

# DRDO

## NEWSLETTER

75  
Azadi Ka  
Amrit Mahotsav



www.drdo.gov.in

A Monthly Bulletin of Defence Research and Development Organisation

APRIL 2022 | VOLUME 42 | ISSUE 04

ISSN: 0971-4391

# DRDO CELEBRATES NATIONAL SCIENCE DAY-2022



Theme: Integrated Approach in S&T for Sustainable Future



### NATIONAL SCIENCE DAY ORATION

on

### Ocean Technologies for Science and Services

by

**Dr. M. Ravichandran**

Secretary, Ministry of Earth Sciences  
CHIEF GUEST

being presided over by

**Dr. G. Satheesh Reddy**

Secretary DDR&D & Chairman DRDO

Kothari Auditorium, DRDO HQ

**28  
FEB**

1430-1630 hrs.





42nd Year of Publication

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: Tapesh Sinha



Scan QR Code to access e-version of DRDO Newsletter

LABORATORY CORRESPONDENTS

- Ahmadnagar : Col Atul Apte, Shri RA Shaikh, Vehicle Research and Development Establishment (VRDE)
Ambernath : Dr Susan Titus, Naval Materials Research Laboratory (NMRL)
Chandipur : Shri PN Panda, Integrated Test Range (ITR)
Bengaluru : Shri Ratnakar S, Mohapatra, Proof & Experimental Establishment (PXE)
Chandigarh : Shri Satpal Singh Tomar, Aeronautical Development Establishment (ADE)
Chennai : Smt MR Bhuvanewari, Centre for Airborne Systems (CABS)
Dehradun : Smt Faheema AGJ, Centre for Artificial Intelligence & Robotics (CAIR)
Delhi : Ms Tripty Rani Bose, Centre for Military Airworthiness & Certification (CEMILAC)
Gwalior : Dr Josephine Nirmala M, Combat Aircraft Systems Development & Integration Centre (CASDIC)
Hyderabad : Dr Prasanna S Bakshi, Defence Bioengineering & Electromedical Laboratory (DEBEL)
Jodhpur : Shri Venkatesh Prabhu, Electronics & Radar Development Establishment (LRDE)
Kochi : Dr Ashok Bansawal, Microwave Tube Research & Development Centre (MTRDC)
Mysuru : Dr Prince Sharma, Terminal Ballistics Research Laboratory (TBRL)
Pune : Smt S Jayasudha, Combat Vehicles Research & Development Establishment (CVRDE)
Tezpur : Shri Abhai Mishra, Defence Electronics Applications Laboratory (DEAL)
Visakhapatnam : Shri JP Singh, Instruments Research & Development Establishment (IRDE)
: Shri Ashutosh Bhatnagar, Centre for Personnel Talent Management (CEPTAM)
: Dr Dipti Prasad, Defence Institute of Physiology & Allied Sciences (DIPAS)
: Dr Dolly Bansal, 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)
: Ms Noopur Shrotriya, Scientific Analysis Group (SAG)
: Dr Rupesh Kumar Chaubey, Solid State Physics Laboratory (SSPL)
: Dr Manorama Vimal, Defence R&D Establishment (DRDE)
: Dr Atul Grover, Defence Institute of Bio-Energy Research (DIBER)
: 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)
: Dr Gaurav Agnihotri, SF Complex (SFC)
: Shri Ravindra Kumar, Defence Laboratory (DL)
: Shri AK Singh, Defence Materials & Stores Research & Development Establishment (DMSRDE)
: Smt Letha MM, Naval Physical & Oceanographic Laboratory (NPOL)
: Dr Dorjey Angchok, Defence Institute of High Altitude Research (DIHAR)
: Dr Gopa B Choudhury, Institute of Technology Management (ITM)
: Dr M Palmurugan, Defence Food Research Laboratory (DFRL)
: Dr (Mrs) JA Kanetkar, Armament Research and Development Establishment (ARDE)
: Dr Vijay Pattar, Defence Institute of Advanced Technology (DIAT)
: Shri S Nandagopal, High Energy Materials Research Laboratory (HEMRL)
: Dr Jayshree Das, Defence Research Laboratory (DRL)
: Smt Jyotsna Rani, Naval Science & Technological Laboratory (NSTL)



# Contents

COVER STORY ..... 4



EVENTS ..... 9

HRD ACTIVITIES ..... 16

PERSONNEL NEWS ..... 20

VISITS ..... 20

<https://www.drdo.gov.in/drdo/pub/newsletter/>

Please mail your feedback and suggestions at:  
*director.desidoc@gov.in; drdonl.desidoc@gov.in*  
Contact at: 011-23902403; 23902472; Fax: 011-23819151

## DRDO CELEBRATES NATIONAL SCIENCE DAY

National Science Day (NSD) is celebrated each year on 28 February 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 the year 1930. The objective of NSD is to promote active involvement of students and teachers in science-related activity, encourage students to ask questions and to get doubts cleared in different areas of science and promote their effective participation and enable

students to know about the latest developments in the fields of Science and Technology (S&T). The theme of NSD 2022 was 'Integrated Approach in S&T for Sustainable Future'.

Defence Research & Development Organisation (DRDO) celebrated NSD with the wide participation of the DRDO fraternity. Defence Science Forum is a platform of DRDO where scientists of various disciplines interact to foster fellowship, exchange ideas with experts of different disciplines,

and debate the feasibility of interdisciplinary projects where expert opinions are required. The Forum organised NSD orations at DRDO Bhawan, New Delhi. Dr M Ravichandran, Secretary, Ministry of Earth Science was the Chief Guest of the event. The function was presided over by Dr G Satheesh Reddy, Secretary DDR&D, and Chairman DRDO.

