



## *From the Convener's Desk...*

The Editorial Board of RRCAT Newsletter is delighted to bring out the first issue of the RRCAT Newsletter of 2017, which gives an account of various activities that have taken place in RRCAT during second half of the previous year. During this period, the Centre has witnessed two important developments. Dr. P. D. Gupta, the former Director, retired on superannuation on July 31, 2016 and Dr. P. K. Gupta, Distinguished Scientist & Associate Director, took over as the Acting Director of RRCAT. Dr. P. K. Gupta retired on superannuation on August 31, 2016 and then Dr. P. A. Naik, Distinguished Scientist & Head, Laser Plasma Division and Indus Synchrotrons Utilization Division, took over as the Director of RRCAT. We congratulate both Dr. Gupta and Dr. Naik for their appointments to these prestigious positions.

The Newsletter begins with reports covering different aspects of research and development in the area of accelerators. The first two reports discuss the development of a system for measuring first and second integrals of APPLE-2 undulator magnetic field in Indus-2 for determining the change in beam angle and position respectively; and the implementation of an automatic sequence based on machine states to switch off Indus-2 injection system that enhances the life of pulse power supplies along with power saving. There are reports on development of a software for baking application that has been successfully used in the baking cycles conducted for the commissioning of undulators U1, U2 & U3 in Indus-2; use of the soft x-ray reflectivity beamline at Indus synchrotron source for studying of off-stoichiometric aluminium oxide thin film to determine optical index profile in the 60-200 Å region; etc.

Then there is an account of various accomplishments in the field of lasers and its applications. There are reports on the development of a diode pump alkali (Rubidium) laser; development of a diode pumped 1.4 kW fibre coupled continuous wave Nd:YAG laser; development of a magneto-optical trap for cooling of fermionic  $^{83}\text{Kr}$  atoms; compensation of phase errors in a tiled single grating laser pulse compressor; etc. Several important works on development of infrastructure in our Centre are also reported. There is a report on commissioning of a new Data Centre Hall as per ANSI/TIA-942 Rated-2/Tier-2 Data Centre specifications in IT Building-A of RRCAT for efficient conduction of IT driven businesses. The reports on commissioning of roof top solar photovoltaic systems for common area lighting and setting up of two vermiculture plants for producing vermin-compost by disposing waste in an eco-friendly way describe efforts of RRCAT on environment conservation.

There are three theme articles, which focus on three important areas of R & D activities in RRCAT. The first article presents an overview of physics and technology of semiconductor optoelectronic devices that are recently developed at RRCAT. The second article discusses the principle of operation, important sub-systems, and special features of free electron lasers along with a review of its present status at RRCAT and abroad. The third article gives an account of light induced therapy for inactivation of bacteria and enhancement of wound healing. Several important events, viz. Graduation function of 16<sup>th</sup> batch of BARC Training School at RRCAT, Celebration of HBNI Scholar's Day, Organization of a mini-marathon "Freedom-70" by HBNI, etc. are also reported. The Newsletter describes the accomplishments of our distinguished colleagues, who have received various honours and awards at different forums during this period and we congratulate them. The Newsletter also remembers those colleagues, who are superannuated during this period and we wish them a happy and healthy post retirement life.

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.

With warm regards,

**( Rajeev Khare )**  
Convener  
RRCAT Newsletter