



From the Convener's Desk...

This issue of RRCAT Newsletter (Vol. 31, Issue 2, 2018) gives an account of the various activities and major developments in the areas of accelerators, lasers, and infrastructure that have taken place during the first six months of 2018. The Editorial Board for RRCAT Newsletter is delighted to bring out this issue.

Various R&D activities in the area of accelerators are covered in the opening section of the Newsletter. Activities leading to the installation and commissioning of the sixth RF cavity in Indus-2 and its operation in round-the-clock mode, have been reported. Development of modular power supplies for solid state RF amplifiers in Indus-2 has also been reported. The commissioning of the first 10 MeV linac (Linac-B1) at *Agricultural Radiation Processing Facility* and the results of high power testing of the other one (Linac-B2) at RRCAT are described in the second report. There are reports on disaster recovery setup for Layer-1 of Indus control system, system for acquiring profile of the booster beam current pulse, and development of general-purpose ARM SoC based VME CPU board aimed to augment the control capabilities in Indus. The reports describing coupling of H⁻ ion source with low-energy beam transport line for beam studies and the results of testing of first five-cell high beta 650 MHz superconducting RF cavity using the infrastructure developed at RRCAT are also included. The section also reports the results of studies towards the compositional analysis of boron carbide thin films, effect of defects states within the band gap in barium titanate and development and measurements of high resolution multilayer mirror for soft x-rays.

The next section of the Newsletter, covering various accomplishments in the field of lasers, begins with a report describing the development of a cost effective maskless photolithography system. Generation of antibacterial surfaces on type 304L stainless steel through laser surface texturing is reported next. Development of laser additive manufacturing system using powder bed fusion is the topic of the next report. The inspection system for the evaluation of x-ray gamma auto radiograph of fast breeder test reactor fuel pins, application of Nd:YAG laser based system for cutting of stuck north end of S-7 coolant channel of KAPS-2 reactor, and development of a 7 J, 10 ns Nd:YAG laser oscillator-amplifier system, are covered subsequently. The section also has reports providing the results of various investigations, such as, the use of Au-ZnO nanocomposites in photocatalytic degradation of dye solutions.

The features of newly constructed Convention Centre are highlighted in the Infrastructure section.

As usual, there are three *Theme Articles* in the Newsletter. The first one reviews different approaches used for generation and controlled manipulation of photonic nano-jet, and overviews various applications being explored. Ultra-high vacuum system is one of the building blocks of a particle accelerator. The second article overviews recent achievements, contributions to Indus accelerators and various technological developments at RRCAT in this area. Design issues in the development of harmonically tuned, solid-state, radio frequency power amplifiers are described in the third article.

The Newsletter covers several important events in the News section including celebration of RRCAT's Foundation Day, National Science Day, Women's Day etc. The section also has reports describing the organization of two conferences, namely, InPAC-2018 and NSRP-21, at RRCAT. Reports on 4th Orientation Course on Accelerators, Lasers and related Science and Technologies (OCAL-2018), Young Scientist Research Programme (YSRP-2018), M. Tech. students' fest (Anugoonj 2k18), accomplishments of our distinguished colleagues, and seminars delivered during this period, are included. The Newsletter lists various activities carried out for the promotion and propagation of Hindi usage. In this section, we also welcome new members to the RRCAT family and bid farewell to those who superannuated during this period.

The Editorial Board appreciates the time and efforts put in by the contributors and would like to thank all of them. It is our privilege to put together all these expositions. We would like to express our deepest gratitude to the Director, RRCAT, for his keen interest and active support at various stages of compilation of this Newsletter. We also look forward to receive constructive suggestions from readers towards improving the Newsletter content.

With warm regards,

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(Mangesh B. Borage)
Convener
RRCAT Newsletter