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## DRDO SUCCESSFULLY CONDUCTS MISSION DIVYASTRA



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**Visakhapatnam** : Smt Jyotsna Rani, Naval Science & Technological Laboratory (NSTL)



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# DRDO SUCCESSFULLY CONDUCTS MISSION DIVYAstra

*Indigenously Developed Agni-5 Missile Makes Maiden Flight with MIRV*

The Defence Research and Development Organisation (DRDO) conducted the first successful flight test of indigenously developed Agni-5 missile with Multiple Independently Targetable Re-Entry Vehicle (MIRV) technology. The flight test named Mission Divyastra was carried out from Dr APJ Abdul Kalam Island in Odisha on 11 March 2024. Various telemetry and radar stations tracked and monitored multiple re-entry vehicles. The mission accomplished the designed parameters.

The Hon'ble Prime Minister Shri Narendra Modi lauded the efforts of the DRDO scientists who participated in the conduct of the complex mission. In a post on the social media platform, he said, Proud of our DRDO scientists for Mission Divyastra, the first flight test of indigenously developed Agni-5 missiles with Multiple Independently Targetable Re-entry Vehicle (MIRV) technology.

Raksha Mantri Shri Rajnath Singh has also congratulated the scientists and the entire team, terming it an exceptional success.



DRDO reposted



**Narendra Modi** @narendramodi · Mar 11

Proud of our DRDO scientists for Mission Divyastra, the first flight test of indigenously developed Agni-5 missile with Multiple Independently Targetable Re-entry Vehicle (MIRV) technology.

# DRDO HANDS OVER 23 LATOT TO INDUSTRIES DURING MAHARASHTRA MSME DEFENCE EXPO 2024

*Domains include Electronics, Laser Technology, Combat Vehicles, Naval Systems, and Aeronautics*

To enhance cooperation and synergy with the industry, DRDO organised a DRDO-Industry Meet on 25 February 2024 during the Maharashtra MSME Defence Expo 2024, Pune. The meet was intended to apprise and update industries, especially MSMEs and start-ups, about various industry-friendly initiatives and policies of DRDO as well as address the concerns of the industry.

During the meet, DRDO handed over 23 Licensing Agreements for Transfer of Technology (LAToT) to 22 industries in the presence of Dr Samir V Kamat, Secretary DD R&D & Chairman DRDO, and other dignitaries.

The technologies transferred cover the domains of electronics, laser technology, armaments, life sciences, materials science, combat vehicles, naval systems, and aeronautics. These include the manufacturing of carbon/carbon aircraft brakes for LCA Tejas, 100m Infantry Foot Floating Bridge, a 40 mm High Explosive Anti-Personnel (HEAP) Grenade for UBGL, Full Trailer of 70t Tank Transporter for MBT Arjun Mk-1A, Expendable Mobile Shelter Solar Heated Shelter, NMR-Super-capacitor, Weaponisation of Hand-held Thermal Imager with LRF (WHHTI), and High Pressure Water Mist Fire



Suppression System (HP WMFSS). The products based on these DRDO technologies will further boost the defence manufacturing sector and self-reliance in defence. The DRDO handed over System for Advance Manufacturing Assessment and Rating (SAMAR) assessment certificates to nine industry partners.

SAMAR is a benchmark to measure the competency of defence manufacturing enterprises. A brief overview of SAMAR was also provided during the event.

Addressing industry partners, Dr Kamat iterated DRDO's commitment to provide all technology support towards the development of Indian defence industries for realisation of Aatmanirbhar Bharat.

He said that the recent success of DRDO has not only made the country more self-reliant on defence technologies but has also provided immense opportunities to the industries in defence manufacturing sector. He further stressed that the industries are invaluable partners, and it is an apt time for an Indian industries to take advantage of the latest initiatives and policies of the government and make the country a hub of defence manufacturing. An open house session was also organised to provide an opportunity for industries to express their challenges, expectations, and the kind of support needed so that framework may be refined to further ease of doing business and facilitate industry.



# VSHORADS MISSILE TESTED SUCCESSFULLY

A Very Short-Range Air Defence System (VSHORADS) missile was successfully tested against high-speed unmanned aerial targets under different interception scenarios during 28-29 February 2024, off the coast of Odisha.



# COLLABORATION OF DLJ WITH SAMEER, KOLKATA

Defence Laboratory, Jodhpur (DLJ) and Society for Applied Microwave Electronics Engineering and Research (SAMEER), Kolkata (Ministry of Electronics and Information Technology) entered into a strategic partnership. This collaboration aims to build next-generation technologies for the country under the Atmanirbhar Bharat and Make in India initiatives.



# FIELD TESTING OF THE GRASS SYSTEM AT JODHPUR

The Defence Laboratory, Jodhpur, successfully carried out the field testing of the Gamma Radiation Aerial Surveillance System (GRASS) at Mahajan Field Firing Range (MFFR) during February 2024.





# DTTC, LUCKNOW INAUGURATED BY HON'BLE RM

The Defence Technology & Test Centre (DTTC), Lucknow, was inaugurated by Hon'ble RM in the august presence of Hon'ble Chief Minister of Uttar Pradesh on 11 March 2024. DTTC is part of the Uttar Pradesh Defence Industrial Corridor (UP DIC) and will assist industries with S&T consultancy, skill development, testing, and incubation of new technologies.

The corridor has been established to achieve Aatmanirbharta and to realise the goal of 'Make in India'.



# INAUGURATION OF VR-BASED APPLICATIONS FOR NAVAL SHIP- VIRANSH CENTRE AT DLJ

Defence Laboratory, Jodhpur (DLJ) has established a 'Virtual Reality-based (Chaff) Applications for Naval Ship' (ViRANSh) Centre for simulating real warfare scenarios by dispensing various chaff rockets for confusing, distracting, and seducing the hostile RF seeker missiles and safeguarding the naval ships.

The prototype model for 'The Virtual Reality-based Naval Chaff Deployment Visualization and Training Console' has been setup in the ViRANSh Center. It will serve as a visualization and simulation tool for R&D related to futuristic technological developments. The facility was inaugurated by Dr Y Sreenivas Rao, DS & DG (NS&M), on 04 March 2024 at DLJ.

