

Report on postgraduate student funding in astronomy in South Africa

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Executive summary

This report explores five (5) key issues relating to human capacity development in astronomy in South Africa. The focus is on the postgraduate student pipeline, which has seen significant change since 2020. The report presents an analysis and a set of recommendations.

The major finding from this report is that **only three (3) students out of 63 who responded to the survey received their funding in January or February of the year they commenced study**. Five students, who had applied for funding in 2022, were still awaiting their first tranche of funding in August 2023. The consequences are dire: students were unable to travel to university, some students had to return to their family homes, others had to accrue debt with family and friends to make ends meet. In all cases, students experienced the situation as highly stressful.

The impact of this is exactly the opposite of what the postgraduate funding policy aims to achieve. The funding framework explicitly states that it sets out to transform the “equity profiles of the South African research workforce”, and that postgraduate funding allocations “are underpinned by the principles of equity of opportunity; representativity; prioritisation; and enhanced access, success, and throughput”. These noble ideals are undermined by deficient implementation. So much so, that **an unintended consequence of the poor implementation is a lack of transformation in the research workforce**. This manifests because students most in need of financial aid are often those from previously disadvantaged groups, and hence have very little by way of a support network that they can lean on when such financial aid is delayed. They are thus subject to higher levels of stress, and higher attrition rates from postgraduate programmes.

In a country where, in an ambitious white paper of 1996, we took the position of maintaining and growing “flagship sciences such as physics and astronomy”, it is an indictment upon us that we literally cannot “feed and clothe” the very students who will lead these flagship sciences. **The recommendation is that the NRF, as the funder, urgently leads engagements with universities to ensure that students receive funding no later than February of the year they commence study.**

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Background

Motivation

At the Astronomy Town meeting held on 8 & 9 September 2022, student funding was identified as a key stumbling block within the astronomy community and a highly emotive issue. Various issues around postgraduate student funding have persisted for at least a decade, and the introduction of a consolidated funding system by the NRF in 2020 seems to have done little to alleviate the problems.

The **key issues** related to student funding that were isolated at the Astronomy Town meeting in 2022 are stated below:

1. Problem 1: There is a perception that funding levels have dropped in a highly inflationary environment, and new funding rules have capped top-ups from supervisors' grant
2. Problem 2: Timing around student recruitment is challenging, coming too early in the academic year.
3. Problem 3: Can we broaden the scope to make bursaries available to students from other African countries?
4. Problem 4: Tying student funding to individuals has the unintended consequence of delaying science projects. Good scientific ideas for student projects may take years to get funded as a PhD project.
5. Problem 5: Student payments are late in the year. Students are borrowing money to survive until NRF funding comes. The recent revamp of the system was intended to prioritise those who are most needy, but these very students are left without means.

This report aims to be an objective overview of the points of failure related to funding that are experienced by postgraduate students in astronomy at universities and national facilities in South Africa.

Authors of the report

One of the outcomes¹ of the 2022 Astronomy Town meeting was that "An HCD task team should be constituted, comprising Heads of University Departments, NASSP, NRF facilities and DSI representatives, to take immediate action on late payment of student bursaries".

The Human Capacity Development (HCD) committee was selected by the Interim Committee², which was established at the Astronomy Town meeting of 2022 in order to a) refine the outcomes of the town meeting and set up both the Astronomy Community Task Team (ACTT) and the HCD committee.

¹ <https://www.sao.ac.za/townmeeting2022/>

² Membership of the Interim Committee: Sunil Chandra, Daniel Cunnama, Kelebogile Gasealahwe, Marisa Geyer, Munira Hoosain, Lucia Marchetti, Lia Labuschagne, Vanessa McBride, Itumeleng Monageng, Jack Radcliffe, Patrick Woudt

The committee was constituted through a mix of nominated and approached individuals that would ensure adequate representation across institutions, and significant experience in the higher education sector in South Africa. The HCD committee was announced to the South African astronomy community by email on 3 May 2023.

