



# E-NEWS

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Covering the Period from  
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Successfully tested.

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## Eminent Indian Aeronautical and Aerospace Personalities in India

No : 5

## Roddam Narasimha

(20 July 1933 – 14 December 2020)



**Roddam Narasimha** FRS was an Indian aerospace scientist and fluid dynamicist. He was a professor of Aerospace Engineering at the Indian Institute of Science (1962–1999), director of the National Aerospace Laboratories (1984–1993) and the chairman of the Engineering Mechanics Unit at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR, 2000–2014).<sup>[6]</sup> He was the DST Year-of-Science Chair Professor at JNCASR and concurrently held the Pratt & Whitney Chair in Science and Engineering at the University of Hyderabad. Narasimha was awarded the Padma Vibhushan, India’s second-highest civilian award, in 2013.<sup>[7]</sup> for his contributions to advance India’s aerospace technology.

### Early life

Narasimha was born on 20 July 1933. He was born in a Telugu family tracing its origins to Roddam, a village in the Anantapur district of Andhra Pradesh. His father, R.L.

Continued.....

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Narasimhaiah, was a professor of physics in Bangalore's Central College, and was also a Kannada language science writer with a focus on physics and astronomy.

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Narasimha completed his schooling at Acharya Pathasala in the Gandhi Bazaar neighbourhood of Bangalore. He obtained his graduate degree in mechanical engineering from University Visvesvaraya College of Engineering in Bangalore, which was affiliated with Mysore University. During this time he visited the Tata Institute (now known as the Indian Institute of Science), where the Spitfire aircraft displayed in the aeronautical department caught his interest. After his graduation in 1953, while he was encouraged by his family members to accept a job with the Indian Railways or with Burmah Shell, he went on to join the Indian Institute of Science in Bangalore for his master's degree in engineering, which he completed in 1955. During this time he worked with Satish Dhawan, who later chaired the Indian Space Research Organisation. He then went to the United States to complete his doctorate in 1961 under Hans Liepmann at the California Institute of Technology.

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## Career

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Narasimha started his research career at Caltech, working on the problem of jet engine noise reduction. After the launch of the Russian *Sputnik* and the resulting interest in space programs, he shifted focus to rarefied gas and fluid dynamics, working with Hans W. Liepmann. He continued this research at the NASA Jet Propulsion Laboratory, where he went on to study aerodynamics and supersonic flows toward better understanding of the structure of shockwaves. During this time, he worked on one of the space agency's first computers.

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He returned to India in 1962, and joined the Indian Institute of Science as a professor in its aeronautical engineering department (1962–1999), where he continued his fluid dynamics research, studying turbulent flow and relaminarisation, including the study of fluid flow from turbulent (chaotic) to laminar (streamlined) forms<sup>1</sup>. In 1970, he was a member of the investigation team under Satish Dhawan that studied the airworthiness of Indian Airlines Avro 748.

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He was the ISRO K. R. Ramanathan distinguished professor at the Indian Institute of Science (1994–1999), Director of the National Aerospace Laboratories (1984–1993), Director of the National Institute of Advanced Studies (1997–2004) and the Chairman of the Engineering Mechanics Unit at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore (2000–2014). He was the DST Year-of-Science Chair Professor at JNCASR and also held the Pratt & Whitney Chair in Science and Engineering at the University of Hyderabad. He was also a visiting member of the faculty at international universities including the University of Brussels, Caltech, University of Cambridge, Langley Research Center, University of Strathclyde and University of Adelaide. He served former Prime Minister Rajiv Gandhi's scientific advisory council.

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During his time at the National Aerospace Laboratories, Narasimha led the research initiative into parallel computing as a means to solve fluid dynamics problems. His efforts led to first parallel computer in India and development of a code for weather prediction of tropical regions. He was also a contributing member to the team that designed the light combat aircraft.

