Accelerators @ASFAP

Ahmed Ali Abdelalim

Joele Mira

Research Accelerator Facilities in Africa

- iThemba Laboratory for Accelerator Based Science (LABS) in South Africa
  I. 200 MeV Separated Sector Cyclotrons
  II. 11 MeV and 8 MeV Solid Pole injector Cyclotrons
  III. 3 MV Tandetron Facility
  IV. 6 MV Tandem Accelerator for AMS Facility
  V. 11 MeV Siemens Accelerator for FDG Facility
  VI. Recently procured the C70 cyclotron for South African Isotope Facility (SAIF)
- University of Pretoria
  I. 2 MV Van de Graaff Accelerator
    i. RBS, NRA and Channeling experiments
    ii. Implantation in semiconductor material
- Centre for Energy Research and Development (CERD) in Nigeria
  I. 1.7 MV Tandem Pelletron Accelerator

  Research Platforms at CERD
    i. Ion Beam Analysis (IBA)
    ii. Positron-induced x-ray emission (PIXE)
    iii. Rutherford Backscattering (RBS)
    iv. Elastic recoil detection analysis (ERDA)

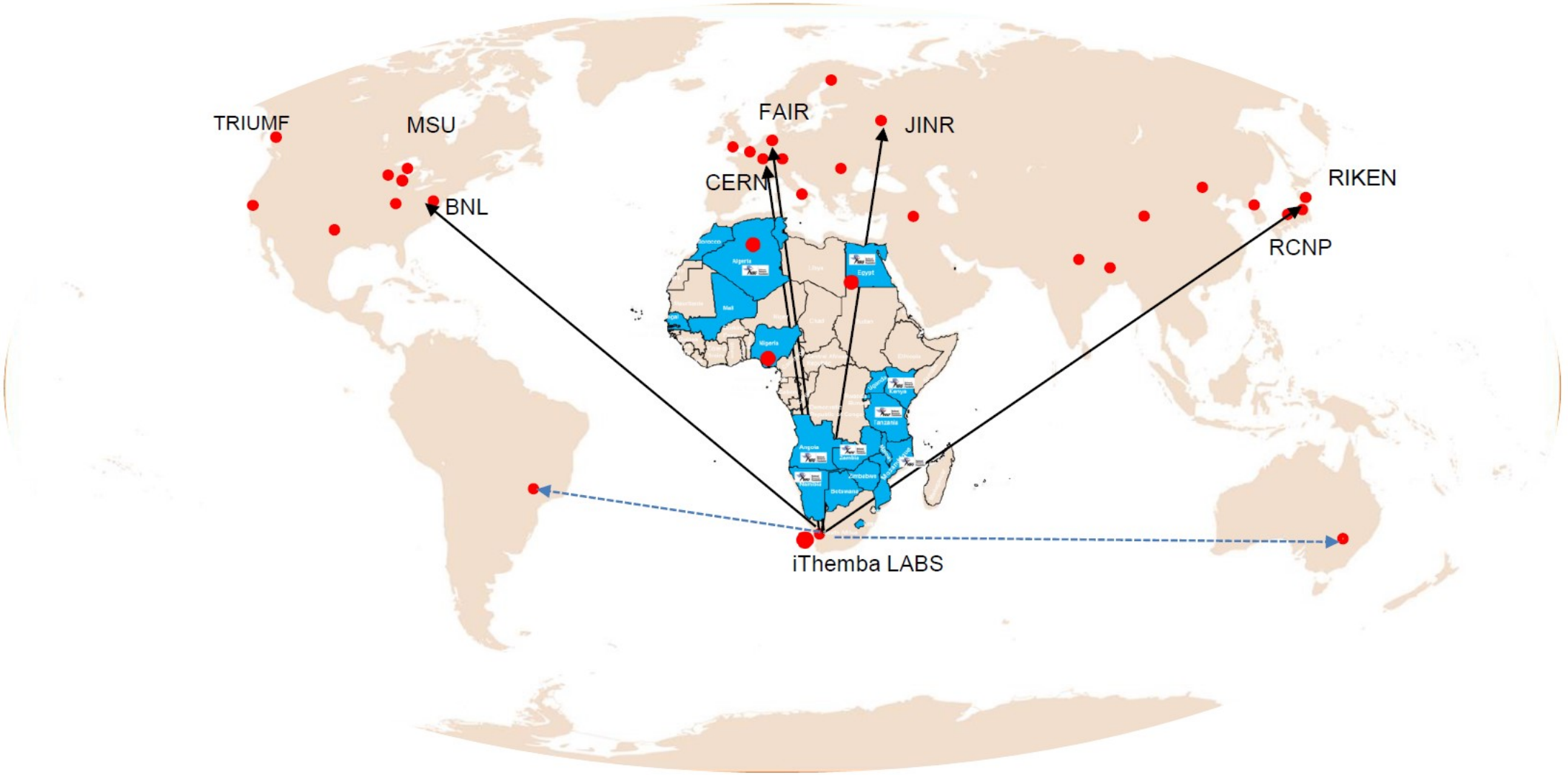
iThemba LABS Research Infrastructures/Platforms

- **Separated Sector Cyclotron (SSC) Laboratory**
- Nuclear Physics: structure, reactions and astrophysics
- Neutron Physics
- Nuclear Data and Radioactivity Measurements
- Radiation Biophysics
- R&D in Accelerator Based Radioisotopes

- **Tandem Laboratory**
- Ion Beams Application
- Very Low Energy Nuclear Physics
- Accelerator mass Spectroscopy
- Isotopes Spectrometry Platform

- **Tandetron Laboratory**
- Ion Beams Application
- Material Research at the nanoscale
- Very Low Energy Nuclear Physics

International Research Infrastructure Gateway



The gateway to International Large Scale Research Infrastructures

Possible Liaisons Groups

- Astrophysics and Cosmology
- Nuclear Physics
- Medical Physics and Radiation Biophysics
- Material Science

The above groups are suggested due to the fact that they make use of charged particle beams. The input of the user groups is more important to determine what infrastructure is required. We will also like to invite the Accelerator convener groups from other continents namely; Europe, Asia and Americas to give us inputs and help with the training.

The following are Suggested Groups

- Charged Particle Ion Sources
  I. Positive charge ion sources
  II. Negative charge ion sources
- Electrostatic Accelerators
  I. Van de Graaff
  II. Tandetron and Tandem
  III. Pelletron
- Linear and Circular Accelerators
  I. Cyclotrons
  II. Synchrotrons
- Beam Transport
  i. Beamline and electromagnet design

Needs and Challenges

- The Accelerator community in an African continent is very small due to lack of training facilities.
- These lead to some accelerator facilities being forced to stop operating their accelerators due to lack of skills.
- It is very crucial to make the career interesting and appealing to young people.
- There is a need to form a collaboration with medical facilities to empower young people with skills to operate and maintain the medical accelerators in our hospitals instead of flying someone for every maintenance.
- This will in turn lower the amount paid by these facilities when buying these machines
- From our research it is extremely difficult if not impossible to find information about particle accelerators in an African continents on the internet.
- Before we could think of building more facilities in African continent we need to equip African youth with necessary skills.

Thank you for your attention!!!