



N.1: RRCAT celebrated 28th Foundation Day

RRCAT celebrated its 28th foundation day on Sunday 19th February 2012. Dr. Srikumar Banerjee, the then Chairman, Atomic Energy Commission (AEC) and then Secretary, Department of Atomic Energy (DAE) was the chief guest and Dr. P D Gupta, Director, RRCAT presided over the function. The programme was started with a welcome address by Dr. P K Gupta, Head, Laser Materials Development & Devices Division and Laser Bio-medical Application & Instrumentation Division.



Dr P D Gupta, Director RRCAT, Dr Srikumar Banerjee, the then Chairman, AEC & Secretary DAE and Dr P K Gupta, Head LBAID & LMDDD during 28th foundation day celebration.

Following the enriched tradition of foundation day celebration, Dr. P D Gupta presented an overview of the scientific activities of the centre and highlighted the important achievements made during the last year. He said, "Indus-1, the 450 MeV Synchrotron Radiation Source (SRS) has been operating round the clock satisfactory with five beam lines". He appreciated the contribution of the teams involved. He further said, "Indus-2 has been operational from February 2010 at 2 GeV, 100 mA. Six beam-lines of Indus-2 are available to researchers from universities, research institutes and national laboratories. Two more beam lines are under commissioning. Solid-state RF amplifier of 60 kW has been developed successfully first time in the world to overcome the difficulties faced in importing Klystrons. Indus-2 has been operated for 2.5 GeV, 100 mA using the solid state RF amplifier." Dr. Gupta nodded the satisfaction on the development activities related to the development of subsystems of Proton Accelerator for future program on Spallation Neutron Source. He presented the progress made in setting up a large infrastructure developmental activities for Superconducting RF (SCRF) cavity, including laser

welding facility. Describing the recent achievements, he said, "Indigenously developed Single cell SCRF cavities has performed satisfactorily and exhibited up to 37.5 MV/m of accelerating gradient at 2 K in a test facility." Dr. Gupta took pride and said, "Liquification rate of 20 liters/hour is achieved using indigenously built Helium Liquefier." He also informed about the development activities of Compact Ultrafast THz Free Electron Laser. He narrated the R&D activities on Electron linac based radiation processing. He also highlighted the significant advances made in the R&D related to lasers and their applications in basic research, biomedical applications and material processing. Recalling the role of lasers developed at RRCAT, he told that these systems have played a pivotal role in remote cutting and welding operation for maintenance and replacement of faulty components of nuclear reactors. He briefed the development of laser based optical inspection station for nuclear fuel pellets and laser rapid manufacturing of small engineering components with expensive materials. He also briefed about soft X-ray lasing in a capillary discharge argon plasma activity, laser driven multi-layer micro rotors having helical stacked particles and technology transfer for fibre coupled nitrogen lasers for medical application. He informed about the development of multifunction magnetic materials and R&D pertaining to materials required for Superconducting cavity. Some of the significant developments made at RRCAT on growth of materials and related studies were also highlighted. He informed about the advancement of high performance scientific computer clusters and human resource development programs at RRCAT.



Dr P D Gupta, Director RRCAT presenting memento to Dr. Srikumar Banerjee, the then Chairman AEC & Secretary DAE

In the chief guest address, Dr. S Banerjee expressed his happiness over the progress made by the scientists, engineers and the supporting staff of RRCAT in the areas of lasers and accelerators. He praised the reliable round the clock operation of Indus-2 and the enthusiasm shown by the researchers from the various universities and national laboratories on utilization of Indus SRS facility. He praised that the work related to enabling technologies and focused R&D efforts



taken up at RRCAT in the development of accelerator system for Spallation Neutron Source. He gave a detailed summary of assessment of safety features of Indian Nuclear Power Plants and future Nuclear Programs in India. He assured that the Indian Nuclear Power Plants are safe for operation and equipped with the necessary features to handle the seismic and Tsunami events. He also gave information on the planned growth of electricity generation using upcoming Nuclear Power projects in India.

