

Towards Aatmanirbhar Bharat Through Heavy-Ion Accelerator Development and Utilization program



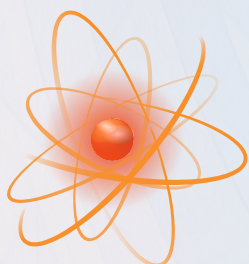
A major leap for the R&D activities related to accelerator based nuclear physics and allied areas happened with the installation of the 14UD Pelletron Accelerator in December 1988 as a collaborative project between the Bhabha Atomic Research Centre (BARC) and the Tata Institute of Fundamental Research (TIFR). This accelerator is nearing more than three-and-a-half decades of successful operations, catering to a large community of scientists in the country. The commissioning of the indigenously developed superconducting linear accelerator in November 2007 to boost the energy of the heavy ion beam delivered from the Pelletron accelerator has further enhanced the capability of this facility. Several notable contributions in the area of structure and reaction dynamics of hot rotating nuclei and allied areas have emanated using this facility, culminating in an exceptionally large number of theses and peer reviewed journal publications of international repute.

To cater to the growing demand and to explore the expanding horizon of heavy-ion research, the community has embarked on development of an accelerator facility with capability beyond the PLF in terms of energy, intensity and variety. This project involves collaboration of multiple divisions across various BARC groups to design, develop, install and construct accelerator systems & facilities such as cryogenic system for SRF cavities, RF supply and control system, radiation safety and protection system, civil infrastructure for accelerator and experimental beam halls and architectural landscaping, etc. Under “Aatmanirbhar Bharat” impetus, the project envisages the development of Niobium Quarter Wave Resonators (QWRs) from raw material available within the country to the final product, with the help of existing expertise within BARC and through setting up of Niobium processing facilities and associated laboratories. This facility is envisaged to deliver stable isotope beams of proton to uranium as well as neutron rich radioactive beams (RIBs) of energy up to 10 MeV per nucleon. This will open up new avenues of fundamental research and enhance radioisotope applications.

The present thematic issue of the BARC Newsletter is an attempt to showcase the achievements in the past decades and chalk out future courses of heavy ion accelerator development as well as heavy-ion research activities in India.

I commend the contributing authors, associate editor, and SIRD editorial team for their exceptional efforts and camaraderie in creating this thematic issue in a time-bound manner.

We are grateful to Scientific Information Resource Division (SIRD) and the Newsletter Editorial Committee for offering us the opportunity to bring out this thematic issue on developments in BARC-TIFR Pelletron LINAC facility and future accelerators for nuclear physics research. We hope that the readers will enjoy reading the articles published in this issue and it will also serve as an important reference for the future as we are passing through an important juncture of development of experimental facilities for nuclear physics research.



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