

# DRDO CELEBRATES NATIONAL TECHNOLOGY DAY



## NATIONAL TECHNOLOGY DAY

17<sup>TH</sup> MAY, 2023

CHIEF GUEST

**Dr Rajesh S Gokhale**

Secretary, Department of Biotechnology

THEME : **Scholar Startups - Inspiring Young Minds to Innovate**

Dr DS Kothari Auditorium

DRDO Bhawan, New Delhi





Editor-in-Chief: Dr K Nageswara Rao  
Associate Editor-in-Chief: Alka Bansal  
Managing Editor: Ajay Kumar

Editor: Dipti Arora  
Editorial Assistance: Raj Kumar

Printing: SK Gupta  
Marketing: Tapes Sinha

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**LABORATORY CORRESPONDENTS**

- Ahmadnagar** : Shri RA Shaikh, Vehicle Research and Development Establishment (VRDE)
- Chandipur** : Shri PN Panda, Integrated Test Range (ITR)  
Shri Ratnakar S, Mohapatra, Proof & Experimental Establishment (PXE)
- Bengaluru** : Shri Satpal Singh Tomar, Aeronautical Development Establishment (ADE)  
Smt MR Bhuvaneswari, Centre for Airborne Systems (CABS)  
Smt Faheema AGJ, Centre for Artificial Intelligence & Robotics (CAIR)  
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Dr Sanchita Sil & Dr Sudhir S Kamble, Defence Bioengineering & Electromedical Laboratory (DEBEL)  
Dr V Senthil, Gas Turbine Research Establishment (GTRE)  
Shri Venkatesh Prabhu, Electronics & Radar Development Establishment (LRDE)  
Dr Ashok Bansiwal, Microwave Tube Research & Development Centre (MTRDC)
- Chandigarh** : Dr Pal Dinesh Kumar, Terminal Ballistics Research Laboratory (TBRL)  
: Dr Anuja Kumari, Defence Geoinformatics Research Establishment (DGRE)
- Chennai** : Shri K Anbazhagan, Combat Vehicles Research & Development Establishment (CVRDE)
- Dehradun** : Shri Abhai Mishra, Defence Electronics Applications Laboratory (DEAL)  
Shri JP Singh, Instruments Research & Development Establishment (IRDE)
- Delhi** : Shri Tapes Sinha, Defence Scientific Information & Documentation Centre (DESIDOC)  
Dr Dipti Prasad, Defence Institute of Physiology & Allied Sciences (DIPAS)  
Shri Santosh Kumar Choudhury, Defence Institute of Psychological Research (DIPR)  
Shri Navin Soni, Institute of Nuclear Medicine and Allied Sciences (INMAS)  
Smt Rabita Devi, Institute for Systems Studies & Analyses (ISSA)  
Shri Ashok Kumar, Scientific Analysis Group (SAG)  
Dr Rupesh Kumar Choubey, Solid State Physics Laboratory (SSPL)
- Gwalior** : Dr AK Goel, Defence R&D Establishment (DRDE)
- Haldwani** : Dr Atul Grover, Defence Institute of Bio-Energy Research (DIBER)
- Hyderabad** : Shri Hemant Kumar, Advanced Systems Laboratory (ASL)  
Shri ARC Murthy, Defence Electronics Research Laboratory (DLRL)  
Dr Manoj Kumar Jain, Defence Metallurgical Research Laboratory (DMRL)  
Shri Lalith Shankar, Research Centre Imarat (RCI)
- Jagdalpur** : Dr Gaurav Agnihotri, SF Complex (SFC)
- Jodhpur** : Shri DK Tripathi, Defence Laboratory (DL)
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- Pune** : Shri Ajay K Pandey, Armament Research and Development Establishment (ARDE)  
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Dr Ganesh Shankar Dombe, High Energy Materials Research Laboratory (HEMRL)
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- Visakhapatnam** : Smt Jyotsna Rani, Naval Science & Technological Laboratory (NSTL)



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*director.desidoc@gov.in; drdonl.desidoc@gov.in*  
Contact at: 011-23902403; 23902472; Fax: 011-23819151





# DRDO CELEBRATES NATIONAL TECHNOLOGY DAY

*DRDO Celebrated National Technology Day 2023, Showcasing Cutting-Edge Innovations and Recognizing Exceptional Contributions*

Defence Science Forum (DSF), DRDO marked the celebration of National Technology Day 2023 (NTD 2023) on 17 May 2023, with an event that highlighted ground-breaking advancements in technology and recognised exceptional scientists for their remarkable contributions to the field. The event, held at DRDO HQrs, witnessed the presence of dignitaries including Secretary DDR&D & Chairman DRDO, Dr V Samir Kamat; Scientific Advisor to Raksha Mantri, Dr Satheesh Reddy; Director General (Life Sciences), and Convener DSF, Dr UK Singh along with other DGs and Directors.

The day is observed to mark the anniversary of Pokhran Nuclear Tests. On 11 May 1998, India conducted three nuclear tests at the Indian Army's Pokhran Test Range in Rajasthan and successfully entered into the elite group of countries with nuclear weapons. Since then, 11 May is observed as National Technology Day (NTD) across India to mark the anniversary of the Pokhran Nuclear Tests. The highlight of this year event was the enlightening oration by Dr Rajesh Gokhale, the renowned Secretary of the Department of Bio-Technology, whose vast knowledge and profound insights captivated the audience. His oration shed light on the transformative potential of bio-technology and its significant impact on various sectors, including healthcare, agriculture, and environmental sustainability.



In recognition of exceptional research, DSF honoured three orators with the medallions and certificates: Ms Mohana Kumari, Electronics and Radar Development Establishment (LRDE), Bengaluru; Dr G Appa Rao, Defence Metallurgical Research Laboratory (DMRL), Hyderabad, and Shri Durga Prasad, Aeronautical Development Establishment (ADE).

The theme of the NTD this year, 'School to Startups-Igniting Young Minds to Innovate' resonated deeply with DRDO's collective vision of nurturing the spirit of innovation and entrepreneurship right from the school level to empowering startups through DIA-CoEs, PhD Students, Research Scholars, and Interns.

Dr Kamat, in his address, emphasised the need to ignite

the minds of youth, engineers, entrepreneurs, budding scientists and provide them with the necessary tools and opportunities to innovate and contribute to the development of the nation.

