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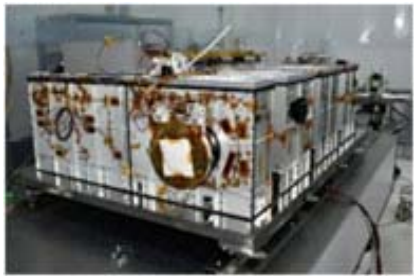
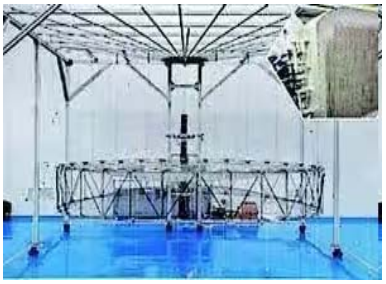


IIA hands over VELC payload to ISRO

DRDO Develops Unfurlable Antenna for Space Radar



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Eminent Indian Aeronautical and Aerospace Personalities in India

Series:6

Udupi Ramachandra Rao

(10 March 1932 - 24 July 2017)

Udupi Ramachandra Rao was an Indian space scientist and former chairman of the Indian Space Research Organisation. He was also the Chairman of the Governing Council of the Physical Research Laboratory at Ahmedabad and Nehru Planetarium at Bengaluru and chancellor of the Indian Institute for Space Science and Technology (IIST) at Thiruvananthapuram.[1] He is known as "*The Satellite Man of India*". He pioneered India's first satellite launch Aryabhata in 1975.

Rao was awarded the Padma Bhushan by the Government of India in 1976, and Padma Vibhushan in 2017. He was inducted into the Satellite Hall of Fame, Washington, on 19 March 2013 at a ceremony organised by the Society of Satellite Professionals International. With this he became the first Indian to be inducted. He was also to be inducted in International Astronautics Federation (IAF) on 15 May 2016. He was again the first Indian to achieve such a feat.

Continued.....

- 1995 Jawaharhal Nehru Award
- 1996 SK Mitra Birth Centenary Gold Medal
- 1997 Yudhvir Foundation Award
- 1997 Rabindranath Tagore Award of Viswa Bharati University
- 1999 *Gujar Mal Modi Award* for Science & Technology
- 2001 Nadoja Award from Kannada University, Hampi
- 2001 *Life Time Contribution Award in Engineering* of INAE
- 2002 Sir M. Visvesvaraya Memorial Award
- 2003 Press Bureau of India Award
- 2004 Star of India Award from Vishwabharathy Foundation, Hyderabad
- 2004 Special Award 2004, Karnataka Media Academy
- 2005 Bharat Ratna Rajiv Gandhi Outstanding Leadership Award
- 2007 Life Time Achievement Award of Indian Space Research Organisation
- 2007 Distinguished Scientist Gold Medal of the Karnataka Science & Technology Academy.
- 2007 *Vishwamanava Award* by Vishwamanava Samsthe
- 2007 A.V. Rama Rao Technology Award
- 2008 Jawaharlal Nehru Birth Centenary Award for 2007-2008 from ISCA
- 2017 Padma Vibhushan

International Awards

- 1973 Group Achievement Award by NASA, USA
- 1975 Medal of Honour by Academy of Sciences, USSR
- 1991 Yuri Gagarin Medal of USSR
- 1992 Allan D Emil Award on International Cooperation
- 1994 Frank J Malina Award (International Astronautical Federation)
- 1996 Vikram Sarabhai Medal of COSPAR
- 1997 Outstanding Book Award of the International Academy of Astronautics for the Book Space Technology for Sustainable Development
- 2000 Eduard Dolezal Award of ISPRS
- 2004 Space News magazine named him as one of the Top 10 International personalities who have made a substantial difference in civil, commerce and military space in the world since 1989
- 2005 Theodore Von Karman Award which is the highest Award of the International Academy of Astronautics.
- 2013 Inducted into Satellite Hall of Fame by Society of Satellite Professionals International'
- 2016 Inducted into Hall of Fame by International Astronautical Federation.