In his keynote address, Dr M Ravichandran stressed the need for the integration of S&T for the exploration of ocean resources



Dr M Ravichandran, Secretary, Ministry of Earth Science delivering keynote address during National Science Day-2022 celebration

for ocean research. Talking about the first manned ocean mission, he highlighted that the mission aims to dive deep into the ocean up to 5000 meters under the Samudrayaan project. He said that the cutting-edge technology will help deep-ocean exploration, clean energy, and the blue economy.

Secretary DDR&D and Chairman DRDO in his address congratulated the scientific community for its ongoing quest to achieve excellence and self-reliance. He emphasised that scientific temperament, humanism, and the spirit of

inquiry are the principles with which we design to equip Indian Armed Forces with indigenous products and technologies. In line with the theme of DRDO shall always provide world-class S&T solutions for the defence of the nation and achieve the mission of an Aatmanirbhar Bharat.

Twenty nine research papers were received from various DRDO laboratories/establishments, out of which three research papers were selected and presented at the event as DRDO Science Day Oration. Defence Science Spectrum, a compilation of all

the scientific papers received from laboratories, published by DESIDOC was also released by dignitaries on the occasion.

On this occasion, a Monograph titled 'Introduction to Explosive Reactive Armour' authored by Harpal Singh Yadav, former Sc 'G' from High Energy Materials Research Laboratory (HEMRL), was released. The monograph describes the basic functioning of Explosive Reactive Armour (ERA) and the fundamentals of explosion dynamics and shock waves which are relevant and necessary to understand the basic mechanism of ERA.



Release of DRDO Monograph 'Introduction to Explosive Reactive Armour' at the hands of the dignitaries

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

## DESIDOC, DELHI

Defence Scientific Information & Documentation Centre (DESIDOC), Delhi celebrated NSD on 4 March 2022. Shri Rajkumar, Sc 'E' gave an oration on 'Digital Rights Management: Reference to Scholarly Content'. He spoke about digital rights, their importance, uses, and different tools and techniques being used related to scholarly content. Dr KP Singh, Professor, University of Delhi gave a keynote address. In his address, he discussed the importance and relevance of celebrating science day. He also talked about the emergence of S&T in India and the applicability of the Raman effect. On the occasion, Dr K Nageswara Rao, Director, DESIDOC addressed the DESIDOC fraternity. He also presented the NSD medal and citation to Shri Rajkumar. Shri Sudhanshu Bhushan, Sc 'F' and Shri Ajay Kumar, Sc 'E' coordinated the event.



## DRDE, GWALIOR

Defence Research & Development Establishment (DRDE), Gwalior celebrated NSD on 28 February 2022. Dr Ram Kumar Dhaked, Sc 'F' delivered the NSD oration on 'Botulinum

Neurotoxins: Precarious Turns to Precious'. He discussed the importance of botulinum neurotoxins as bio-weapon as well as their utility in cosmetics. Dr MM Parida, Director, DRDE presented him the NSD medal and citation.

## DRL, TEJPUR



National Science Day-2022 was celebrated by Defence Research Laboratory (DRL), Tezpur on 28 February 2022 with great enthusiasm. As a part of the programme related to the celebration of NSD and 75 years of Indian Independence (Azadi ka Amrit Mahotsav), various scientific activities including quiz, drawing competitions, etc., were organised among the school students. A quiz competition was organised at DRL campus on 22 February 2022. Out campus events were organised in three different schools of the locality. The event at Udmari Primary School, Dekargaon was conducted by Dr PK Raul, Sc 'D' and his team on 23 February 2022. The other two schools were Rangapara Higher Secondary school and Tezpur Chariali Girls High school, in which scientific programme was conducted on 24 February 2022, under the coordination of Dr D Dutta, Sc 'D' and Dr YD Bhutia,



Sc 'E' and their teams, respectively. The science day function was held at DRL. Dr Dev Vrat Kamboj, Director, DRL, welcomed the guest and participants with an inaugural speech emphasising the significance of the day. Shri Daya Lama, Sc 'E' delivered NSD oration on the topic entitled 'Importance of Dehumidification in Protection of Defence Related Materials'. Dr Dhananjay P Ghanwat, Superintendent of Police, Sonitpur, Assam, graced the occasion as Chief Guest. He delivered a very inspiring and thought-provoking speech, and encouraged the participants, especially the students to be inquisitive to seek scientific answers of the problems encountered in everyday life. Shri Lama was awarded with medal and certificate for his NSD oration. The winners of the various competitions were awarded by the Chief Guest.

## INMAS, DELHI

Dr Himanshu Ojha, Sc 'E', delivered an NSD oration on the topic 'Novel Hydrogel-based Topical Formulations for Traumatic Injuries' at the Institute of Nuclear Medicine & Allied Sciences (INMAS), Delhi on 28 February 2022. In his oration, he focused on the importance of using both silver nanoparticles and hydrogel in the development of fast wound healing topical formulation



for traumatic injuries.

Silver has been used in various medical applications all over the world since ancient times. Recently, various research groups are working on modalities of combining the antimicrobial activity of silver nanoparticles with materials like hydrogel, alginate, hydrocolloids, etc. In the present work, silver nanoparticles were synthesised using green chemistry and later their characterisation was carried out using dynamic light scattering, tunnel electron microscopy, XRD crystallography, and other spectroscopic techniques. Subsequently, synthesised nanoparticles were assessed for their antimicrobial study using disk diffusion and colony counting techniques. After, confirming antimicrobial activity and different hydrogel formulations were designed and prepared, and subjected to various rigorous testing. In the preclinical animal study, the prepared formulations were tested for in vivo toxicity as per OECD guideline 410 and efficacy testing on Sprague Dawley rats. The final formulation was found safe and efficacious in animal studies and results were submitted in the form of an Indian patent which was granted in October 2020. Dr Anil Kumar Mishra, Sc 'G' & Director

INMAS, presented NSD medal and citation to Dr Himanshu Ojha.