The facility has the following features:



- ✘ Visualisation of actual warfare
- ✘ Failure analysis of a mission
- ✘ Various chaff rockets deployment studies and their performance analysis
- ✘ Training on Kavach Chaff Decoy Deployment System.



# DRDO CELEBRATES NATIONAL SCIENCE DAY

The Defence Research & Development Organisation (DRDO) celebrated National Science Day 2024 (NSD2024) through lectures, orations, and open house activities in its laboratories and establishments on 28 February 2024. A special event was organised by Defence Science Forum (DSF) at DRDO Bhawan in New Delhi. Dr Samir V Kamat, Secretary, DD R&D & Chairman, DRDO presided over the function. Prof. Ajay Kumar Sood, Principal Scientific Advisor to the Government of India, was the Chief Guest.

National Science Day is celebrated on 28 February every year to commemorate the discovery of the 'Raman Effect' in 1928 by Sir Chandrasekhara Venkata Raman, which led to the Nobel Prize being awarded to him in 1930. The purpose of celebrating this day is to enhance scientific temper, popularize science, encourage innovative activities by infusing scientific temperament in the masses, and create a positive scientific research culture.

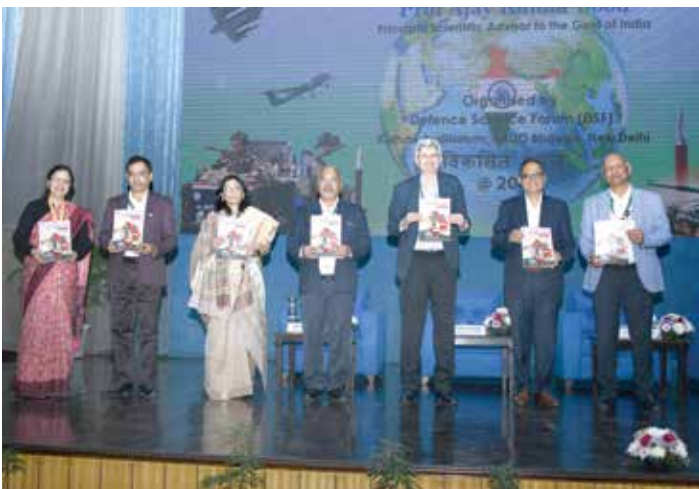


On the occasion, the Chairman DRDO greeted the scientific community and spoke about the relevance of this year's theme as per the Prime Minister's ambitious vision to transform the nation as Viksit Bharat.

A keynote address was delivered by Prof. Sood on 'Cracking an Age-Old Thermodynamic Puzzle in Micro Heat Engines'. A lecture was also delivered by Dr MA Maluk Mohamed, Co-founder and

VP research M/s Twin Health, Chennai, on 'Precision Health Management using Digital Twin', wherein he brought out how individuals with chronic metabolic diseases can benefit from using this technology.

A total of 39 oration papers were received from various DRDO laboratories/establishments, out of which three were selected for presentation. Shri Nomila Adinarayana Prasanth, Sc 'D' from







ARDE, Pune; Dr Amit Pratap, Sc 'F' from CHES, Hyderabad; and Dr Pankaj Kumar Sharma, Sc 'F' from CFES, Delhi, delivered the talks on their respective areas of work and were felicitated by the Chief Guest.

During the event, DRDO song was released by the Chairman DRDO, and awards were given to the lyrics writer and music composer. A monograph written by Dr AK Chakrabarti, Ex Director DRDL, Hyderabad, on 'Innovative Practices in Product Development Through the Eyes of Product Developers' was released by the Chief Guest. The dignitaries also released *Jai Vigyan Takniki Visheshank* (Issue 18) of the in-house magazine *Raksha Anusandhan Bharati* of the DRDO HQs during the occasion.

The following laboratories of DRDO also celebrated NSD 2024 at their respective places:

### ACEM, Nasik

Advanced Centre for Energetic Materials (ACEM), Nasik, celebrated NSD 2024 on 27 February 2024. Dr A Subhananda Rao former DS, CC (R&D-Aero, Retd), was invited as the Chief Guest. Shri T V Jagadeeswar Rao, Sc 'G' & GM, ACEM, and Shri RS Patil, Joint Director, highlighted the significance of the day. Shri Rao in his address stressed the importance of the implementation of AI and motivated young scientists to carry out research, innovate, and develop scientific rigor and zeal. The NSD oration was presented by Shri Vinay Siram, Sc 'C', on 'Consistent Definitions for Automatic Burn Rate Calculation of Subscale Solid Rocket Motors' and Shri Akash

Biswas, Sc 'B', on 'Exploring the Scope of Space Weather Prediction Using Neural Networks'. The Chief Guest delivered the keynote talk on 'Evolution of Solid Propellant Technology in DRDO'.



### ASL, Hyderabad

Advanced Systems Laboratory (ASL), Hyderabad, celebrated NSD 2024 on 28 February 2024. Shri BV Paparao, DS & Director, ASL, inaugurated the event and addressed the gathering. Dr Goutam Chattopadhyay, Senior Research Scientist, NASA-Jet Propulsion Laboratory, California Institute of Technology delivered an invited talk on 'NASA Technologies to Unlock the Mysteries of the Universe'. Dr I Kingstone LJ, Sc 'F' delivered NSD Oration on 'Development of Non-ACR Propellant to Enhance the Life of Pyrogen Igniters for Large Rocket Motors'. In his oration, he covered the background which entailed the development of non-ACR propellant for Pyrogen Igniters, various challenges and



milestones encountered in the entire development process. Shri Paparao awarded silicon medal and commendation certificate to the orator.

### CABS, Bengaluru

Shri Ramanjaneyulu Naidu, Sc 'D', Centre for Airborne Systems (CABS), Bengaluru, delivered a talk on 'Nuances of Turbulance Modeling on Dorsal Mounted Antenna on Carrier Aircraft', during the occasion of NSD 2024. The event was celebrated on 28 February 2024.



### CVRDE, Chennai

Combat Vehicles Research & Development Establishment (CVRDE), Chennai, celebrated the NSD 2024 on 28 February 2024. Dr K Srinivasan, Additional Director (Admin), delivered the welcome address and Shri V Kavivalluvan, Sc 'F', presented the oration on 'Design & Development of Track Systems for Armoured Fighting Vehicles'. Shri J Rajesh Kumar, OS & Director, CVRDE, addressed the gathering and honored the orator with the Science Day award. During his speech, the Director recalled the invaluable contributions of scientists and stressed the need to foster a spirit of scientific curiosity for delivering quality products to the nation.