Approach

In investigating the key issues raised above, the HCD committee undertook:

An **analysis of the NRF policy governing student funding** since 2020. This report refers to the policy as outlined in the “DSI-NRF Postgraduate Student Application and Funding Framework for Funding in 2024 Academic Year”. This document is provided as Appendix 1 of this report, and will be referred to as the *2024 Funding Framework* in this report.

Two self-reported, anonymous surveys : one of **NRF-funded postgraduate students** in astronomy, and the other of **supervisors** of NRF-funded postgraduate students in astronomy.

The committee draws from these approaches in analysing the key issues above.

Surveys

Supervisors of postgraduate students pursuing astronomy-related research, and the postgraduate students themselves were requested to participate in a survey about the NRF’s postgraduate funding policies and processes. The aim of the (anonymous) survey was to obtain input, based on the experiences of supervisors and their students of

- the implementation of NRF’s postgraduate funding policies,
- the funding application process,
- *NRF Connect*’s functionality and useability,
- the award of funding and
- the payment of scholarship funds to students.

The survey questions were compiled by the HCD committee, on behalf of the Astronomy Community Task Team. The survey was circulated electronically to the SAastronomers mailing list on 7 August 2023, with the survey closing on 18 August 2023.

Survey Respondents

The breakdown of respondents is provided in Table 1.

Table 1: Survey Respondents

	Supervisors	Postgraduate Students
Number of respondents	26	63
Number of institutions represented	11	17
General	Average of 10 years supervision experience	28 Doctoral students (45%), 31 Master's students (49%), 4 Honours students (6%)

Summary of findings from supervisors responses

The overall sentiment of supervisors towards the NRF postgraduate funding policy's structure and implementation is negative. For all questions (except one) posed to the supervisors, negative responses were received from more than 50% of respondents, and for some questions more than 70% of supervisors responded negatively, i.e the sentiment of the supervisors who participated in the survey is that the NRF's postgraduate funding policy, the application process, as well as the administration and payment of scholarships is significantly problematic.

Summary of findings from students responses

Students generally perceive the situation more favourably than supervisors. However, it's worth noting that only students who were successful in receiving NRF scholarships took part in the survey.

A full set of survey questions is provided in Appendix 2

Results

Problem 1: There is a perception that funding levels have dropped in a highly inflationary environment, and new funding rules have capped top-ups from supervisors' grant

From the *2024 Funding Framework* document, and similar from preceding year, the annual scholarship values in South African rands are as follows:

Table 2: Postgraduate scholarship values

	Honours		Master's		Doctoral		Ref
	Full	Partial	Full	Partial	Full	Partial	
2024	157 125	118 125	175 795	118 795	182 318	107 318	³
2023	150 735	117 735	169 158	112 158	176 196	101 196	⁴
2022	154 700	105 700	172 900	105 900	180 430	95 430	⁵
2021	149 000	100 000	167 000	100 000	175 000	90 000	⁵
2020	76 000	30 000	90 000	50 000	120 000	70 000	⁵

The policy states that the scholarship amounts will be reviewed annually subject to agreed CPI-linked sector-wide increases, and in alignment with the *Guidelines for the Department of High Education and Training Bursary Scheme for Students at Public Universities*.

From the scholarship values presented in Table 2, it's clear that the new NRF scholarship levels, as implemented in 2021, were a vast improvement on the previous levels. The adjustments were in line with inflation in 2021 -> 2022, but only half of the inflation rate in 2022 -> 2023 (likely because inflation was unexpectedly high at 6.9% in 2022). Adjustments for 2023 -> 2023 appear to be close to the predicted inflation rate, but it's worth noting that adjustments consistently below inflation have a cumulative effect on scholarship values as time goes on.

Problem 2: Timing around student recruitment is challenging, coming too early in the academic year

The deadline for student applications for NRF funding is mid-July in the year preceding commencement of study. Students and supervisors were polled on the closing date for applications through the surveys. The results are summarised in Figure 1.