DRDO Technology Spectrum, the compilation of the orations delivered by DRDO scientists, was released during the occasion. The dignitaries also released the DRDO Monograph on 'High Temperature Materials for Gas Turbine Applications' authored by Debashis Mukherji and April 2023 issue of Technology Focus on 'Advanced Semiconductor Material Technologies'.

Dr Singh expressed delight in witnessing the remarkable progress achieved by DRDO and its commitment to technological excellence.



Dr N Ranjana, Secretary, DSF & Director, DIT&CS, in her vote of thanks, urged the DRDO community to continue pushing the boundaries of innovation and research for the betterment of the nation. The NTD celebration at DRDO HQrs was an extraordinary occasion that showcased DRDO's remarkable achievements in technology.

Besides, celebration at DRDO HQrs, following laboratories also celebrated NTD 2023 at their respective places:

### ACEM, Nasik

Advanced Centre for Energetic Materials (ACEM), Nasik celebrated NTD on 11 May 2023. The event was graced by Prof. Padmanav Acharya, NITIE, Mumbai as the Chief Guest. Shri RS Patil, JD, HRD welcomed the gathering and highlighted the significance of the day.

Shri TV Jagadeeswar Rao, Sc 'G' & General Manager, ACEM in his address stressed the importance of technology in development of a nation and motivated young scientists to carry out innovation and develop scientific rigor & zeal.

Technology Day presentations were delivered by Shri Ashutosh Sharma, Sc 'E' on 'Effect of Burn Rate Modifiers on Properties and Ageing Characteristics of Solid Propellant' & Shri Deepak Chauhan, Sc 'C' on 'Propellant Mixing Technology'.

Prof. Acharya delivered a keynote address on 'Technology in Logistics'. On the occasion, various competitions such as crossword was also conducted for ACEM employees and the winners were awarded.



### ARDE, Pune

National Technology Day 2023 was celebrated at the Armament Research & Development Establishment (ARDE), Pune, on 11 May 2023. Shri A Raju, OS & Director, addressed the gathering. He highlighted the importance of technology in the DRDO and expounded on how self-reliance in defence technologies can propel India in the field of defence. Shri Raj Kumar, Sc 'G' shared his personal experiences of working in the Pokhran-II test on this occasion. The NTD oration was given by Shri Ajit Babar, Sc 'E', on 'Design and Development of Hydro-pneumatic Systems for Artillery Guns'. Dr SR Naik, former GD, ISRO, was the Chief Guest. He delivered a speech on some of the important space missions of ISRO'.



### ASL, Hyderabad

Advanced Systems Laboratory (ASL), Hyderabad celebrated NTD 2023 on 22 May 2023. Dr M Rama Manohara Babu, DS & Director, ASL, addressed the gathering and highlighted the importance of this year NTD theme 'School to Startups: Igniting Young Minds to Innovate'. Dr K Tejasvi, Sc 'F', delivered the NTD oration on 'Development of EPDM Rubber and Establishment of Rubber Lining Facility'.

Smt R Sheena Rani, OS & Associate Director (S) presented Titanium Medal and certificate to Dr K Tejasvi, Sc 'F'.



### CABS, Bengaluru

Centre for Air Borne Systems (CABS), Bengaluru celebrated the NTD 2023 on 11 May 2023. An oration was delivered by Shri Mandeep Singh, Sc 'E', on 'Design and Development of Composite Sandwich for Airborne Surveillance Applications'. Dr K Rajalakshmi Menon, DS & Director, CABS presented him the certificate and medal.







## DEBEL, Bengaluru

Defence Bioengineering and Electromedical Laboratory (DEBEL), Bengaluru, celebrated the 25th year of NTD on 11 May 2023 with great enthusiasm. Dr TM Kotresh, OS & Director DEBEL, inaugurated the event and introduced the Chief Guest, Padma Shri AS Kiran Kumar, Former Chairman-ISRO, Former Secretary-Department of Space and Member, Space Commission, Govt of India.

During his keynote address, the Chief Guest recounted many incidents about space research and shared his insights. He touched upon several topics in his lecture such as advances in the area of artificial intelligence and the power it holds.

The recipient of this year's NTD Medal, Dr RG Revaiah, Sc 'F' delivered the NTD-2023 oration on 'Exploration of p-Aramid Coated Fabrics for Military Applications'.

On the occasion, Director, DEBEL highlighted the significance of the NTD celebration, and achievements of DEBEL, and motivated the scientific community of DEBEL in its quest to achieve excellence and self-reliance. The event was organised by TCD, DEBEL.



## DESIDOC, Delhi

Defence Scientific Information & Documentation Centre (DESIDOC), Delhi celebrated NTD 2023 on 18 May 2023. Dr Yusuf Ansari, Sc 'F' gave NTD oration on 'Web Applications Security Threats and Defence Mechanism'. He talked about various threats and attacks that can breach the security especially during the design, development, and deployment of web applications.

During the occasion, Dr Nipun Bansal, Astd. Professor, DTU, was invited as the chief guest. He spoke on 'Web Application Security Threats and Defence Mechanisms'.



## DIPAS, Delhi

Defence Institute of Physiology and Allied Sciences (DIPAS), Delhi celebrated the NTD 2023 on 17 May 2023, and the NTD oration was delivered by Dr Rajkumar Tulsawani, Sc 'E' on 'Bio-effects of High-energy Laser using Unique *in situ* Photo-thermal Study System'. A unique high energy laser system equipped with 532 nm and 1064 nm has been designed and developed for studying laser bio-effects on cells and ex-vivo tissue under biological micro-environment, viz. optimal humidity and temperature conditions. The system has aligned

FLIR thermal camera to sample holder for capturing real time micro-thermography. The system would enhance the capability of DIPAS in the field of high-energy laser research including understanding of tissue-laser radiation and generate biological data to address safety concerns of high-energy laser (532 nm and 1064 nm).

Dr Rajeev Varshney, Director, DIPAS commended the work and presented him with the medal and certificate.



## DLRL, Hyderabad

Science & Technology (S&T) Forum, Defence Electronics Research Laboratory (DLRL), Hyderabad organised a technical talk by Dr Anupam Sharma, OS & Associate Director, DSP, Hyderabad and Shri Meva Ram Gurjar, Sc 'C', DYSL-AI, Bengaluru on 12 May 2023 at DLRL as a part of NTD celebrations.