During the occasion, the laboratory also organised an exhibition at Dwaraka Doss Goverdhan Doss Vaishnav College, Chennai. The exhibition was inaugurated by Dr MV Sangaranarayanan, Professor Emeritus, Department of Chemistry, IIT-Madras.



### DEBEL, Bengaluru

NSD 2024 was celebrated at Defence Bio-engineering and Electromedical Laboratory (DEBEL), Bengaluru, on 28 February 2024. Shri Amarjeet Singh Tak, Head-Research Microscopy Solutions, M/s Carl Zeiss India, Bengaluru was the Chief Guest. He delivered a keynote address on 'Seeing the Un-seen: How Microscopy Shapes our World and Future'. Dr Geetika, Sc 'E', delivered the oration on 'Zirconia-based Amperometric Oxygen Sensor: Design, Characteristics and Applications'. Dr TM kotresh, OS & Director, DEBEL remembered Dr CV Raman's discovery of the scattering of photons.



### DESIDOC, Delhi

The Defence Scientific Information & Documentation Centre (DESIDOC), Delhi celebrated NSD 2024 on 28 February 2024. Shri Rahul, Sc 'B' gave an oration on 'Evolution of Quantum Computers: Redefining Security Frontiers'. He spoke on the continual evolution in quantum computing and its implications for the current web security paradigm. He also gave a demonstration on DRDO Library Automation Software. Shri Raj Kumar, Sc 'E', gave a demonstration on digital library software. Dr K Nageswara Rao, Director, DESIDOC, also addressed the DESIDOC fraternity, highlighting the importance of NSD in the scientific field. He felicitated the speakers by presenting the NSD medal and citation to Shri Rahul and a memento to Shri Raj Kumar. Shri Tapesh Sinha, Sc 'F' coordinated the event.



### DGRE, Chandigarh

Defence Geoinformatics Research Establishment (DGRE), Chandigarh celebrated NSD 2024 on 28 February 2024. The Chief Guest of the event was Prof. Dulal Panda, Director, NIPER, Mohali & Chair-Prof. at the Department of Biosciences & Bioengineering at IIT-Bombay. Dr PK Satyawali, OS & Director, in his address emphasised the applications of

Raman's effect in other areas of technology. Dr Panda gave brief contributions of Indian scientists in the area of medicines and delivered a talk on 'Anti-microbial resistance'. Dr Pratik Chaturvedi, Sc 'E', delivered the NSD oration on 'Application of Time Series Interferometric Synthetic Aperture Radar (InSAR) and Deep Learning Algorithms in Prediction of Dynamics of Noney Landslide, Manipur'. Dr Chaturvedi was awarded with a medal and a certificate for his oration.



### DL, Jodhpur

Defence Laboratory, Jodhpur (DLJ), organised NSD 2024 on 28 February 2024. Dr Vijay Singh Choudhary, Sc 'F', delivered the oration on 'Camouflage Schemes for Military Applications'. Dr Arvind Mathur, Director, ACMERI, graced the occasion as the Chief Guest and gave an invited talk on 'Health Promotions for the Scientific Community'. Director DLJ, in his address, emphasised the need for identifying niche technologies and accordingly initiating developmental activities





to become a world-class leader in strategically important areas.

### DMSRDE, Kanpur

Defence Materials and Stores Research & Development Establishment (DMSRDE), Kanpur, celebrated NSD 2024 on 28 February 2024. On the occasion, Dr Mayank Dwivedi, OS & Director, DMSRDE, addressed the DMSRDE fraternity and highlighted the benefit of science for the society and celebration of NSD as a festival by scientific community. Prof. Vinay Kumar Pathak, Hon'ble Vice Chancellor, Chhatrapati Shahu Ji Maharaj University (CSJMU), Kanpur, was the Chief Guest. He talked about his research experience on Vedic Mathematics.

Dr Bablu Mordina, Sc 'E' gave an oration on 'High Performance Supercapacitor Materials'. He spoke about the use of supercapacitor for energy storage applications. Director, DMSRDE presented the NSD medal and certificate to the orator. Shri Amit Saraiya, Sc 'F' coordinated the event.



### DRL, Tezpur

Defence Research Laboratory (DRL), Tezpur, celebrated NSD 2024 with great enthusiasm. Prof. (Dr) Karuna Hazarika, Principal-

Chief Superintendent TMCH, Tezpur, was the Chief Guest. The programme commenced with the address of the Dr Dev Vrat Kamboj, Director, DRL. The oration was delivered by Dr Vanlalhmuaka. He deliberated on the various aspects of Horizontal Environmental Genetic Alteration Agents (HEGAA) technology and its applications in dual (human welfare as well as nefarious) purposes.

Dr Vanlalhmuaka was conferred with a commendation certificate and a medal.



### IRDE, Dehradun

Instruments Research & Development Establishment (IRDE), Dehradun, celebrated NSD 2024 on 28 February 2024. Mrs Ruma Dhaka, Sc 'G' and Officiating Director, IRDE, inaugurated the event. The Chief Guest of the event was Prof. Ramesh Chandra, Indian Institute of Technology (IIT), Roorkee. He delivered a keynote address on 'Manipulation of 2D Materials for Sensors and Devices: An Overview of the Current Trends'.

Dr NR Das, Sc 'G', IRDE, delivered the NSD oration on 'Active and Passive Spectroscopic Techniques for Stand-Off Detection of Chemical and Biological Agents/Molecules'.



### LRDE, Bengaluru

Electronics & Radar Development Establishment (LRDE), Bengaluru, celebrated NSD 2024 on 28 February 2024. Dr Prahalada Rama Rao, Pro- Chancellor, S-VYASA, was the Chief Guest. Dr Rao and Shri Gampala Viswam, DS & Director, LRDE, inaugurated the event. Smt Sushma BR, Sc 'E' delivered the Science Day oration on 'Evolution of Radar Transmitters for Aerospace Application'. The dignitaries presented a medal and a commendation certificate to the orator.

