

IDIA/SARAO MeerKAT+ and mm-wave astronomy postdoctoral fellowship

This is a joint fellowship between the Inter-University Institute for Data Intensive Astronomy (IDIA) and the South African Radio Astronomy Observatory (SARAO) to support research related to MeerKAT+, heterogeneous interferometers, and mm-VLBI developments relevant to South Africa's participation in global mm-wave astronomy initiatives.

The fellow will spend approximately 50% of their time conducting research related to MeerKAT+ science commissioning activities and operations, contributing to the characterisation and calibration of the array. The other 50% of the fellowship will be to explore a range of topics relevant to mm astronomy developments in South Africa, including research related to the enhancement of candidate mm sites in South Africa using Frequency Phase Transfer algorithms.

MeerKAT is a 64-dish radio interferometer located in South Africa and serves as a precursor to the Square Kilometre Array Mid-frequency array (SKA-MID). In parallel with a robust science programme, development of new capabilities continues, including the MeerKAT+ project, which will see 14 new 15-metre dishes added to the MeerKAT array. This project is funded through a collaboration between SARAO, the German Max Planck Society (MPG), and the Italian National Institute for Astrophysics (INAF).

MeerKAT+ will enable a significant step towards the SKA-MID, including addressing the data processing challenges posed by the heterogeneity of the antennas and their corresponding primary beams. This, together with the significant increase in angular resolution and sensitivity that MeerKAT+ provides, will offer significant new challenges in the characterisation and calibration of the telescope, providing growth opportunities to a dedicated team of technically-minded astronomers.

The other half of this position will be allocated to Very Long Baseline Interferometry (VLBI) at mm wavelengths, with a specific focus on the development and application of algorithms that utilise the Frequency Phase Transfer technique, and the enhancement that a potential South African mm antenna will bring to the Event Horizon Telescope (EHT) array.

The successful candidate will work closely with the IDIA Director, the SARAO Science Operations team, and the SARAO mm-wave Working Group, conducting the following activities:

- Contribute to the commissioning and science verification of MeerKAT+
- Contribute to quality assurance and quality control analyses of the MeerKAT+ S-band Science Legacy Programme
- Robust comparison of different data processing pipelines on MeerKAT+ data
- Assist in the preparation of various technical reports of MeerKAT+ data processing
- Develop and test FPT algorithms in end-to-end interferometric simulations
- Quantify EHT array performance enhancement with prospective SA-EHT sites and specifications. Assist in more general technical contributions to the SARAO mm-wave Working Group

The candidate will split their time between the SARAO offices in River Park, Mowbray, Cape Town and the IDIA offices at the University of Cape Town in Rondebosch.

The successful candidate will be affiliated with the Department of Astronomy at UCT and will have the opportunity to work with MeerKAT data from open time and eXtra-Large Projects (XLPs), including the MeerKAT-South Pole Telescope Survey. The successful candidate may, as part of

their professional development, be requested to participate in departmental activities such as limited teaching and co-supervision and duties incidental thereto.

The successful applicant will have access to the ilifu data-intensive cloud computing facility, which is operated by IDIA (<https://idia.ac.za/ilifu-research-cloud-infrastructure/>).

Mandatory Knowledge, Skills and Experience

- The successful candidate will have a University PhD degree in Astronomy, Physics, Engineering or another closely related and relevant field, by the time of starting the fellowship.
- Expertise in advanced radio and mm interferometry, including simulations and data processing
- Ability to program in C/ Python/shell scripts
- Linux operating systems
- Effective oral and written communication skills in English
- Flexibility and adaptability to change

Desirable Knowledge, Skills and Experience

- Experience with MeerKAT and EHT data processing and simulations
- Experience commissioning radio astronomy instrumentation
- Experience with radio telescope observations.

Eligibility

- Applicants who were awarded their PhD more than five years ago at the time of application will not be considered.
- Applicants may not have previously held a full-time permanent professional or comprehensive academic post.

Value and Tenure

The expected value of the fellowship for 2026 is ZAR R478 826 per annum, tax-free, which will have annual inflation-matched increases. No benefits or allowances are included in the value of the fellowship. Additional funding is available for research equipment and travel expenses. The position is for three years, subject to adequate performance. The successful applicant is expected to commence the fellowship by July 2026, subject to mutual agreement.

Applicants should email a single PDF document to Nicky Walker, the IDIA Administrator (admin@idia.ac.za), by the **13 April 2026** deadline, including the following.

- a cover letter
- a CV (including a list of publications and copies of all academic transcripts)
- a description of previous/current research and future plans/interests (maximum: 3 pages)
- names and emails of two referees

For any further inquiries, please use the email above.

The appointment is subject to the rules and approval of the University of Cape Town and SARAO/ National Research Foundation of South Africa. The successful incumbent will be required to comply with the University of Cape Town's approved policies, procedures, and practices for the postdoctoral sector. Eligible and complete applications will be considered by the Director of IDIA, the SARAO Chief Scientist, and a sub-committee of UCT, IDIA and SARAO staff members. The University of Cape Town reserves the right to disqualify ineligible, incomplete and/or inappropriate applications, as well as change the conditions of award or to make no awards at all.

IDIA and SARAO are committed to equity in employment and to supporting diversity in the research environment. Applications from suitably qualified candidates from underrepresented groups are particularly encouraged.
