

The Guest of Honour of the function Prof. U. Kamachi Mudali delivered an engrossing talk to the staff members of the Centre. He mentioned that RRCAT is the leading institute in the Country in the areas of lasers, accelerators, and non-nuclear advanced technologies. He highlighted the importance of sustainable developmental goals set up by the United Nations, wherein he specifically elaborated on the role of Artificial Intelligence in achieving goals of Industry 4.0 and Education 4.0.



*Prof. U. Kamachi Mudali, former Chief Executive and Chairman, Heavy Water Board, Department of Atomic Energy, and the present Vice-Chancellor, VIT Bhopal University delivering his talk during the Foundation Day function.*

The Chief Guest of the function Shri K. N. Vyas delivered a motivating talk to the staff members of the Centre. He congratulated RRCAT fraternity for its excellent scientific and technological accomplishments during the past one year under the leadership of Dr. Nakhe. He elaborated on the role of nuclear power to meet the goal of “Net Zero” by 2070. He presented the advantages of nuclear energy vis-a-vis other sources of energy such as thermal power and solar power plants. In this regard, he described the role of small modular reactors, which could be industry built. He advised to utilize the unique strengths of different DAE units by establishing collaborations among each other as well as with academics and industries. He expressed his happiness that many industrial partners came forward to absorb the high-end technologies developed at RRCAT.



*Shri K. N. Vyas, Chairman, AEC and Secretary, DAE delivering the Foundation Day address.*

The vote of thanks was proposed by Shri Purushottam Shrivastava, Director, Proton Accelerator Group, RRCAT. The

function was attended by several dignitaries from DAE including the former Directors of RRCAT, Dr. P. D. Gupta, Dr. P. K. Gupta and Shri S. C. Joshi, and the Directors of DAE-UGC CSR, Prof. Amlan J. Pal and Prof. Vasant Sathe. Many eminent personalities from outside DAE also graced the occasion including Dr. Dhruv Ghai, Pro Vice-Chancellor of Oriental University, Indore, Dr. Prithvi Yadav, Vice-Chancellor, Symbiosis University of Applied Science, Indore, Dr. Dilip K. Pattnaik, Vice-Chancellor, Medicaps University, Indore, Dr. Rajeev Vishwakarma, Pro Vice-Chancellor, APJ Abdul Kalam University, Indore, Dr. R. K. Khare, Dean (Administration), SGSITS, Indore, Dr. V. Ganesan, Dean, Medicaps University, Indore, Shri Dev Kumar Vasudevan, an eminent Social Worker, and several senior officials of District Administration and Police Department of Indore. The proceedings of the function were telecast live at different centres of DAE and also at several locations within RRCAT.

*Reported by:  
Shovan. K. Majumder (shkm@rrcat.gov.in)*

### **N.5: Theme meeting on “Control Systems and Instrumentation for Future Accelerator Projects”**

A one-day theme meeting on “Control System and Instrumentation for Future Accelerator Projects” was organized by RRCAT in collaboration with Indian Society for Particle Accelerators on May 26, 2023 at Convention Centre, RRCAT, Indore. The theme meeting had inaugural session and two invited talk sessions. Shri Uday Vaidya, Head, RCnD, BARC was the Chief Guest and Dr. S. V. Nakhe, Director, RRCAT chaired the inaugural session. Shri T. A. Puntambekar, Group Director, Electron Accelerator Group, RRCAT, gave the inaugural address giving the relevance of the meeting and covered major challenges associated with the control system of particle accelerators. Addressing the meeting Dr. Nakhe highlighted the importance of this meeting in light of upcoming high brilliance synchrotron radiation source (HBSRS) project. Shri Uday Vaidya gave a talk on “Challenges & Approach in Design of Control and Instrumentation for Future Accelerator Projects”. He emphasized on a systematic, documented & well controlled, life cycle-based design process for system development.



*Dr. S. V. Nakhe, Director, RRCAT along with other dignitaries lighting the lamp during inauguration of Theme meeting.*

The invited talk sessions had ten talks by eminent experts in the field of control and instrumentation from major Indian institutes involved in the development of particle accelerators. The various topics covered were related to control and instrumentation including SCADA system, embedded system design and development, beam diagnostics & related instrumentation, application of AI/ML in control systems, precision timing and synchronization system and, development of detectors and sensors and ASICs for particle accelerators. The meeting was concluded with a panel discussion in which panellist highlighted importance of documentation and suggested for initiation of V&V process. The meeting was attended by more than 130 registered participants from various DAE units and academic institutes along with invited guests and senior officials of RRCAT. This theme meeting has generated a lot of enthusiasm among the participants and generated collaboration possibilities among institutes on various aspects of control and instrumentation for particle accelerators and in particular for development of detectors and sensors using ASICs. This meeting will serve to foster better networking among participants for realization of robust control and instrumentation systems for particle accelerator projects.

*Reported by:*  
*R. K. Agrawal (ragrawal@rrcat.gov.in)*

### N.6: National Science Day Celebration at RRCAT

National Science Day (NSD) is celebrated in India on 28<sup>th</sup> February of each year to commemorate the discovery of the Raman Effect by Prof. C. V. Raman who was awarded Nobel Prize in Physics in the year 1930 and Bharat Ratna in 1954. RRCAT celebrated the National Science Day on last Saturday and Sunday of February 2023 i.e., on 25<sup>th</sup> and 26<sup>th</sup> February by holding an open house for the school and college students, teachers, family members and guests of RRCAT staff and invitees from public. The theme of this year's National Science Day was "Global Science for Global Wellbeing".



*Dr. S. V. Nakhe, Director, RRCAT addressing the students during celebrations of NSD-2023.*

On Saturday, February 25, 2023, students of Class XI and teachers from schools in and around Indore, were invited for a full day visit. About 850 students and teachers invited from 57 schools of Indore and nearby places visited RRCAT. The program started with an address by Dr. S. V. Nakhe, Director, RRCAT on the basics of Raman Effect and working principles of accelerators and lasers, which are the main areas of research and development at RRCAT. His lucid explanation in simple Hindi language was very much appreciated by the students and the teachers. A few small movies depicting importance of hygiene and cleanliness were also shown to students and teachers under "Swachha Bharat Abhiyaan".

Special arrangements were made for the Hearing and Speech impaired students invited from special schools to participate in the celebrations accompanied by interpreter-teachers. Director, RRCAT, along with senior members of organizing committee, interacted with about 50 special students in a separated interactive session and tried to address their queries with the help of interpreter-teachers. The students participated actively in this interaction session.

After the address, all the students were taken to exhibit places at laboratories and RRCAT Convention Centre, in organized groups, under the guidance of RRCAT volunteers.



*Enthusiastic participation of specially-abled students in an interaction session with the expert panel.*

There were working exhibits on lasers like use of light and lasers for biomedical applications, demonstrations on applications of lasers like: laser cutting and marking, laser additive manufacturing and Nd:YAG and fibers lasers, etc. To explain some basic science concepts, special experiments had been set up like Raman effect, Michelson interferometer, glow discharge, laws of motion, gas laws, conservation of momentum, change in physical properties of materials at low temperature, etc. To explain some technological applications, live demonstration with models of superconducting magnetic levitated trains, Agni-Rakshak, CNC machining, induction heating, glass blowing, etc. were shown. Videos on Indus Synchrotrons and their uses, development of superconducting radio frequency cavities, indigenous 10 MeV linear accelerator, optical diagnosis of cancer, laser additive manufacturing, laser cutting, detection of RF and microwave signals, etc. were shown.