Honours

People's President and distinguished scientist Dr. A. P. J. Abdul Kalam had an effective association with Prof. U. R. Rao. While Dr. A.P. J. Abdul Kalam was President, he presented the Life Time Achievement Award constituted by ISRO and Astronautical Society of India (ASI) to Prof. Rao for his outstanding contribution to the organization.

D. Litt. (Hon. Causa) from Kannada University, Hampi

D.Sc (Hons. Causa) from the Universities of:

- 1976 Mysore
- 1976 Rahuri
- 1981 Calcutta
- 1984 Mangalore
- 1992 University of Bologna (Italy)
- 1992 Banaras
- 1992 Udaipur
- 1993 Tirupati (SV)
- 1994 Hyderabad (JN)
- 1994 Madras (Anna University)
- 1994 Roorkee University
- 1995 Punjabi University, Patiala
- 1997 Shri Shahu Ji Maharaj University, Kanpur
- 1999 Indian School of Mines, Dhanbad
- 2001 D.Litt. (Hons. Causa) from Kannada University, Hampi
- 2002 Ch. Charan Singh University, Meerut
- 2005 UP Technical University, Lucknow
- 2006 Viswesvaraiah Technical University, Belgaum
- 2007 Indian Institute of Technology - Delhi

Legacy

On March 10, 2021, a Google Doodle was made in honor of his 89th birthday.

Fellowships / Memberships

- Fellow of the Indian Academy of Sciences
- Fellow of the Indian National Science Academy
- Fellow of National Science Academy
- Fellow of Third World Academy of Sciences
- Fellow of the International Academy of Astronautics
- Fellow of Indian National Academy of Engineering
- Fellow of the Astronautical Society of India
- Hon. Fellow of the Aeronautical Society
- Distinguished Fellow Institution of Electronics and Telecommunication Engineers

- Hon. Fellow of Indian National Cartographic Association
- Fellow of Broadcasting and Engineering Society of India
- Hon. Fellow Aero Medical Society of India
- Distinguished Fellow of Physical Research Laboratory, Ahmedabad
- Fellow of World Academy of Arts & Sciences, USA.
- Fellow of International Aeronautical Federation (IAF) proposed.

Professional Activities in International Arena

- 1986-1992 Vice President, International Astronautical Federation
- 1988 to date President, Committee for Liaison with Developing Nations (CLODIN) of IAF
- 1997-2000 Chairman, UN-COPUOS (United Nations - Committee on Peaceful Uses of Outer Space)
- 1999 President, UNISPACE-III Conference
- 2007 Chairman, 30th International Antarctic Treaty Consultative Committee Meeting

Other roles

- President of UNISPACE III Conference, Vienna, in 1979
- Led Indian Delegation in COPUOS and S&T Sub Committee of COPUOS from 1980 to 1994, UNISPACE-II in 1982 and President UNISPACE-III in 2000.
- Chairman of the UN Committee on Peaceful Uses of Outer Space (1996–1999)

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.

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.

Career

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.

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] In 1970, he was a member of the investigation team under Satish Dhawan that studied the airworthiness of Indian Airlines Avro 748.

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.

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 lead 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.

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.

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

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.

Some of his honours and awards include:

- 1975 – SS Bhatnagar Prize
- 1987 – Padma Bhushan, India's third highest civilian award.
- 1990 – Gujarmal Modi Award
- 1998 – S. Ramanujan Medal, Indian Science Congress[36]
- 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

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.

CURRENT AFFAIRS

Bengaluru: Aero India registrations near 600

Nearly 600 companies have registered for the 14th edition of Aero India, scheduled to be held in Bengaluru between February 13 and 17. As per information provided on the official website of the show, 557 Indian exhibitors and 41 foreign exhibitors have already confirmed participation. The event will have representation from 23 countries. Meanwhile, an official statement said the 2023 edition of the show has received "tremendous response". The space offered initially for the event has been fully booked and an additional hall, opened on December 31, has been fully booked and an additional hall, opened on December 31, has also been booked, the statement said. The five-day event, to be held at the Air Force Station, Yelahanka, will combine a major trade exhibition of the aerospace and defence industries with an aerial display by the Indian Air Force. Besides global leaders and major investors in the aerospace industry, the show will see participation by think-tanks from across the world. Apart from setting a platform for idea exchange among leaders in the aviation industry, the show will expand the scope of the 'Make in India' initiative, the statement said.

