is being set up between the Ordnance Factories Board (OFB) from the Indian side, and Rosoboron Exports and Kalashnikov on the Russian side. The OFB owns 50.5% equity and Russian side holds the remaining 49.5%. The JV was formed following the Inter-governmental Agreement between India and Russia in February 2019.

To have oversight over the process and ensure timely deliveries, the Army has appointed Major General Sanjeev Senger as the Chief Executive Officer of IRRPL. Officials said the JV has obtained all the requisite licences for production and export. The Ministry of Defence has already floated a Request For Proposal (RFP) to the JV for the supply of 6.71 lakh rifles.

Reviewing the operationalisation of the project few months back, Defence Minister Rajnath Singh had stressed on the need “for 100% indigenisation of the rifle as per the project understanding, and focusing on the export of the rifles from IRRPL to other friendly countries”.

### **Other small arms**

In addition to the AK-203, the Army recently began inducting the first batch of 10,000 SIG-716 assault rifles. Troops engaged in counter insurgency operations in the Army’s Northern Command have started receiving these rifles, sources said. The rifles are being procured under a contract signed in February 2019 with Sig Sauer of the U.S. for 72,400 SIG-716 assault rifles worth over ₹ 700 crore.

The initial idea was to equip the entire Army with the SIG-716, one officer said. He added that given the huge cost, it was decided that the rifles would be provided to frontline troops, while the remaining forces can be equipped with AK-203 rifles. “It was decided based on the requirement,” he stated.

### **Replacing INSAS**

The Army has been looking to replace the indigenous INSAS (Indian National Small Arms System) rifles in use with a modern rifle. The MoD had approved the procurement in January 2018 through the Fast Track Procurement route. Of the 72,400 rifles, 66,400 are for the Army, 2,000 for the Navy and 4,000 for the Air Force. The entire quantity is expected to be delivered within 12 months from the date of signing the contract.

<https://www.thehindu.com/news/national/army-to-sign-mou-for-ak-203-assault-rifles-in-a-month/article30486064.ece>

## Battle groups to boost force: Army Chief

*By Ajay Banerjee*

New Delhi: The Army's review of its cadre — to decide on strength of officers, pace of promotions and level of ranks — is linked to the outcome of the Integrated Battle Groups (IBGs) which has been proposed to the government, the newly appointed Army Chief Gen MM Naravane told The Tribune on Friday evening.

The last cadre review was conducted in 1984. The recommendations of the Ajai Vikram Singh Committee for reducing age profile of commanding officers by two years following the Kargil war in 1999 had resulted in an increase in higher designations. The Second Administrative Reforms Commission had also suggested periodic review of the cadre.

“A committee is looking into cadre review, but its outcome will depend on the IBGs,” said the Army Chief, adding that the approval for the integrated groups was awaited. “After the approval, it would take two years to set up an IBG,” the Army Chief said.

The IBG is the biggest restructuring of the Army's offensive capabilities since the ‘Cold Start doctrine’ was drafted after the Operation Parakaram in 2001. It will involve integration of existing elements of infantry, tank regiments, artillery, UAVs, engineers and signals.

The IBG is expected to bring a significant operational change in the Army. The Army has carried out two field tests — one under 9 Corps in the Pathankot sector and the other in the Northeast using the mountain strike corps.

On the issue of the opening avenues for soldiers, General Naravane said training was being given to young jawans who wanted to appear for test to become officers. “We will not lower the selection standard, but are providing them Services Selection Board-level education to take the test and have more opportunities. There is an age limit,” he said.

On being asked if any changes were being considered in policies for grading officers, the Army Chief said, “Every evaluation system has to work. We are keeping an eye on sudden increase or decrease of grading by the seniors.”

On taxing pensions of disabled soldiers, the General said “The matter is with the Ministry of Defence.”

### **‘Need to be resolute, not aggressive with China’**

- Meeting a group of journalists, the Army Chief said, “with China we have to be firm in our resolve. We don't have to be aggressive”
- On nuclear weapons, he literally called the bluff of the neighbour. He said the nuclear weapons had been good deterrence, but their role ends with that only
- On Balakot airstrike, he said it signalled that terrorist camps and infrastructure could be taken out anywhere

<https://www.tribuneindia.com/news/battle-groups-to-boost-force-army-chief-21083>

## **Securing AI is as relevant as its use for cyber security**

*By Vijay Mohan*

Chandigarh: In the field of cyber security, artificial intelligence (AI), the current buzzword in the Information Technology world, is emerging as a double-edged weapon, redefining both the criminal modus operandi as well as counter measures. While AI can improve security by handling data and analysis faster and identifying threats more accurately than humans, it may conversely help cyber criminals spot vulnerabilities and overpower defensive mechanisms with relative ease.