## IRDE, DEHRADUN

Instruments Research & Development Establishment (IRDE), Dehradun celebrated NSD on 28 February 2022. Dr BK Das, OS and Director IRDE inaugurated the event. The Chief Guest of the event was Dr Dharmendra Singh, Professor, Indian Institute of Technology (IIT), Roorkee. Dr Singh delivered a keynote address on the topic 'Smart Application of drones'. He explained the various applications of drones that have been developed by IIT. He described the methodology and test results of drones in defence applications, railways track health monitoring systems, and agriculture monitoring systems. Dr Shailendra Singh Yadav, Sc 'F', IRDE delivered NSD oration on the topic 'Lightweight Electro-Optical Payload'.



On this auspicious occasion, Dr Das remembered Dr CV Raman's discovery of scattering of photons which was later known as the 'Raman Effect'. Dr Das congratulated the scientific community of IRDE for its quest to achieve excellence and self-reliance. He further lauded the efforts of scientists of IRDE for

the implementation of electro-optical technology in the anti-drone system. He emphasised that drones will be a game-changer in future technology. The function was organised by IRDE Science Forum.

## ITM, MUSSOORIE

National Science Day-2022 was celebrated at Institute of Technology Management (ITM), Mussoorie on 28 February 2022. In his opening address, Shri BP Upreti, TO 'C', explained the significance of celebrating the special day. Thereafter, Shri Prithipal Singh, Sc 'C' gave a talk on 'The Effect of Lockdown on Mental Health'. The talk was based on his research in which he observed that the level of obsessive-compulsive disorder post-lockdown has generally increased as compared to pre-lockdown levels. He also inferred that the increase was more prominent among female subjects. Thereafter, Shri SA Katti, Sc 'G' & Director ITM highlighted the importance of S&T in day-to-day lives. He also emphasised that work is worship, drawing inspiration from the sloka of Bhagavad Gita "कर्मण्येवाधिकारस्ते मा फलेषु कदाचन। मा कर्मफल हेतुर्भुमा ते संगोऽस्त्वकर्मणि". The event was concluded with a vote of thanks by Gp Capt M Subramanian. A group photograph was taken to commemorate the event.



## NMRL, AMBERNATH

National Science Day was celebrated at Naval Materials Research Laboratory (NMRL) on 28 February 2022 with great enthusiasm and adherence to COVID guidelines. The theme for the programme was 'Integrated Approach in Science and Technology for a Sustainable Future'. NMRL scientists attended the programme and Director, NMRL, Shri PT Rojatkar, OS, addressed the gathering. Science Day Oration Award-2022 was conferred on Shri Shashidhara, Sc 'E'. He delivered a lecture on 'Electrochemical Supercapacitor'.



Shri Shashidhara, Sc 'E' delivering a lecture on 'Electrochemical Supercapacitor'.

## NSTL, VISAKHAPATNAM

Naval Science & Technological Laboratory (NSTL), celebrated NSD on 28 February at Visakhapatnam.

The event was inaugurated with the welcome address by Shri B Mohan Rao, Sc 'F' & Chairman, NSDC-2022.

Dr Y Sreenivas Rao, OS & Director, NSTL expressed his happiness over the overwhelming response from government and private school students for various competitions conducted as part of the event. He explained India's importance in disseminating knowledge of S&T to the world since ancient times.

Dr Sameer V Kamat, DS & DG (NS&M) in his address said S&T is the foundation for economic development. He appreciated the efforts of organisers of NSDC-2022 in promoting S&T to school and engineering students.

Shri M Senthil Kumar, Sc 'D' gave an oration on 'Design and

Development of Sodium-ion Cell in Prismatic Configuration'. Dr V Bhujanga Rao, DS (Retired) & former DG (NS&M) remembered 43-years of association with DRDO and explained in detail how Raman Effect is playing a vital role in today's society in various fields. Dr W Selvamurthy, DS (Retired) & former CCR&D, Distinguished Guest delivered an invited talk

on 'S&T-Key to Development'. On the occasion, the Independent Verification & Validation (IV&V) Policy of NSTL and E-Version of NSTL Hindi Magazine 'Manthan' were released by the dignitaries.

The celebrations concluded with the distribution of prizes to the winners of painting, essay writing, quiz competitions among various school students.



Release of 'Independent Verification & Validation Policy of NSTL' at the hands of dignitaries



## AZADI KA AMRIT MAHOTSAV

Defence Research & Development Organisation (DRDO) participated in 'Azadi Ka Amrit Mahotsav Science Showcase: Roadmap to 2047' during 22-28 February 2022 at various places in the country. The event 'Science is revered everywhere-Festival of scope for all' was jointly organised by Jai Narain Vyas University, Jodhpur, and MBM University, Jodhpur. Defence Laboratory, Jodhpur coordinated the event on behalf of DRDO.

During the event, DLJ developed systems, viz., nuclear radiation detection and contamination monitors, microwave chaff cartridge, PCM-based systems, water purification systems, CAM paints, thermal target system, and counter Covid-19 systems were displayed. In addition to DLJ's systems, the models made by students of various streams of MBM University and technologies of local industries were also exhibited. The exhibition was opened from 10 AM to 5 PM daily

and students and faculty members from academia of Jodhpur, i.e., schools, colleges, university, and IIT visited and interacted with the DLJ team for exhibited systems. The valedictory function was organised on 28 February 2022 and Shri Ravindra Kumar, OS & Director, DLJ was the presiding guest of the occasion. He delivered the Keynote speech entitled 'DRDO's Journey Towards Self-reliance in Critical Defence Technologies'.