Source: https://www.deccanherald.com/city/top-bengaluru-stories/bengaluru-aero-india-registrations-near-600-1178346.html

Aero India 2023: Rajnath Singh meets ambassadors from 80 countries

The upcoming Aero India 2023 would witness participation from at least 645 exhibitors from 80 countries, the Defence Ministry said here. Minister Rajnath Singh met ambassadors from these nations to brief them about the biennial air show. Describing the show as Asia's premier aviation trade event, Singh appealed to the diplomats to use Aero India 2023 for increased collaboration with India's military manufacturing capabilities, particularly in the areas of drones, cyber-technologies, Artificial Intelligence and radars. The air show which began in 1996 with a handful of companies, has grown in size over the years with more than 600 firms participating in the last two editions. The 14th edition of the show will be held at Yelahanka air base between February 13-17. The air show comes at a time when India is looking at options to buy more than 100 medium multi-role combat fighters for the Indian Air Force besides deck-borne fighters for the Indian Navy and hundreds of helicopters for the IAF, Indian Navy, Indian Army and the Indian Coast Guard. India's defence exports have grown by eight times in the last five years with New Delhi exporting such items to over 75 countries. Aero India 2023, Singh said, would provide a unique opportunity for the exchange of information, ideas and new technological developments in the aviation industry. The previous edition witnessed the attendance of over 600 exhibitors physically and another 108 virtually from 63 nations. "We want to build with you, we want to launch with you and we want to create with you. There is an old African proverb 'If you want to go fast, go alone. If you want to go far, go together'. We intend to go far and we want to do it together. We wish to create symbiotic relationships, where we can learn from each other, grow together and create a win-win situation for all."

Source: https://www.deccanherald.com/national/aero-india-2023-rajnath-singh-meets-ambassadors-from-80-countries-1179481.html

Future tech in focus at Aero India's startup showcase

About 70 startups working across defence and aerospace domains will display innovations as part of an industry showcase at Aero India 2023. The 14th edition of the biennial event – to be held from February 13 to 17 in Bengaluru – will host them at a pavilion by iDEX (innovations for defence excellence), affiliated with the Defence Innovation Organisation under the Ministry of Defence (MoD). "We are interacting with the startups – that include existing and prospective collaborators – and the registrations are being shortlisted. It is early to discuss numbers but we are expecting close to 70 of them at the iDEX pavilion," a senior iDEX official told DH. The MoD initiated the iDEX framework, in 2018, to encourage indigenous innovation in defence and aerospace. The agency, in line with the Union Government's Atmanirbhar Bharat Abhiyaan (self-reliant India campaign), provides financial grants, supports startups, MSMEs, R&D institutions, academia, and individual innovators and facilitates the procurement of their products.

Domain range

At Aero India, the startups will showcase prototypes and innovations under four broad themes. Fixed-wing systems, drones and anti-drone technologies (weaponisation and payloads), and defence in the space sector will be some of the themes. Startups that work with AI and robotics, IoT, 5G, blockchain, Industry 4.0, immersive technologies including augmented and virtual reality platforms, and additive manufacturing will display their innovations. Lt Col Anthony Selva Kumar (Retd), programme director, iDEX, told DH that the agency's collaborations with startups are important markers in India's pursuit of atmanirbharta in Defence. "The idea has been to develop a platform to co-create tech solutions locally. From being one of the largest importers of defence products, India is shifting to a phase of indigenisation," he said. iDEX handholds the startups to develop these solutions, in partnership with premier institutions including the IITs. It has organised eight editions of the Defence India Startup Challenge where problem statements are presented to the startups for resolution. The iDEX programme director said the scope of the agency's role has widened during the four years, as reflected in the increase in the number of these problem statements. He said iDEX is providing the startups space at Aero India free of cost. On the third day of Aero India (February 15), iDEX will also organise Manthan 2023, a defence innovation event that brings together startups, MSMEs, innovators, industry, and military representatives. As part of the indigenisation push, 68% of the capital procurement budget for Defence in the 2022-23 Union Budget was earmarked for domestic industry, and 25% of the Defence R&D budget was set aside for private industry and startups.

