



**South African Radio Astronomy Observatory
Call for Applications for a Doctoral Bursary for 2019**

Application Guide

Read this guide carefully before completing an application form

Closing date for applications is 1 August 2018

Application forms online at <https://skagrants.nrf.ac.za>

1. SARAQ Doctoral Bursary Applications

- 1.1. SARAQ will consider applications from eligible students (see Section 2) who wish to complete a Doctoral degree in SKA/MeerKAT-relevant science or engineering.
- 1.2. For 2019, SARAQ will award up to 10 bursaries to Doctoral students.

2. Eligibility

- 2.1. South African citizens and citizens of Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia, who wish to complete a relevant Doctoral degree at a South African university, or at a university in an SKA partner country in Africa.
- 2.2. Academically excellent students who have completed/are completing a Master's degree, which is relevant to the scientific and technical goals of the SKA and MeerKAT radio telescopes.

3. Review Criteria

- 3.1. Student's academic performance and potential to be an excellent Doctoral researcher.
- 3.2. Relevance of student's Masters research work to SKA and MeerKAT Science or Engineering.
- 3.3. Student's nationality and demographic status.
- 3.4. Student's biography and letters of reference.

4. Research Projects for SARAQ Doctoral Bursary Students

- 4.1. Students who wish to apply for a SARAQ Doctoral bursary must complete an online application form.
- 4.2. Students DO NOT need to submit a research project proposal with their bursary application form. Students are only required to indicate their preferred research area/s on the application form (For noting, the priority research areas for 2019 are provided in Annexure 1).
- 4.3. A panel, duly appointed by SARAQ, will evaluate all bursary applications, and recommend to SARAQ which applicants should receive a Doctoral bursary in 2019 (*If required, the panel may interview short-listed students*).
- 4.4. Students approved for a Doctoral bursary will be notified by SARAQ, and will be provided with the list of approved research projects for 2019. Students must select the project they wish to pursue for their Doctoral degree from the list of approved projects. STUDENTS MAY NOT PURSUE PROJECTS THAT ARE NOT ON THE LIST.
- 4.5. Each of the projects listed on the approved projects' list will provide the information of the project supervisor. Students must contact the relevant supervisor to discuss project details, and ascertain suitability to pursue the project. Note that a project supervisor is not obliged to accept a student if the supervisor feels the student is not suitably qualified to pursue a particular project.
- 4.6. IMPORTANT: Students awarded a Doctoral bursary from SARAQ will have to register at the university where the supervisor of the research project is based, and the student will have to undertake his/her research at that university.

5. Structure of a SARAQ Doctoral Bursary

(Note: The bursary levels quoted in the table below are the current levels, and may be adjusted to take into account changes in university fees and inflation.)

Grant Item	Current Level	Comments
Bursary	R 136,000 per year	For a Doctoral degree, bursaries are awarded for a maximum of three years.
Travel grant	R 32,000 per year	<ol style="list-style-type: none">1. Travel grants are awarded annually, for the duration of the bursary, which is three years for a Doctoral degree.2. The student must use the travel grant for travel related to his/her research.3. It is compulsory for a student to travel at least once a year to a conference/workshop for research purposes.

		4. Travel grants, or any funds remaining from a travel grant, for a particular year, will be carried over to the following year.
Equipment grant	R 36,000 once-off	<ol style="list-style-type: none"> 1. The equipment grant is a total amount available for the full duration of the bursary (i.e. this is not an annual amount). 2. The equipment grant is available to the student to support the purchase of equipment required for his/her research. 3. Equipment purchased using funds from SARAQ is the property of the university where the student is registered, and not the property of the student. 4. Equipment grants, or any funds remaining from an equipment grant will be carried over to the following year.
Home travel grant	Cost of one return ticket, with one change, per year	SARAQ will organise and pay for one return ticket, per year, for students from Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia, to travel to South Africa.
Repatriation fee	Paid in full, if required	SARAQ will pay the repatriation fee, if required, for students from Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia.
Emergency medical insurance	Paid in full	SARAQ will pay the cost of emergency medical insurance for students from Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia.

