

# **ANNUAL REPORT**

## **2013-2014**

### **अन्तर-विश्वविद्यालय त्वरक केन्द्र**

## **Inter-University Accelerator Centre**

(विश्वविद्यालय अनुदान आयोग का स्वायत्त केन्द्र)

(An Autonomous Inter-University Centre of UGC)

Post Box No. 10502, Aruna Asaf Ali Marg, New Delhi - 110 067 (India)

Tel. : 011-26893955, Fax : 26893666 Website : [www.iuac.res.in](http://www.iuac.res.in)

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Cover Photographs

Top : Negative Ion Accelerator

Middle : Neutron- $\gamma$  discrimination using home-made PSD module  
based on zero-cross timing.

Bottom : Automated Graphitization Equipment

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editorial@iuac.res.in

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## DIRECTOR'S REPORT

There has been excellent progress in development and research activities and outreach programs of IUAC. The 15UD Pelletron accelerator providing high energy ion beams to the large number of users, carrying out scheduled experiments round the clock, have been maintaining excellent uptime. The other 1.7 MV Pelletron has been in regular use for Rutherford Back Scattering / Channelling experiments.

A new Negative Ion Beam facility providing negative ions having energies up to 200 keV has been developed and installed as the other complementary part of the existing Electron Cyclotron Resonance Ion Source based facility to provide almost all ion beams having both polarities under 'Low Energy Ion Beam Facility (LEIBF)' program of the Centre. The beams from LEIBF will be allotted to the user community by Accelerator Users' Committee (AUC).

All three superconducting LINAC modules are operational. The helium gas based slow tuners in two modules are replaced by piezo-electric actuator based tuners for better performance. The first Drift Tube Linac (DTL) is tested off-line successfully. The other DTL modules are designed and are in the process of fabrication. The prototype low beta cavities which will be an important part of transition region from high current injector to the LINAC are fabricated and tested. High temperature Electron Cyclotron Resonance Ion Source is being installed on the High Voltage platform developed at the Centre. The RFQ is placed and aligned along the beam line and is undergoing tests. Free Electron Laser activities are started in collaboration with KEK Japan.

The National Array of Neutron Detectors are installed and tested successfully using beam. A wide varieties of scheduled experiments are conducted successfully in the areas of nuclear physics, materials science, atomic/molecular physics, radiation biology and accelerator mass spectrometry by researchers from all over India using the latest facilities developed in respective beam lines. The research works carried out by hundreds of researchers in a collaborative research environment are published regularly in international refereed journals. The PhD and Post-Doctoral Scholars are trained in latest experimental techniques and scientific analyses/interpretations using the advanced experimental and computational facilities at IUAC.

The development of the new  $^{14}\text{C}$  accelerator mass spectrometry system funded by the Ministry of Earth Sciences has been going as per schedule. This facility will be fully operational by next

academic year and will enhance the research activities in the areas of Earth Sciences and other inter-disciplinary areas of science. The Graphitization facility has been developed successfully in collaboration with ETH Zurich.

The new version of the compact Computer Interface for Science Experiments (ExpEYES) has got very good response from the academic community. The teachers and researchers from all over the country have been trained regularly on computer interfaced science experiments, Python programming based data analyses, visualization and installation of open source educational software.

I congratulate the employees of IUAC and the researchers from the universities, institutes and laboratories for their contributions in the development and research activities at the Centre.

I would like to thank the University Grants Commission and other Govt. Funding agencies for the generous support provided for regular upgradation and expansion of the research facilities. I shall expect that the user community will continue to utilise the advanced research facilities created at IUAC to their full potential.

**Dinakar Kanjilal**

July 2014