



South African Radio Astronomy Observatory
Research Project Proposals for Masters and Doctoral Research in 2019

Application Guide

Read this guide carefully before completing an application form

Apply online at <https://skagrants.nrf.ac.za/FPF/>

Closing date for Proposals is 31 July 2018

1. Supervision definitions for the purposes of SARAO-funded postgraduate research

- 1.1. Primary Supervisor: A permanent academic staff member at a South African university, or a university in an SKA Partner Country, and therefore a member of the respective faculty board, or equivalent, at the university. The primary supervisor is responsible for ensuring that all university policies, rules and regulations with respect to the supervision of postgraduate students are adhered to. The primary supervisor may also be the research supervisor, i.e. responsible for supervising the research aspects of a postgraduate student's studies.
- 1.2. Co-supervisor/Research Supervisor: Not a permanent staff member at a South African university, or a university in an SKA Partner Country. The co-supervisor/research supervisor is responsible for supervising/co-supervising the research aspects of a postgraduate student's studies.

2. Important information pertaining to the submission of postgraduate research project proposals, and the supervision of approved research projects

- 2.1. All research project proposals must be submitted by a primary supervisor (see the definition of a primary supervisor in Section 1). In the case where the primary supervisor is not the research supervisor, the details of the co-supervisor, who will be responsible for supervising the research, must also be provided.
- 2.2. The research project(s) proposed must be relevant to one or more of SARAO's priority areas for postgraduate research in 2019. Please refer to Annexure 1, which provides the areas for Masters and Doctoral research in 2019.
- 2.3. The subsidy for postgraduate degrees from the Department of Higher Education is optimised for a

Masters degree to be completed in two years, and a Doctoral degree to be completed in three years. SARA O bursaries are aligned with this framework, and the research project proposals must be structured to ensure completion within the prescribed time.

- 2.4. Supervisors may submit more than one research project proposal, however, separate applications must be submitted for each research project proposal.
- 2.5. Supervisors may not submit the same project for Masters and Doctoral research.
- 2.6. Supervisors must ensure that the relevant data, equipment and facilities for any research project will be available when they are required, for doing the proposed research.
- 2.7. All research project proposals will be reviewed by SARA O, using the evaluation criteria listed in Section 3.
 - 2.7.1. The list of approved research projects, as well as the contact details of the relevant supervisors, will be made available to the Masters and Doctoral students who will be awarded SARA O bursaries for 2019.
 - 2.7.2. SARA O-funded postgraduate students will be required to select one of the approved research projects for 2019, for their Masters or Doctoral degree. Students may not pursue research projects that are not on the 2019 list of approved projects.
 - 2.7.3. Supervisors of the approved research projects will be provided with the contact information of the Masters and Doctoral students who have been approved to receive SARA O bursaries for 2019.
 - 2.7.4. Students and supervisors will then be given the opportunity to contact each other to discuss project details and ascertain suitability for supervision, etc.
- 2.8. A supervisor of an approved research project may not supervise more than one student on the same research project.
- 2.9. A supervisor of an approved research project will be required to submit Annual Progress Reports to SARA O, detailing a student's progress. Progress will be measured against the original research project proposal, as approved by SARA O. If (minor) changes have been made to the research project, these will need to be explained and justified in the Annual Progress Report. Major changes will require prior discussion with SARA O HCD.

3. Research project proposals evaluation criteria

Research project proposals will be evaluated based on the following:

- 3.1. The relevance of the research proposed to SARA O's focus areas for postgraduate research in 2019 (see Annexure 1), and its scientific/technical merit.
- 3.2. The applicability of the research project to the respective academic level (Masters or Doctoral), and the feasibility of the project being completed within the appropriate time scales (Masters projects in two years and Doctoral projects in three years).
- 3.3. Feasibility of the research project in terms of the availability of relevant data and access to required equipment and facilities.

3.4. Relevant experience of the research supervisor, including the number of postgraduate students successfully supervised in a particular research area, as well as the time taken for a supervisor's postgraduate students to complete their degrees. The number of students currently being supervised by the prospective supervisor will also be considered. In addition, a supervisor's track record of producing relevant research will be taken into account.

Queries may be directed to Mr. Loyiso Gura: lgura@ska.ac.za or (011)442-2434

Annexure 1: Priority Areas for Masters and Doctoral Research in 2019

1. Radio Pulsar and Fast-Transient science, instrumentation and data analysis (including real-time RFI detection).
2. Real-time Signal Processing instrumentation for Radio Astronomy, specifically using FPGA and GPU platforms.
3. Radio Astronomy antennas and receivers.
4. Big Data topics, including the development of hardware and middleware platforms.
5. Instrumentation and systems for Radio Frequency Interference (RFI) detection and data analysis/archival/interrogation/visualization.
6. Science topics that involve the exploitation of MeerKAT data projected to be available by 2019-2020. (Multiwavelength projects that are directly linked to approved MeerKAT Large Survey Projects will be considered.)
7. Epoch of Reionization and Intensity Mapping data reduction and analysis.
8. Interferometric Data Processing and Analysis, including calibration and imaging.
9. VLBI science, instrumentation, observations and data processing (astronomy, astrometry and geodesy applications).
10. C-BASS South data processing and C-BASS all-sky data analysis.
11. LSST science in the context of approved South African LSST PI proposals.
12. Predictive maintenance and scheduling using sensor data analytics, machine learning and system modelling.