Source: https://www.deccanherald.com/business/dh-wheels/future-tech-in-focus-at-aero-india-s-startup-showcase-1184560.html

DRDO Celebrates its 65th Foundation Day; Floral Tributes Paid to Former President Dr APJ Abdul Kalam at DRDO Headquarters in New Delhi

Floral tributes were today paid at the bust of former President Dr APJ Abdul Kalam at DRDO Headquarters in New Delhi to mark the 65th Foundation Day of the Organisation, which is celebrated on 1st January every year. Secretary, Department of Defence R&D and Chairman, DRDO Dr Samir V Kamat along with Director Generals and senior officials of DRDO paid floral tributes at the bust of Missile Man of India. The event, organised to mark the day, also included release of two books comprising articles on defence technologies, a dictionary on scientific and technical terminology, Stores Manual and guidelines (SMG-2023), third anniversary issue of bimonthly bulletin InSight and DRDO Technology Foresight. DRDO Technology Foresight will be shared on DRDO website so that industry and academia may plan their R&D activities accordingly. A DRDO monograph 'Infrared Signatures, Sensors and Technologies' authored by Dr Kamal Nain Chopra, a former DRDO Scientist, was also released by the Chairman DRDO. DRDO calendar 2023 was also released. In addition, Secretary DD R&D and Chairman DRDO felicitated all the employees who have completed 25 years of their service in DRDO. In his address to the DRDO fraternity on the occasion, Dr Samir V Kamat congratulated

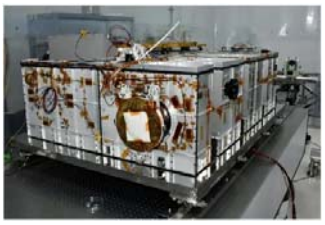
them for achieving a number of milestones in 2022, urging them to focus on developing the defence R&D ecosystem in the country and strive to realise Prime Minister Shri Narendra Modi's vision of 'Aatmanirbhar Bharat'. The DRDO Chairman stated that several systems developed by DRDO have been delivered, inducted or handed over to the users. These include three firing units of Medium Range Surface to Air Missile for IAF, Shakti EW system, InfraRed Signature Suppression System for ships, Brake Parachutes for Su-30 fighter aircrafts, Commanders Thermal Imaging Sight with Laser Range Finders for T-90 Tank, Dhwani Automated Sonar Trainer, four types of Radiation Contamination Monitoring Systems, MIG-29 Aircrew Helmet and Pressure Breathing Oxygen Masks etc. Dr Kamat added that the Acceptance of Necessity (AON) has also been accorded by DRDO News DRDO Technology News 2 the Defence Procurement Boards and Defence Acquisitions Council for induction of several DRDO developed systems. Some of the notable systems include: Sarang ESM system, Light Tank, Tactical Advance Range Augmentation (TARA) kit, Long Range Guided Bomb (LRGB)- Gaurav, Naval Anti-Ship Missile-Medium Range (NASM-MR), Air surveillance radar for NGMV, Low Level Transportable Radar (LLTR) -Ashwini, New Generation Anti-radiation Missile (NGARM), Pralay, Guided Extended Range Rocket Ammunition for Pinaka, SelfPropelled Mine Burier, Infantry Combat Vehicle-Command, Anti-Personnel Fragmentation Mine 'Ulk', Infantry Floating Foot Bridge, Bridge Laying Tank (BLT) T-72 and ACADA. The DRDO Chairman added that Authority Holding Sealed Particulars (AHSP) of Army version of Akash Weapon System have been handed over to Missile Systems Quality Assurance Agency. Several major systems have either been completed or are in the final stages of user evaluation. These include Advanced Towed Artillery Gun System (ATAGS), Third Generation Helicopter Launch Anti-Tank Guided Missile 'Helina', NAMIS (Tracked) and 'Nag' Anti-Tank Guided Missile, Quick Reaction Surface to Air Missile, Medium Range Surface to Air Missile, Mechanical Mine Layer (self-propelled), 84 mm Anti-Thermal/Anti-Laser Smoke Grenade, HEPF and RHE (Enhanced) Rocket Ammunition for Pinaka MRLS, 125 mm FSAPDS, Air Defence Fire Control Radar 'Atulya', Weapon Locating Radar for Mountains, V/UHF Manpack Software Defined Radio, P-16 Heavy Drop System, Portable Diver Detection Sonar System, Advanced Light Weight Torpedo, and Sea Water Purification Kit for Gaganyan Mission. Dr Kamat stated that several systems are also undergoing developmental trials. These include Electronic Warfare Systems for Naval platforms under the programme Samudrika, Phase-II Ballistic Missile Defence Interceptor AD-1 Missile, extended range version of BrahMos from Su-30 aircraft, Very Short Range Air Defence System, Naval Anti-Ship Missile-Short Range, Agni Prime, Vertical Launch-Short Range Surface to Air Missile (VL-SRSAM), Akash-New Generation, Man-Portable Anti-Tank Guided Missile (MPATGM), Enhanced Range Pinaka Rocket System, High speed expendable Aerial Target 'Abhyas', Small Turbo Fan Engine, Kaveri Dry Engine WhAP-CBRN, Shatrughat and EW Systems for Plains and Desert Active Electronically Scanned Array Radar 'Uttam', Advanced Light Towed Array Sonar among others. The DRDO Chairman said that it is expected that most of the systems under trials will be handed over to the users in the coming year. He summarised that five CCS programmes worth Rs 26,000 crore and 55 other projects worth Rs 11,000 crore were sanctioned in 2022. 32 previously sanctioned projects were successfully completed. Some other flagship programmes such as Advanced Medium Combat Aircraft (AMCA) are also under consideration for approval by CCS. Dr Kamat brought out that in the past year, DRDO has signed 145 ToTs. Towards IP protection, 160 patents were filed and 100 have been granted during 2022. The fund limit under Technology Development Fund (TDF) Scheme was enhanced to Rs 50 crore from Rs 10 crore per project. This will enable DRDO to support industry for development of more complex technologies. He mentioned that MoU was also signed between Naval Innovation and Indigenisation Organisation and TDF to work jointly on advanced naval technologies. In addition, he mentioned that the 4th version of Dare to Dream contest has been launched by the Raksha Mantri. He informed that DRDO has now established a total of 15 DRDO-Industry-Academia Centres of Excellence (DIACoEs). Currently, 867 projects are on-going with academia at a cost of Rs 1,183 crore.