Director, LRDE, also addressed the gathering, followed by the address of Dr Rao.





## MTRDC, Bengaluru

Microwave Tube Research & Development Centre (MTRDC), Bengaluru, celebrated NSD 2024 on 28 February 2024. The orator for the event was Shri Sudhir Kumar, Sc 'E'. The topic for his presentation was 'Application of LASER and LASER-based DEW'. Shri Sudhir was felicitated with the NSD oration certificate and silicon medal.



## NMRL, Ambernath

NSD 2024 was celebrated at the Naval Materials Research Laboratory (NMRL), Ambernath, on 28 February 2024, with great enthusiasm. Shri PT Rojatkar, OS & Director, NMRL, addressed the gathering. The NSD 2024 was conferred on Shri Praveen Sreenivasan, Sc 'E'. A lecture on



'Multilayer Vibration Damping Coating for Mitigation of Structural Vibrations of Naval Platforms' was delivered during the occasion. The lecture was well received and appreciated by the audience.

## NPOL, Kochi

Naval Physical & Oceanographic Laboratory (NPOL), Kochi, observed NSD 2024 on 28 February 2024, with enthusiasm to commemorate the discovery of the Raman Effect. Dr KK Vijayan, former Director, Central Institute of Brackish Water Aquaculture, ICAR, Chennai, was the Chief Guest on the occasion. Dr A Raghunadha Rao, Sc 'G' and Vice Chairman, HRD Council, welcomed the attendees, setting the stage for a Captivity Day oration by Dr Sreehari CV, Sc 'F' on 'Advances in Fibre Optic Sensing for Underwater Acoustic Applications'.

The keynote address of the Chief Guest on 'Bio-technology as a Driver of Aquaculture in the Context of the Blue Economy' enriched the occasion. Dr Ajith Kumar K, OS & Director, NPOL,



presented the NSD medal and citation to the orator.

## NSTL, Visakhapatnam

Naval Science & Technological Laboratory (NSTL), Visakhapatnam, celebrated NSD 2024 on 28 February 2024. Dr Kishore Kumar Katkani, Sc 'F', gave the welcome address. RAdm Nelson D'Souza, NM, CSO (Tech), Eastern Naval Command, Visakhapatnam, was the Chief Guest for the occasion. He exhorted scientists to develop advanced maritime systems. Dr Abraham Varughese, OS & Director, NSTL, also addressed the NSTL fraternity. Sri Nabjyoti Sharma, Sc 'E', gave the oration on 'An AI-based Fault Diagnostic System for Rotating Machine Faults'.



## RAISING DAY CELEBRATIONS

### IRDE, Dehradun

Instruments Research & Development Establishment (IRDE), Dehradun, celebrated its 64th Raising Day on 16 February 2024. Dr Ajay Kumar, OS & Director, IRDE, conveyed his thanks and appreciated all employees of IRDE for the completion of projects during the year 2023. Dr Ajay Kumar released the IRDE annual Hindi magazine 'Sankalp' and 'Sankalp' technical magazine.

As part of the celebration, Annual Sports Day was also commemorated. The event was inaugurated by Dr BK Das, DS, & DG (ECS) on 29 January 2024. Various sports like badminton, carom, chess, cricket, football, Kabaddi, table tennis, and volleyball were conducted, along with different track and field events. All members of the IRDE family participated in these sports events with full zeal and enthusiasm. Winners and runners-up of the events were awarded by the Director.

### ITM, Mussoorie

The Institute of Technology Management (ITM), Mussoorie, celebrated its 62nd Raising Day on 23 February 2024. The event was inaugurated by Dr SS Negi, OS & former Director, IRDE & ITM, the Chief Guest of the occasion, and Shri SA Katti, OS & Director, ITM. During his address, the Chief Guest congratulated all employees for the celebration and highlighted the importance of ITM towards nation-building.



During the event, Shri Vinay Kapoor, Technical Officer 'C', was felicitated for the completion of 25 years of service in the DRDO. Commendation certificates were also distributed to the employees. Various events, such as photography competitions, slogan competition, quiz competitions, were organised and sports prizes

were distributed. A local Hindi magazine, 'Srijan' was also released during the event. In his address, Director ITM, highlighted that ITM has conducted 22 courses for 835 participants during the preceding year and congratulated Team ITM for its contribution. Gp Capt RK Mansharamani delivered the vote of thanks.



# NATIONAL SAFETY WEEK CELEBRATIONS

## CVRDE, Chennai

As a part of the 53rd National Safety Week 2024 (NSW 2024) celebrations, a special lecture on 'Safety, Health, and Environment' was delivered by Dr Nitin Shrinivas Gedam, Assistant Director (Industrial Hygiene), DGFASLI, at CVRDE, Chennai, on 06 March 2024. Dr Lalit R Gabhane, DG-National Safety Council, delivered his presentation on 'Focus on Safety Leadership for ESG Excellence'. Shri Devendra Gill, ED Safety, DMRC Ltd., also presented his lecture on 'Safety Challenges of Undertaking Construction Projects in Urban Areas'. A live demonstration with the fire-fighting equipment's (Mock Fire/Disaster Drill) was held and the safety methods to be followed during the unforeseen period. Shri J Rajesh Kumar, OS & Director, CVRDE, also addressed the gathering.



## DEBEL, Bengaluru

The NSW 2024 was organised at Defence Bio-engineering and Electromedical Laboratory (DEBEL), Bengaluru, during 4-10 March 2024 to spread awareness among employees. Several events were organised throughout the week, viz., quiz, essay writing and Safety slogan writing competition on safety aspects

to propagate awareness about best safety practices and related DRDO safety policies. A practical demonstration on handling of portable fire extinguishers was conducted by Shri Sathyaseelan, Sc 'E' and Shri Jayakumar, KK, TO 'C'. On the concluding day, the 'Safety Pledge' was taken by all the employees followed by an invited lecture by Shri Saras Chandra Kulkarni, Sr DGM, QA/QC, L&T-Defence, Bengaluru on 'Industrial Safety'. Dr TM Kotresh, OS & Director, DEBEL, addressed the gathering by emphasising the importance of safety practices as well as disciplined work approach in carrying out multidisciplinary activities. DEBEL employees actively participated in all the events. Director, DEBEL and Dr Alka Chatterjee, Associate Director, DEBEL, distributed the prizes to the winners and runner-ups.



