



## ADVERTISEMENT

### Technical Research Fellow

Contract type: Long Term Contract

Period of Contract: 3 years

Job Level: Skilled / Middle Management

Work Location: Cape Town, Western Cape

The National Research Foundation (NRF) supports and promotes research and human capital development through funding, the provision of National Research Facilities and science outreach platforms and programmes to the broader community in all fields of science and technology, including natural sciences, engineering, social sciences and humanities.

iThemba LABS is Africa's leading research facility for accelerator-based science that is committed to advance knowledge, transform lives and inspire the nation. We do this through probing fundamental aspects of nuclear structure, investigating the origins of matter, and advancing humanity's understanding of condensed matter. In addition, we have a direct societal impact through the provision of radioisotopes for the health sector and a biophysics research program focusing on the impact of radiation on human health, as well as isotope analysis for the environmental sector.

The ALICE Experiment at the CERN's Large Hadron Collider is dedicated to the study of strongly interacting matter and the quark-gluon plasma (QGP). The South African ALICE groups at iThemba LABS, the University of Cape Town and the University of the Witwatersrand are participating in this quest to understand the QGP, from the initial conditions in the extremely hot and dense fireball, to the transport properties of some of the heaviest and rarest particles that exist in this medium, to the thermodynamic properties, like temperature and pressure, of the droplet of QGP created in these heavy-ion collisions.

The opportunities in fundamental science must be accompanied by research in detector technologies, data processing and analysis capabilities to exploit the full potential of the heavy-ion beams at the Large Hadron Collider. We have taken the responsibility for different projects within the ongoing upgrade of the ALICE Detector, in the areas of implementing the FPGA user logic for a new readout system, the development of the online processing and reconstruction software and the implementation of a power supply system for detector electronics.

In the future, we plan to expand our technical contributions to the ALICE Experiment. We see great potential in the silicon detector technology that has been developed for the upgrade of the ALICE Inner Tracking System, and we will join the R&D effort for further upgrades during the next long shutdown in 2026 and an entirely new detector that will be proposed for 2032, named ALICE3.

We are seeking to strengthen our team with a motivated research fellow fitting key requirements, who can drive the technical projects arising in the ALICE Experiment and work together with the physicists on the ALICE detector upgrades. We are convinced that these technical projects, in combination with our group as local point of contact, an extensive international network of experts, and the available infrastructure at iThemba LABS and participating universities, provide a challenging and rewarding environment even for researchers without prior contact to CERN.

The successful candidate is envisaged to be based at iThemba LABS (<https://tlabs.ac.za/>) within the Technology and Innovation Platform (TIP) in Cape Town and will work with researchers at iThemba LABS SSCLab and the universities that are within the SA-CERN consortium. The activities at CERN include technical projects whereby South African based researchers, engineers and technicians are involved in the instrumentation projects, and activities on the upgrade of detectors and research facilities at CERN.

#### Key Responsibilities:

Participate in efforts towards the next ALICE upgrade in the areas of readout electronics, data acquisition, and online data processing. Develop the necessary local infrastructure to carry out these tasks and coordinate and oversee the South African contributions. It is expected that this work will evolve into further technical contributions, and the successful application is expected to explore, in cooperation with the current South African researchers in ALICE, future upgrade projects. The appointed candidate will contribute to capacity building and skills development by training South African students.

#### Key Requirements:

##### Qualification:

A Ph.D in high-energy physics or an MSc degree in Electrical Engineering

Minimum three years of relevant professional experience working in at least one of the following fields:

Digital electronics and FPGAs, with a working knowledge of HDL hardware description language

and/or data acquisition systems for high-energy physics, with experience in interfacing with readout electronics

Track record in the design, implementation, and deployment of complex electronic or computational systems

**Experience:**

- \* Experience in designing and implementing readout and data acquisition systems.
- \* Ability to work in a culturally diverse team of engineers and scientists, paying special attention to experimental details and scientific discipline.
- \* Excellent technical skills and problem-solving abilities
- \* Ability to work under pressure.
- \* Project management skills.
- \* Mentoring MSc and BSc Honours students.

**Knowledge:**

- \* Keen interest in the electronics, software development and modern detector technology.

**Additional Notes:**

Enquiries: [careers@tllabs.ac.za](mailto:careers@tllabs.ac.za)

**Information:**

The website [www.nrf.ac.za](http://www.nrf.ac.za) provides more details on the NRF initiatives and activities.

**Applications:**

Applicants should submit a comprehensive CV by logging to <https://ess.nrf.ac.za/Account/Recruitment> and apply online. Applications should be accompanied by a letter of motivation indicating the applicant's suitability for the position. The names and contact details of at least three referees should be provided.

**Closing Date: 13 June 2023**

The NRF offers a challenging career and competitive remuneration package which is commensurate with qualifications and experience. The NRF is committed to employment equity and redress and the appointment to the position will be made in line with the NRF Employment Equity Plan.

The NRF reserves the right not to make an appointment.

Correspondence will be sent to short-listed candidates only