



## From the Director's Desk

It is a pleasure to see that the first issue of 2009 RRCAT Newsletter is ready to go to the press. The issue reports on a number of significant advances made in the Centre over the last few months. The fact that after a successful trial in May/June 2008, Indus-2 has been operating at its full design energy value of 2.5 GeV, is a matter of satisfaction for all those who have contributed to the realization of this machine. This confirms that the sub-systems can deliver the required performance for the full energy operation. In the coming months, once we have adequate number of fully trained operating staff available, it will be our endeavour to run the machine on a three shift per day basis. We will try to ensure that the machine operates reliably at the highest energy so that the Synchrotron Radiation from it can be put to use for actual research problems. Already significant advance has been made on some of the beamlines that can facilitate full exploitation of Indus-2. The other developments reported in the issue, concern the Linac under development, besides the studies on cryogenics and superconducting materials, where important advances were made by us in the recent months.

In the area of lasers, high point of the scientific activities continue to be both the biomedical applications as well as laser-based plasma acceleration experiments. Several latest results in these areas have been presented in this issue along with the development of high power side-pumped Nd:YAG laser, where we have broken new ground. Many other materials development activities for numerous applications are also included in this issue of Newsletter. The three theme articles cover areas where the Centre has made notable contributions. These provide valuable information in the area of power sources for copper vapour lasers, survey and alignment systems for accelerators and superconducting and magnetic materials. In addition, the issue carries usual reports on several events, notable achievements and publications of staff members. I hope this issue will give the readers a flavour of some of our recent activities and promote follow-up interactions with our scientists and engineers.

In the end, I wish to compliment the Editorial Board, especially the younger members - Dr. Shovan Majumder and Dr. Vinit Kumar - for their laudable efforts.

V.C. Sahni

## From the Editorial Board

A warm welcome to the first issue of the RRCAT Newsletter of 2009! The Editorial Board is delighted to bring it out at its designated appearance time. As usual, the issue covers scores of activities the Centre has witnessed over the later half of the past year through the beginning of the current year.

The Newsletter begins with reports covering different aspects of research and developments in the area of accelerators. The most significant of these is the full energy operation of Indus-2, which is a major milestone in the country's accelerator programme. This is followed by an account of Centre's various accomplishments in the field of lasers and their applications, ranging from laser wake-field acceleration for generating high quality relativistic electron beam to the laser spectroscopy and imaging for detecting tissue pathology. The Infrastructure section of the issue highlights various important developments including that of a modified power distribution system required for improved performance of Indus-2 and the different computer networking and communication systems for smooth flow of information. The issue also carries three theme articles, which focus on three important areas of research activities. The first one describes development of an all solid state pulsed power supply for copper vapour lasers, the second one details a systematic and proper methodology that has been adopted for precise survey and alignment of two important accelerator machines of our Centre, and the third article, in the Young Scientists Forum, provides a lucid presentation on how the magnetic materials and superconductors behave in the presence of magnetic field.

It is really heart warming to see all these contributions. The Editorial Board appreciates the time and effort that have been devoted by the different contributors and would like to thank them all. Further, the Editorial Board would like to record its appreciation for the splendid effort put in to the present issue by two of its younger members : Dr. Shovan K. Majumder and Dr. Vinit Kumar. Last but not the least, the Editorial Board would like to express its gratitude to the Director, RRCAT, for his keen interest and support.

Editorial Board  
March 2009