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Over the course of his six decade long academic career he has made significant contributions to fundamental and applied fluid dynamics. At the Indian Institute of Science, his research included the 'bursting' phenomenon in a turbulent boundary layer, non-linear vibration of an elastic string, equilibrium and relaxation in turbulent wakes, relaminarization, hydrodynamic instability wall jets and the study of clouds as volumetrically heated jets. At the Engineering Mechanics Unit of the Jawaharlal Nehru Centre for Advanced Scientific Research, Narasimha continued his research on fluid dynamics of clouds via laboratory experiments as well as numerical simulations. He also studied gas turbine blades, turbulent free shear layers and proposed a novel wing design for turboprop aircraft.

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He was the longest-serving member of the Indian Space Commission, a policy-making body for space exploration in India. He resigned from this position in February 2012, in protest at the blacklisting of three former ISRO technocrats

including G. Madhavan Nair, former ISRO chairman, for their perceived role in a controversial agreement between ISRO's commercial entity Antrix and Devas Multimedia in 2005.

## Honours

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Narasimha was an honorary member of the American Academy of Arts and Sciences, and a Fellow of the Royal Society of London, and also of the American Institute of Aeronautics and Astronautics. He was a distinguished alumnus of Caltech and the IISc. He was also a foreign associate of the National Academy of Engineering and the National Academy of Sciences in the United States.

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## Some of his honours and awards include:

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- 1975 – SS Bhatnagar Prize
- 1987 – Padma Bhushan, India's third highest civilian award.
- 1990 – Gujarmal Modi Award
- 1998 – S. Ramanujan Medal, Indian Science Congress<sup>[36]</sup>
- 2000 – Fluid dynamics Award, American Institute of Aeronautics and Astronautics
- 2008 – Trieste Science Prize, The World Academy of Sciences
- 2009 – Lifetime Achievement Award, Science and Technology Congress, Gulbarga University
- 2013 – Padma Vibhushan, India's second highest civilian award
- 2019 – Lifetime Achievement Award for Mentoring in Science, *Nature* Magazine

He was the author of more than 200 research publications and fifteen books

## Personal life

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Narasimha died on 14 December 2020, from brain haemorrhage at the MS Ramaiah Memorial Hospital in Bangalore. He was 87 and was survived by his wife and daughter.

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## CURRENT AFFAIRS

### Completion of third batch of UNNATI programme at URSC, ISRO

The third batch of UNISpace Nanosatellite Assembly & Training by ISRO (UNNATI) by URSC/ISRO was conducted between October 15, 2022, and December 15, 2022. Thirty-one participants from 19 countries attended the training. A total of 107 lectures were organized in two major parts: 70 lectures on general satellite technology and 37 lectures on nanosatellite design and testing. The faculty comprised of experts from various centres of ISRO namely URSC, SAC, ISRO HQ, ISTRAC, and IISU. The lecture sessions, which began on October 17, 2022, got concluded with an interactive session chaired by Director, URSC on November 18, 2022. During the hands-on training sessions that commenced on November 21, 2022, the participants were divided into three teams. Each team was given the opportunity to integrate various subsystems of a nanosatellite. This was followed by training on disassembled mode tests, panel closure, and assembled mode tests. The sessions concluded with antenna and solar panel deployment and thermal implementation. The teams made a presentation to a review committee on their learning and takeaways from the sessions. Participants visited the facilities at the ISITE campus of URSC covering cleanroom, checkout, CATF, CATVAC, and HILs on December 14, 2022. The rich cultural heritage of India was presented to the participants through a Bharatanatyam performance involving expressive songs and dances. The valedictory session was held at URSC on December 15, 2022. Chairman ISRO and Director URSC presided over the function, with Joint Secretary (Economic Diplomacy) MEA, Govt of India as the Chief Guest. Chairman, ISRO thanked the participants and hoped that they remain connected with URSC/ISRO as their Alma Mater. The Chief Guest congratulated URSC/ISRO for the successful conduct of the program and wished the participants to score high in their space endeavour's participants appreciated the programme



and ascertained that it was the knowledge enriching and memorable. They opined that the program, in addition to helping them gain technical knowledge, helped them get along with people of different backgrounds, cultures, and countries.

**Source:** <https://www.ISRO.gov.in/>

### **Rocket motor Produced by Industry Successfully tested.**

The first PS OM XL motor, which forms the PS0 stage of PSLV-XL, produced by Economic Explosives Ltd., Nagpur is tested at SDSC, SHAR today. The performance is satisfactory. VSSC/ISRO had transferred the technology to Economic Explosives Ltd., Nagpur in 2019. With today's test, the industry's capability to produce the PS0 stage for PSLV is established. This is the first step in the end-to-end production of PSLV through Industry.