At the onset, Smt Lakshmi, Sc 'F', Chairperson gave a report on the S&T forum activities. Dr Sharma, spoke on 'Advanced Technologies for Space Warfare'. He spoke about the space technologies and their future impacts on space EW.



Shri Gurjar, Sc 'C' spoke on 'AI/ML in EW Systems'. He talked about AI technologies as they are used in speech & language translation, use of AI in EW, and gave brief description about the works carried out at DYSL-AI. The talks were followed by Q&A session, and the programme concluded with vote of thanks by Member Secretary, S&T Forum.



### DMSRDE, Kanpur

Defence Materials and Stores Research & Development Establishment (DMSRDE), Kanpur celebrated NTD on 12 May 2023. To mark the special occasion, Shri Hari Babu Srivastava, DS & DG (TM) was the Chief Guest and Shri MH Rahaman, Director, DIA-CoE, IIT Delhi was the Guest of Honour. Shri Kailash Kumar Pathak, Director, DFTM was the invited guest. Dr SM Abbas, Associate Director, DMSRDE delivered the welcome address. This was followed by the addresses by Dr Mayank Dwivedi, Director, DMSRDE, Guest of Honour, and by the Chief Guest. Guest of honour in his speech stressed on understanding the role of technology to achieve self-reliance. He urged DRDO to work in conjunction with academia and industry. Chief Guest spoke

about the global perspective in R&D and GOI initiative on 'Developed Nation by 2047'. Smt Priyanka Katiyar, Sc 'E', delivered the NTD oration on 'Innovative Materials and Technologies for Defence Protective Clothing'. Chief Guest presented NTD medal and certificate to Smt Priyanka Katiyar. An open day exhibition of DMSRDE developed products and technologies was conducted on the occasion and inaugurated by the Guest of Honour. More than 250 students from 07 schools and colleges of Kanpur participated in the programme.



### DRDE, Gwalior

Defence Research & Development Establishment (DRDE), Gwalior, celebrated NTD on 11 May 2023. On the occasion, Dr ASB Bhaskar, Sc 'F' delivered NTD oration on 'Trends in Drug Discovery and Delivery Technologies'. Dr Vikas B Thakre, Sc 'G' presented him the NTD medal and certificate.



### DRL, Tezpur

Defence Research laboratory (DRL), Tezpur celebrated NTD 2023 with great enthusiasm and fervour on 12 May 2023. Maj Gen Dinesh Hooda VSM, COS HQ 4 Corps graced the occasion as the Chief Guest. The programme started with a welcome address by Dr Dev Vrat Kamboj, Director, DRL who aptly described the significance of the day. He encouraged the students to be motivated and inspired in the field of science and technology for newer innovation. NTD-2023 oration on 'Bio-fortification of Pearl Millet through Alternate Sulphur Feeding Strategies' was delivered by Dr Ankit. He was conferred with a commendation certificate & medal. To commemorate NTD-2023, science model and quiz competition were organised on 10 May 2023 amongst the school students of Sonitpur district, Assam. Students were briefed about DRDO and DRL activities by scientists of the laboratory. The Chief Guest also addressed the august gathering and motivated students to take keen interest in science and technology to pursue careers in R&D. Prizes were distributed to the winners of the competitions.



### INMAS, Delhi

Dr Maria M D'souza, Sc 'F', delivered NTD oration on 17 May





2023 on 'Seeing the Unseen: Multimodality Imaging of Neuroplasticity in Spinal Trauma' at (INMAS), Delhi. She highlighted the fact that spinal cord injury was becoming an increasingly prevalent problem in the military and civilian population, with long-term devastating complications. She highlighted the role of imaging which plays a key role in the diagnosis of changes at the spinal level. This is accompanied by subtle neuronal changes in the brain, which may contribute to hastening or impeding recovery. There is a need to develop quantifiable metrics which would elucidate the level of cortical reorganization secondary to injury, which has a major effect on the overall outcome and level of functional independence.

During the occasion, Dr AK Mishra, Director, INMAS, released an in-house annual bulletin of INMAS 'Nucleus' issue. Dr Mishra also presented NTD Titanium medal and certificate to Dr D'souza.



### ITM, Mussoorie

National Technology Day 2023 was celebrated at the Institute of Technology Management (ITM), Mussoorie on 11 May 2023. In his opening address, Shri Sunil Bhandari, TO 'B', talked about the significance of NTD.

Dr Gusain delivered an oration on 'Application of Interpretive Structural Modeling in Defence and Manufacturing: A Review'. Smt Anita Mohindra, Sc 'F' and Officiating Director ITM felicitated Dr HS Gusain, Sc 'F' with a medal and certificate.

During her address, Officiating Director highlighted the importance of S&T in our day-to-day lives. She also highlighted the role played by DRDO in nation-building by providing cutting-edge technologies and transforming India from a developing country to the fastest-growing economy in the world. She added that India is stepping towards the position of the global leader in S&T due to the efforts put in by our visionary leaders.



### ITR, Chandipur

ITR, Chandipur celebrated National Technology Day 2023 on 11 May 2023. Shri HK Ratha, OS & Director, ITR inaugurated the programme. In his inaugural address, he highlighted the importance of technology in modern life and encouraged all scientists, technologists to be more creative and innovative in their approach in addition to their normal assignment. Mrs B Sucharita, Associate Director spoke about the theme 'School to Start-ups Igniting Young minds to Innovate'. Oration on the paper 'Deep Learning-based Tracking in

Electro optical Video Sequences to Discriminate Birds from Aircrafts' by Dr Pradipta Roy, Sc 'F' was delivered during the celebration. The orator was awarded with a DRDO Commendation certificate, Medal, and a memento.

The programme was organised by Shri PN Panda, Sc 'F', AGD (HR) & his team.



### VRDE, Ahmednagar

Vehicles Research and Development Establishment (VRDE), Ahmednagar celebrated NTD on 12 May 2023. Dr Vijay V Patel, OS & Sc 'H', ADA, Bengaluru presided over as Chief Guest. Shri G Ramamohana Rao, Director, VRDE in his address, highlighted the importance of the day. Shri VV Jagirdhar, Sc 'F' delivered the NTD oration on 'Decision Making for Mode of Transportation Using Analytic Hierarchy'. Dr Patel delivered the keynote address on 'LCA Flight Control, Design, Development, and Testing'.





