



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.

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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



(ARCI) & Dr. L M Kukreja (RRCAT) covered the basics of laser material processing and applications of lasers in high-resolution spectroscopy was covered by Dr. B M Suri (BARC). Dr. K K Pant (RRCAT) and Dr. D S Rana (IISER Bhopal) discussed Free electron lasers and THz sources respectively. Lasers in Biophotonics was covered by Dr. P K Gupta and Dr. Sanjeeb Chatterjee (RRCAT) covered various techniques of Optical Metrology. Laser based Instrumentation was covered by Dr. Sendhil Raja S.

The School also organized lab experiments to expose the participants to hands-on experiments on some of the areas covered in the School. These included Diode pumped solid state laser characterization, Yb doped fiber laser characterization, femto second laser pulse characterization, copper vapour pumped dye laser, XeCl excimer laser characterization, laser welding of stainless steel, laser rapid manufacturing, optical coherence tomography, optical micro-manipulation, and magneto-optic Kerr effect.



SERC School Participants and Faculty posing for a group photo.

Five evening lectures were also arranged as part of the school delivered by Dr. L M Gantayet (BARC), Dr. D D Bhawalkar (Quantalase), Prof. Kankan Bhattacharya (IACS), Prof. Deepak Mathur (TIFR), and Dr. A Maini (Lastec).

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N.4: 1st Interaction Meeting on Synchrotron Utilization

RRCAT is home to two synchrotron sources Indus-1 and Indus-2. There are 7 commissioned beam-lines in Indus-2 and 5 beam-lines in Indus-1. In order to enhance the utilization of these national facilities and increase the user base in the country, it has been planned to hold regular interaction meetings with leading scientists and researchers from different parts of the country. Further, students and young researchers from different institutions are invited for these talks. This will bring them in contact with the latest international research scenario and also open up the possibility of experiments by these students at the Indus

facilities. Each such interaction meeting is proposed to be focused on a specific experimental technique with emphasis on the facilities present at/to be added to the beam-lines.



Participants of the 1st interaction meet on Synchrotron Utilization posing for a group photograph.

The first such interaction meeting on synchrotron based X-ray diffraction was held on 24th - 25th January 2012. The theme of this meeting was 'Structure determination using X-ray diffraction at ambient and high pressures'. The programme included lectures by the following eminent scientists in X-Ray diffraction, Prof. T.N.Guru Row, IISc, Bangalore, Prof. Chandrabhas Narayana, JNCASR, Bangalore, Dr. S.N.Achary, BARC Mumbai, Dr. N.P.Lalla, UGC DAE CSR Indore, Dr. Nandini Garg, BARC Mumbai, Dr. Anthony Arul Raj, IGCAR Kalpakkam and Dr. Amitabh Das, BARC Mumbai. The total number of student participants from various institutes other than RRCAT was about 50.

The lectures covered the range of experiments that are presently being performed at ADXRD and EDXRD beamlines. Prof. T.N.Guru Row talked about the various issues related to the single crystal diffraction and several aspects related to the determination of the crystal structure from the diffraction pattern of single crystals. Prof. Chandrabhas Narayana gave a detailed account of high pressure experiments and the physics behind high pressure studies. He also explained the details of the high pressure XRD setup that he has been involved in developing at the ADXRD beamline at Indus-2. Dr. N.P. Lalla, Dr. Anthony Arul Raj and Dr.S.N.Achary talked about the details of powder diffraction experiments, data reduction and data fitting procedures. Dr. Nandini Garg talked about the details of the Energy dispersive mode of X-Ray diffraction and some of the recent results obtained from that beam-line. Dr. Amitabh Das talked about another important and interesting aspect of diffraction: analysis of X-Ray data from amorphous samples. There was a hands-on session in the second day afternoon where the students were exposed to the techniques of XRD data analysis and structure refinement.

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