**Source:** <https://www.ISRO.gov.in/>

### **Integration of Aircraft with INS Vikrant Likely by May/June Next Year: Navy Chief**

Chief of Naval Staff Admiral R. Hari Kumar on Wednesday said the integration of aircraft with the newly commissioned aircraft carrier INS Vikrant is likely to be accomplished by May or June next year. The sea-going trials are already over after which the carrier was commissioned. Now, the aircraft integration trials have been started, he told reporters after reviewing the Passing Out Parade of the 143rd course of the National Defence Academy (NDA) at Khadakwasla in Maharashtra's Pune district. The first thing we need to check is about the aircraft landing system. Those trials are going on currently. Normally, the integration of the aircraft takes anytime between six to eight months from the commissioning of the aircraft. We hope to accomplish it by May or June before the monsoon," he said. On the induction of the first batch of women cadets in the NDA, he said, "Our forces are gender neutral. Women are already doing combat services. There are women officers in the forces including Navy." The Navy has started inducting women sailors as well which is a landmark achievement, he said. "This year, we had 3,000 vacancies for sailors for which we received 10 lakh applications including 82,000 from women," the Navy chief said. Asked about the Navy's modernisation plan, Admiral Kumar said, "The Indian Navy is on a modernisation programme. Our first small ship was commissioned indigenously in 1960. Since then, we are building ships bigger and bigger. After this, we started building destroyers, culminators and aircraft carriers. Incidentally, the (latest) aircraft carrier is 76 per cent indigenously, so it's a great achievement for the nation." In the last seven years, 29 ships and submarines built in India have been commissioned, he said. "We have 45 ships under construction out of which 43 are built in India. We are processing the acceptance of necessity for another 49 ships. Thus, there's much focus on the modernisation plan and the government is supporting us. The work is in progress as expected," he added. Asked about the budget for the Indian Navy, he said, "There's no problem of budget. There is adequate budgetary support from the government to support all the programmes which we are taking forward."

**Source:** <https://www.thehindu.com/news/national/integration-of-aircraft-with-ins-vikrant-likely-by-mayjune-next-year-navy-chief/article66204249.ece>

### **India's Latest Earth Observation Satellite Starts Serving Images**

ISRO released first-day images of the Earth Observation Satellite-06 covering the Himalayan region, Kutch region of Gujarat and the Arabian Sea. The Earth Observation Satellite-06 launched by the Indian Space Research Organisation

on November 26 has started serving images, the national space agency said on Wednesday. First-day images received by the Earth Observation Satellite-06 on November 29 2022, at NRSC, Shadnagar cover the Himalayan region, Gujarat Kutch region and the Arabian Sea Bengaluru-headquartered ISRO shared on Twitter the first-day images received on Tuesday at National Remote Sensing Centre, Shadnagar, Telangana, covering the Himalayan region, Kutch region of Gujarat and the Arabian Sea. "They are captured by the Ocean Color Monitor (OCM) and Sea Surface Temperature Monitor (SSTM) sensors (on board EOS-06)", it said. The images 27 were released by ISRO Chairman S Somanath in virtual mode, in the presence of Director of U. R. Rao Satellite Centre, M. Sankaran, and NRSC Director Prakash Chauhan, it was stated.



**Source:**<https://www.thehindu.com/sci-tech/science/indias-latest-earth-observation-satellite-startsserving-images/article66204571.ece>

### **Two-Day DFRL Meet in Mysuru on Futuristic Strategies for Troops**

The Mysuru-based Defence Food Research Laboratory (DFRL) is conducting a national conference on "Futuristic strategies for the sustainment of troops in different terrains" at Southern Star here on December 7 and 8. U.K. Singh, Director General (Life Sciences), DRDO, Delhi will inaugurate it. The conference is an effort to bring researchers, tri-service users, industry participants, and academics on a common platform to debate the current challenges faced by all stakeholders and to develop concepts for technical solutions, a release said here. It also creates a common forum where past experiences, difficulties, and future course of action will be imagined and discussed, it said. The conference will be inaugurated at 4 pm on December 7. Cdr Manoj Sharma, director, PDCV, NHQ, New Delhi and R. Umamaheshwaran, Director, HSFC, ISRO, Bengaluru will be the guests of honour.