## DL, Jodhpur

Defence Laboratory, Jodhpur (DLJ) celebrated NSW 2024 during 04-10 March 2024 to enrich the safety awareness among employees working at their work place. Shri RV Haraprasad, OS & Director, DLJ inaugurated the event. A fire safety demonstration/

drill, poster making competition, and first-aid awareness activities were organised as a part of the celebration. Ms Shilpi Sharma, Senior Environmental Engineer & Regional Officer, Rajasthan State Pollution Control Board, delivered an enlightening safety awareness talk.



## DGRE, Chandigarh

NSW 2024 was organised at Defence Geoinformatics Research Establishment (DGRE), Chandigarh, during 04-10 March 2024. Lt Col Vasul Sharma, Safety Group Head and Fire Section, DGRE coordinated various competitions like slogan writing 'Safety Aspect in High Altitude Area' and making of posters on the theme of the year 'Focus on Safety Leadership for Environmental, Social and Governance Excellence' and lecture on 'Fire Safety and Fire Fighting' delivered by Shri Pali Ram, Station Officer and Shri Surjeet, Leading Fireman of DGRE. DGRE fire personnels carried out the mock drill of fire





situation with evacuation drill and demo of fire-fighting equipment.

### DLRL, Hyderabad

Defence Electronics Research Laboratory (DLRL), Hyderabad, celebrated NSW 2024 during 04-10 March 2024. Essay writing, safety slogans, poster competitions, and lectures on safety were organised during the event. As a part of the celebration, Shri M Srinivasa Rao, Deputy Chief Inspector of Factories, was invited as the Chief Guest. His talk on 'Industrial Safety' was well received by the audience, and safety measures to be addressed at the laboratory were noted. Also, a lecture on 'Advances in Neurosciences: Basic Head Injury to Brain Tumor' was delivered by Dr S Ramesh, MS, MCH, neurosurgeon at Kamineni Hospital, Hyderabad. The safety day celebration concluded with a live demonstration of putting out Class A, B, and C fires by DLRL Firemen.



### IRDE, Dehradun

Instruments Research & Development Establishment (IRDE), Dehradun, celebrated NSW 2024 during 04-10 March 2024. Shri Punit Vashisth, Sc 'G' & Officiating Director, and Dr Sudhir Khare, Additional Director, inaugurated the event. Shri Pawan Kumar, GM & In-Charge, Fire Services & HSE, ONGC Dehradun, delivered a lecture on 06 March 2024 to

sensitize IRDE employees about industrial and fire hazards and mitigation techniques. A fire safety demonstration or drill was also conducted.



### NMRL, Ambernath

NSW 2024 was celebrated at the Naval Materials Research Laboratory (NMRL), Ambernath, during 04-10 March 2024. Employees took a safety and health pledge administered by Shri PT Rojatkar, OS & Director, NMRL. A lecture and demonstration on fire victims, chemical burns, work injuries, snake bite handling, and the first aid approach were conducted by Dr Aadesh Ravi, MI Room. A lecture on 'Safety Management System' was delivered by Shri G Ananda Murugan G, Sc 'F' & GH (Range & SEG), ARDE, Pune. 'Adherence to the Safety-Best Department Trophy-2023' was awarded to the Protective Coatings department.



### NPOL, Kochi

Naval Physical and Oceanographic Laboratory (NPOL), Kochi, celebrated NSW 2024 during 04-10 March 2024 to

promote safety awareness among the employees in the organization. A safety flag was hoisted by the senior technician, Smt Jaya VP. This was followed by a safety day pledge administered by Shri Prince Joseph, OS & Director (Systems). A live firefighting demonstration and practical training session by the Fire Division of NPOL were held. A safety quiz was conducted by Shri Raju RP, Sc 'E', followed by a safety awareness talk by Shri Saleen Ammiyankara, AGM (Safety), Cochin Shipyard Ltd.



### NSTL, Visakhapatnam

Naval Science & Technological Laboratory (NSTL), Visakhapatnam, organised NSW 2024 during 04-10 March 2024. Dr Rama Prasad Duvvada, GM, Vizag Steel Plant and Shri D Lakshmana Rao, Deputy Superintendent of police, CID were the Guests of Honour and Shri KTP Rudrappa, Senior Manager (Safety), RINL, was the Guest Speaker. Dr Abraham Varughese, OS & Director, stressed the importance of safety at work during his address and narrated various initiatives taken to strengthen safety aspects at the laboratory.





# INTERNATIONAL WOMEN'S DAY CELEBRATIONS

The International Women's Day (IWD) is celebrated globally on 08 March every year to reflect the progress made by women. This year, Terminal Ballistics Research Laboratory (TBRL), Chandigarh celebrated DRDO IWD 2024 with the theme, 'Assiduously Accomplishing Research Outlook through Her Initiatives (AAROHI-2024)' during 14-15 March 2024. Senior scientists and nearly 250 delegates from more than 50 DRDO institutions attended the event. Dr Sameer V Kamath, Secretary, DD R&D & Chairman DRDO was the Chief Guest for the occasion and Ms U Jeya Shanti, OS & DG (HR) was the Guest of Honour.

Eminent speakers namely Ms Nidhi Bansal, Chairperson Women Cell, DRDO Hqrs; Ms Backia Lakshmi M, Sc 'H', CABS, spoke on women empowerment and leadership role of women. They also shared their experiences in DRDO journey. Ms Angela Nalini Margeret, OS & Director (PM), O/o DG (ECS), Bengaluru, apprised about her role and journey to excel in DRDO. Ms Sunita Devi Jena, Sc 'H', DRDL, who led DRDO tableau as contingent commander during Republic Day Parade-2024 delivered an informative talk on 'Liquid Fuel Ramjet-based Tactical Missiles. Other invited talks were on 'Cyber Security Awareness' by Shri Balvir Kumar, Director, DIT & CS, DRDO Hqrs and 'Insights into POSH Act 2013' by Ms Nishi Shrivastava from DOP, DRDO Hqrs. The talks were very interactive and were appreciated by all the delegates for including



such topics which are very relevant in today's scenario. AAROHI-2024 had invited technical and non-technical papers from DRDO laboratories to compile the significant contributions in the form of a souvenir. The selected best papers were also presented by the authors. The two-day workshop was concluded with panel discussion on the theme, 'How Can Women be Empowered to Take the Leadership Roles'.