## WOMEN'S DAY CELEBRATIONS

Women's Day is celebrated every year on 8 March globally. The day is celebrated to commemorate the cultural, political, and socio-economic achievements of women. The theme of International Women's Day (IWD)-2022 is 'Gender Equality Today for a Sustainable Tomorrow'. Following laboratories of DRDO celebrated the day with zeal and enthusiasm.

### DRDE, GWALIOR

The Defence R&D Establishment (DRDE), Gwalior celebrated International Women's Day (IWD) on 8 March 2022. The occasion was graced by Dr (Smt) N Ranjana Sc 'G', Director, Directorate of Systems and Technology Analysis (DSTA) and Directorate of Public Interface (DPI) as Chief Guest. The celebration was formally inaugurated by Dr Ranjana along with Dr MM Parida, Director

DRDE, and Dr Uma Pathak Sc 'F' by lighting the lamp and worship of Goddess Saraswati.

The welcome address was given by Dr Uma Pathak. She emphasised on realising and sharpening our own capabilities is the key to women empowerment and a sustainable future. Dr Ranjana inspired the DRDE Staff with her professional experiences and challenges while working on various missile systems like the importance of systems software in AGNI system integration. She dwelt upon all DRDE staff to continue their best

efforts to achieve excellence in all their endeavours and also to be considerate of each other.

Director, DRDE highlighted the involvement of women scientists in various project activities of chem-bio defence technologies. Various cultural activities and technical presentations were also conducted focusing on the contribution of women scientists in chem-bio defence technologies and work-life balancing. The programme was attended by all the women employees and students of DRDE. The event was concluded with a vote of thanks by Dr Manisha Sathe, Sc 'F'.



### DRL, TEZPUR

The Defence Research Laboratory (DRL), Tezpur celebrated the IWD-2022 on 8 March 2022 with enthusiasm to appreciate the role of women in every aspect of life. Shri Ashish Pratim Bora, Consultant Clinical



Psychologist of Tezpur University graced this occasion as the Chief Guest. The programme started with the welcome address by Dr Rama Dubey, senior scientist, followed by a speech by Dr Dev Vrat Kamboj, Director, DRL, who emphasised the need of acknowledging and admiring the contributions of women in our lives. Subsequently, the Chief Guest delivered an interesting and important talk on understanding, discussing, managing mental health and stressed on greater communication and complementation among the genders. Poems and songs were also recited by women researchers and staff of the laboratory. The programme concluded with distribution of prizes to the participants of an essay competition based on the theme of this year's IWD.

## DLRL, HYDERABAD

Defence Electronics Research Laboratory (DLRL), Hyderabad celebrated IWD-2022 on 5 March 2022 in online (virtual) mode. Chief Guest for the celebration was Smt Nabanita Radhakrishnan, former DG (R&M), DRDO.

The Guest Speaker was Smt B Sita Devi, Director, IHA

Consultancy, Hyderabad.

At the onset Smt Soma Vashishta, Sc 'G', Co-Chairperson Women's Cell, introduced Director DLRL to the guests. Thereafter, Dr K Maheswara Reddy, DS & Director DLRL, wished all the participants and stressed the need for more women to come forward and dissolve the boundaries of gender bias. Shri RV Hara Prasad, Sc 'H' & Associate Director also attended the online celebrations and advised the DLRL women fraternity to choose challenges in areas of technology, arts, management, and leadership and stand up for gender equality. Smt Lakshmi, Sc 'F' anchored the event.

Chief Guest Smt Radhakrishnan spoke on 'DRDO Women-Celebrating the Success'. She stressed 'How to Balance work/life' and brought out the measures to be taken for dissolving the issues



which hamper the work. Guest Speaker Smt Sita Devi spoke on 'Contemporary Women-A Global Influencer', and brought out that today's women love challenges, grab opportunities, set benchmarks, and are equal in all domains.

## IRDE, DEHRADUN

Instruments Research & Development Establishment (IRDE), Dehradun and Defence Electronics Application Laboratory (DEAL), Dehradun jointly celebrated the IWD on 8 March 2022 to commemorate the contribution of women employees in the technologies of electro-optics and communication. Padma Shree Santosh Yadav, Indian Mountaineer was invited as the Chief Guest of the function. Dr BK Das, OS & Director IRDE, briefed the Chief Guest about the IRDE products displayed in the Diamond Jubilee gallery. The visit was followed by a cultural function which was presented by women employees of IRDE and DEAL. The theme of the cultural function was dedicated to 'Azadi Ka Amrit Mahotsav' and contributions of women towards achieving freedom were showcased. The Chief Guest shared her rich experience of climbing the highest mountain peak Everest four times, including the toughest Kangshung Face, and inspired the leadership qualities, self-confidence, and courage in women employees. Shri LC Mangal, OS & Director DEAL, addressed the gathering. He motivated the employees and encouraged everyone towards organisational excellence. Dr Das addressed the gathering with his powerful oration highlighting the



contributions made by women in the workplace as well as at home. The event showcased the fusion of two premier laboratories as one family instilling the message of togetherness at the workplace.

### ITR, CHANDIPUR

The IWD-2022 was celebrated at Integrated Test Range (ITR), Chandipur on 8 March 2022. Shri HK Ratha, Director, ITR inaugurated the programme and emphasised on the empowerment of women. Mrs B Sucharita, Associate Director briefed about the women's activities in ITR and welcomed distinguished personalities on the occasion. Ms V Kavitha, Manager, QC-RO, Engineer-SG, Satish Dhawan

Space Centre, SHAR, ISRO, and Flt Lt Nidarshana, Indian Air Force graced the occasion over the virtual platform and delivered talks on the theme. A video depicting the excellence of women's power was displayed during the celebration. Around 150 officers and staff including all women employees attended the programme.

