



From the Editor's Desk...

We are happy to bring out the second issue of RRCAT Newsletter of the year 2019, giving a highlight of various activities and events that have taken place in the first half of this year.

The first section reports important achievements made on the accelerator related activities. It begins with the status report on Indus operations and utilization. This is followed by a report on development and deployment of a system that provides automatic verification of the ramping process in Indus-2 magnets. For the electron linacs for Agricultural and Radiation Processing Facility (ARPF), the ARPFOne web portal has been developed for presenting the machine generated data of Linac-1 and Linac-2 on the web, which is described in the next report. This is followed by three reports on H⁻ linac related activities – first, on development of a compact external RF antenna based H⁻ ion source, then, on fabrication and installation of a Horizontal Test Stand (HTS) cryostat at RRCAT to test the dressed superconducting RF cavities, and third one on development of electroforming technology for 3 MeV H⁻ beam dump. Finally, there are three reports on materials research activities using Indus, which are on the interesting electrical properties in bulk delafossite CuFeO₂, on the effect of atomic disorder on magnetic and electronic properties of NiCrGa half Heusler alloy, and on development of soft x-ray excited optical luminescence (XEOL) measurement setup at Indus-1 reflectivity beamline.

Important achievements on laser related activities are described in the next section, which begins with a report on removal of L-8 coolant channel of 540 MWe TAPS-4 reactor, by in-situ laser cutting operation, using indigenously developed fiber coupled pulsed Nd:YAG laser. This is followed by two reports on laser plasma acceleration activities, namely electron radiography of metallic and plant sample using laser plasma accelerator, and intense laser driven fast electron generation in transparent target and effect of pre-plasma formation. Development of carbon aerogel based supercapacitor for energy storage application is a notable progress, which is described next. This is followed by a report on development of diode pumped solid state green laser at 9 kHz pulse repetition rate for dye laser pumping. On the front of ultrashort laser technology, two interesting studies have been performed, one on the characterization of ultrashort pulses, and another one on the development of efficient ultrafast stimulated Raman scattering source at 1120 nm, which are described in the next two reports.

The first Theme Article describes electron accelerator based radiation processing facility being set up by RRCAT at Indore, giving the details of electron accelerators, processing equipment and the process techniques. Details of very important recent development of photonics based devices for early detection of disease like cancer and tuberculosis are described in the second Theme Article. The last Theme Article describes measurement of longitudinal and transverse beam parameters of Indus-2, using the emitted synchrotron radiation, carried out as a part of first author's Ph. D. thesis.

The news section reports lots of new events and happenings in the first half of the year 2019. It begins with reports on Director's charge handing over ceremony. Several important events such as RRCAT Foundation Day celebration, National Science Day celebration, inauguration of Agricultural Radiation Processing Facility, fifth Orientation Course OCAL-2019, YSRP-2019 etc. are covered in the Newsletter. Several important meetings, such as DAE-SERB school on ultra-high intensity laser plasma interaction, RRCAT-NPCIL interaction meeting on laser based technologies in nuclear reactors, and discussion meeting on indigenous development of high power lasers for various applications took place in the Centre, which are reported. Further, the reports on accomplishments of our distinguished colleagues and various activities carried out for the promotion and propagation of Hindi usage are included. 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 would like to thank all contributors. Several changes have been brought out in this issue of Newsletter, including a new look to cover pages, and adding some new features in its content. We would like to express our deepest gratitude to Director, RRCAT, for his keen interest, guidance and active support. We look forward to receive constructive suggestions from readers towards improving the Newsletter content.

With warm regards,

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Vinit Kumar
Chairman, Editorial Board
(on behalf of RRCAT Newsletter Editorial Board)