Pointing out that the large deployment of devices across the globe results in a single vulnerability or failure making significant compromises that are usually beyond the ability of human operators to cope with, a report on ‘Cyber Security, Safety, Legal And Ethical Issues’ submitted last year by a committee set up by the Ministry of Electronics and Information Technology states that the necessity is for AI to act as a force multiplier by augmenting the cyber security workforce’s ability to defend at scale and speed.

“The agility created by AI augmentation of a cyber security system may, however, be two-sided. Along with a rapid response to both detection and remediation comes the potential for an equally rapid corruption of systems,” the report cautions.

There are already instances, for example, where attackers are using AI to detect when the malicious activities are being monitored within a “security sandbox” and alter its behaviour accordingly to escape detection and thereby extend the potential damage and surface attack. AI will allow computers to take over Internet security tasks from humans and then do them faster and at scale. These include:

1. Discovering new vulnerabilities and, more importantly, new types of vulnerabilities in systems, both by the offence to exploit and by the defence to patch, and then automatically exploiting or patching them;
2. Reacting and adapting to an adversary’s actions, again both on the offence and defence sides. This includes reasoning about those actions and what they mean in the context of the attack and the environment;
3. Abstracting lessons from individual incidents, generalising them across systems and networks, and applying those lessons to increase attack and defence effectiveness elsewhere; and
4. Identifying strategic and tactical trends from large datasets and using those trends to adapt attack and defence tactics.

Observing that it is near impossible to predict what AI technologies will be capable of, the report states that it’s not unreasonable to look at what humans are doing today and then imagining a future where AI is doing the same things but at computer speeds, scale and scope.

“However, cyber security of AI is as relevant as AI for cyber security. The models and data need protection from manipulation,” the 55-page report by the 11-member committee chaired by Prof Rajat Moona, Director, IIT-Bhilai, states while adding that the new ‘Cyber Security AAA: Automation, Analytics and AI’ is going to be the next battleground through 2020 and beyond.

“As predictive analytics gains ground, mathematics, machine learning and AI will be baked more into security solutions. These will learn from the past, and essentially predict attack vectors and behaviour based on that historical data,” it states.

Observing that AI technologies have the potential to upend the advantage that attack has over defence on the Internet, the report says this has to do with the relative strengths and weaknesses of people and computers, how all those interplay in Internet security, and where AI technologies might change things.

“Defence is currently in a worse position precisely because of the human components. Present day attacks pit the relative advantages of computers and humans against the relative weaknesses of computers and humans, thereby creating asymmetry. Both attack and defence will benefit from AI technologies, and we can safely presume that AI has the capability to tip the scales more toward defence. There will be better offensive and defensive AI techniques,” the report forecasts.

<https://www.tribuneindia.com/news/securing-ai-is-as-relevant-as-its-use-for-cyber-security-21663>



Sat, 04 Jan 2020

## **PM calls for revolutionising Indian science, technology and innovation at India Science Congress**

*The PM inaugurated the 107th session of the Indian Science Congress, which began at Bengaluru today*

Prime Minister, Mr Narendra Modi, today emphasised the need to revolutionise the landscape of Indian science, technology and innovation and said both technology and logical temperament were needed to give a new direction to the country’s socio-economic development process.

“I have always been of the view that science and technology had a great role to play in connecting society and to bring about equality. For instance, the developments in the area of information and communication have ended a big source of privilege by producing cheaper smartphones and data. Due to this, even a common man has gained confidence that he is not alone and that he can also connect with the Government and speak to it directly. We need to promote and strengthen these kinds of changes”.

Inaugurating the 107th session of the Indian Science Congress, which began at Bengaluru today, he said the common man has also been a witness to progress in the area of rural development and noted that technology and good effective governance had been behind the success of major welfare programmes from Swachha Bharat Abhiyan to Ayushman Bharat.

In this regard, he pointed that the Government had set a record yesterday by disbursing money under the PM Kisan Samman Nidhi to six crore people in the country simultaneously. “How did it happen? It was because of Aadhar enabled technology”, he said.

He also pointed out that the Government has been able to speed up the implementation of various projects by using the techniques of geo-tagging and data science and increasingly fill the gap between schemes and beneficiaries with the help of real-time monitoring systems.

He asserted that the Government was continuing its efforts to ensure ease of doing science and effectively use information technology to reduce ‘red tape’ and said water governance could be a new frontier of research with the Government launching a programme on water called Jal Jeevan mission.

There is, he said, a need to develop cheaper and more effective technologies for water recycling and reuse, create scientific solutions for using domestic wastewater in agriculture, produce high-quality

seeds that required lesser quantity of water, and generate technologies to make the optimal use of the data in soil health cards.