### NSTL, VISAKHAPATNAM

In commemoration of Azadi Ka Amrit Mahotsav, the IWD-2022 was organised at NSTL, Visakhapatnam on 8 March 2022. The programme started with garlanding Bharat Ratna Dr Abdul Kalam's statue by the distinguished guests along with the

women fraternity. The programme was inaugurated by lighting the lamp by Distinguished Guests, Dr T Vasudha; Mrs Smita Kamat, Mrs Shilpa Dantu, Smt Lakshmi Rao, President Mahila Kalyan Manch and Ms M Vijaya, Sc 'G' and Chairperson of IWD-2022.

Ms Vijaya welcomed the gathering with an inaugural speech and explained how the women fraternity is being encouraged in NSTL. Dr Y Sreenivas Rao, OS & Director NSTL applauded the women fraternity to stand behind everyone's success and for finding solutions to critical problems in various capacities. Dr T Vasudha gave an insightful talk on 'Breaking Bias for Diversity and Inclusion'. She expressed that gender equality can be achieved by not giving special treatment to women. Three meritorious girls students of Ramanath Secondary School were felicitated by Distinguished Guest, Dr Vasudha.



Mrs Shilpa Dantu, Founder, Yo Vizak, and Entrepreneur, explained her career journey and opined that any family with no gender bounds can create future leaders irrespective of gender. Mrs Smita Kamat expressed that women leaders will be born with education and can be produced by nurturing the culture of gender equality since childhood.



International Women's Day celebrations at ITR, Chandipur

## DRDO PARTICIPATION IN VIGYAN MAHOTSAV

**D**r BK Das, OS & Director, Instruments Research & Development Establishment (IRDE), Dehradun was invited as Chief Guest in Vigyan Mahotsav, organised at Vigyan Dham of Uttarakhand State Council for Science & Technology (UCOST), Dehradun on 27 February 2022. The programme was attended by eminent personalities. Dr Das delivered a keynote lecture on the topic 'Looking Ahead: Science & Technology Roadmap for Next 25 Years'. Addressing the gathering, Dr Das pointed out the enormous possibilities for the development of S&T in the state. He said that the state is blessed with natural water, forest, and land. The research



can be encouraged in the state where natural resources and biodiversity are present. Dr Das also made aware the audience about the different missiles and satellites programmes. He emphasised that science is embedded in the soul of Uttarakhand but the need is

to understand it. He suggested to students that all the answers will be found from nature only. IRDE also showcased its products in the exhibition organised in 'Vigyan Mahotsav'. Dr DP Uniyal, Director UCOST thanked Dr BK Das for sharing his views on the occasion.

## RAISING DAY CELEBRATIONS

### IRDE, DEHRADUN

Instruments Research & Development Establishment (IRDE), Dehradun celebrated its 62nd Raising Day on 18 February 2022. Dr BK Das, OS & Director IRDE welcomed the august gathering and congratulated officers, staff, and their families on Raising Day of IRDE. He conveyed his thanks and appreciated all employees of IRDE for the completion of 21 projects during the year 2021 under the 'Achievement 21'. He strongly believed that the projects targeted for the year 2022 will be completed as a part of 'Mission 22' with the committed workforce of IRDE.



Dr Das released IRDE annual Hindi magazine 'Sankalp'. He also

released the first issue of 'Sankalp' technical magazine which covers

the technical articles written by IRDE officers and staff in Hindi language.

Dr Das distributed various laboratory-level DRDO awards and cash awards to the meritorious employees. Laboratory scientist of the year award was conferred on Shri Mukesh Kumar Mathuria, Sc 'F'; Shri Pradeep Kumar, Sc 'F'; Shri Rakesh Ravi Das, Sc 'E'; and Shri Ashish Kumar, Sc 'D' for their outstanding contributions in different projects.

Director Dr BK Das instituted the Life Time Achievement Award of the laboratory for the first time for providing an outstanding contribution to DRDO. This award was given to Shri JK Bajpai, OS & Sc 'H'; Shri Avnish Kumar, Sc 'G'; Shri B S Chauhan, Sc 'G'; and Dr (Late) Anil Kumar Razdan, Sc 'G' for their remarkable performance in DRDO during their entire career. In his address, Dr Das shared his

vision to make next-generation systems for our armed forces with quality, reliability and enhanced performance to be delivered on time which will outperform all the contemporary systems. Robotics soldiers, optronic shields, and test simulators will be the game-changer for the future.

### ITM, MUSSOORIE

Institute of Technology Management (ITM), Mussoorie celebrated its Diamond Jubilee on 26 February 2022. The event was inaugurated by Lt. Gen Anil Kumar Bhatt, PVSM, UYSM, AVSM, SM, VSM (Retd), and Shri SA Katti, Sc 'G' & Director ITM. In his address, Lt Gen Bhatt highlighted the importance of DRDO towards nation-building and self-reliance in defence technologies.

As part of the celebration, various events such as photography competitions, slogan



competitions, quiz competitions, and sports activities were conducted. Local Hindi magazine, 'Srijan' was also released during the event. Shri SA Katti, Sc 'G' & Director, ITM thanked the Chief Guest for gracing the occasion. In his address, Director ITM highlighted the achievements of ITM during the preceding year and congratulated 'Team ITM' for its contribution. He impressed upon all employees to continue their best efforts to achieve excellence in future endeavors. The event was concluded with a vote of thanks by Mrs Anita Mohindra, Sc 'F'.

## IRDE PARTICIPATES IN SPRING FESTIVAL AT RAJ BHAWAN

Instruments Research & Development Establishment (IRDE), Dehradun participated in a two-day Spring Festival 'Vasantotsav' organised at Raj Bhawan, Uttarakhand during 8-9 March 2022. Governor Lieutenant General (retd) Gurmit Singh inaugurated the festival. Various floral events were organised during the event. About 30 departments of the state participated in the event. IRDE Director's Bungalow 'Vikas Bhawan' was awarded first prize in the state floral exhibition. IRDE exhibited the floral plant pyramid which received third prize.