Source: https://pib.gov.in/PressReleasePage.aspx?PRID=1888133

TECHNOLOGY

IIA hands over VELC payload to ISRO

Indian Institute of Astrophysics (IIA), Bengaluru handed over Visible Line Emission Coronagraph (VELC) payload for Aditya-L1 mission to ISRO in a ceremony held on January 26, 2023 at the Centre for Research and Education in Science and Technology (CREST) Campus, Hosakote, near Bengaluru. VELC payload was designed and realised at CREST campus. The payload was handed over to Director, U R Rao Satellite Centre (USRC) by Director, IIA in the presence of Chairman, ISRO/ Secretary, DOS Shri S Somanth. Project Director of Aditya-L1 Smt. NigarShaji, and Principal Investigator of VELC Dr. B Raghavendra Prasad were present on the occasion. The payload would be integrated to the satellite at URSC. VELC has a mechanism to occult the solar disc to separate and discards the light from the disk.The light from the Corona is captured by the coronagraph for further processing. VELC aims to collect the data for solving how the temperature of the corona can reach about a million degrees while the Sun's surface itself stays just over 6000 degrees Centigrade. For this, the payload targets at the continuous observations of the Corona, right from its lowermost boundary upwards after having discarded the bright light from the solar disc. VELC weighs 90 kg and is 1.7 m x 1.1 m x 0.7 m in dimension.