**Source:**<https://www.thehindu.com/news/national/karnataka/two-day-dfrl-meet-in-mysuru-on-futuristicstrategies-for-troops/article66226973.ece>

### **Full Support of Government for Aero India 2023, Says Bommai**

Chief Minister Basavaraj Bommai has promised complete support of the State government for hosting the 14th edition of Aero India which is to be held at Air Force Station, Yelahanka, from February 13 to 17. Mr. Bommai who met a Ministry of Defence team along with HAL officials thanked the Prime Minister and the Defence Minister for selecting Bengaluru as the venue for Aero India 2023 and promised complete support of the host State to make this edition the largest ever since its inception. The Ministry of Defence team led by Anurag Bajpai, Joint Secretary (DIP) and Cdr. Achal Malhotra, CEO, Defence Exhibition Organisation along with C.B. Ananthakrishnan, CMD, HAL met the Chief Minister. The Ministry of Defence team also took an on-site assessment at the Air Force Station and has fast-tracked all planning and execution of the mega event which will showcase India's resolve to achieve self-reliance in Aerospace and Defence. HAL which is the nodal organization for the airshow said that it has constituted its teams and are ready to interact with the nodal teams of the State government and the Air Force to ensure seamless execution of Aero India 2023 which has multiple stakeholders.

**Source:**<https://www.thehindu.com/news/cities/bangalore/full-support-of-government-for-aero-india2023-says-bommai/article66226776.ece>

## **Made in India MALE UAV Completes Flight Test of 18 Hours**

The TAPAS 201 Medium Altitude Long Endurance (MALE) UAV has achieved a significant milestone after undertaking a flight test lasting 18 hours at the Aeronautical Test Range in Chitradurga, Karnataka. TAPAS 201 has been designed and developed by the Bengaluru-based Aeronautical Development Establishment (ADE). HAL and BEL will be the production partners for the MALE UAV. Announcing the milestone, Defence Research and Development Organisation (DRDO) tweeted: India's TAPAS UAV, #designed & #developed by Aeronautical Development Establishment (ADE), Bengaluru for tri-services has successfully achieved #milestone flight test of 18 hours at Aeronautical Test Range, Chitradurga. TAPAS 201 is a multi-mission UAV being developed to carry out Intelligence, Surveillance and Reconnaissance roles for the three wings of the armed forces with endurance in the range of 24 to 30 hours. Described as the Indian version of the US's Predator drones, TAPAS 201 is capable of carrying different combinations of payloads, like Medium Range Electro Optic, Long Range Electro Optic, Synthetic Aperture Radar, Electronic Intelligence, Communication Intelligence and Situational Awareness Payloads, to perform missions during day and night. The MALE UAV, which was earlier referred to as RUSTOM II, undertook its first flight in November 2016. Since then, it has undertaken many test flights. In 2019, the TAPAS 201 programme suffered a setback when the UAV crashed during an experimental flight near the Aeronautical Test Range in Chitradurga. Apart from the Indian army, air force and navy, internal security agencies like State Police Forces, BSF, CRPF, and the Coast Guard are also prospective users of the MALE UAV.

**Source:**<https://www.thehindu.com/news/cities/bangalore/made-in-india-male-uav-clears-flight-test-of-18-hours/article66239096.ece>

