

# Future prospects for Neutron Scattering in South Africa

“Neutrons in Lifesciences Research” mini-symposium within SA-BrightnESS<sup>2</sup> program

19 January 2021, 10:00 to 13:00

Venue: Zoom  
Andrew Venter

Diffraction Section, Science Leader

Research and Technology Development Division, Necsa SOC Limited

[Andrew.venter@necsa.co.za](mailto:Andrew.venter@necsa.co.za)

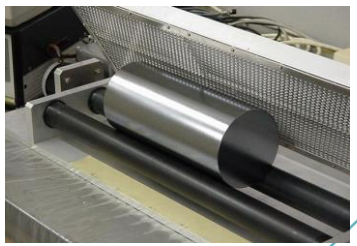
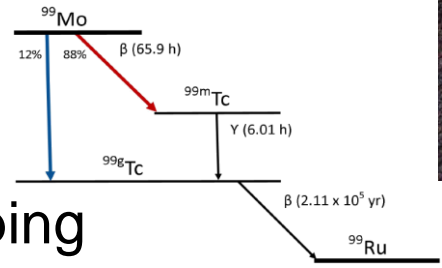
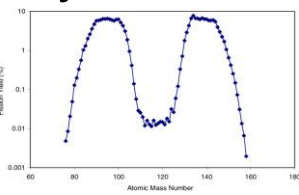
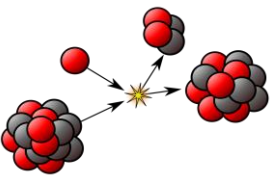
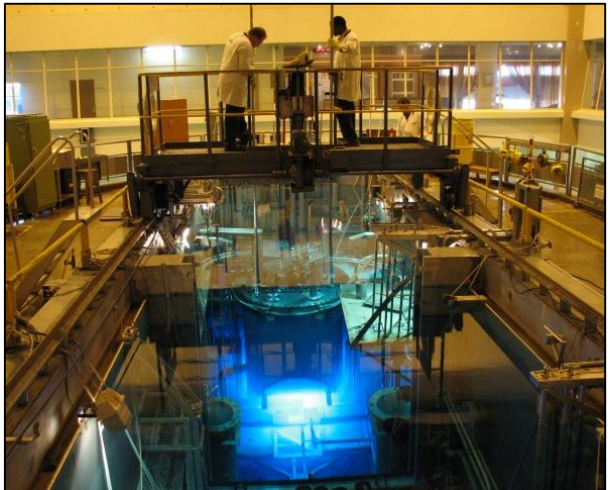


# Neutron source: SAFARI-1

- ❑ South African Fundamental Atomic Research Installation
- ❑ 20 MW tank in pool
- ❑ Commissioned in 1965 (55 years)
- ❑ ~300 days availability p/a

### Applications:

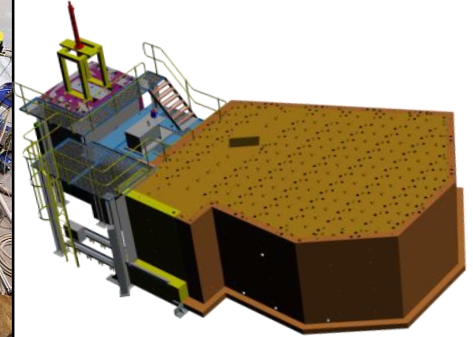
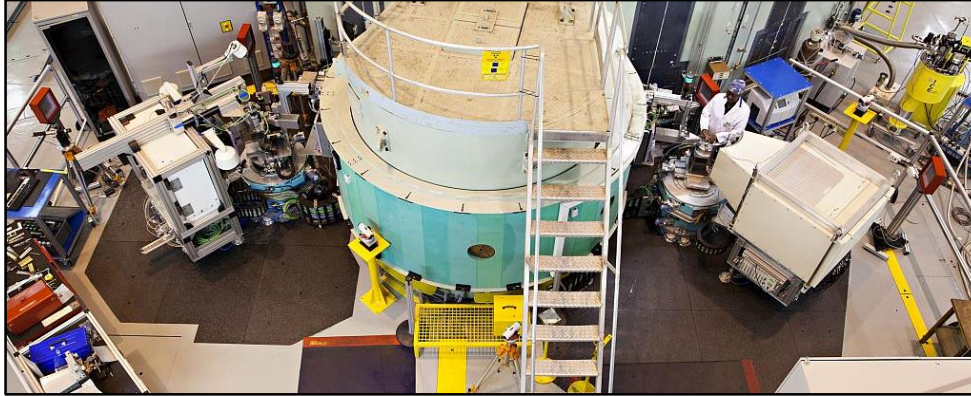
- ❑ Irradiation services (neutrons, gammas)
- ❑ Neutron Activation Analysis
- ❑ Medical isotopes
- ❑ Neutron transmutation silicon doping
  - $^{30}\text{Si}(n,\gamma)^{31}\text{Si} \rightarrow ^{31}\text{P} + \beta^-$  ( $T_{1/2} = 2.62\text{h}$ )
- ❑ Beam line facilities