## DIPAS SIGNED MoU WITH POWER GRID CORPORATION OF INDIA LIMITED

A Memorandum of Understanding (MoU) was signed between the Defence Institute of Physiology and Allied Sciences (DIPAS), Delhi, and Power Grid Corporation of India Limited, a Public Sector Enterprise of Govt. of India for collaboration in a project related to the transmission of 500 GW power generated through solar and hybrid technologies in Ladakh to the national power grid. Power Grid Corporation has taken on the mammoth task of Evacuation of Power from Renewable Energy Park in Leh, Ladakh, and laying of a 500 GW transmission line from Pang (~15,500 ft) to Kaithal (Haryana). The project, which is an initiative of the government to

harness non-conventional energy generation capacity in Ladakh, will involve the deployment of manpower at altitudes ranging up to 4700 m amidst sub-zero temperatures, low-air density, and high-wind velocities.

DIPAS, which is a pioneer in research on high-altitude physiology in the country, has decades of experience in technologies and solutions for induction, survival, sustenance, and performance of humans in extreme altitude regions. Several of the technologies developed by DIPAS have been inducted in the Indian Army and ITBP for extreme altitude operations. The MoU will equip Power Grid Corporation

with DRDO technologies required for manpower deployment in the extreme climatic conditions of Pang. Secretary DD R&D & Chairman DRDO appreciated this collaborative endeavor in the national interest and promised full technical support to Power Grid for establishing systems and sustenance & optimal health of manpower at high altitudes through DIPAS being the nodal laboratory. MoU was signed in the presence of Dr Samir V Kamat, Secretary DD R&D and Chairman, Power Grid, Director General (Life Sciences), Director DIPAS, Director DIITM, and other senior officials from DRDO and Power Grid Corporation.





# HANDING OVER OF PARAMILITARY VARIANT OF WhAP 8X8 TO CRPF

An order for the development and supply of 06 Nos Paramilitary Variant of Wheeled Armoured Platform 8x8 was placed on Vehicle Research and Development Establishment (VRDE), Ahmednagar by Central Reserve Police Force (CRPF).

The Paramilitary Variant of WhAP 8x8 has been specially developed to suit the requirements of paramilitary forces. This version/variant of the vehicle is based on an 8x8 wheeled configuration equipped with ballistic armoured protection and enhanced blast protection. The vehicle is powered by a 600 hp engine and automatic transmission with amphibian capability. A specially developed cost-effective 7.62 mm RCWS has been integrated onto the vehicle.

VRDE completed the design and development of the vehicle

within time and demonstrated it to the users. After successful inspection and acceptance, the vehicles were handed over to CRPF in an event organised on 21 March 2023. Secretary DD R&D and Chairman DRDO, Dr Samir V Kamat presided over the event virtually. Dr SV Gade, OS & DG (ACE) headed the event from VRDE. IG (Provision) Shri Rajesh Kumar, IPS, along with his team was also present for the programme. Chairman DRDO virtually flagged off the Paramilitary Variant of WhAP 8x8 from DRDO HQ and all the vehicles were handed over to CRPF.

Shri Rajesh Kumar, IPS, IG (Provision) in his speech thanked DRDO for developing the vehicle as per their requirement and also expressed his wish for such collaboration in the future.



Flagging off by Dr SV Gade, OS & DG(ACE)



The Paramilitary Variant of WhAP 8x8

## 6<sup>TH</sup> TECHNOLOGY COUNCIL MEETING

The 6th Technology Council meeting between the Ministry of Home Affairs (MHA) and DRDO was held on 12 April 2023 at DRDO Bhavan, New Delhi. The meeting was chaired by Dr Chandrika Kaushik, OS & DG (PC&SI). All members of the Technology Council, senior officials from MHA, Intelligence Bureau (IB), Assam Rifles, Border Security Force (BSF), Central Industrial Security Force (CISF), Central Reserve Police Force (CRPF),

Indo-Tibetan Border Police (ITBP), National Security Guard (NSG), and Sashastra Seema Bal

(SSB) as well as officers from DRDO HQrs, and various DRDO laboratories attended the meeting.





During the discussions, the Chairman informed that as per the decision taken in the 3rd Apex Council Meeting, MHA has issued a simplified procedure for induction of DRDO products in CAPFs and a separate category has been created for uploading DRDO developed products on the GeM portal. The Chairperson

also highlighted the need for users to identify new technology requirements and inform DRDO to take them forward.

Director DLIC, Member Secretary, presented the DRDO-developed products inducted by security forces with their gross value from 1999 to 2022.

The meeting was followed by a

display of 49 LIC-related DRDO-developed products at Display Hall, DRDO Bhavan to familiarise all members and participants with the actual equipment as well as to have technical interactions with the corresponding scientists from various DRDO laboratories and industry partners.

## ACADEMIA-INDUSTRY MEET ON DEFENCE COMMUNICATION AT DEAL

Academia-Industry Meet on Defence Communication (AIM-DefCom 2023) was organised at Defence Electronics Application Laboratory (DEAL), Dehradun in collaboration with IETE, Dehradun Centre during 11-12 April 2023. The event aimed to build strong connections with academia and industry and find innovative ways to work together towards the common goal of achieving self-reliance in defence communication. The event was inaugurated by Dr BK Das, DG (ECS). Prof. Durgesh Pant, DG (UCOST) was the distinguished guest on the occasion. Shri LC Mangal, Director, DEAL welcomed the delegates and outlined the futuristic technologies in which a synergic approach can be taken involving Academia and Industries.

AIM-DefCom2023 had 20 exhibits from various industries to interact and explore partnerships and collaborations. In addition to this, around 90 delegates from various academic institutions and industries participated in the event. The event had an impressive

lineup of speakers both from academic institutions and industry

who shared their experiences and insights.





## INTERNATIONAL WOMEN'S DAY-2023 CELEBRATIONS

Office of DG (ECS), Bengaluru celebrated International Women's Day-2023 on 17 April 2023. During the occasion, Dr BK Das, DG (ECS) was the Chief Guest, and Ms Sanhita Kar, IDAS (Retd), Member Finance, OFB was the invitee speaker.

