

SERC dinner was also organized for the students and faculty members. Free Wi-Fi connection was provided to the students at Guest House, which was highly appreciated and used by the students. There was a lab visit also organized on one day. In this visit, students visited Indus-1 and Indus-2 synchrotron sources, the 150 TW Ti:sapphire laser system, different types of Solid state lasers, Dye lasers, and Copper vapour lasers.

On the second-last day, there was a multiple choice type quiz given to the participants to gauge how much they had grasped during the School. This was followed by a feed-back session to get detailed feedback from the students. The feedback showed that overall the students were quite happy with all the aspects related to the school. On the last day, there was concluding session wherein prizes were distributed to the 5 winners of the quiz and participation certificates were distributed to all the participants by Dr. P.D Gupta, Director, RRCAT.

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The participants and faculty of Fifth SERC School on Micro-fabrication and Micromachining posing for a group photograph

Total 30 lectures were given by 25 faculty members and researchers from RRCAT and outside. The lectures were arranged to cover all the dimensions of multidisciplinary area of X-ray lithography. Three teachers from abroad were also invited to deliver the Lectures. Dr Lucia Alianelli from Diamond Light Source, UK discussed the various fabrication processes for design and development of X-ray lenses. The advanced course on X-ray lithography including the device fabrication and testing was taken by Prof Y Utsumi from Hyogo University, Japan. Dr R Bhatia from SpotOptics, Italy explained the process involved in metrology of micro devices. Dr V K Suri from BARC, Mumbai shared his valuable experience in the field of micro-nano engineering for realization of innovative micro-nano devices for societal applications during the evening talk.

Beside lectures and tutorials, project proposal and presentation was organized each day where each participant presented a brief research plan. Around 28 projects were presented by the participants which included application in the field of mechanical, electrical, biological and physical science. The 3 hands-on experiments related to X-ray lithography were performed with 2 batches. While one batch was busy with the hands-on experiments the other batch was involved in visiting the laser micro-fabrication facilities. The participants also visited Indus-1 and Indus-2 synchrotron sources. In addition, two cultural evenings were organized for the participants and faculties. The feedback was collected from the participants that showed happiness with the arrangements and overall usefulness of the school.

Dr T Ramasami, Secretary, Department of Science and Technology presided the concluding session of the SERC School. Dr Ramasami in his key note address talked

N.5: Fifth SERC School on micro-fabrication and micromachining

The fifth SERC School in the series of micro-fabrication and micromachining was organized at Raja Ramanna Centre for Advanced Technology (RRCAT), Indore during October 29-November 03, 2012. The theme of the school was “New developments in micro-fabrication with focus on synchrotron radiation-based Deep X-ray Lithography”. The total 57 participants from all over the country participated in the School. They were selected from 160 applicants, based on their academic records, research interests and relevance.

The school was inaugurated on October 29, 2012 by Dr. P.K Gupta, then Officiating Director, RRCAT. Prof. P.K Kalra, Director, IIT Jodhpur was the Guest of Honour. Dr. G S Lodha, gave an introduction on X-ray lithography and theme of the school. The school was a combination of class room lectures and hands-on experiments on X-ray lithography. The participants were given a very famous reference book, Fundamentals of Micro-fabrication and Nanotechnology (vol. 1, 2 and 3) by Marc J Madou.

about various programs being conducted under umbrella of the department and stressed the need pioneering research in advanced technologies.

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N.6: Theme meeting on Structure determination using X-Ray diffraction

An interaction meeting on Synchrotron Utilization with the theme: “Structure determination using X-Ray diffraction” was held in RRCAT from 23rd to 25th day of July 2012. This was the fourth in the series of the meetings held in the calendar year 2012, where the principal emphasis was to bring researchers from different universities and other research organizations to RRCAT and make them aware of the facilities at the Indus synchrotrons - a national research facility. The present meeting was primarily focused on the utilization of X-Ray diffraction beamlines at Indus-2 namely the Angle dispersive and Energy dispersive X-Ray diffraction beamlines for measurements at ambient and high pressures. The function was inaugurated by Dr. P D Gupta, Director RRCAT. The first talk was delivered Prof. Dhananjai Pandey, Director IIT BHU. He explained the various issues related to X-Ray diffraction and the role of symmetry in determining the diffraction selection rules and the pattern. He also explained the methods used for structure determination from X-Ray diffraction. The other talks presented in this meeting were by Dr. V S Shastri, (UGC DAE CSR, Kalpakkam), Dr. A K Sinha (RRCAT), Shri H Poswal (BARC) and Dr. N Chandrashekhar (IGCAR). Dr. V S Shastri talked on Pair distribution function approach for crystal structure determination, Dr. A K Sinha talked on the available facilities at the ADXRD beamline on Indus-2, Shri H Poswal talked on the facilities available at the EDXRD beamline on Indus-2 and some of the high pressure experiments that have been performed at this beamline. Dr. N Chandrashekhar explained the basics of high pressure physics and the instrumentation relate to high pressure measurements that have been developed at IGCAR. The meeting was attended by about 20 students from different institutes outside RRCAT. Two practical sessions on the basics of Rietveld refinement were also conducted on the afternoons of the first and the second day of the meeting. These were coordinated by Dr. C Upadhyay from IITBHU and RRCAT scientists. These training sessions and all the talks were very useful for young researchers who plan to make a career in materials

synthesis and structure determination using X-Ray diffraction.

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N.7: Theme meeting on Synchrotron based EXAFS: Techniques and Applications

A much awaited theme meeting on “Synchrotron based EXAFS: Techniques and Applications” was held at RRCAT during Sept 27-28, 2012 with an objective to bring together users as well as experts in the field of EXAFS, to present an overview of results, activities and to provide a platform for discussing emerging new applications and future trends. Meeting had a overwhelming response amply justifying the interest in this emerging field. More than 115 participants, from various universities (12), national institutes (6) and other Synchrotron facilities (Elettra, Italy & Soleil, France) attended the meeting. The two-day theme meeting was organized into four sessions, including practical sessions for experimental demonstration at Dispersive EXAFS beamline (BL-8) and hands-on-training on EXAFS data analysis.



The participants of Theme meeting on Synchrotron based EXAFS posing for a group photograph

Dr. P D Gupta, Director, RRCAT, presided over the inaugural function held on 27th Sept. 2012. Dr. Gupta, in his inaugural address, informed the participants that a series of focused theme meeting are being organized to promote the utilization of Indus Synchrotron Facility by increasing the user base in the country. Dr. N K Sahoo, Head, Applied Spectroscopy Division, BARC welcomed the delegates, invited speakers and students and invitees attending the function and also gave an overview of EXAFS facilities at Indus-2 synchrotron radiation source.