## **100th Surface-to-Air Missile Kit Delivered to IAF**

Kalyani Rafael Advanced Systems (KRAS) on Tuesday announced the rolling out of its 100th Medium Range Surface to Air Missile (MRSAM) mid-section kit. The kit was delivered to the Indian Air Force. The MRSAM kit is a collaborative effort of KRAS and the Defence Research and Development Organisation (DRDO). CMD of Bharat Forge Ltd., Baba N Kalyani expressed his intentions to make the company a "missile house" that would produce modern weapons for the defence of India and also high-quality hardware for the Indian armed forces. He expressed confidence that the industry would soon surpass the target of achieving \$5 bn in defence exports by 2025. Speakers said that Tuesday's development and the collaborative efforts between Indian and Israeli companies affirm the commitment to indigenisation and Prime Minister Narendra Modi's vision of Atmanirbhar Bharat. Distinguished scientist B.H.V.S. Narayana Murthy congratulated KRAS for delivering the 100th mid-section. He said that given the significant milestone, a speeding up of deliveries to the armed forces is required and expressed confidence that given the available infrastructure, that too would be achieved. Director of DRDO's Research Centre Imarat U. Raja Babu congratulated both companies on the roll-out and also requested KRAS to accelerate deliveries. Speaking to the media on the sidelines of the event, Major General (retired) Yoav Har-Even said Rafael has supplied different kinds of missiles to the Indian armed forces. "We understood the vision and the mission of Make in India. This is why we established this joint venture with Kalyani Group almost six years ago and this is parallel with what we are doing with PSUs. Our mission at the end of the day is to be able to produce, supply and support all relevant systems that Rafael has," he said. He said that the company has invested several million dollars and is willing to invest more according to the investment opportunities.

**Source:**<https://www.thehindu.com/news/national/telangana/100th-surface-to-air-missile-kit-delivered-to-iaf/article66259131.ece>

## **TECHNOLOGY**

### **Successful CE-20 Engine Hot Test with 20t off-nominal & 22.2t vacuum thrust**

CE-20 engine is successfully operated with a thrust level of 22t for a long duration of 650 s on December 23, 2022, at the Cryogenic Main Engine & Stage Test Facility of ISRO Propulsion Complex (IPRC), Mahendragiri, Tamil Nadu. With

this, the engine qualification for 20 t thrust level is also successfully completed for induction in flight. The CE20 engine is designed and developed by Liquid Propulsion Systems Centre (LPSC), Valiamala, Kerala. The engine was operated with a 20.2t thrust level for the first 40 s, followed by an operation at 20t off-nominal zones) before operating it at 22.2 t for a duration of 435 s, by moving the thrust control valve. The mixture ratio and thrust control were in open-loop mode. During the test, the engine and the facility performed normally, and the required engine performance parameters were achieved as predicted. The engine used for this hot test had undergone 11 hot tests with a cumulative duration of 2720 s earlier. Thus, this engine has undergone 3370 s cumulative burn duration at different thrust & mixture ratio levels.



Source: <https://www.ISRO.gov.in/>

### First blow down test of Trisonic Wind Tunnel at VSSC

The first blow down test of the newly realised Trisonic Wind Tunnel was held on 8th December, 2022 at Vikram Sarabhai Space Centre, Thiruvananthapuram. The Trisonic Wind Tunnel is a system to aid aerodynamic design of rockets and re-entry spacecrafts by characterizing a scaled model by evaluating forces, moments, load distribution, unsteady pressures, acoustic levels etc. The tunnel has an overall length of about 160m and has a maximum cross section of 5.4m. The tunnel can be used for testing various space vehicles in three flight regimes - below the speed of sound, at the speed of sound and above the speed of sound: hence the name trisonic wind tunnel. The tunnel can simulate flight conditions from 0.2 times the speed of sound (68 m/s) to 4 times the speed of sound (1360 m/s). The blow down was formally switched on by Shri S Somanath, Chairman, ISRO/Secretary, DOS in presence of senior officials of ISRO including Dr S Unnikrishnan Nair, Director, VSSC, Dr. V Narayanan, Director, LPSC and Dr D Sam Dayala Dev, Director, IISU. The huge structure was built with several hundred tonnes of steel and was implemented through M/s Tata Projects India Ltd Mumbai in association with M/s Aiolos Engineering Corporation, Canada and fully realised by industries across India such as M/s Walchandnagar Industries, Pune, M/s Acoustic India, Tiruchirappalli, M/s Artson Engineering, Nashik, M/s Summits Hygronics, Coimbatore, M/s Hydrocare Fluid Power Systems, Bangalore and M/s Siemens Energy, Ahmedabad. The trisonic wind tunnel is a major step towards India's increasing self-reliance in Aerospace sector.

