

adviser to the government of India in organizing the interaction meetings. Dr. Gupta assured full support to all the participants and faculty members for the utilization of the Indus Synchrotron facility.



Participants of the Interaction meeting on X-ray lithography and microfabrication

Dr. V K Suri delivered the first lecture where he pointed out the need of micro and nano fabrication facilities for producing micro-nano engineering products. Dr. S K Deb gave an overview about the present and previous meetings held for x-ray lithography and a brief update about the Indus-2 synchrotron facilities. Prof. Shuji Miyamoto, Director of Laboratory for Advanced Science and Technology, Hyogo University, Japan and Prof. A Yamaguchi, Hyogo University delivered the lectures on the x-ray lithography facilities and nano magnets engineering respectively. Prof. B Bhattacharya (Jadavpur University), Prof. S Bhattacharya (IIT Kanpur), Prof. Monica Katiya (IIT Kanpur), Dr. Sunil Bhand (BITS-Pilani Goa Campus), Prof. N J Vasa (IIT Madras), Dr. V B Chandratre (BARC), Prof. Uday Dixit (IIT Gauwahati), Prof. A Sidpara (IIT Kharagpur), Dr. P Ram Sankar (RRCAT), Dr. Arvind Srivastava (RRCAT), Shri Vishal Dhamgaye (RRCAT) and Dr. Rahul Shukla (RRCAT), delivered the lectures during the interaction meeting covering various aspects of microfabrication.

There was a special session to discuss science involved in microfabrication and to identify new projects. Dr. Suri and Dr. Lodha chaired the session. The participants were asked to discuss their projects for 2-5 minutes. Following the interests of the participants it was decided to further explore the projects and its viability by the exchange of knowledge. It was also decided that all the necessary facilities and beam time at Indus-2 X-ray lithography beamline will be provided to carry out these projects.

Reported by:
Vishal Dhamgaye Prabhakar (vishal@rrcat.gov.in)

N.4: One Day Interaction Meeting on Engineering Applications of Beamline on Indus-2

One day interaction meeting was organized on 14th December 2013 on engineering applications of beamline. This meeting was organized to compile the needs of engineering research community in the country. This beamline is mainly based on x-ray diffraction experiments having the possibilities of both monochromatic and white beam. This beamline can be used for powder diffraction, stress and texture measurements in large size components up to 1 m in dimension. It can also be used for testing large size reflective x-ray optics. Scientists are invited from various national research centers and academic institutes for this meeting. In the meeting, the current plan of experiments on the beamline and ray tracing results were presented to participants. Thereafter, the invited scientists presented their plan and requirements from such a beamline. At the end, the inputs regarding facilities required in the experimental station were also taken from participants. These inputs are very useful to meet the requirements of a large user base.

Reported by:
Sanjay K Rai (sanjayrai@rrcat.gov.in)

N.5: Indus Interaction meeting titled "Indus beamlines: their development and utilization"

A one day interaction meeting on Indus beamline utilization titled: "Indus beamlines: their development and utilization" was held on the 18th December 2013 at RRCAT. The speakers in this meeting were Dr. B.N.Jagatap (BARC), Dr. Chandrabhas Narayana (JNCASR, Bangalore), Dr. Shankar Ghosh (TIFR, Mumbai), Prof. B.D.Shrivastava, (Univ. of Ujjain), Dr. D.M.Phase (UGC DAE CSR, Indore) Dr. P.Ch. Sahu (IGCAR, Kalpakkam), Dr. G.S.Lodha (RRCAT) and Dr. Ravi Makde (BARC/RRCAT). The speakers talked about the various experiments carried out at the Indus beamlines and their personal association with the development and utilization of Indus-1 and Indus-2 beamlines. The meeting was attended by various scientists and researchers from different institutes, including, UGC-DAE-CSR, Indore; DAVV Indore; Univ. of Ujjain and RRCAT.