During his address, DG (ECS) congratulated all the women employees and applauded their valuable contribution to projects & other activities of the ECS cluster.

Ms Kar delivered a motivational talk & shared tips for how to maintain a balanced life for working women. Ms Kavitha K from Microwave Tube Research & Development Centre (MTRDC), Bengaluru who was awarded by Secretary, DDR&D, DRDO in the International Women's Day



2023 at DFRL, Mysore for her poem titled 'Women in Digital Era Technology', was also invited on the occasion. She recited the

poem Reps from O/o DGECS who attended IWD-2023 at DFRL, Mysore also shared their experiences.

## 21<sup>ST</sup> ANNUAL DAY CELEBRATION OF ASL

Advanced Systems Laboratory (ASL), Hyderabad celebrated its 21st Annual Day on 16 April 2023. Dr Samir V Kamat, Secretary, DDR&D and Chairman, DRDO was the Chief Guest and Dr BHVS Narayana Murthy, DG (MSS) was the Guest of Honour.

M Raghavendra Rao, Chairman, Organising Committee welcomed the august gathering. Shri Neil Dubey, Sc 'F', Director, Management Services presented the Annual Report of ASL. Dr M Rama Manohara Babu, DS & Director, ASL, in his address highlighted various achievements, milestones achieved, progress of several ongoing project activities as well as put forward goals of



the laboratory for coming years. Dr Murthy appreciated the dedicated work done by all employees of ASL and highlighted new technology projects of ASL. Dr Kamat congratulated the ASL fraternity and appreciated the

effective and efficient work done by ASL to make the country proud. Commendation certificates and mementos to employees, who have completed 20, 25, 30, & 35 years of service were presented. Dr I Srikanth, Sc 'F' proposed the vote of thanks.

# DR BR AMBEDKAR & DR BABU JAGJEEVAN RAM JAYANTI CELEBRATIONS

Defence Metallurgical Research Laboratory (DMRL), Hyderabad organised the 132nd birth anniversary of Bharat Ratna Dr BR Ambedkar & 115th birth anniversary of Dr Babu Jagjivan Ram on 20 April 2023 at Tamhankar Auditorium. Dr R Balamuralikrishnan, OS & Director, DMRL was invited as the Chief Guest. Prof. E Sudha Rani, Director, GRC R&D, Dr BR Ambedkar Open University, Hyderabad was invited as the guest of honour, and Dr N Siddoji Rao, Convener, IAS/IPS Officers Forum was the Special Invitee. Shri B Ram Babu, President, of DMRL's SC/ST Welfare Association presided over the function. Shri Vikrant J Taksande, General Secretary of the Association welcomed the gathering. Dr Venkat, Sc 'F' & Liaison Officer addressed the gathering and highlighted the significant contributions of Dr BR



Ambedkar with special emphasis on constitutional provisions made by him to bring social justice, economic, and political empowerment to the Indian Society. Dr Balamuralikrishnan in his address, brought out the various aspects of Dr Ambedkar's life including his academic

achievements despite several hardships. Dr Rao said that Babasaheb means full of energy, confidence, and learning from every source. Prof. Sudha Rani addressed the gathering and stated that Babasaheb Ambedkar was a symbol of knowledge and a sign of inspiration.

## BOOK EXHIBITION IN DEBEL

Technical Information Centre (TIC) of Defence Bioengineering and Electromedical Laboratory (DEBEL), Bengaluru organised a Book Exhibition during 25-28 April 2023. The event was inaugurated by Dr TM Kotresh, OS & Director, DEBEL. Around 2200 books were displayed covering aerospace & aviation medicine, mechatronics, textile, nanotechnology, composite materials, biosensors, MEMS, embedded electronics, biomedical signal processing, underwater technology, NBC,



etc. The exhibition received an overwhelming response, and

around 226 books have received recommendations from the visitors.





# USER-INTERACTIVE WORKSHOP ON HUMAN FACTORS ENGINEERING FOR MILITARY PLATFORMS

A two-day user-interactive workshop on Human Factors Engineering for Military Platforms was organised by the Defence Institute of Physiology & Allied Sciences (DIPAS), Delhi during 15-16 March 2023 at DRDO Bhawan, New Delhi. The workshop addressed the need and future roadmap for the implementation of human-factor engineering in the product life cycle of indigenous products. Dr Rajeev Varshney, Director, DIPAS, gave an overview of the workshop. General Anil Chauhan, CDS, inaugurated the workshop in the presence of Dr Samir V Kamat, Secretary, DDR&D and Chairman, DRDO. During the concluding session, a panel discussion was chaired by Dr G Satheesh Reddy, SA to RM.



Dr Kamat; Lt Gen Karanbir Singh Brar, DG Armoured Corps, Shri Anish Dayal, DG ITBP; Dr UK Singh, DG (LS); ADG Infantry; ADG Army Design Bureau (ADB); ADG Warship Design Bureau; Director Generals of DRDO and

senior officials from Tata Advanced Systems Limited (TASL); Larsen & Toubro (L&T), MKU; Hindustan Aeronautics Limited (HAL); Mazagon Dock Shipbuilders Limited, and Hindustan Shipyard Limited (HSL) were also present.

## TRAINING ON PROTECTED CULTIVATION TECHNOLOGY

Hands-on trainings-cum-demonstrations were conducted at DRDO greenhouses installed at users' locations in high-altitude areas of Tawang on 20 April 2023. The training aims to utilise this greenhouse effect-based protected structures for the year-round production of nutritious exotic vegetables. The working principle of greenhouses along with the importance of exotic vegetables in terms of high antioxidants requirement in hypoxic environment especially for the



Distribution and planting of pak choi and Chinese cabbage seedlings at 10700 ft. (11 Jack Engineers, Chuje)





troops who are engaged in heavy job works and as a horticulture therapy for stress bursting at high altitudes was explained on-site by Dr Ankit, Scientist, Defence Research Laboratory (DRL), Tezpur. Land preparation, method of vermicompost and foliar spray application, and

planting technique of delicate soilless nursery of Chinese cabbage (pak choi and pe tsai) were demonstrated to acquaint the recurring units of troops at altitudes of 10,800 feet and 12,200 feet of Tawang by Senior Technical Assistants: Shri Gaurav Singh Dhakad, Shri Parashuram

Lamani, and Shri H. Worchan. The training was imparted to a total of 25 troops (14 nos. at 10,800 feet while 11 nos. at 12,200 ft.) where each greenhouse was provided with high-quality soilless nursery (396 nos.), NPK (20:20:20) fertilizer (2 kg) and vermicompost (10 kg).

