



From the Convener's Desk...

The new Editorial Board, reconstituted in June 2014, is delighted in bringing out its first issue, which happens to be the second issue of RRCAT Newsletter of 2014. In its long glorious journey of 27 years, the RRCAT Newsletter has attained new heights due to fine works of the past Editorial Boards. The present Editorial Board will leave no stone unturned in maintaining the high standards of the Newsletter.

The current issue of the Newsletter gives an account of various activities that have taken place in RRCAT during first half of the present year. Last year, in December 2013, the stored beam current of Indus-2 was increased to 175 mA at 2.5 GeV, which was reported in the first issue of RRCAT Newsletter of 2014. Now the stored beam current has further increased to more than 200 mA at 2.5 GeV by taking various steps, which are reported in the present issue. There are several interesting reports on various aspects of the Indus-2 machine, like new bunch filling patterns, global fast orbit feedback control system, etc. In Indus-1 also, an automatic electron beam current limiting system is developed. The other reports are related to the testing of fast tuning system with 1.3 GHz prototype RF cavity, development of 150 kVA, 430 Hz power source for high voltage generator of 2.5 MeV dc accelerator, development of solenoids for ARPF project, etc.

Then there is an account of various accomplishments in the field of lasers and its applications. The development of gas-assisted underwater laser cutting of pressure tube stubs of pressurized heavy water reactor by RRCAT and its successful testing at the Kakrapar Atomic Power Station is a very important application of laser in the area of nuclear technology. The other reports are related to development of CVL MOPA system with a solid state switch power supply, demonstration of a MOPA-LOPUT based single mode laser at 1064 nm, production of K- α radiation by the interaction of ultra-short, ultra-intense laser pulses, development of Kr MOT with hollow Zeeman slower beams, studies on ordering of hemoglobin molecules in red blood cells by using Raman optical tweezers, enhancement of resistance of stainless steel against stress corrosion cracking by laser peening, etc.

There are three theme articles, which focus on three important areas of R & D activities. The first article gives an account of development of copper-HBr laser at RRCAT along with scientific studies. The second article gives a perspective of electron beam orbit control systems for synchrotron radiation sources and Indus-2. The third article discusses the first order magneto-structural phase transition in Fe-Rh based alloys and its implications on the functional properties.

Several important construction works like tunnel for IRFEL lab, buildings of H-ion lab, LCW plant, etc. are reported in the Newsletter. Several important celebrations, viz. 30th Foundation Day of RRCAT, National Science Day and Women's Day are also reported in this issue. The organization of Young Scientist Research Program (YSRP) was an important event related to human resource development. The theme meeting on "Indigenous technology development for synchrotron X-ray mirrors" and the school on "Basics of magnetism and investigations of magnetic properties of materials using synchrotron radiation" are the two important academic events, which had taken place in RRCAT.

We feel privileged in compiling these reports to bring out a comprehensive picture of new developments at RRCAT. The publication of the present issue of the Newsletter has been possible only due to excellent cooperation from many colleagues of different Divisions of RRCAT. We express our sincere gratitude to all of them. In the last but not the least, we would like to express our deepest gratitude to the Director, RRCAT, for his keen interest, stimulating support and continuous encouragement.

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Convener
RRCAT Newsletter