Source: <https://www.ISRO.gov.in/>

### Spacecraft for 'Gaganyaan' Mission Developed: ISRO Scientist

The Indian Space Research Organisation (ISRO) has developed a spacecraft for carrying astronauts to space as part of the ambitious 'Gaganyaan' mission and the crew module that has been successfully designed is under production. The coming year is crucial for the mission as a series of tests will be undertaken with the test vehicle already developed for a couple of unmanned missions before the manned mission takes off. Disclosing the ISRO's progress of 'Gaganyaan' mission at the three-day national conference on "Futuristic strategies for the sustainment of troops in different terrains", organised by the DRDO-DFRL in Mysuru, R. 27 Umamaheshwaran, Director, HSFC, ISRO, Bengaluru said the pandemic affected the mission's progress and the project now has gained full momentum. This pan-world programme has been supported by Russia, Japan and agencies including NASA besides the academia and the industry. Nearly 700 industry partners are involved with the ISRO in the mission. Describing 'Gaganyaan' a "complex programme" and most challenging one, the ISRO scientist said the astronauts identified for the mission have successfully



undergone training in Russia and are also undergoing another round of training in Bengaluru at the astronaut training centre. The DFRL was developing food for the astronauts and the thermo-stabilised food has been developed for them because of its simplicity, he added. Phase of testing Dr. Umamaheshwaran said the 'Gaganyaan' has entered a phase where a lot of testing will be carried out, including the crew escape system - in the ascent phase, orbital phase and descent phase. The crew health monitoring system has also been developed. The space scientist said the ISRO's plan of carrying humans to space was actually thought of 20 years ago as a study team was constituted to understand its feasibility and explore the methodologies to be involved for the project. Another team was formed to study what technology has to be employed and the launch vehicle required for the mission. In 2012, an initial project study was constituted and the ISRO decided to take up the challenge after undertaking a wide range of studies. Prime Minister Narendra Modi announced 'Gaganyaan' mission in 2018. "It's been four years now and a lot of work has been done. We lost time because of COVID-19 but the project is in brisk phase now, with the launch vehicle – a most powerful rocket – developed, and the liquid engine test already done successfully," he told the gathering.

**Source:**<https://www.thehindu.com/news/national/karnataka/spacecraft-for-gaganyaan-missiondeveloped-ISRO-scientist/article66235226.ece>

## **Landing Experiment of ISRO's Reusable Launch Vehicle Planned for Next Year, Centre Tells Parliament**

The Centre has told the Parliament that the landing experiment of ISRO's reusable launch vehicle (RLV) is planned for early next year. "The RLV project is under progress at ISRO. The RLV technology demonstrator (RLV-TD) was successfully flight tested on May 23, 2016, from the spaceport in Sriharikota, validating the critical technologies such as autonomous navigation, guidance & control, reusable thermal protection system and re-entry mission management," Union minister Jitendra Singh said in a written reply. "The next test planned under the project is the first runway landing experiment or RLV-LEX, which is scheduled early next year from the aeronautical test range in Challakere, Chitradurga," he added. Meanwhile, the first PS0MXL motor, which forms the PS0 stage of ISRO's Polar Satellite Launch Vehicle-XL (PSLV-XL), produced by Nagpur-based company Economic Explosives Limited has been tested at the space agency's spaceport in Sriharikota. The PS0 or PS-zero stage refers to six strap-on motors that are around the PS1 (the first stage of the rocket) stage. "The performance is satisfactory. The Vikram Sarabhai Space Centre had transferred the technology to Economic Explosives in 2019. With today's test, the industry's capability to produce the PS0 stage for PSLV is established. This is the first step in the end-to-end production of PSLV through Industry," ISRO said. The PSLV-XL is one of the variants of ISRO's workhorse launch vehicle — PSLV — which has four other variants built over the years since its first successful launch in October 1994.