³ *2024 Funding Framework*, p11

⁴

<https://www.nrf.ac.za/wp-content/uploads/2022/05/DSI-NRF-Postgraduate-Scholarship-Framework-for-2023-Funding-26-April-2022-FINAL.pdf>

⁵ Private communication - NRF RISA

The figure shows the responses from the surveys, separated into categories of *Supervisors*, *Doctoral students* and *Master's students*. All students in this analysis applied in 2020 or later (51 students). Most students (62%) find that the closing date for NRF funding applications is appropriate, while most supervisors (66%) find it is problematic. Master's students are very evenly split between those who find the closing date problematic and those who don't.

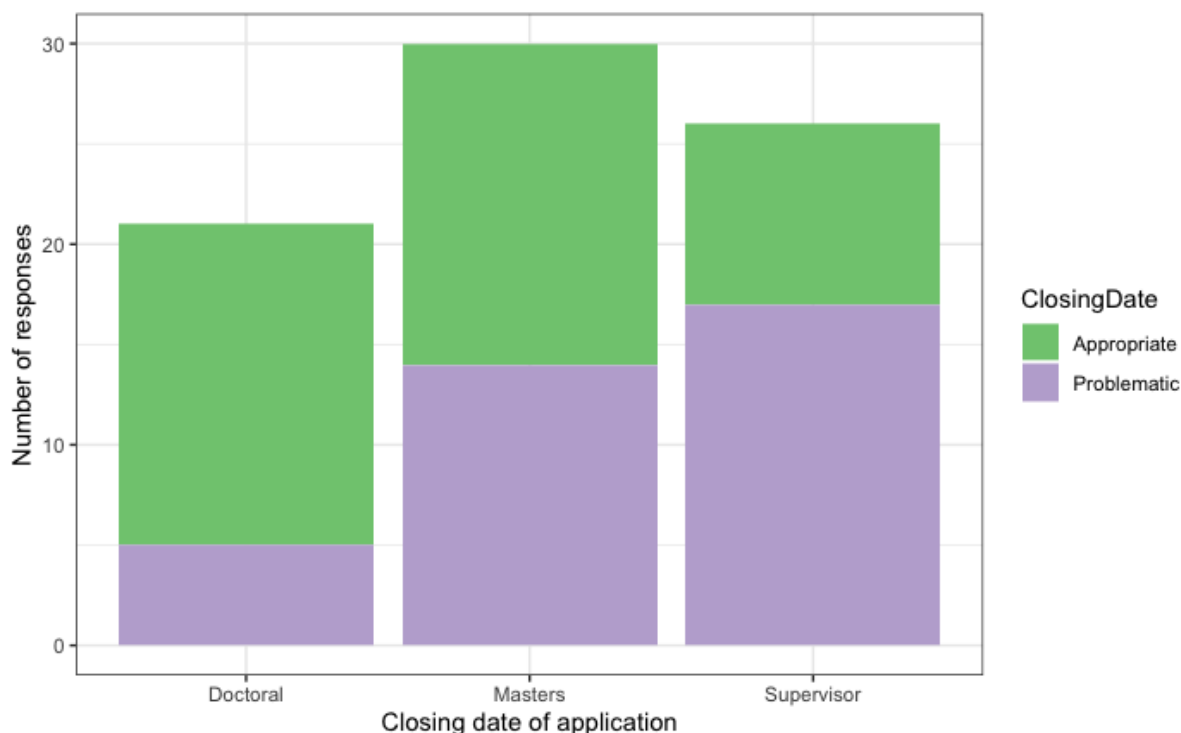


Figure 1. Survey responses on the closing date of NRF postgraduate funding applications

Drilling down into the free text responses of these answers brings up two (2) prime difficulties around the closing date for Master's applications:

- Honours students applying for a Master's scholarship are **not yet familiar with the different astronomy research areas, and do not know the supervisors**. This is because research projects only start in the second semester, i.e. around the time that the NRF applications close.
- The Master's application process takes **significant time** (the application form is onerous, and finding a suitable project and supervisor is very time consuming), and **becomes a major source of stress** because the application timeline overlaps with mid-year exams and other deadlines.