## KSHITIJ—ECS CLUSTER'S PROJECT DIRECTORS' CONFERENCE

KSHITIJ—Conference for Project Directors' of Electronics and Communication Systems (ECS) cluster was organised jointly by O/o DG (ECS) and Instruments Research and Development Establishment (IRDE), Dehradun during 28-29 April 2023 at IRDE, Dehradun.

The conference was inaugurated by DG (ECS) in the presence of ECS cluster laboratory Directors, Centre Heads; Director Planning & Coordination, DRDO HQrs, CE, CEMILAC, Director, PM, and other dignitaries. Director, PM in her welcome speech welcomed all the dignitaries & invitees and presented the roadmap of the conference consisting of 4 technical and one-user sessions, followed by panel discussions and



open house of DG (ECS) with the Project Directors.

During his address, DG (ECS) emphasised the need for active participation of industry & academia and urged the laboratories to focus on next-gen technologies. He urged scientists to increase their reading and learning capabilities.

To mark this milestone event, a PD compendium, a compilation of write up of nineteen projects of ECS cluster laboratories was released to percolate some of the best practices being followed by the PDs to create awareness and learning for successful project execution.

## COURSE ON LIFESTYLE DISORDERS AT INMAS

A Three-day Continuing Education Programme (CEP) entitled 'Lifestyle Disorders: Measures for Prevention and Control' was organised at the Institute of Nuclear Medicine and Allied Sciences (INMAS), Delhi during 2-4 May 2023. The course was inaugurated by

Dr UK Singh, OS & Director General (Life Sciences) DRDO HQrs, and Dr Anil Kumar Mishra, Sc 'G' & Director, INMAS. Dr Ratnesh Singh Kanwar, Sc 'F' was Course Director and Dr Reena Wilfred, Sc 'F' was Dy. Course Director.

The course provided

comprehensive information about lifestyle disorders with a focus on prevention and control. As Covid-19 pandemic had reinforced the need to maintain a healthy lifestyle to prevent and control all emerging infections, this CEP was an attempt to sensitize and educate the DRDO employees toward



achieving holistic health through adopting healthy lifestyle patterns. Lifestyle disorders, commonly known as Non-communicable Diseases (NCDs) have diverse clinical manifestations and multiple underlying risk factors.

Besides lectures by peer in the field, a practical hands-on training was also provided on basic life support and cardio-pulmonary resuscitation. Apart from covering the major lifestyle disorders, there were sessions covering women's health issues and work-life balance. The course was attended by 49 participants from different directorates of DRDO HQrs and from various laboratories/establishments.



## GARDENING AND HYDROPONICS EVENT AT DRL

Defence Research Laboratory (DRL), Tezpur hosted ASC Bn (MT), 4 Corps to organise a Gardening and Hydroponics Event as part of Summer Camp on 17 May 2023. A total of 20 students of 10 to 17 years age group from Army Public School and 10 lady Officers and 2 Service Personnel participated in the event showcasing field demonstration of smart agriculture technologies and were briefed about tools and techniques of growing crops without soil as rooting medium known as soilless farming and hydroponics by Dr Ankit, Scientist, DRL. Thorough demonstrations on soilless media such as cocopeat, perlite, and vermiculite; soilless nursery raising technique in portrays and cultivation of exotic vegetables such as pak choi and lettuce in grow bags, hook pots, and vertical farming stands, etc., were done for the participants. Students



were elaborated through a unique, hands-on experience showcasing the installation, function, and use of the hydroponics unit to acquaint young minds with the smart alternative forms of agriculture. To raise interest and awareness in students, a question-answer session on the commercial viability and modus operandi of cocopeat and water-based cultivation techniques was

conducted to impregnate the basic idea of crop management in soilless farming. The participants also visited DRL Chitramandap (Exhibition Hall) where Dr Bodhaditya Das, Technical Officer, briefed them about the ongoing R&D activities of DRL at Tezpur and its Centres at Salari (West Kameng) and Changbu (Tawang) Arunachal Pradesh for the welfare of Armed Forces.



## JOINT-INDUSTRY PARTNER MEET AT LRDE

Medium Power Radar (MPR) project was sanctioned to Electronics and Radar Development Establishment (LRDE), Bengaluru in November 2008 to meet the operation requirements of the Indian Air Force (IAF). The Radar was realised in 2015 and subsequently underwent user trials at various IAF sites and completed trials in 2017. LRDE identified and signed LaToT with M/s BEL, GAD as the production agency for MPR in the year 2019. Subsequently, on 23 March 2023, IAF placed the production order to M/s BEL, GAD for 8 MPR Radars. In this connection, a tripartite meeting between LRDE, Production



partner M/s BEL, and various development partners of MPR was held on 19 April 2023. Dr P Radhakrishna, OS & Director, LRDE chaired the meeting. Senior

officers of LRDE, the MPR team from LRDE and Shri Vinay Kumar Gupta, Sr AGM, BEL, GAD, and various development partners were present in the meeting.

## CONFERENCE ON CONDITION MONITORING

National Conference on Condition Monitoring (NCCM-2023), was organised by the Naval Science and Technological Laboratory (NSTL), Visakhapatnam in collaboration with Condition Monitoring Society of India (CMSI) during 27-28 April 2023. The conference was inaugurated by Dr Samir V Kamat, Secretary, DDR&D and Chairman, DRDO. He wished the eminent scholars and practitioners bring out roadmap for evolving conference monitoring according to the recent technological advancements.

Shri MZ Siddique, DG (NS&M) was the Distinguished Guest. In his address, he emphasised the need to reap the benefits of Industry-4.0 and for effective maintenance of equipment.