The following laboratories of DRDO also celebrated IWD 2024 at their respective places:

## CVRDE, Chennai

As a part of the IWD 2024, Combat Vehicles Research & Development Establishment (CVRDE), Chennai, organised an outreach program at Government Polytechnic, Sevvapet, on 24 February 2024. Shri J Rajesh Kumar, OS & Director, CVRDE, graced the inaugural function with his august presence and delivered a special address. The program

was followed by special lectures Dr Dhanalakshmi Sathishkumar, Sc 'G' & Additional Director (PM&HR), Dr K Srinivasan, Sc 'G' & Additional Director (Admin). Shri K Anbazhagan, Sc 'F' & RPRO, motivated the students to take up competitive exams.

An exhibition of CVRDE products was held by Women Cell and the WWA of CVRDE. The interaction program started with a brief note about IWD by Ms Jeyapradha Ganesh, Sc 'G' & Additional Director (IT), and then a quiz competition was also conducted.



## DGRE, Chandigarh

IWD 2024 was celebrated at Defence Geoinformatics Research Establishment (DGRE), Chandigarh, on 12 March 2024. On the occasion, Dr Amod Kumar, Associate Director DGRE, addressed the role of women at various capacity in the organisation as well as at personal







front, he lauded the DGRE women's contribution towards mountain geo-hazards and assessment research activities of the Establishment and encouraged the DGRE women employee to come forward and harvest their full potential.

Prof. Geetanjali Jindal, MBBS, MD (Pediatrics), Govt Medical College and Hospital, Chandigarh, gave a special talk on 'We are the World' to the DGRE fraternity describing the collective role of gender for child health in present scenario of nuclear-professional life so that neonatal mortality rate may be lowered down.

### NMRL, Ambernath

IWD 2024 was celebrated at the Naval Materials Research Laboratory (NMRL), Ambernath, on 12 March 2024. Dr Jyotirmayee Mohanty, FRSC, FNASc, Scientific Officer 'H', BARC, graced the occasion as the Chief Guest.



Dr Madhubala Joshi Chinchalkar, MD, Seth GS Medical College & KEM Hospital, Mumbai, was the Guest of Honor. She delivered lecture on 'Amazing Antarctica' sharing her life experience during her one-year stint with the Antarctica expedition for scientific research.

A workshop on self-defence for women employees of the NMRL was organised by Krav Maga Global System, Mumbai. Following this, Shri PT Rojatkhar, OS & Director, NMRL, highlighted the importance of women's empowerment.

### NSTL, Visakhapatnam

IWD 2024 was celebrated at the Naval Science & Technological Laboratory (NSTL), Visakhapatnam, on 12 March 2024. The Chief Guest of the event was Dr Priya Abraham, Professor, Christian Medical College, Vellore, and former Director, National Institute of Virology, Pune. Other distinguished guests on the occasion were Mrs Y Lakshmi, First Lady of the Naval Systems & Materials Cluster, and Mrs Ilin Dinah Abraham, First Lady of the NSTL, & President, MKM. Dr B Mamata, Sc 'F' gave the welcome address and Mrs Abraham gave a talk on 'Inspire Inclusion'.



## A MODEL DISPLAY ARENA AT NSTL

Dr Y Sreenivas Rao, DG (NS&M), inaugurated the NSTL Trident at Naval Science & Technological Laboratory (NSTL), Visakhapatnam, on 28 February 2024. The Trident is aimed to raise awareness about DRDO-developed world-class products through scale-down models and to instil a patriotic spirit among employees, students, and the general public.

Dr Abraham Varughese, Director, NSTL, lauded the efforts of the PTD Directorate, which has executed the task under the leadership of Shri C Kedarnath, Sc 'G' and Sri S Madhu Kiran, Sc 'F'.





## DRDO'S PARTICIPATION IN GARVI GUJRAT-2024

Defence Laboratory, Jodhpur (DLJ) represented DRDO in the 'Garvi Gujrat 2024' exhibition during 09-11 March 2024 in Gujarat. The event was inaugurated by Hon'ble Cabinet Minister of Fisheries Shri Purshottam Rupala in the auspicious presence of Hon'ble Rajya Sabha Member Shri Rambhai Mokariya and Hon'ble Lok Sabha Member Shri Mohanbhai Kundariya.

DLJ exhibits and technologies, were showcased during the exhibition. DRDO Display Pavilion received an awe-inspiring response and was awarded the Best Display Award.



## MILAN TECHNICAL EXPOSITION AT VISAKHAPATNAM

Milan Technical Exposition (MTEX-2024) was jointly organised by the Indian Navy and FICCI during 20-23 February 2024, at Naval Dockyard, Visakhapatnam. The Hon'ble Raksha Mantri, Shri Rajnath Singh, inaugurated the exposition. Delegates from the Indian Navy as well as the Navy's of 20 friendly countries visited the exhibition. DRDO laboratories, viz., NSTL, NMRL, NPOL, DMRL, and R&DE (E), Indian Navy, Defence PSUs, and private industries showcased their products and technologies during the exposition. NMRL exhibited products such as the Air Independent Propulsion (AIP) system, weld consumables,



protective coatings, the ICCP system, sacrificial anodes, BBO-remediation, supercapacitors, etc.

The DRDO pavilion received a good response from service personnel, industries, and academia.



## DRDO'S PARTICIPATION IN MAHARASHTRA SHINING-2024

Maharashtra Shining 2024 was organised by the Maharashtra State Government at Phaltan, Maharashtra. With Vehicle Research and Development Establishment (VRDE), Ahmednagar as the nodal laboratory, R&DE (E) and DYSL-QT participated in the event and showcased a number of exhibits like models of Superconducting Quantum Computers (SQC), quantum random numbers,

mechanical mine layer self-propelled, MRSAM army mobile launcher systems, sarvatra bridging systems, sonar domes, WhAP 8x8, WhAP CBRN, CBRN Rv Tr Mk-II, and the actual product of the CBRN Mini UGV. The exhibition was inaugurated by Shri Ranjit Singh Naik Nimbalkar (Hon'ble Member of Parliament). The event received a very good response, and lots of school and college students visited the

exhibition. In the event, DRDO received the 'Best Stall Award'. The award was handed over by Smt (Adv) Jijamala Ranjit Singh Naik Nimbalkar.