Problem 3: Can we broaden the scope to make bursaries available to students from other African countries?

This question relates directly to the NRF postgraduate funding policy. Page 18 of the *2024 Funding Framework* states that 95% of DSI-NRF postgraduate student funding will be awarded to South African citizens and permanent residents, which 5% may be awarded to students from SADC countries and the rest of the world.

The community request that's posed here aligns with DSI's commitment to developing astronomy on the African continent -- a commitment that has been realized through the support for the African Astronomical Society over the last three years. The astronomy community vision is to recommend a larger fraction of African students be eligible for scholarships to grow research networks, and in due course, research infrastructure, across the continent. The long-term vision is intra-African collaboration that is just as strong as South Africa's links with astronomy in the global north. With the XXXII General Assembly of the International Astronomical Union to be held on African soil (in Cape Town) for the first time, next year provides an opportunity to expand postgraduate funding opportunities to the broader African community.

Question 4: *Tying student funding to individuals has the unintended consequence of delaying science projects. Good scientific ideas for student projects may take years to get funded as a PhD project.*

This question was difficult to address through either a survey or through analysis of the policy. Hence, this report does not provide any findings or recommendations related to this point.

Question 5: *Student payments are late in the year. Students are borrowing money to survive until NRF funding comes. The recent revamp of the system was intended to prioritise those who are most needy, but these very students are left without means*

The surveys polled students directly about when they received funding. The results are shown in Figure 2, and indicate that

- **Only three (3) out of 63 students received their first tranche of funding in January or February, and**
- **five (5) students were still awaiting funding at the time of the survey (August 2023). All five of these students had applied in 2022, and are in the first year of their degrees.**

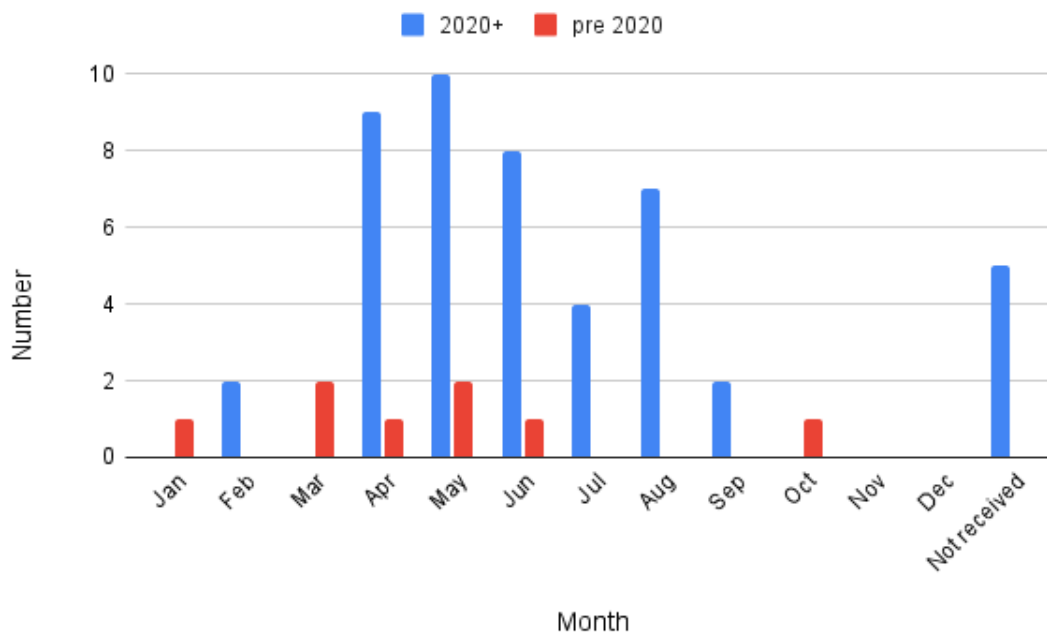


Figure 2. Month of receipt of first tranche of student funding

Similarly, when supervisors were asked whether their students received scholarship funding timeously over the last three years, **77% answered “No”**.