6. Conditions of Award

- 6.1. The duration of a SARA0 bursary is three years for a Doctoral degree.
- 6.2. Students must be registered as full-time students at the university where their supervisor is based.
- 6.3. Students are required to submit proof of registration at their university, to SARA0. No funds for a bursary will be released until SARA0 has received the proof of registration.
- 6.4. Once SARA0 has received proof of registration for a student's first year of their Doctoral degree, SARA0 will pay 100% of the student's bursary (excluding the travel and equipment grants) to the university. It is the responsibility of the student to manage his/her annual bursary funds to ensure that he/she has sufficient funds for one full academic year (twelve months). Under NO circumstances will SARA0 release additional bursary funds to a student.
- 6.5. The second and third years of a student's Doctoral bursary, is renewable at the sole discretion of SARA0. Renewal is subject to satisfactory performance, which will be determined through Annual Progress Reports (APR), detailing progress on deliverables as per the original research proposal. In the report, deliverables should be demonstrated by showing evidence thereof e.g. peer-reviewed papers, conference proceedings, developed hardware, preliminary results of simulations or data analysis, etc. APRs must be drafted and submitted to SARA0 by the student's supervisor.
- 6.6. Following approval of a student's APR, and on receipt of proof of a student's registration for his/her second or third year of a Doctoral degree, SARA0 will pay 100% of the student's bursary (excluding the travel and equipment grants) to the university. It is the responsibility of the student to manage his/her annual bursary funds to ensure that he/she has sufficient funds for one full academic year (twelve months). Under NO circumstances will SARA0 release additional bursary funds to a student.
- 6.7. Students may not hold full-time salaried employment during this bursary, but may undertake up to twelve hours of work per week. If a student is found to be working for any organisation for more than twelve hours per week, his/her bursary will be cancelled and he/she will have to refund all payments of the bursary already received by them (this includes funds paid out from a student's travel and equipment grants).
- 6.8. All research papers published by students must acknowledge the financial assistance of SARA0. ***"The financial assistance of the South African Radio Astronomy Observatory (SARA0) towards this research is hereby acknowledged (www.ska.ac.za)"*** A copy of research papers published by students must be provided to SARA0.
- 6.9. Students are required to attend the annual SARA0 Postgraduate Bursary Conference, and to present their research at the conference.
- 6.10. Following the National Research Foundation's policy, students are allowed to hold supplementary grants or emoluments, during this bursary, to a maximum of 50% of the SARA0 award, but the student must inform SARA0 via his/her university of such awards or emoluments.
- 6.11. If a student wishes to change his/her research project, field of study, or the university, for which the bursary was offered, he/she must provide a motivation to SARA0 for approval, prior to any

changes. SARAO is under no obligation to continue to support a student if the changes do not align with the original criteria on which the bursary offer was made.

6.12. Students who do not obtain the degree for which the bursary was awarded will have to refund all payments of the bursary already received by them (this includes funds paid out from a student's travel and equipment grants).

6.13. On completion of a degree, funded by a SARAO bursary, students are required to submit a copy of their degree certificate to SARAO.

6.14. The annual travel grant is available to support travel related to a student's research.

- An application for travel must be submitted to SARAO, via the university research office.
- To allow for the time taken to process the payment of grants from SARAO to the university, travel grant applications for international travel should be submitted at least two months before any trip is to be undertaken, and for local travel, at least one month before any trip is to be undertaken.
- Travel grant applications must be endorsed by a student's supervisor.
- The approval of a travel grant application is at the sole discretion of SARAO.
- The grant includes subsistence and accommodation.
- Unspent travel grant funds will automatically be carried over from one year to the next, for the duration of the bursary award.

6.15. The equipment grant is available to support the purchase of equipment required to enable a student to do his/her research, and is a total amount for the duration of the bursary.

- An application to purchase equipment using this grant must be submitted to SARAO, via the university research office.
- The approval of an equipment grant application is at the sole discretion of SARAO.
- Equipment purchased using funds from SARAO is the property of the university at which the student is registered.
- Unless circumstances are motivated as exceptional, SARAO will NOT approve funding to purchase books, cellular phones, media players, E-readers, printers, digital projectors, iPads or other tablets.
- Unspent equipment grant funds will automatically be carried forward from one year to the next, for the duration of the bursary award.

7. Application Forms and Submission Information

- 7.1. Application forms can be found online at <https://skagrants.nrf.ac.za>.
- 7.2. Students must submit their applications via the research office at the university where they are currently registered (**Students not currently registered at a South African university may submit their application forms directly to SARAQ. Contact SARAQ at lgura@ska.ac.za if you require further clarification**).
- 7.3. Only one application per student may be submitted.
- 7.4. In completing an application form for a bursary from SARAQ, you accept the conditions of award listed above.
- 7.5. No late or incomplete applications will be accepted.
- 7.6. **Successful applicants will be notified by 10 November 2018. If you have not heard from SARAQ by 10 November 2018, please assume that your application was NOT successful.**
- 7.7. SARAQ reserves the right not to accept any application in part or in whole. The decision of SARAQ will be final and no correspondence will be entered into after the decision.
- 7.8. As a business unit of the National Research Foundation, SARAQ is committed to employment equity and redress.
- 7.9. **Queries may be directed to SARAQ at lgura@ska.ac.za**

Annexure 1: Focus Areas for 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.