Source: https://www.isro.gov.in/

DRDO to Test Guided Anti-tank Missiles in High Altitude Areas

The Defence Research and Development Organisation (DRDO), which is developing HELINA, a helicopter-fired guided anti-tank missile, is in the process of carrying high altitude tests of the weapon system. This comes following a requirement by the Army in the light of a likely tank action on the Chinese front. The missile has been developed by Defence Research and Development Laboratory (DRDL), an establishment under DRDO based in Hyderabad. The HELINA missiles were on display at the DRDL stall at the 108th Indian Science Congress in the city. Normally, tank battles are expected to take place in plains. The missiles have already successfully undergone user trials in such areas, including deserts. However, considering the Chinese factor, the Army also wants it to function in the high altitude areas along the eastern front, for which further user trials are planned and the process is on. Aspects like gravitational force, density of air and other factors related to high altitudes have to be considered, said sources.The DRDO has already developed tank-to-tank fired Nag missiles, which are again of third generation guided systems. Nag is made by ordnance factories. Once ready, the know-how for HELINA will also be available on transfer of technology (ToT) basis to both private and public sector, said sources.Another version — the man portable anti-tank guided missile (MPATM) — was also put up on display in the expo. This is also third generation shoulder-fired anti-tank missiles. If it succeeds, it would be the first ever indigenous weapon of this kind, said sources. However, now the challenge is to reduce the recoil which the solider has to take on his shoulder. At present, recoil, which is the reverse pressure exerted from a gun or weapon that is fired, is too much for a solider to handle. Efforts are on to reduce the

force. Work is also on to tune the booster energy to such a level that the recoil can be endured by the solider and flight of the missile is also maintained, a source said.

Source:https://timesofindia.indiatimes.com/city/nagpur/drdo-to-test-guided-anti-tank-missiles-in-highaltitude-areas/articleshow/96746215.cms

DRDO Develops Unmanned Aerial Vehicles for Himalayan Border Operations

The Defense Research and Development Organization (DRDO) aims to conduct logistics operations on the Himalayan border with a tethered multicopter payload; an unmanned aerial vehicle (UAV) was developed. 3 The multicopter was exhibited by DRDO at the 108th Indian Science Congress in Nagpur, Maharashtra. A successful multicopter test was conducted in Sikkim at an altitude of 14,000 feet. DRDO official Mahesh Sahu said the product is ready for military deployment after his two remaining trials. DRDO is developing a multicopter with a payload capacity of 5kg to 25kg and is working to increase the capacity to 30kg, he said. The multicopter can perform autonomous missions with waypoint navigation with a radius of up to 5 km. He said it could drive to a specific location in automatic mode, release the payload, and return to its home location. It could also be used to drop bombs on hostile locations without the risk of losing people, officials said. Similarly, payload UAVs could help drop drugs on soldiers deployed in highlands and war zones, he said. A 100mm beacon-based landing accuracy, a ground vehicle following mode, and a modular design for ease of use are some of the other features of the Multicopter His payload. This feat achieved by DRDO will provide an immense edge to Indian forces in hostile locations where countering the opponent puts lives of personnels at greater risk and where missions can be carried out better with discretion without putting the lives of soldiers at risk. The autonomous deployment will make this UAV seem straight out a sci-fi flick but with DRDO turning this project into reality will further enhance the prowess of Indian forces in mountain warfare and guerrilla warfare.

Source: https://www.timesnownews.com/auto/drdo-develops-unmanned-aerial-vehicles-for-himalayanborder-operations-article-96797417

DRDO Develops Unfurlable Antenna for Space Radar

In a key development, Electronics and Radar Development Establishment (LRDE), a Bengaluru lab of the Defence Research and Development Organisation (DRDO), has developed a major subsystem for a space radar, which holds significant potential not only for the Indian Space Research Organisation (Isro), but also for the military. LRDE, which has been involved in the development of space-borne imaging radar — mainly consisting of electronic radar subsystems and antenna deployment mechanisms — for installation on satellites has completed the development of an UnFurlable Reflector Antenna (UFRA). UFRA is one of the major subsystems of a radar, LRDE said, adding that radars for space applications require an antenna to be stowed in compact volume during launch and then deployed in the required shape once the satellite is in the required orbit. “To meet this requirement, LRDE has developed the UFRA system which consists of a rim trussbased deployable mechanism, primary arm, reflector mesh, tension ties, nets, and motor. A cable is routed through the diagonal members of the rim truss elements,” it said, adding that one end of the cable is fixed and the other end is pulled by a motor. “When the cable is pulled by a motor, the antenna made up of metallic mesh will be deployed to the desired size. The UFRA was realised and the deployment of the antenna to the required height was achieved successfully by an unfurlable deployment mechanism. The design can be adapted to realise any size of UFRA,” it added. The antenna, sources said, is likely to be part of a space-based military radar, which LRDE is working on. “The specific details about the radar cannot be divulged at this moment, but the development of UFRA is a key milestone in the development of the radar,” one source said. LRDE is a key DRDO lab with a mission to design and develop state-of-the-art radar systems meeting current and futuristic requirements of the tri-services, paramilitary forces, intelligence and strategic missions. It is also tasked with establishing indigenous production capability through industry partnership to achieve total self-reliance in the field radars besides promoting in-house research, engaging academia and industry to build competence towards creating a centre of excellence in the field of radar technologies.