**Source:**<https://timesofindia.indiatimes.com/india/landing-experiment-of-ISROs-reusable-launch-vehicleplanned-for-next-year-centre-tells-parliament/articleshow/96091107.cms>

## **BUSINESS**

## **ISRO and Social Alpha join hands to establish SpaceTech Innovation Platform - SpIN: Focussed on Lab to Market Transition and Venture Development in Space Industry**

Indian Space Research Organisation (ISRO) and Social Alpha today signed an MoU to launch SpaceTech Innovation Network (SpIN), India's first dedicated platform for innovation curation and venture development for the burgeoning space entrepreneurial ecosystem. A one-of-its-kind public-private collaboration for start-ups and SMEs in the space industry, this novel partnership is a significant step forward in providing further stimulus to India's recent space reform policies and will work towards identifying and unleashing the market potential of the most promising space tech innovators and entrepreneurs in India. SpIN will primarily focus on facilitating space tech entrepreneurs in three distinct innovation categories: Geospatial Technologies and Downstream Applications; Enabling Technologies for Space &



Mobility; and Aerospace Materials, Sensors, and Avionics. “Space applications cut across various domains from earth to sky. Innovative technologies are expected to bring paradigm shift in utilising the space applications to maximise the economic, social and environmental benefits for the larger society. I wish the SPIN platform would be useful for various stakeholders to collaborate and contribute to the space ecosystem in the country”, says **Shri. S Somanath, Chairman, ISRO** According to the Economic Survey Report 21-22, there are now over 100 active space start-ups in India - the number of start-ups in this sector has more than doubled in the last year alone. Through this partnership, ISRO will support the creation of an open innovation and scale-up platform for all space ecosystem stakeholders and promote active collaboration to make early-stage space start-ups successful. This also marks the entry of Social Alpha in the area of space tech, a vertical that has the potential to grow manifolds and introduce innovations that can directly impact millions of lives and livelihoods. *“Space science, technology, and data have the potential to contribute to various Sustainable Development Goals with high-impact applications in ensuring food security, reducing disaster risks, preventing humanitarian crises, and monitoring natural resources. At Social Alpha, we have stayed committed to our goal of bringing breakthrough innovations to the social sector with applications across climate, health, and livelihoods, and this partnership with ISRO will significantly strengthen our ability to create impact”*, says **Manoj Kumar, Founder, Social Alpha**. In line with the partnership announcement, SpIN has launched its first innovation challenge. Early-stage start-ups for developing solutions in areas of maritime and land transportation, urbanisation, mapping and surveying, disaster management, food security, sustainable agriculture, environmental monitoring, and natural resources management among others are encouraged to apply. The selected start-ups and innovators will be able to access both Social Alpha’s and ISRO’s infrastructure and resources as per the prevailing guidelines. They will be provided active handholding in critical areas including access to product design, testing and validation infrastructure, intellectual property management, go-to-market strategy, and access to long-term patient capital, among other technical and business inputs. Applications are open from December 6, 2022, to February 6, 2023.

### About Social Alpha

Social Alpha is a multistage innovation curation and venture development platform for science and technology start-ups that address the most critical social, economic, and environmental challenges through the power of entrepreneurship and market-creating innovations. Since its inception in 2016, Social Alpha has supported more 200 start-ups including 60+ seed investments.

Source: <https://www.ISRO.gov.in/>

### DFRL Told to Redefine, Partner with Industry Innovation

A three-day national conference on “Futuristic strategies for sustainment of troops in different terrains” organised by the Mysuru-based Defence Food Research Laboratory (DFRL), a DRDO lab, got off to a start in Mysuru on Wednesday. The conference gave researchers, service users, industry partners, and academics a common platform to debate the nuances of the challenges at hand and develop concepts for solutions. During the conference, the past experiences will be shared, difficulties discussed and potential future course of action will be imagined. Inaugurating the conference, DRDO Director General (Life Sciences) U.K. Singh told the DFRL to redefine its roles and collaborate with the industry in R and D as it is important to become atmanirbhar in all our productions. Nearly 25 per cent of the funding for R and D is now given to the industry other than the labs with the focus on bringing in innovation. While complimenting the DFRL for its roles during natural disasters, he said the DFRL sent food supplies to the affected persons during disasters like Kerala floods and Nepal earthquake. With regard to technology transfer, an apricot processing plant has come up in Leh, Ladakh with the help of DFRL. The industry partners must be seen as the competitors and work towards bringing innovation, he added. “I think the DFRL can think beyond and come up with innovative foods that help reduce stress, developing foods with special ingredients. The world is working way ahead of us. The academia and the industry must become close partners to bring about the change. It’s time to think of even developing technology for artificial photosynthesis,” he felt. In his address, R. Umamaheshwaran, Director, HSFC, ISRO, Bengaluru spoke about the contributions of the DFRL and the food technologies it developed for the Army, Navy and the Air Force, for different terrains and conditions. “It’s time the labs innovate and go along with the situations for developing foods, like how it