## AVALANCHE AWARENESS TRAINING TO 14 CORPS ZONE BY DGRE MMC SASOMA

To enhance the troops preparedness towards safer mobility on operational duties and commitments in Siachen of Indian Himalaya, snow-meteorological data collection and avalanche awareness trainings for troops of 14 Corps Zone were conducted by DGRE at during 06-09 February 2024 for Other Ranks (14 No's) and during 20-22 February 2024 for Officers (03 Nos). DGRE officials Lt. Col Saurabh Sharma, Capt. Sumit Ojha, Vikas Juyal, TO 'B' and Hav Ashwani Kumar Parmar made aware the troops of 14 Corps about different forms of snow and avalanches, training on snow-meteorological data collection from instruments and installed AWS and its transmission. They were also briefed about various avalanche safety-rescue



procedures and operational issues in snow glaciated region of

Siachen that are prone to snow, ice avalanches.



## CULTIVATION TECHNOLOGY TRAINING

Keeping in view of the high-altitude environmental challenges, a first-hand knowledge of protected cultivation technology was disseminated to DRDO Greenhouse users (20 nos.) of various army units under 190 and 40 Mountain Brigade. The training was organised by Defence Research Laboratory (DRL), Tezpur, on 12 March 2024 under PS Project DRL-101. The Users were apprised of the importance of nutrient-dense exotic vegetables along with their production technology right from nursery raising to harvest management. For efficient utilisation of the



greenhouses, the users underwent live demonstrations of good agricultural practices during the training.

## ORIENTATION PROGRAMME ON RAJBHASHA AT ADE, BENGALURU

An orientation programme on Rajbhasha was jointly organised by DRDO HQrs and Aeronautical Development Establishment (ADE), Bengaluru on 22-23 February 2024 for all Junior Translation Officers (JTO) of DRDO Official Language cadre. The event was organised by Shri Y Dilip, OS & Director, ADE and the Chief Guest of the event was Dr Ravindra Singh, OS & Director, DPARO&M. Smt Asha Garg, Sc 'H' & Associate Director (ADE) and Smt Anamika Mishra, Sc 'F' was also present on the occasion.

The Chief Guest during his keynote address stressed on the importance of the event so as to give the new entrants a right direction to their work so that, after being a part of a technical



organisation like DRDO, they should move towards gaining the skills of the technical tools and technical resources available in Hindi, as they are only responsible for the work related to the Official Language in their laboratories.

Dr Balendu Sharma Dadhich, Director Localization, Microsoft India and Shri Rahul Dev, Linguist

were invited speakers from outside DRDO and the other guest speakers of the event were from various laboratories of DRDO.

Shri Akhilesh Kumar Jha, Sc 'F' & Co-chairman of the event presented the vote of thanks. The coordinators of the programme were Smt Arun Kamal, AD (OL) & Smt Uma S.G., AD (OL).



## Higher Qualification Acquired



Shri Jawed Kumar, Sc 'F', Centre for Air Borne Systems (CABS), Bengaluru, has been awarded a PhD from

the Dept. of Electronics and Electrical Engineering for his thesis titled 'Investigation of Multi-dynamic Radar System: A Concept for Airborne Surveillance Application', by IIT- Guwahati.



Shri Nripen Besra, Sc 'C', Naval Physical and Oceanographic Laboratory (NPOL), Kochi, has been awarded a PhD from the

Department of Physics, Jadavpur University, for the thesis titled, 'Investigation on the Synthesis and Application Aspects of Organic-Inorganic Metal Halide Perovskites'.



Shri Baiju M Nair, Sc 'F', Naval Physical and Oceanographic Laboratory (NPOL), Kochi, has been awarded a PhD from the

Center for Applied Research in Electronics (CARE), IIT, Delhi, for his thesis titled, 'Processing Methods for Left-right Ambiguity Resolution in Twin Line Towed Array Sonar'.

## Patents Granted

### Defence Laboratory, Jodhpur

- ❖ A patent number 483573 for 'Thermoelectric Non-material Preparation and Implementations Thereof' has been granted by the Indian Patent Office to Jasaram, Rapaka S Chandra Bose, Prem Kumar DS, Vinita Sheoaran, Pratibha Saharan, and PSH Vaishnavi.
- ❖ A patent number 478722 for 'Method and Arrangement of Manufacturing Conformal Microwave Absorbing Structures Based on Artificial Electromagnetic (AEM) Patterns' has been granted by the Indian Patent Office to Anuj Shukla, Smita Soni, Avanish Kumar Shrivastva, Hanuman Kumhar, Gaurav Upadhayay, Umesh Kumar, Defence Laboratory Jodhpur, I Shrikanth (ASL), and TC Subba Reddy (ADA).
- ❖ A patent number 495578 for 'A New Latent Heat-Based Heat Exchanger for Thermal Management of Cyclically Operated Heat Dissipating Systems' has been granted by the Indian Patent Office to Ravindra Kumar, Manvendra Sharma, Bobin Mondal, and Deepak Gupta.
- ❖ A patent number 514474 for 'Method and System of Terrain Land Cover Classification' has been granted by the Indian Patent Office to SL Borana, SK Yadav, and RT Paturkar.

## MERIT DAY – 2024 AT NPOL

Naval Physical and Oceanographic Laboratory (NPOL), Kochi, organised NPOL-Varuna Merit Day 2024 on 28 February 2024 to felicitate the students of Bhavan's Varuna Vidyalaya, Kochi, who excelled in the 12th standard CBSE board exams of the academic year 2022-2023. Bhavan's Varuna

Vidyalaya is a joint venture of NPOL-DRDO and Bharatiya Vidya Bhavan. The event was graced by the presence of Dr KK Vijayan, former Director, ICAR, CIBA, Chennai, as the Chief Guest.

Dr K Ajith Kumar, OS & Director, NPOL; Smt KP Remadevi, Principal, Bhavan's Varuna Vidyalaya; and Shri Biju Gopal, Sc 'G' & Chairman, School Management Committee,



addressed the gathering while the Chief Guest gave away the memento and certificate to the students.