Source:https://timesofindia.indiatimes.com/india/drdo-develops-unfurlable-antenna-for-spaceradar/articleshow/97469706.cms

ISRO Eyes June-July Launch for Solar Mission, Receives Primary Payload

The Indian Space Research Organisation (Isro) is targeting a June-July time frame to launch Aditya L1, India's first dedicated scientific mission to study the Sun, Isro Chairman and Secretary, Department of Space, S Somanath said. He was speaking at an event in Hosakote that marked the formal handing over of Visible Line Emission Coronagraph (VELC), the mission's primary payload developed by the Indian Institute of Astrophysics (IIA). "Currently, we are getting the (Aditya L1) satellite ready. The payload will reach the U R Rao Satellite Centre and will be integrated with the satellite. It will go through extensive testing and evaluation and will be launched on the PSLV, by June-July," Somanath said. The satellite with seven payloads will be launched to the L1 orbit – the first Lagrangian point of the Sun-Earth system, about 1.5 million km from the Earth – from where it can view the sun continuously, without blockage. The primary payload The 90-kg VELC was assembled, tested, and calibrated at the IIA's Centre for Research and Education in Science and Technology campus in Hosakote. The payload took about 15 years in the making, from concept to realisation. VELC is designed to facilitate continuous observations of the Sun's atmosphere, the Corona. The extremely bright light from the Sun's surface, or disk, makes observation of the lower Corona very difficult. VELC comes with an 'internal occulter' that separates out this light, discards it, and sends the remaining light (from the Corona) for processing. 31 "It can image the solar Corona as close as 1.05 times the solar radius. It can also do imaging, spectroscopy, and polarimetry at the same time, and can take observations at a very high resolution and many times a second," Prof B Raghavendra Prasad, Principal Investigator of VELC, said. Uninterrupted observations of the Corona are critical in studying the gap between temperatures in the Sun's atmosphere (about a million degrees) and its surface (only about 6,000 Kelvin), IIA said. VELC is designed to study processes that lead up to the heating of the Corona and solar wind acceleration, aspects of space weather, and measurement of coronal magnetic fields. There are six other payloads on Aditya L1, developed by Isro and other institutions1. Solar Ultraviolet Imaging Telescope (SUIT) – to provide full disk images of the solar atmosphere 2. Solar Low Energy X-Ray Spectrometer (SoLEXS) – to study the coronal heating mechanism 3. High Energy L1 Orbiting X-Ray Spectrometer (HEL1OS) – to observe dynamic/eruptive events in the Corona 4. Aditya Solar Wind Particle Experiment (ASPEX) – to study solar wind and its spectral characteristics 5. Plasma Analyser Package for Aditya (PAPA) – to understand the composition of solar wind plasma and its energy distribution 6. Magnetometer – to measure the magnitude and nature of the interplanetary magnetic field.