developed foods for the astronauts.” Cmde Manoj Sharma, Principal Director, C and V, Naval HQ also spoke on the occasion. DFRL Director Anil Dutt Semwal spoke about the DFRL’s contributions since its inception and the way forward. Scientists V.A. Sanjay Kumar and R. Kumar were present. On the occasion, new technologies developed by the DFRL were released by the dignitaries, and the MoU documents were handed over to the industry partners to whom the technology transfer has been done. The technologies developed include biodegradable cutlery, milk testing kit (Mark II), multilayer degradable food packaging materials and biodegradable films for packaging applications. The conference will look into military dietary needs and focused nutritional delivery besides development of sustainable food packaging. hybrid technology for food DRDO News DRDO Technology News 1 processing, modern methods and strategies for evaluating the safety and quality of food; designing food processing and packaging systems with artificial intelligence assistance; utilising 3-D printing technology to create culinary products are among the thrust areas of the conference. Food sustainability – current challenges and potential while preserving the food supply chain and R and D for optimising and enhancing military performance will also be discussed at the conference. DFRL said it has engaged in research and development project to build a technology platform by utilising cutting-edge processing technologies such as microwave sterilisation, infrared processing, high pressure processing, pulsed electric field processing etc to develop newer products/processes to extend shelf life of products to meet military nutritional requirements and enhance soldier acceptance for food products.

**Source:** <https://www.thehindu.com/news/national/karnataka/dfri-told-to-redefine-partner-with-industryinnovation/article66235679.ece>

## **Make-in-India in Defence Sector**

The Government has taken several policy initiatives in the past few years and brought in reforms to encourage indigenous design, development and manufacture of defence equipment, there by promoting self-reliance in defence manufacturing & technology in the country. These initiatives, inter-alia, include according priority to procurement of capital items from domestic sources under Defence Acquisition Procedure (DAP) 2020; Announcement of 18 major defence platforms for industry led design & development in March 2022; Notification of four ‘Positive Indigenisation Lists’ of total 411 items of Services and three ‘Positive Indigenisation Lists’ of total 3738 items of Defence Public Sector Undertakings (DPSUs), for which there would be an embargo on the import beyond the timelines indicated against them; Simplification of Industrial licensing process with longer validity period; Liberalisation of Foreign Direct Investment (FDI) policy allowing 74% FDI under automatic route; Simplification of Make Procedure; Launch of Mission DefSpace; Launch of Innovations for Defence Excellence (iDEX) scheme involving start-ups & Micro, Small and Medium Enterprises (MSMEs); Implementation of Public Procurement (Preference to Make in India) Order 2017; Launch of an indigenisation portal namely SRIJAN to facilitate indigenisation by Indian Industry including MSMEs; Reforms in Offset policy with thrust on attracting investment and Transfer of Technology for Defence manufacturing by assigning higher multipliers; and Establishment of two Defence Industrial Corridors, one each in Uttar Pradesh and Tamil Nadu; Opening up of Defence Research & Development (R&D) for industry, start-ups and academia with 25 percent of defence R&D budget; Progressive increase in allocation of Defence Budget of military modernisation for procurement from domestic sources, etc. With focus on indigenisation and procurement from domestic industries, all the major areas of domestic defence production ecosystem such as weapons, ammunition, fighter aircrafts, helicopters, missile systems, warships, submarines, armoured vehicles, radars, communication systems, surveillance systems, etc. have benefited from the aforesaid initiatives and also given boost to the growth of domestic industries including MSMEs & start-ups.

**Source:** <https://pib.gov.in/PressReleasePage.aspx?PRID=1882700>

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