

Nuclear Science at NRF-iThemba LABS



SSC Laboratory



science, technology
& innovation

Department:
Science, Technology and Innovation
REPUBLIC OF SOUTH AFRICA

Advancing knowledge. Transforming lives. Inspiring a nation.



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NOTE: any omission in this report
is not intentional



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Focus of the SSC Lab Department

Laboratory broad objectives

- to promote and produce **world-class research** in the field of **basic nuclear science and applied nuclear science**,
- to actively and continuously contribute to **training** of the **next generation of research scientists**
- to **provide high quality internationally benchmarked services** to all our stakeholders
- to efficiently **assist external users** with **experimental set-ups and data** taking using facilities and instruments coordinated via the department
→ Facilities: research using iTL SSC, iTL Tandetron and CERN

Highlights

- * Beam for research : Despite SAIF constraints experimental campaign has commenced (since Jan 2025):
5 beamtime slots was allocated for research
 - > F-line: Gamma-ray spectroscopy with alpha beam (55 MeV)
 - > S-line: K600, ^{18}O beam (20 MeV/u, RF @ 9.36 MHz) + commissioning of the MAGNEX FPD
 - > 200 MeV proton beam was tested using the B-line Radiation Biophysics vault) and the D-line (neutron physics) vault)
 - > Test beamtime with the H-line at the Tandatron facility
- * Ongoing research program @ ALICE
- * Joint-appointment & Strategic Capability Agreement framework, opportunity to grow staff compliment
- * SAINTS Training opportunities, hands-on experience and theoretical lectures (Summer School as well as a curriculum of specialized course e.g. radiation and instrumentation, AI, accelerators, radiobiology, professional communication etc.)
- * IASEN2024 Symposium in December 2024, well attended by local students and researchers
- * Detector development (PANGOLINS, and low pressure prototype for K600)
- * signed MOU's with RCNP(Japan), INFN (Italy), IRB (Croatia)
& renewing MOU with TUT and Oslo University
- * 6x UK Science and Technology Facilities Council (STFC) projects approved

Looking ahead

4th African Nuclear Physics Conference (ANPC2025) in Cape Town, 24 – 28 November 2025

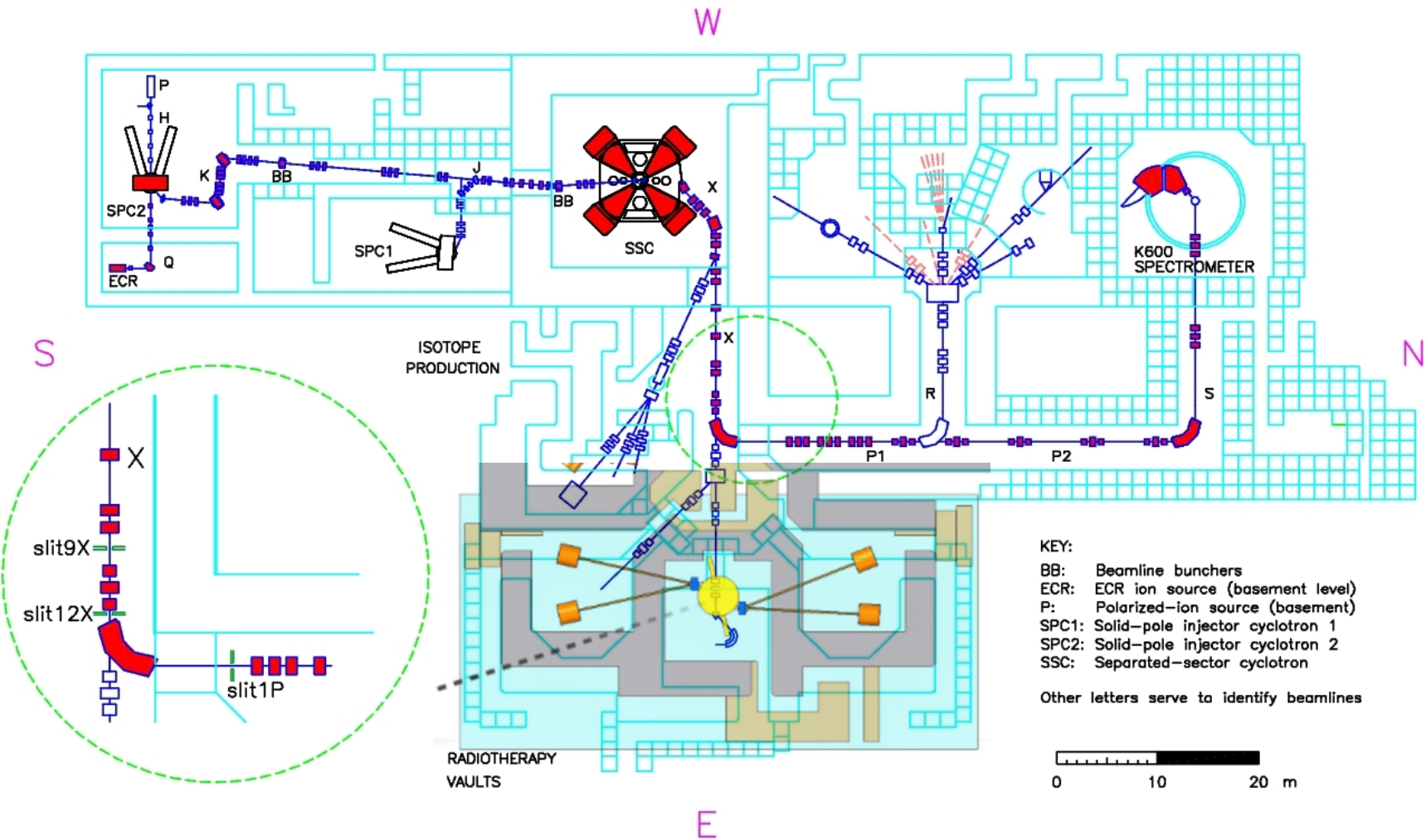
6th Advanced Nuclear Science and Technology Techniques (ANSTT) in first semester in 2026

Beamtime for experiments: Sept – Dec: 4 experimental slots (We-Mo)
(still awaiting details)

Approved 3 week H-line experiment scheduled to happen in Aug/Sept

Challenges

- Long term solution on Beam Allocation to Research, related to SAIF status (communication challenges)
- Shortage of manpower in research and technical support departments
(However, key position in the lab recently filled: Joele Mira as accelerator dept head)
- Aging infrastructure requiring urgent attention (SSC repair and/or replacement)
(related to funding and people-power issues)
- General shortage of funding for repairs, including for spare parts for instruments
(detectors, etc.)
- Backlog of PAC approved experiments awaiting beam time
(29 experiments, total approved time ~3900 h, or 163 days)
- Currently no dedicated SSC PAC members (incl. secretary) appointed
(last PAC meeting was Jan 2023, last Users meeting held 27 March 2025)





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