Source:https://www.deccanherald.com/science-and-environment/isro-eyes-june-july-launch-for-solarmission-receives-primary-payload-1184930.html

India Conducts Another Test in A Bid to Develop Hypersonic Weapons

India tested its own hypersonic technology demonstrator vehicle (HSTDV) powered by a scramjet engine, amid the ongoing race among China, Russia and the US to manufacture manoeuverable hypersonic weapons that fly over five times the speed of sound and can negate missile defence systems. The indigenous HSTDV, which in the future could serve as a critical building block for hypersonic weapons with speeds over Mach 5, was tested from the APJ Abdul Kalam Island off the Odisha coast in the afternoon, sources said. There was, however, no official word from either the defence ministry or DRDO on whether the test was successful or not. A source, in turn, said, "The initial launch and take-off was successful. But there are question marks on the subsequent performance of the scramjet engine of the HSTDV for which the data has to be analysed in detail." The first test of the HSTDV failed in June 2019. But the second one in September 2020 was successful to the extent that the scramjet-powered 'cruise vehicle' or HSTDV flew for 22-23 seconds at Mach 6 speed after separation from the `launch vehicle' of solid rocket motor of an Agni-I ballistic missile at a 30km altitude. Flight tests of a much longer duration — at least a few minutes — will be required to

eventually develop hypersonic weapons, which could become a reality after five to six years. India's intent to develop hypersonic weapons was made quite clear by defence minister Rajnath Singh when he directed the DRDO in December 2021 to move swiftly towards developing such an arsenal to 'maintain' the country's minimum credible deterrence against adversaries, as was then reported by TOI. The directive had come after China had tested a nuclear-capable missile carrying a hypersonic glide vehicle and warhead in July that year. China has forged ahead of even the US in developing hypersonic weapons with nuclear warheads. Both China and Russia, in fact, are regarded to be ahead of the US in designing aerodynamically manoeuverable hypersonic weapons for use with nuclear warheads. Hypersonic weapons are basically of two types. One, hypersonic cruise missiles that are powered by high-speed, air-breathing engines or "scramjets" during their entire flight. And two, hypersonic glide vehicles that are launched atop ballistic missiles before gliding to their targets at speeds over Mach 5. Hypersonic weapons pose a challenge to the current missile and air defence systems due to their enormous speed and manoeuvrability, both vertically and horizontally, as well as low altitudes of flight. The Indian armed forces already have the conventional ramjet-powered BrahMos supersonic cruise missiles, which fly at Mach 2.8 speed, developed jointly with Russia. Their strike range 4 has been enhanced from the original 290-km to 450-km now. But while ramjet engines operate well at supersonic speeds around Mach 3, their efficiency drops at hypersonic speeds.

Source:https://timesofindia.indiatimes.com/india/india-conducts-another-test-in-a-bid-to-develophypersonic-weapons/articleshow/97389386.cms Defence Strategi

BUSINESS

2023 Edition will be the Largest-Ever Aero India, Says Defence Minister

Defence Minister Rajnath Singh reviewed the preparations of the forthcoming Aero India during the apex committee meeting held in New Delhi and exhorted the stakeholders to ensure foolproof arrangements for the participants of the airshow, which is to be held between February 13 and 17 in Bengaluru.He said that Aero India 2023 will not just be an event, but a display of the growing prowess of the defence and aerospace sector and the rise of a strong and self-reliant New India. The five-day event, on the theme 'The runway to a billion opportunities', will be the largest-ever aero show organised at Air Force Station, Yelahanka, in a total area of around 35,000 sq m.As on date, 731 exhibitors have registered for the event. Defence Ministers' Conclave, with the theme 'Shared Prosperity Through Enhanced Engagement in Defence (SPEED)', and a CEOs Roundtable are among the marquee events. The Manthan start-up event and Bandhan ceremony, which witnesses signing of MoUs, will also be part of the event, along with an air show on all the five days."Not just the private sector, but R&D establishments and academia are also working together with the government. Aero India is a medium to provide a platform to all the stakeholders to jointly strengthen the defence and aerospace sector and contribute to nation building," Mr. Singh said.Mr. Singh commended 7 Bengaluru for successfully organising several editions of Aero India, saying that the event is shaping Karnataka as an epicenter of aviation and aerospace industry. "The State is known for its skilled manpower and robust defence manufacturing ecosystem. It is a preferred center for manufacturing and R&D activities for domestic and multinational defence and aviation companies," he saidChief Minister BasavarajBommai and State government officials joined the meeting through videoconferencing.

Source:https://www.thehindu.com/news/cities/bangalore/2023-edition-will-be-the-largest-ever-aeroindia-says-defence-minister/article66428621.ece/amp/

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