This meeting also coincided with the birthday of Dr. S.K.Deb, the then Head of Indus Synchrotrons Utilization Division, who superannuated on 31st of December 2013. It was an opportunity to felicitate Dr. Deb, and recount the immense contributions made by him towards the development of the beamlines at Indus and enhancing their utilization. The last session of this meeting was thus devoted to his felicitation where several senior scientists who had a



long association with Dr. S.K. Deb, recollected their thoughts and feelings. This session concluded with a talk by Dr. P.D.Gupta Director RRCAT, who recollected the various contributions made by Dr. Deb towards the progress of Indus beamline development and their utilization. A collection of all the publications from Indus-1 and Indus-2 in the last two years was also presented to Dr. Deb by Dr. P.D.Gupta on this occasion.

*Reported by:
Tapas Ganguli (tapas@rrcat.gov.in)*

N.6: One Day Conference on Non-equilibrium Superconductivity & Magnetism

On behalf of the Materials and Advanced Accelerators Sciences Division, a one day conference on "Non-equilibrium Superconductivity & Magnetism" was organized on 20th December 2013 to honor Dr. P. Chaddah on his superannuation. The Occasion was used as an opportunity to recapitulate and review the scientific activities of the Low Temperature Physics Laboratory of RRCAT (renamed later on as the Magnetic & Superconducting Materials Section) over the last 22 years. The scientific activity in this laboratory was first started on "Non-Equilibrium Superconductivity" and then the horizons were expanded to Non-Equilibrium Magnetism and its role on various functional magnetic materials.

Dr. P. D. Gupta, Director, RRCAT, in his welcome remarks appreciated the efforts to start the Low Temperature Physics Laboratory. He highlighted the scientific contributions made by this laboratory in the area of Non-equilibrium Superconductivity & Magnetism. He emphasized that such contributions have not only made international scientific community to notice this laboratory but also recognized and accepted their systematically researched ideas. He encouraged the research group to continue in their endeavors, and the younger generation to understand the importance of the courage to get their ideas peer reviewed and the importance of constructive interactions with people from different fields.

Among the invited speakers, Prof. A. K. Nigam from Tata Institute of Fundamental Research Mumbai shared the exciting results and the understanding that was developed over a period of time in collaboration with Low Temperature Physics Laboratory, RRCAT on-antiferromagnetism, metamagnetism and first order transition in pure and doped CeFe₂ compounds. Dr. Alok Banerjee, from UGC-DAE Consortium for Scientific Research, Indore, shared his experience of working on-tunable metastability in magnetic oxides.



Dr. P. D. Gupta, Director, RRCAT and Dr. S. B. Roy, Head MAASD presenting the Memento to Dr. P. Chaddah in the presence of the members of Low Temperature Physics Laboratory and the invitees.

Among the speakers from RRCAT Dr. S. B. Roy shared his early experience of working in "Non Equilibrium Superconductivity: Critical Current and Vortex Matter", when there was hardly any experimental infrastructure available, but still quite exciting and interesting results leading to newer ideas could be obtained and shared with the scientific community across the world through scientific publications. Such newer ideas were subsequently applied in the area of magnetism, and this was elaborated by Dr. Meghmalhar Manekar in his talk on the "Phase Co-existence across First Order Magneto-Structural Transitions". He drew the attention of the audience by showing a video clip of formation of ice from the supercooled water by simply tapping the bottle and emphasized that the interesting phenomenon of first order phase transition could be experienced in our kitchen! Dr. M. K. Chattopadhyay talked about the "Properties of Magnetic Materials across the Disorder Influenced First Order Magneto-Structural Transition". He presented various distinctive features associated with such phase transitions, and the commonality of physical behavior amongst different class of magnetic materials across such phase transitions. Dr. Kanwal Jeet Singh Sokhey talked about the "Manifestation of First Order Transition in Magneto-Transport Properties", and then Dr. Vishnu Kumar Sharma shared his experiences of working in new class of materials and gave his talk on "Magneto-structural Transitions and Associated Multi-Functional Properties of Ferromagnetic Shape Memory Alloys". Dr. P. Chaddah shared his experiences of working in this area for the last few decades, and on the difficulties faced while convincing the scientific community of the world about the "Access to Magnetic Fields and understanding First Order