Besides, he called for research to find alternatives to single-use plastic and to extract and reuse metals from electronic waste and said the technologies that would be developed could be then transferred to medium, small and micro-enterprises. “Lot of opportunities are available to establish startups dedicated to promoting the concept of green, circular and sustainable economy in villages. Agricultural residue and household wastes are increasingly creating the problem of pollution in villages. We have to quickly come out with methods to convert them into wealth. We want to reduce the import of crude oil by at least 10 per cent by 2022. There is a lot of scope for setting up startups for biofuel and ethanol productions”.

He also emphasised the importance of promoting well being and said there was a need to not only practice some of the tested traditional wisdom but also continuously enlarge its scope by introducing modern tools and concepts of contemporary biomedical research. He highlighted the need to develop a roadmap for sustainable and environment-friendly transportation and energy storage option, and explore, map and harness oceanic resources of water, energy, food and minerals.

“We have to give more importance to industry-oriented research and promote dialogue among all stakeholders. Your efforts would play a big role in making India a 5 trillion dollar economy”, he said.

<https://www.firstpost.com/tech/science/pm-calls-for-revolutionising-indian-science-technology-and-innovation-at-india-science-congress-7857001.html>



Sat, 04 Jan 2020

## **Modi exhorts students to innovate and patent at Indian Science Congress**

*“New India” needs technology and a “logical temperament” to invent and disseminate technological solutions, says PM*

Bengaluru: Prime Minister Narendra Modi on Friday called upon students to “innovate, patent, produce and prosper” in his inaugural speech at the 107th Indian Science Congress.

“New India” needed technology and a “logical temperament” to invent and disseminate technological solutions.

Cost-effective agriculture was critical to benefit farmers, he said at the function themed ‘Science and Technology: Rural Development.’

At the event in the University of Agriculture Sciences (UAS), GKVK campus, he was accompanied on stage by Harsh Vardhan, Union Science Minister; Rajendra Prasad, Vice Chancellor, UAS; K.S. Rangappa, General President, Indian Science Congress Association.

Mr. Rangappa, in his address beseeched the Prime Minister that he “turn his attention a little more on science and technology” for the country to scale newer heights.

The inaugural saw thousands of students, scientists and officials from the Union Science Ministry in attendance.

According to the organisers, about 15,000 participants were expected to attend the event between January 3 and 7.

A highlight of this edition of the gathering is the Farmers Congress that is expected to see 110 “innovative” farmers discuss climate change, agriculture and novel farming practices.

## Deep sea exploration

Mr. Modi said that scientists in the country will now focus on deep sea exploration, after a successful space programme. Speaking at the Indian Science Congress in Bengaluru, he said, “Our successes in space exploration should now be mirrored in the new frontier of the deep sea. We need to explore, map and responsibly harness the vast oceanic resources of water, energy, food and minerals.”

The Prime Minister also congratulated scientists for helping improve India’s ranking in the Innovation Index. “Our programs have created more technology business incubators in the last five years than in the previous 50 years! I congratulate our scientists for these accomplishments. When we start the year 2020 with positivity and optimism of science and technology driven development, we take one more step in fulfilling our dream.”

<https://www.thehindu.com/sci-tech/science/after-space-india-will-now-explore-the-deep-sea-says-modi-at-indian-science-congress/article30467991.ece>

# THE TIMES OF INDIA

Mon, 06 Jan 2020

## Gsat-30 lift-off from French Guiana on January 17 to be ISRO’s first satellite launch this year

*By Surendra Singh*

New Delhi: The lift-off of geostationary communication satellite Gsat-30 on January 17 from European spaceport in French Guiana will be Indian Space Research Organisation's (ISRO's) first satellite launch this year, space agency chairman K Sivan told TOI. Gsat-30 weighing 3,450 kg will be a replacement for Insat-4A satellite.

The space agency is also scheduled to launch high-throughput communication satellite Gsat-20 this year. Three other high-throughput satellites of similar band Ku and Ka frequencies like Gsat-19 (June 5, 2017 launch), Gsat-29 (14 November 2018 launch) and Gsat-11 (ISRO'S heaviest satellite launched on December 5, 2018)) had already been launched.

The four together will boost internet revolution in India, especially in rural areas, as it will provide high bandwidth connectivity of over 100 Gbps, including in-flight and maritime connectivity. Together, all these satellites will help bridge the digital divide.

Gsat-11-like satellites are meant to provide multi-spot beam coverage over India's mainland and nearby islands. The satellites are special as they use multiple spot beams (a special kind of transponder that operates on a high frequency) that will increase internet speed and connectivity.

The Gsat-30 and Gsat-20 are among 25 missions that have been planned to be launched this year. Besides the satellite missions, ISRO has also lined up big missions like Aditya L1 solar (middle of this year) Chandrayaan-3 and Small Satellite Launch Vehicle test flight and first Gaganyaan unmanned test-flight (year-end) this year.

<https://timesofindia.indiatimes.com/india/gsat-30-lift-off-from-french-guiana-on-january-17-to-be-isros-first-satellite-launch-this-year/articleshow/73114396.cms>