Director, NSTL emphasised the need for effective maintenance of systems in defence as well as civil sectors. He mentioned that NSTL has been a pioneer in this domain since the 1990s and contributed significantly towards spreading awareness of this field in the entire

Nation. Speaking on the occasion, Rear Admiral Sanjay Sadhu, Admiral Superintendent, Naval Dockyard (V) brought out that Indian Navy adopted condition monitoring of shipboard assets for a long time and lauded NSTL for its stellar role in achieving this.



## COURSE ON 'WYAS' FOR NEWLY APPOINTED DIRECTORS

A Course Widening Your Administrative Skills (WYAS) for newly appointed directors was organised by Directorate of Human Resource Development (DHRD) at Institute of Technology Management (ITM), Mussoorie during 27-29 April 2023. Twenty Directors/Programme Directors/General Managers/Center Heads of various DRDO laboratories/Establishments attended the course. The course was aimed to enhance leadership capabilities to tackle new technological and HR challenges at strategic as well as operational level and also to create leadership bandwidth to lead the



organisation towards realisation of its vision. During the course, project case studies and expert lectures were delivered on various topics by several eminent speakers from DRDO and academia.

Dr Samir V Kamat, Secretary DD (R&D) and Chairman DRDO virtually interacted with the participants. The course was well appreciated by all the participating delegates.

## MIDDLE LEVEL LEADERSHIP DEVELOPMENT PROGRAM

Defence Institute of Psychological Research (DIPR), Delhi organised series of three-day Middle Level Leadership Development Training Program (PRAGATI) for Sc 'F' of ADE during 19-21 April 2023 at Aeronautical Development Establishment (ADE), Bengaluru. Earlier similar training was organised for Sc 'F' at Dehradun.

The training programme was aimed to bring awareness for developing insight into one's strengths & weaknesses, interpersonal skills, leadership skills, understanding conflicts, enhancing positive emotions through mindfulness training, strategies for effective commu-



nication, decision making, and group dynamics.

Learning was made effective through experiential activities and group exercises in addition to classroom lectures by Dr RK Sokhi, Sc 'G', Division Head, DIPR & Director of the training programme

and her team comprising of Dr Ari Sudan Tiwari, Sc 'F', Dr Sandhya Verma, Sc 'E', Dr Nity Sharma, Sc 'E', Dr Rajesh Tripathi, Sc 'E' and Dr Harsheeta, Sc 'C'. The training was highly appreciated by the participating scientists and respective laboratory directors.



## AWARDS & RECOGNITIONS

### Telangana Academy of Sciences Honour



Dr G Appa Rao, OS & Associated Director, Defence Metallurgical Research Laboratory (DMRL), Hyderabad has been elected as a Fellow of Telangana Academy of Sciences (TAS) with effect from the year 2021.

The honour is in recognition of his significant contributions to the field of powder metallurgy and the establishment of advanced manufacturing technologies for different applications.

### IETE - Lal C Verman Award- 2022

Shri VR Prakash Babu, Sc 'F', Electronics & Radar Development Establishment (LRDE) has become the first recipient of 'IETE-Lal C Verman Award-2022' from LRDE for his exceptional contribution to the standardisation of the quality assurance and quality control process within the establishment to manufacture high quality and reliable radars. He received this



prestigious award from the Chief Minister of Manipur and IETE President on 8 April 2022 at NIELIT, Imphal.

### EMU (R&D), Hyderabad bags 33 Awards at Garden Festival

The Government of Telangana, Department of Horticulture conducted the 7th Garden Festival and 1st Urban Farming Festival 2023 during 10-20 January 2023. EMU (R&D), Hyderabad for its various green initiatives, had reaped a bountiful 33 awards. Out of this, 17 were First Prizes, and the remaining 16 were Second Prizes.

EMU (R&D), Hyderabad was also bestowed with the Special Jury Award in the Defence Category. These Awards were presented on 15 April 2023 during the Award Ceremony organised by the Horticulture Department of Telangana in the Central Lawns of the Public Gardens, Nampally.

The event was graced by the Chief Guest Sri S Niranjan Reddy Garu, Hon'ble Minister for Agriculture and Horticulture,



and by the Guest of Honour, Dr Palla Rajeshwar Reddy Garu, MLC and Chairman, Telangana Rythu Bandhu Samithi. Dr Shaik Ghouse Mohiddin, Addl. CCE and the Estate Manager received the

Awards.

The Chief Guest appreciated Arboriculture Team for their persistent efforts which have resulted in the achievement of large number of Awards.





## FELICITATION of ABHAY & MAAREECH PROJECT TEAMS AT NPOL

Shri MZ Siddique, DS & DG (NS&M) felicitated Naval Physical & Oceanographic Laboratory (NPOL), Kochi project team on 17 April 2023 on the occasion of the successful induction of two sonar systems, viz. MAAREECH and ABHAY by the Indian Navy.

Shri Siddique appreciated the efforts of the NPOL team in completing the induction of the indigenous sonar system for national service.

Dr Chandrika Kaushik, Sc 'H' & DG (PC & SI) was also present during the occasion. She stated that these products would significantly boost the 'AatmaNirbhar Bharat.' and India's 'Make in India' commitment. Dr Ajith Kumar K, Sc 'G' and Director NPOL, congratulated the project team members for realizing the project and lauded the efforts put forward by the Indian industry in learning

and productionising the sonar systems.

MAAREECH is an Advanced Torpedo Defence System (ATDS) developed by the NPOL and Naval Science and Technological Laboratory (NSTL), Visakhapatnam. The system offers a complete solution to detect and locate an incoming torpedo and apply countermeasures to protect the naval platform against attacks.

ABHAY is an advanced Active-cum-Passive sonar system indigenously designed and developed by NPOL for coastal surveillance/patrol vessels in India.

Indian Navy has nominated Sonar ABHAY as the Hull mounted sonar for sixteen Shallow Water Crafts by Garden Reach Shipbuilders & Engineers Ltd (GRSE), Kolkata and Cochin Shipyard Limited (CSL), Kochi.

On the occasion, Shri Chezian, Additional General Manager, BEL, expressed his appreciation and thanked NPOL for unstinted support of NPOL during the design and development phase. During his address, Shri Satish Bharathan, General Manager, L&T Defence highlighted the design realization efforts, incorporating design inputs from NPOL in record time. Shri Hemachandran, AGM, Keltron, lauded the indigenisation efforts of DRDO and unwavering support in realising subsystems.