Dr. S M Oak, Head, Solid State Laser Division proposed the vote of thanks. The foundation day programme was conducted by Sh. S C Joshi, Head, Proton Linac & Superconducting Cavity Division.

N.2: National Science Day at RRCAT

National Science Day (NSD) is celebrated every year on the last Saturday of the month of February at Raja Ramanna Centre for Advanced Technology, Indore. This year, it was celebrated on 25th February, 2011. Around 1640 students and teachers of 113 schools and colleges from Indore and some from faraway places came to visit the scientific facilities in RRCAT. In main function at RRCAT auditorium, Shri H S Vora, Convener NSD-2012, welcomed the students and teachers. He invited Dr. P D Gupta, Director RRCAT to inaugurate NSD-2012 and address the gathering. Dr. Gupta informed that the National Science Day is celebrated to commemorate the path-breaking discovery of Raman Effect which led to the winning of Nobel Prize by Prof. C V Raman. Dr. Gupta brought out several inspirational aspects of Prof. Raman's personality and life-style besides his scientific contributions. He also gave an overview of RRCAT activities on Laser and Accelerators and explained several applications. His simple and easy to understand explanations had a stimulating effect on all the students and teachers. He also pointed out the importance of science and ingenious technology development and briefed the prospects for students who may like to make a career in scientific research. Shri Sanjay Chouksey, Co-Convener NSD-2012, presented vote of thanks.



Dr. P D Gupta, Director RRCAT addressing the students and teachers during National Science Day Celebration

Elaborated arrangements were made by Sh. Rajesh Arya, Sh. M P Kamath and Dr. C P Paul to take students to different laboratories in organized groups under the guidance of enthusiastic volunteers from RRCAT. The students and teachers were greatly enthused by the interesting exhibits. The staff members of RRCAT had prepared about 80 exhibits/posters/presentations which were kept in 14 buildings to explain the scientific and technical activities of the Centre. Students visited Synchrotron Radiation Sources (SRS) Indus-1 and Indus-2, laser laboratories, cryogenic laboratory, workshop, magnet laboratory, fire safety, industrial accelerator lab and other interesting laboratories. Snacks and lunch were served to all the students and accompanying teachers from various schools and colleges by the team of volunteers led by Sh. S D Sharma. Aroused scientific queries of the students were addressed by a team of senior scientists led by Dr. G Sinha during the lunch break. This yearly effort brought an enthusiasm among the students. They admired the scientific activities being pursued by DAE in general and RRCAT in particular.

In the afternoon, families and friends of RRCAT officials visited the laboratories.

*Reported by:
H S Vora (vora@rrcat.gov.in) &
Sanjay Chouksey.*

N.3: SERC School on Laser Physics and Technology

A SERC school on Laser Physics and Technology was organized at RRCAT during 12th-30th March, 2012 sponsored by Science & Engineering Research Council (SERC) of the Department of Science & Technology (DST), Govt. of India. About forty participants were selected from 120 applicants from all over the country, based on their previous academic records and relevance of their research work. The School was inaugurated by Dr. P D Gupta, Director RRCAT and conducted under the directorship of Dr P K Gupta.

The first week of the school focused on the basics of laser physics. Dr. P K Gupta introduced the basics of lasers covering various topics such as laser mechanism, resonator optics, line broadening etc. A basic course on non-linear optics was taken by Dr. M P Joshi (RRCAT) followed by the basics on engineering aspects of lasers by Dr. Sendhil Raja S (RRCAT). The details of various gas lasers were discussed by Dr. S K Dixit (RRCAT) and semiconductor lasers were discussed by Dr. S K Mehta (SSPL). The basics of fiber-lasers and diode pumped solid state were covered by Prof. K Thyagrajan (IIT Delhi) and Dr. P K Mukhopadhyay (RRCAT) respectively. Prof. D N Rao (Hyderabad University) took a course on Ultra short pulsed lasers followed by a course on OPO & Tunable lasers by Dr. K Dasgupta (BARC). The second and third week of the school was focused on various laser applications. Dr. S V Joshi