## DRDO CENTRAL ZONE CRICKET TOURNAMENT

The DRDO Central Zone Cricket Tournament 2023-24 was held at Proof & Experimental Establishment (PXE), Chandipur, during 05-09 February 2024. A total of 10 teams participated in the tournament, and matches were played on a league-cum-knockout basis.

The event was inaugurated by Shri Subodha Kumar Nayak, Director, PXE. The final match was played between the DRDL and ASL. Shri Nayak distributed the prizes and trophies during the closing ceremony.



## INAUGURATION OF SPORTS COMPLEX AT NSTL

Dr Samir V Kamat, Secretary DD R&D & Chairman DRDO, inaugurated the 'Sports Complex and Swimming Pool' in the residential complex of the Naval Science & Technological Laboratory (NSTL), Visakhapatnam. The foundation stone was laid by former Vice President of India Shri M Venkaiah Naidu. The Sports Complex has two badminton courts, a tennis court, a gymnasium, and a swimming pool. Dr Kamat expressed satisfaction over the design of the sports complex and the successful execution of the project. In his address, he mentioned that the sports complex offers tremendous benefits to the residents, such as improved health & quality of life, access to a variety of sports, reduced stress, socializing opportunities, and convenience to pursue the sports that are available.



Shri Vijay Kumar Gupta, Chief Engineer (R&D), Secunderabad, expressed happiness over the successful completion of the project.

Dr Y Sreenivas Rao, DS & DG (NS&M); Dr Abraham Varughese, OS & Director, NSTL; Dr Manu Korulla, OS & Director Civil Works

& Estates (DCW&E); Dr HN Das, Sc 'G' & Chair-man Works Committee; Shri Ch V Satya Srinivas, Sc 'G' & Group Director (Works & Estate); Dr B Choubey of CCE (R&D) South; Dr Anil Khurana of CCE (R&D, estate) South; and other dignitaries participated in the event.

## VISITORS AT DRDO LABORATORIES

### DESIDOC, Delhi

105 students, along with three professors from the Department of Library & Information Science (LIS), University of Delhi, visited the Defence Scientific Information & Documentation Centre (DESIDOC), Delhi, on 20 February 2024. The purpose of their visit was to gain insights into the operations and resources available at DESIDOC.

Dr K Nageswara Rao, Director, welcomed the students and faculty members. He addressed the gathering, and emphasised the role of DESIDOC in the DRDO & LIS fields, and advised the students to adopt the latest advancements in IT as applicable to libraries for their future growth. The visit was coordinated by Shri Tapesh Sinha, Sc 'F' & DH, HRD.



Students from University of Delhi at DESIDOC, Delhi

### DGRE, Chandigarh

Inspector General (IG), Northern Frontier (NF), ITBP, Ministry of Home Affairs, Govt of India, Shri Ashok Tiwari (IPS) visited DGRE, Chandigarh on 23 February 2024. Dr PK Satyawali OS & Director, DGRE, welcomed IG (NF) Tiwari and briefed about him DGRE avalanche forecasting models for predicting avalanche hazards of Indian Himalaya and further its dissemination to troops deployed in snow terrain on operational duties.

IG (NF) Tiwari interacted thoroughly and appreciated the DGRE team and expressed the modalities of joint data collection and providing support to DGRE. As an outcome of this visit,



Shri Ashok Tiwari (IPS), Inspector General, ITBP at DGRE, Chandigarh

DGRE initiated to furnish regular Avalanche Bulletins to the AOR of ITBP.

### DL, Jodhpur

Dr Sameer V Kamat, Secretary DDR&D & Chairman DRDO visited Defence Laboratory Jodhpur (DLJ) on 17 February 2024. The products and technologies developed by the laboratory in

recent years were demonstrated to him. Dr Kamat also reviewed the progress of various ongoing projects and the future plans of the laboratory. Dr (Mrs) Chandrika Kaushik, OS & DG (PC & SI), was also present during the visit.

### DMSRDE, KANPUR

Dr R Balamuralikrishnan, OS & Director, DMRL, Hyderabad



**Dr Sameer V Kamat, Secretary DD R&D & Chairman DRDO, during his Visit to DL, Jodhpur**



**Dr R Balamuralikrishnan, OS & Director, DMRL, Hyderabad, during his Visit to DMSRDE, Kanpur**

visited Defence Materials and Stores Research & Development Establishment (DMSRDE), Kanpur, on 14 March 2024. There was a briefing by Dr Mayank Dwivedi, OS & Director, DMSRDE, followed by discussion and demonstration of products and technologies developed by DMSRDE in the area of ceramics and ceramics matrix composites, stealth & camouflage materials, nanomaterials, coatings, polymers & rubbers, fuels & lubricants and personal protection systems.

**LRDE, Bengaluru**

Lt Gen Sumer Ivan D’Cunha, SM, DG Army AD, visited the Electronics & Radar Development

Establishment(LRDE),Bengaluru, on 07 March 2024. Shri Gampala Viswam, DS & Director, LRDE, made a presentation on LRDE projects. The dignitary along with senior scientists visited the Radar Gallery, where the LRDE radars were displayed.

**PXE, Chandipur**

Lt Gen S Harimohan Iyer, AVSM, Commandant School of Artillery, and Senior Colonel Commandant Regiment of Artillery, along with his team led by Brig APS Chahhal, Commander Trial Wing School of Artillery, visited Proof & Experimental Establishment (PXE), Chandipur, during 07-09 February 2024.

The Lt Gen and his team visited various firing points and block houses, where they could witness the ongoing proof and trial activities.

The team also visited various entities in the laboratory, including the Ammunition Preparation Lab, Conditioning Chamber, Integrated Coastal Surveillance System (ICSS), Meteorology Laboratory, and Recovery Ammunition Section.

He appreciated the outstanding contribution by PXE towards the trial and proofing of all armaments and ammunition for the services, as well as PSU, DPSU, and academics.



**Lt Gen Sumer Ivan D’Cunha, SM, DG Army AD, at LRDE, Bengaluru**



**Lt Gen S Harimohan Iyer, along with his team at PXE, Chandipur**