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Opening New Frontiers in Nuclear Science and applications and Moving Forward with iThemba LABS' Long Range Plan

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The iThemba Laboratory for Accelerator Based Sciences (iThemba LABS) is a National Research Facility. It is also the premier atomic particle accelerator laboratory on the African continent and the only facility of its kind in the southern hemisphere. The facility contributes to the National System of Innovation (NSI) through the provision of unique research infrastructure platforms supported by highly skilled scientists, and operations staff. The research agenda of the facility is based largely on the Separated Sector Cyclotron (SSC), a particle accelerator which produces particle beams for research.

iThemba LABS plays a pivotal role in the NSI through its collaboration network with South African Universities and Institutions. The facility enjoys a prominent global position and plays a critical role in co-ordinating African contributions in collaborative initiatives with prestigious institutions like the European Organisation for Nuclear Research (CERN) and the joint Institute for Nuclear research (JINR) in Russia. The research and production of accelerator-based radioisotopes is a demonstration of basic and applied research being translated into innovative real world solutions.

iThemba LABS has adopted through its Long Range Plan exercise an ambitious strategy to create the South African Isotope Facility (SAIF). The plan will be executed mainly through the acquisition of a new 70 MeV cyclotron, and is based on two phases namely:

- Establishment of the Accelerator Centre for Exotic Isotopes (ACE Isotopes) which will allow the migration of the radioisotope production programme from the existing particle accelerator (the SSC) to the proposed new 70MeV cyclotron. This will then release capacity on the existing SSC to be entirely devoted to the transdisciplinary research agenda of the facility which will thus meet the requirements of its national and international stakeholders.
- Development of the Accelerator Centre for Exotic Beams (ACE Beams) which will support the production of artificially produced isotopes which will allow iThemba LABS to seriously expand their research agenda in this area. The production of exotic beams will invigorate basic and applied research from innovative cancer therapy treatment modalities to understanding the origin and creation of chemical elements in the universe, the latter being already started with the building of the Low Energy Radio-active Ion Beams facility.

The SAIF project as part of the Long Range Plan of iThemba LABS will be discussed.

Apply to be considered for a student award (Yes / No)?

No

Level for award (Hons, MSc, PhD, N/A)?

N/A

**Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?**

No

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