In their respective addresses, Dr K Ajith Kumar and Shri P Balakrishnan, Sc 'G' & Project Director (ABHAY), highlighted the support from DRDO HQ, MoD and industry partners in realising the system. They mentioned the features and functionalities of the system and the timelines of the projects.







## Accreditation of International Organization

The International Towing Tank Conference (ITTC) is an association of worldwide organisations that have responsibility for the prediction of the hydrodynamic performance of ships and marine installations based on the results of physical and numerical experiments. This premier international body has accorded permanent membership to all four test facilities of the HR Directorate of Naval Science and Technological Laboratory (NSTL), Visakhapatnam, viz. High-Speed Towing Tank, Seakeeping and Manoeuvring Basin, Wind Tunnel, and Cavitation Tunnel.

These facilities are now officially listed on the ITTC website ([www.ittc.info](http://www.ittc.info)). With this, the hydrodynamic facilities of



NSTL are now available on world map of such existing elite and prestigious facilities worldwide. Any global commercial/military

shipbuilding agency, marine design house, etc., can now approach NSTL for model testing requirements.

## HIGHER QUALIFICATIONS ACQUIRED



Shri PK Verma, Sc 'E', of Vehicles Research and Development Establishment (VRDE), Ahmednagar has been

conferred Doctor of Philosophy for his thesis titled 'Fabrication and Annealing of TiB/Ti-6Al-4V Composites using Laser Powder Bed Fusion Additive Manufacturing' by DIAT (Deemed to be University), Pune on 15 May 2023

## OTHERS

### INAUGURATION OF MI ROOM AT DMSRDE, KANPUR

A MI Room at Defence Materials and Stores Research & Development Establishment (DMSRDE), Kanpur was inaugurated by Dr Mayank Dwivedi, Director, DMSRDE on

Services Division of the laboratory. Capt. Basavaraj, RMO is the OIC of MI Room. MI Room is equipped with all the equipment required for the first-aid treatment of lab employees.

18 April 2023. The MI Room has been made operational after a gap of 7 years by the splendid efforts of Shri Shilendra Kumar, Sc 'F' & Head Works & Estate Division and Shri Jitendra Kumar Yadav, Sc 'F' & Head, Management



## Visitors to DRDO Labs

### ARDE, Pune

Dr Samir V Kamat, Secretary, DD (R&D) and Chairman, DRDO visited Armament Research & Development Establishment (ARDE), Pune on 5 May 2023. Shri A Raju, OS & Director, ARDE welcomed Dr Kamat. A firing demonstration under the guidance of Director, ARDE along with Associates Directors was organised for Electromagnetic Rail Gun (EMRG) and 40 mm Grenade followed by a visit to the HILS facility and display & demonstration of infantry weapons.



### DLRL, Hyderabad

Dr Samir V Kamat, Secretary DD (R&D) and Chairman, DRDO visited Defence Electronics Research Laboratory (DLRL), Hydera on 24 March 2023. Shri N Srinivas Rao, OS & Director, DLRL welcomed the Chairman, DRDO in the presence of Dr BK Das, DG (ECS), and gave a presentation on all ongoing projects of DLRL.

Dr Kamat interacted with Additional Directors and Project Directors and briefed them about the status of projects and activities of the Directorates.



### DRL Tezpur

Lt Gen Manish Erry, AVSM, SM, GOC 4 Corps visited Defence Research Laboratory (DRL), Tezpur on 28 April 2023. Dr Dev Vrat Kamboj, Director, DRL briefed about the various projects, products, and technologies developed by DRL. GOC 4 Corps showed keen interest in products and technologies such as Capsispray, Capsigranade,



Biodigesters, Water Purification Systems, etc. He was enthusiastic and appreciated the R&D work carried out by DRL which

provides technological solutions for the benefit of army personnel deployed in the challenging terrains of North East India.



### HEMRL, Pune

Dr SV Kamat, Secretary DD R&D and Chairman, DRDO visited High Energy Materials Research Laboratory (HEMRL), Pune on 5 May 2023. He interacted with senior scientists & technical officers of the laboratory and discussed on various issues of ongoing projects of HEMRL. He also visited Gun Propellant Facility & Multiple Motor Processing Facility and shown keen interest in the exhibits and activities of HEMRL.



### IRDE, Dehradun

Dr G Satheesh Reddy, SA to RM visited Instruments Research & Development Establishment (IRDE), Dehradun on 21 April 2023. Dr Ajay Kumar, Director, IRDE., presented major R&D initiatives taken by IRDE and technologies developed by IRDE towards Atmanirbhar Bharat. Dr Reddy appreciated the efforts of IRDE in developing state-of-the-art systems and efforts in achieving the self-reliance in India's defence sector.



### NSTL, Visakhapatnam

\* Corporate Directors and other team members visited Naval Science & Technological Laboratory (NSTL), Visakhapatnam on 10 April 2023. Corporate Directors along with DGs visited NSTL Project Sites, Facilities, and Laboratories. A new wet canteen inaugurated by the members was conducted where an interaction session they interacted with members of Works Committee, JCM-IV, registered Unions of the Laboratory.





\* SURG VADM Arti Sarin, VSM DGMS (Navy) visited NSTL, Visakhapatnam on 21 April 2023. Dr Y Sreenivas Rao, Director, NSTL and team welcomed her. She interacted with senior scientists and discussed about NSTL facilities.

\* Dr Samir V Kamat, Secretary, DD (R&D) and Chairman, DRDO visited the NSTL on 27 April 2023. Er MZ Siddique, DG (NS&M) briefed him about NSTL activities and a Product Display Centre was inaugurated by Dr Kamat.



### VRDE, Ahmednagar

\* Dr Vijay V Patel, OS & Sc 'H', (ADA), Bengaluru visited Vehicles Research and Development Establishment (VRDE), Ahmednagar on 11 May 2023. He deliberated on the projects planned by VRDE to be taken up in the future and emphasised that VRDE should come up with solutions for better mobility in the field of combat vehicles. He visited various work centers of VRDE and witnessed various products being developed by VRDE.



\* Commodore Rupak Barua, ADG-SSQAG visited VRDE on 12 May 2023. He interacted with the project team and Director, VRDE and discussed on the progress of various Projects of VRDE. He also visited various work centers of VRDE including National Center for Automotive Testing (NCAT).