## Facilities:

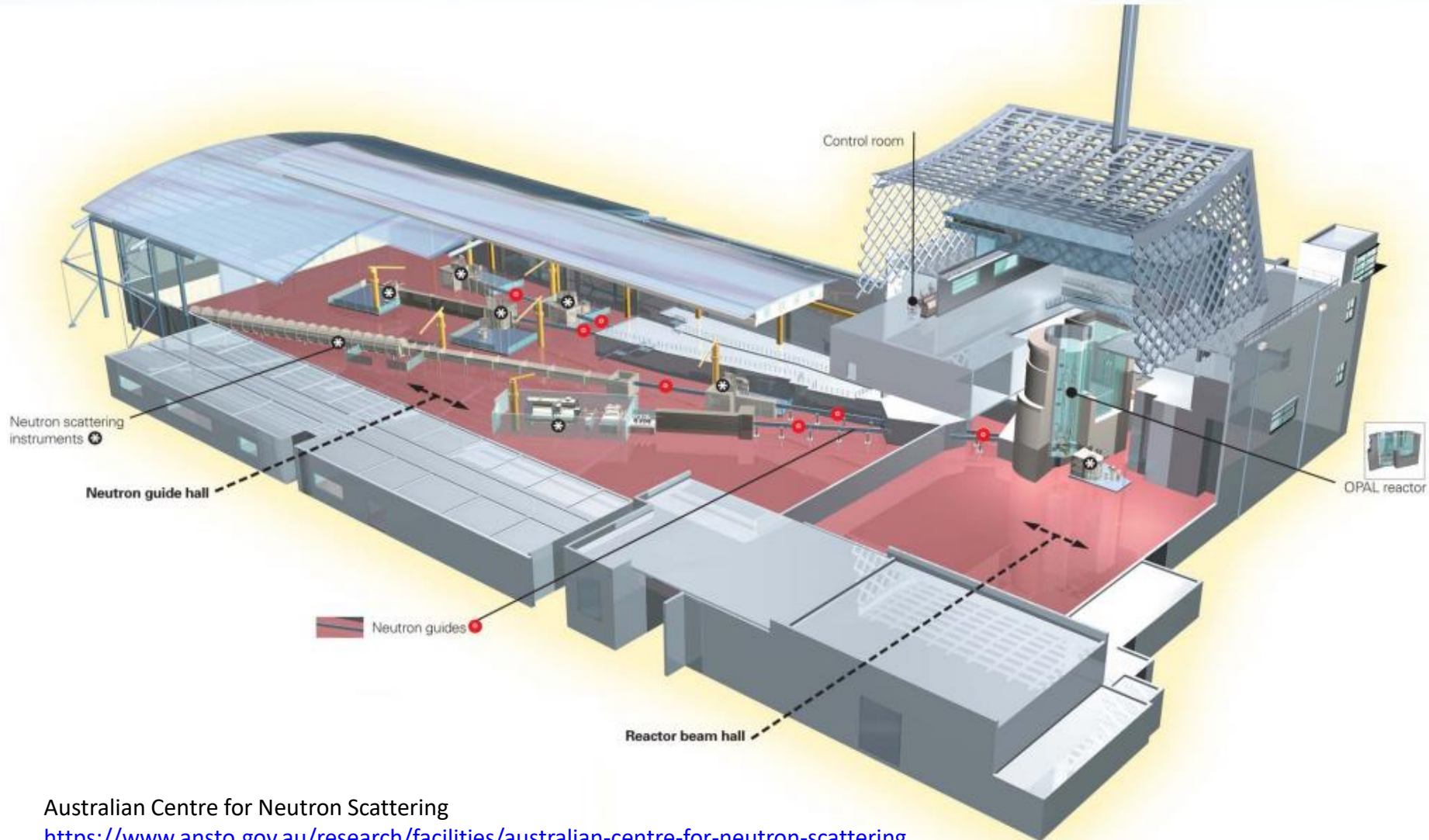
- Strain scanner
- Powder diffraction
- Neutron imaging



## Multi-Purpose Reactor (MPR) as replacement of SAFARI-1:

- DMRE / Necsa initiative to replace SAFARI-1 by 2030 with involvement of DSI
- Extensive suite of neutron beamline facilities:
  - Powder diffraction instruments (High intensity as well as High Resolution)
  - Material science instrument (Residual stress and Texture)
  - Single crystal diffraction (Quasi Laue)
  - Triple-axis instruments (studying of dynamic structural and magnetic phenomena): Thermal and cold neutron beams
  - Small angle neutron scattering: Cold neutron beam
  - Reflectometry: Cold neutron beam
  - Neutron imaging: Thermal and cold neutron beams

# Neutron beamline facilities at MPR



Australian Centre for Neutron Scattering

<https://www.ansto.gov.au/research/facilities/australian-centre-for-neutron-scattering>