The impact of the systemic inefficiencies that result in late student funding can be illustrated in very real terms through the free-text responses to question 22: *“For those students who received their letters of scholarship award and/or their scholarship funding late, please explain in as much detail as possible how this affected you and your studies.”*

“The most challenging part was the long wait for the funds to be released. It was the toughest few months of my life, where I felt like I would have been better off if I stayed at home where they can at least share what they have to eat with me. Surviving five months without any financial support was the worst nightmare.”

“I received NRF funding for four years, each year the payment date was later in the year. This is completely unacceptable for students, such as myself, who are reliant on the funding for rent accommodation etc. Because of this I accepted a PhD position abroad.”

“I was severely financially constrained and had to move back in with my parents, which caused them financial strain as my dad retired in 2022. I was considering putting my PhD on pause and finding work in the meanwhile.”

“I was unable to meet day-to-day expenses, which included traveling to the university. It made progress in my studies much slower.”

“Since you have precisely two years to submit your MSc from the date you register, I committed to a lease agreement and started working as soon as I had registered. The lateness of the funds made it impossible to pay my rent and sustain myself for two to three

months in a city where I have no family. I had to take on debt with family members to survive. Obviously, this kind of stress makes it very difficult for anyone to focus completely on their work. I strongly considered switching my degree to part-time so I could go and find a job.”

“The biggest impact was on monthly payments like rent, water and so forth. I also had to make concerted efforts to somehow have enough money to survive from December till March of the next year. This often required lending money from family to survive or doing extra tutoring work to make the difference. Even if we got our back payment in March for the previous months, it did not help our situation at all. Furthermore, we had to devise loaning strategies from the university in order to have something for those first few months, but I could not get that right personally. The impact of this personally worsened yearly due to COVID-19 and inflation, and also the birth of my son and a large influx of medical bills that I had to pay monthly.”

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Conclusions and recommendations

Out of the five key issues explored, the issue of **late payments to students is the most prevalent and has the most significant impact** on the astronomy research landscape in South Africa. We list recommendations below in order of decreasing urgency.

The postgraduate funding policy has clearly been designed to transform the “equity profiles of the South African research workforce”. However, these ideals are compromised by the implementation of this policy, which results in previously disadvantaged students having no financial support network to survive the first few months of a postgraduate degree (as most funding arrives only in April or May, or in some cases as late as August of the year of commencement of study). **An unintended consequence of this unsatisfactory implementation is a lack of transformation in the research workforce**, as the very groups necessary to transform the demographics of the workforce are eroded by the difficult circumstances they find themselves in.

Recommendation 1: Urgent action should be taken by the NRF, in consultation with South African universities, to ensure payment of postgraduate funding no later than February of the year of commencement of study.

Recommendation 2: Benchmarking of NRF postgraduate scholarship allowances to take place every five (5) years to ensure adequate and competitive funding.

Recommendation 3: A change in the postgraduate funding policy to allow 10% of postgraduate scholarships to be taken up by African recipients will serve to build stronger inter-African research networks. This is especially timely, given the IAU General Assembly in 2024.

Recommendation 4: The deadline for applications for Master’s scholarships be moved to September in the year preceding study. This will allow honours students to develop a better idea of research, and the research landscape in South Africa.

Appendix 1: [DSI-NRF Postgraduate Funding Framework](#)

Appendix 2: Questionnaires and Surveys

[Survey of NRF-funded postgraduate students](#)

[Survey of Supervisors of NRF-funded postgraduate students](#)

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