



From the Editor's Desk....

It is heartening to bring out the second issue of the RRCAT Newsletter of the year 2013. It presents, as usual, the different activities that took place in the Centre over the earlier half of the current year. These include areas ranging from lasers through accelerators to infrastructure.

The Newsletter starts with the reports spanning the different aspects of research and developments in the area of accelerators. Notable among these is surely the enhancement of the stored beam current of Indus-2 from 100 mA to 150mA at full energy operation, which by itself is a pronounced achievement in the country's accelerator programme. This is followed by a range of reports which include design and development of X-ray diagnostic beam line at Indus-2, development of 650 MHz single-cell bulk Niobium SCRF cavity, processing of 1.3GHz Single Cell SCRF Cavity, development of aluminium plate fin heat exchangers for cryogenic applications, local fast orbit and global slow orbit feedback control systems for Indus-2 and indigenous development of S-band test facility up to 45MW peak power for testing accelerator components among others.

On the laser front, the noteworthy achievements are laser wake-field acceleration of electrons in laser produced solid plasma plume, development of a chirped pulse amplification based 40 TW Nd:glass laser system, laser cooling and trapping of noble gas Krypton atoms, development of diode-end-pumped Nd:YVO laser with 4 different cooling geometries, development of specialised optical coatings and studies on anatomical variability of in vivo Raman spectra of normal oral cavity and its effect on oral tissue classification to name a few from a longer list.

The Infrastructure section of the issue highlights reports on the accomplishments by the computer and civil divisions of RRCAT. This is followed by three theme articles which focus on three important areas of research. The first article provides an overview of Indus-2 control system and its evolution over the years to cater to the necessary requirements for enhancing the performance of Indus-2. The article on laser wake-field acceleration (LWFA) outlines the fundamental principles of plasma based acceleration using lasers and presents the different schemes of compact electron accelerators based on LWFA. The third article in the young scientist forum depicts detailed structural, optical and electrical properties of InP/GaAs type-II ultrathin quantum wells. The publication section consolidates the series of research papers appeared either in peer-reviewed journals or presented in national or international symposia during first half of this year and the news section gives a comprehensive coverage of the various happenings the Centre has witnessed over this period.

It is our privilege to put together all these expositions. We feel glad to acknowledge the kind support and encouragement of all those who contributed directly or indirectly to make the newsletter a success. We also would like to convey our deepest gratitude to the Director, RRCAT for his keen interest and active support at various stages of compilation of the Newsletter.

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Chief Editor
RRCAT Newsletter