# CELEBRATION OF NATIONAL SAFETY DAY/WEEK

## ITR, CHANDIPUR

The National Safety Day/Week was celebrated at Integrated Test Range (ITR), Chandipur on 4 March 2022. Shri HK Ratha, Director ITR inaugurated the programme and administered a pledge on safety and health to all employees of ITR, Chandipur. In his inaugural address, he highlighted the importance of safety in range scenarios. He appreciated efforts made by all employees for maintaining zero accidents throughout the year.

Directorate of Telemetry of ITR and Shri Ramachandra Bhanj, Tech 'B' and Shri Amulya Kumar Das, MTS, was adjudged as Best Safety Conscious Directorate and Best Safety Monitors for the year 2021-22, respectively and awarded with a trophy, certificate, and prize. The programme was organised by Dr SK Sahu, Sc 'E' Group Director (FI & ES), and Chairman Safety Committee and his team.

## NMRL, AMBERNATH

The National Safety Week was celebrated with great enthusiasm at Naval Materials Research Laboratory (NMRL), Ambarnath during 4 to 10 March 2022 to spread awareness on safety, health and environment among all the employees. Apart from this, the focus was also on building a positive safety culture, motivating employees to make the workplace safer, promoting the participation of employees in various safety activities, and bringing awareness about safety



Shri HK Ratha, Director ITR during the inauguration of National Safety Week



Director, NMRL, offering the memento to the Chief Guest

systems and safety programme. Fire mock drills along with the handling of fire victims in emergencies demonstration-cum-training sessions were arranged during the safety week. Fire and Safety Group provided training on operation and usage of fire extinguishers, their types, protocol in the situation of a fire emergency, information on fire hydrants, etc. MI Room specialists, provided information on the handling of victims in an emergency in particular acid injury, burn injury, electrical shock, emergency communication, actions

required to manage a fainted person, etc. Essay and slogan competitions were arranged. A talk on "Safety Practices in Test Range" was delivered by Shri R Appavuraj, Chairman, CEPTAM on 7 March 2022. The lecture was well-received by NMRL employees. Employees took Safety and Health pledge administered by Director, NMRL. "Adherence to the Safety-Best Department Trophy-2021" was awarded to the Polymer Science and Technology Directorate (PSTD) of NMRL during the function held on 7 March 2022.

## ENVIRONMENTAL SAFETY AWARENESS AT ITR

An STC on “Industrial and Environmental Safety Awareness” was organised at Integrated Test Range (ITR), Chandipur, during 9-10 March 2022. Shri HK Ratha, Director, ITR inaugurated the course. During his inaugural address, Director, ITR highlighted the need for conducting such STC and emphasised the stringent safety implementation in the test range to avoid any major accident.

The course aimed at making the participants aware of industrial and environmental safety and emergency preparedness and how to implement safety measures during occurrences.

Various topics related to industrial and environmental safety were covered (both in



theory and practice) in the STC. Thirty-Eight participants from ITR attended the course.

Shri Subrata Panigrahi, Director, IQEMS, Bhubaneswar,

and his team conducted the training programme.

The course was organised by Course Director Dr SK Sahu, Sc ‘F’ and his team.

## SCIENCE WEEK FESTIVAL CELEBRATIONS

Defence Research Laboratory (DRL), Tezpur actively participated in the programme “Vigyan Sarvatra Pujyate” (Science Festival) organised by Vigyan Prasar & Mizoram Science, Technology & Innovation Council (MISTIC) at Aizawl, Mizoram and by Nagaland Science & Technology Council at Kohima, Nagaland to celebrate Azadi Ka Amrit Mahotsav. Dr Vanlalhmauka, Sc ‘E’ delivered a lecture on “History of DRDO” under the theme “From the Annals of History of Science” on 23 February 2022. He emphasised on products and technologies developed by DRDO for Armed Forces on the event conducted



at Aizawl. Mr Daya Lama, Sc ‘E’ delivered a lecture on ‘Effect of Humidity on the Reliability of Military Equipment and the Dehumidification Technology

as Mitigation Strategy’ under the theme ‘Integrated Approach in Science, Technology for Sustainable Future’ on 25 February 2022.

## ONLINE COURSE ORGANISED BY NSTL

A Virtual Course on 'Emerging Trends in Vibration and Noise Control' was organised by Naval Science and Technological Laboratory (NSTL), Visakhapatnam during 21-25 February 2022. Dr V Bhujanga Rao, DS&DG (NS&M) [Retd.] delivered inaugural address and Dr K Jagadisan, OS (Retd), RCI, DRDO graced the occasion by giving opening remarks.

Shri PVS Ganesh Kumar, OS & Course Director briefed about the course. He stated that the course broadly covers the latest trends followed in vibration and noise control, particularly in defence applications. In his inaugural address, the Chief Guest, Dr Rao, emphasised the importance of vibration and noise control in military and aerospace



applications. Dr Jagadisan stated that the course is very useful to learn the nuances of vibration and noise domain. Dr Sameer V Kamat, DS&DG (NS&M) appreciated course organisers and expressed happiness at the participation of a large number of delegates in the course from both DRDO and the

Indian Navy.

Eminent speakers and experts from institutions like IIT Kharagpur, IIT Chennai, IIT Bhubaneswar, IIT Hyderabad, NIT Warangal, Professors of Andhra University, and Professors of Hindustan University gave lectures in the course.

## TWO DAYS OPEN HOUSE EXPO-2022 AT NSTL

Two days Open House Expo from 25 to 26 February 2022 was organised at NSTL, Visakhapatnam. The expo was inaugurated by Dr Y Sreenivasa Rao, Director, NSTL at Ramnath Secondary School located in NSTL Campus, Visakhapatnam.

Dr Rao interacted with media persons and said that Varunastra indigenously developed Torpedo by NSTL, was deployed on the Indian Naval Ship at Visakhapatnam. Stealth technologies based on Infrared Signature Suppression (IRSS) developed by NSTL were also handed over to Navy. The laboratory also developed Torpedo Advanced Lightweight (TAL), Anti Torpedo Decoy Systems and



designs were being given to the public sector Bharat Dynamics Limited (BDL) and other manufacturers for production.

In the expo, the products developed by NSTL—Varunastra, Mareech-Decoy System, and underwater mines were displayed.



## UTKARSH-2022 AT ADE

**U**tkarsh 2022: Joint Rajbhasha, S&T Seminar jointly conducted by Aeronautical Development Establishment (ADE), Centre for Artificial Intelligence and Robotics (CAIR), Gas Turbine Research Establishment (GTRE), Defence Bioengineering and Electromedical Laboratory (DEBEL), and DRDO Young Scientist Laboratory (DYSL)-AI on 17-18 February 2022, which was organised by the ADE under the Chairmanship of Shri Y Dilip, OS, and Director, ADE. Shri Jayakumar Venkataraman, Sc 'H' and Associate Director,

LRDE, was the Chief Guest. On the occasion, the Souvenir of Utkarsh-2022 was released by the Chief Guest.

A total of 48 research papers were presented under the Chairmanship of Shri Sreenivas Reddy G, Sc 'G' and Chairman-Utkarsh 2022 and Shri Akhilesh Kumar Jha, Sc 'F' and Vice-Chairman-Utkarsh-2022. The closing ceremony was organised under the chairmanship of Shri Shashikant CC, Sc 'G', and Group-Director (M&S). On the occasion, Dr Ravindra Singh, Sc 'G' and Director, Directorate of Rajbhasha from DRDO HQ joined



through video conferencing. He said that the usage of Rajbhasha should not only be limited to administration but should also be used in other areas. Shri Shashikant in his address extended thanks to Director, Rajbhasha for giving a chance to ADE for organising Utkarsh-2022. He gave six best research paper mementos, certificates, and awards to authors.

## ALL INDIA JOINT RAJBHASHA S&T SEMINAR AT ASL

**A**dvanced Systems Laboratory (ASL), Hyderabad hosted the First All India Joint Rajbhasha Scientific and Technical Seminar (Hyderabad Cluster-1) during 6-7 January 2022. The theme of the Seminar was “75 Years of Independence and Glorious Journey of DRDO”. The seminar was jointly organised by ASL, Research Centre Imarat (RCI), Defence Electronics Research Laboratory (DLRL), Directorate of Special Projects (DSP), Naval Science and Technological Laboratory (NSTL), Visakhapatnam, and DRDO Young Scientist Laboratory (DYSL)-CT, Chennai. Dr BHVS Narayana Murthy, DG (MSS) was the Chief Guest and Dr Ravindra Singh, Director, Directorate of Parliamentary Affairs, Rajbhasha, and O&M (attended through video conference) was the Guest



of Honour. Dr M Rama Manohara Babu, Director, ASL; Shri U Raja Babu, Director, RCI; Dr Y Sreenivas Rao, Director, NSTL; Dr PSR Srinivasa Sastry, Director, DSP; Dr AK Singh, DLRL; Shri Durgendra Pandey, DYSL-CT; and Dr Sanjay Anandrao Khalane, Chairman, Organising Committee graced the occasion. About 81 papers were received from different DRDO laboratories along with Om

Parkash Joginder Singh University, Rajasthan; Electronics Corporation of India Limited; Central Research Institute for Dryland Agriculture; Indian Institute of Maize Research; and the University of Hyderabad. Shri Neil Dubey, Director, MS, ASL was the Chief Guest in the valedictory function. Certificates, mementos, and Glossary of Administrative Terms were distributed to the participants.

## RAJBHASHA SEMINAR-AMRITVAANI

Centre for Airborne System (CABS), Bengaluru, in association with other Bengaluru cluster-based laboratories of DRDO, viz., Electronics and Radar Development Establishment (LRDE), Centre for Military Airworthiness & Certification (CEMILAC), Microwave Tube Research & Development Centre (MTRDC), Combat Aircraft Systems Development and Integration Centre (CASDIC) organised a two-day Rajbhasha Scientific and Technical Seminar 'Amritvaani-2021' to promote the use of official language in R&D activities. The two days annual event was held in CABS. The main theme of the seminar was aligned with the country-wide celebrations of Azadi ka Amrit Mahotsav, commemorating 75 years of rapid strides towards progressive independent India. It was a proud occasion to celebrate and demonstrate the S&T achievements of DRDO since



its inception, in Rajbhasha Hindi. The event was inaugurated by Shri M Sankaran, Distinguished Scientist, Director, UR Rao Satellite Centre, Bengaluru. The Chief Guest in his inaugural address emphasised the importance of the use of Hindi in administrative and technical work.

Director CABS, Shri MZ Siddique, Distinguished Scientist welcomed all the delegates and informed them about the wide range of S&T topics related to defence technologies to be discussed during the seminar. Shri Sujit Kumar Mehta, Assistant

Director (Rajbhasha) from the Directorate of PAROM graced the occasion with his presence. Participants from various DRDO laboratories and other research institutes across Bengaluru, Balasore, Chandigarh, Hyderabad, and New Delhi presented their research work in Hindi during six technical sessions. In addition, Director, DPAROM, Shri Ravindra Singh, Sc 'G' addressed the gathering during the valedictory function of the seminar through video conference and congratulated the CABS team for grandly organising the seminar.

## TRAINING COURSE ON RADIATION MEDICINES FOR INDIAN NAVY MEDICAL OFFICERS

Institute of Nuclear Medicine & Allied Sciences (INMAS), Delhi conducted a two-week training course on 'Radiation Medicine and Management of Radiation Emergencies' for medical officers of the Indian Navy from 14-25 February 2022. Five naval medical officers nominated by DGMS (Navy), who

are working on or supposed to be working on nuclear submarine platforms at Visakhapatnam and other naval establishments, participated in the training course. The training aimed to impart the necessary domain knowledge and hands-on experience to handle the scenarios emerging in radiological and nuclear emergencies. The

purpose of the training was to augment the preparedness and response of navy medical officers for handling emergencies involving radioactive contamination and radiation exposure scenarios onboard in nuclear-powered vessels and also at other platforms and establishments. INMAS faculties and experts

covered the theoretical and practical knowledge (basic and medical) in multiple sessions specific to each relevant area of CBRN emergency management including medical management as well. Hands-on and practical demonstrations, e.g. function of the whole-body counter, gamma camera, human patient simulator, and radioactivity detection and decontamination were performed in the course for the participants. Relevant case studies were given and discussion among faculty and participants was carried out in several settings to give them immersive learning. Radiological and nuclear event scenarios related to naval settings were also given for their learning assessment



Dr Anil Kumar Mishra, Sc 'G' & Director INMAS with Naval Officers

followed by discussion. At the end of the course learning assessment of the participants was carried out in form of a written examination. Broad domains of CBRN emergency

management, i.e., protection, detection, decontamination, emergency response, and medical management were covered in this extensively.

## WEBINAR ON APPLICATION OF AI AT IRDE

Instruments Research & Development Establishment (IRDE) in association with the Birla Institute of Technology and Science (BITS), Pilani conducted a one-day webinar on the 'Application of Artificial Intelligence (AI) for Electro-Optical Sensors' on 4 February 2022. More than 300 participants attended the programme virtually. Papers were presented on the application of AI in various fields.

The webinar was inaugurated under the chairmanship of Prof Sudhir Kumar Barai, Director BITS Pilani. Dr BK Das, OS & Director IRDE was the Chief Guest. Dr Das emphasised the importance of AI and neural networks on various defence applications. He highlighted the AI implementation with intelligent computational architecture, high bandwidth on-chip memory,



synaptic memory, and deep neural network. He further suggested that young scientists, engineers, and start-ups should think differently in AI to strengthen our defence forces which will be game-changers in the future. He proposed the programme, Dreamz Unlimited, wherein every student and start-up can share some unique ideas

and the best few ideas will be implemented as hardware. The lectures were delivered by Shri JP Singh, Sc 'G' and Dr Anita Singh, Sc 'E' from IRDE while Dr Kamlesh Tiwari, Dr Pawan Ajmera, and Dr Shivi Agarwal delivered lectures from BITS, Pilani. The webinar was coordinated by Dr Anita Singh and Dr Shivi Agarwal.

## HIGHER QUALIFICATION ACQUIRED



Mrs Sukeszni Rawal, Sc 'E' has been awarded the degree of PhD (Chemistry) by Defence Institute of Advanced Technology (DIAT) (Deemed University) for her thesis entitled "Effect of Energetic Materials on Pyrotechnic Performance of Igniter Compositions". Her guides were Dr PK Khanna, Professor, DIAT (External Guide) and Dr (Mrs) Seema D Kakade, Sc 'G', HEMRL (Internal Guide).



Ms Kavita Ghosh, Sc 'E' has been awarded the degree of PhD (Chemistry) by the Defence Institute of Advanced Technology (DIAT) (Deemed University) for her thesis entitled "Preparation and Characterisation of HTPB-based Polymer – Clay Nanocomposites and their Evaluation in Composite Propellant" under the guidance of Dr Shaibal Banerjee, Associate Professor, DIAT (External Guide) and Dr Manoj Gupta, Sc 'H', HEMRL (Internal Guide).

## VISITORS TO DRDO LABS

### IRDE, DEHRADUN

Shri SA Katti, Director ITM visited Instruments Research & Development Establishment (IRDE), Dehradun on 4 January 2022. Dr BK Das, Director IRDE welcomed him. Dr Das explained in detail about the products and technologies developed by IRDE. Shri Katti took keen interest in these products and technologies. He appreciated the role of IRDE in providing electro-optics solutions for users.



Shri SA Katti, Director ITM during his visit at IRDE

### NPOL, KOCHI

Dr Samir V Kamat, DS & DG (NS&M) visited Naval Physical & Oceanographic Laboratory

(NPOL), Kochi from 24 to 25 February 2022. Shri SVijayan Pillai, OS & Director, NPOL welcomed DG (NS&M) and briefed him on the project activities being carried out at NPOL. Dr Kamat reviewed the status of ongoing as well as proposed projects being taken up by NPOL. He also reviewed the technology development activities of the technical groups.

### NSTL, VISAKHAPATNAM

Sri Rameshwar Teli, Hon'ble Union Minister of State for Petroleum and Natural Gas & Labour and Employment visited

Naval Science & Technological Laboratory (NSTL) on 22 January 2022. Dr Y Sreenivas Rao, OS & Director NSTL briefed him on the activities of the laboratory. The Minister visited various work centres and was apprised on the R&D activities in the fields of underwater weapons, batteries, and warship technologies. He also visited the Lithium-Ion Battery Development Centre and appreciated the work being carried out.

Dr A Srinivas Kumar, Senior Scientist briefed the Minister on Military and Civilian Applications of Battery Technologies being developed by NSTL.



Sri Rameshwar Teli, Hon'ble Union Minister of State for Petroleum and Natural Gas & Labour and Employment taking keen interest in NSTL activities