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Research Facilities

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## 1. Strategic background

### 1.1. Context

The *White Paper on Science and Technology* (1996) and the *National Research and Development Strategy* (2002) emphasised the need for South Africa to transform its Science, Engineering and Technology (SET) workforce. Other policy and strategies of government, including the *Human Resource Development Strategy* (2009) and the *Medium Term Strategic Framework* (2009), note the shortage of high-level skills as a significant constraint in the development of the economy and society. In this regard, South Africa must produce a greater number of highly skilled individuals; particularly in SET, to achieve the goal of “*an equitable, sustainable, and inclusive growth path that brings decent work and sustainable livelihoods, education, health, safe and secure communities, and rural development*”.

The South African Research Chairs Initiative (SARChI) was established in 2006 by the Department of Science and Technology (DST). This Funding Instrument is managed by the National Research Foundation (NRF) through a contractual agreement with DST. It is a strategic intervention of the South African government designed to attract and retain excellence in research and innovation at South African universities, science councils and National Research Facilities. In particular, the instrument is aimed at increasing scientific research capacity through the development of human capacity and stimulating the generation of new knowledge. It is also intended to support the realisation of South Africa’s transformation into a knowledge economy in which the generation of knowledge translates into socio-economic benefits.

SARChI is designed to significantly expand the scientific research base of South Africa in a way that supports implementation of the national research and

development policies. Since inception, 199 Research Chairs have been awarded in various disciplines and research fields. The funding Instrument has been successful in retaining leading South African scientists in the university system and attracting leading foreign researchers and expatriate researchers to South Africa.

## 1.2. SARChI Aim and Objectives

### *Aim*

The main goal of SARChI is to strengthen and improve Research, Development and Innovation (RDI) capacity of public universities, research councils and National Research Facilities in order to produce high quality postgraduate students and research outputs.

### *Objectives*

- Expand the scientific research and innovation capacity of South Africa;
- Improve South Africa's international research and innovation competitiveness, while responding to social, economic and transformation imperatives of the country;
- Attract and retain excellent researchers and scientists;
- Increase the production of Masters and Doctoral graduates; and
- Create research career pathways for young and mid-career researchers, with a strong research, innovation and human capital development output trajectory.

## 1.3. SARChI Guiding Principles

In order to ensure participation of National Research Facilities in the SARChI programme, the following principles inform the awarding of the Research Chairs specifically to National Research Facilities:

- Research Chairs may be held by a National Research Facility exclusively, but a Chair holder must be affiliated to at least one South African public university to allow registration and awarding of degrees to postgraduate students.

- National Research Facilities will bid for a Research Chair in an open and competitive process; hence the Research Chair will not be pre-allocated to National Facilities. That is, this is an open call targeted to National Research Facilities, which will follow the same robust process for selecting SARChI candidates.
- Each National Research Facility may nominate and submit a maximum of three (3) applications but only one (1) Chair will be awarded per national research facility in the current call.
- The SARChI Chairs for National Research Facilities will be considered and awarded at the Tier 1 level provided nominated candidates meet minimum requirements for Tier 1. Therefore, the NRF reserves the right not to award the Chair should all the nominated candidates not meet the minimum requirements for Tier 1 stipulated in the selection criteria on Table 1.
- The Research Chair's proposal must be aligned to the research strategy, capabilities and offerings of the respective National Facility. The Chair and his/her students must be based at the respective national facilities but the students must register in public universities, preferably historically disadvantaged universities, with a relevant *Programme and Qualification Mix* (PQM) approved by the Department of Higher Education and Training;
- The Chair will be expected to dedicate at least 80% of his/her time conducting research and also supervising an average of 10 Masters and Doctoral students per annum. The chair is also expected to mentor postdocs and emerging researchers. The remainder of the time may be dedicated to administration and/or undergraduate teaching at South African public universities to which the Chair is affiliated.
- While SARChI chairs are generally tenable at Tier 1 and 2, respectively; the SARChI Chairs to National Research Facilities will only be tenable at Tier 1. Tier 1 is for Chairs who are established researchers that are

recognised internationally as leaders in their field, and/or have received substantial international recognition for their research contributions.

- Qualifying candidates from abroad nominated and approved by the National Research Facility and that are willing to spend at least 50% of their time in South Africa at the respective National Research Facility are eligible for consideration at the Tier 1 level. The intention is to attract African scholars and South Africans in the diaspora, who have distinguished themselves in their research fields.
- While all demographics groups and nationalities may apply, preference will be given to females and Blacks; in particular African South Africans and Coloured candidates because they are grossly underrepresented in the SARChI programme. These preferred candidates must first meet the minimum requirements stipulated in the criteria on Table 1.

#### **1.4. Accountability for SARChI Chairs**

A Chair must be appointable at the level of a full Professor or Honorary Research Professor with affiliation to a University. The Chair will fit into the normal management structures of the host National Research Facility. Accountability for the Research Chair will reside with the Managing Director of the host National Research Facility.

#### **1.5. Profile of Candidates**

The NRF will require the approved candidate for the SARChI Chair to enter into a five year performance agreement in the form of '*Conditions of Grant*' and will evaluate the performance of the Chair against the research plan, stated objectives and targets. The plan will be reviewed every five years. Subject to satisfactory performance by the Chair following the 5 year in-depth review, the grant may be renewed for up to 2 more 5 year cycles for Tier 1 Chairs. Therefore, the track record of the nominated candidate is very important to the selection process and success of the Research Chair.

Each National Research Facility submitting an application to host a Research Chair will be able to nominate up to three candidates for the Chair position. Nominated candidates may be current staff members, new or potential recruits to the National Research Facility. If the Chair is taken up by a candidate who is a current research staff member at the National Research Facility, consistent with the SARChI principle of additionality the National Research Facility must immediately initiate a process to fill the vacated position with a suitably qualified candidate. The replacement candidate must be employed on a full-time basis for at least the duration of the tenure of the Research Chair. Where such replacement candidates are not young, black or female, the National Research Facility must develop a succession plan designed to develop a range of possible candidates with competitive capacity within two cycles of a Research Chair award.

All candidates who are requested by the National Research Facility to apply for a Research Chair must be established researchers that hold a doctoral degree or an equivalent research qualification and must submit a proposed research programme that is innovative, original and of high quality. All applications must be endorsed and submitted through a relevant National Research Facility. Following the peer review of the full proposal and the *curriculum vitae* of the candidate, Chairs will be approved at the Tier 1 level based on their past research and innovation outputs, track record in supervising and mentoring postgraduate students and postdoctoral fellows as well as national and international recognition for their research contributions. The minimum criteria that must be met by nominated candidates for approval at the Tier 1 level are detailed in Table 1. **It is important to emphasise that nominated candidates for possible SARChI Chairs at National Research Facilities must meet requirements for Tier 1 since the Chairs will only be awarded at that level.**

**Table 1:** Criteria for SARChI Tier 1 Research Chairs

### **Tier 1 Research Chairs**

- Should be appointable at the level of a full Professor benchmarked nationally;
- Typically should be A or B NRF rated researcher;
- Should be an outstanding and innovative researcher whose accomplishments have made a major impact in their field;
- Should be recognised internationally as an undisputed leader in their field and/or have received substantial international recognition for their research contributions;
- Should have a superior record in attracting and supervising post-graduate students and postdoctoral fellows, taking into account the practices of the field; and
- Should reside full time in South Africa for the duration of the Research Chair award. Candidates from abroad, including African scholars and South Africans in the diaspora, that are willing to spend at least spend 50% of their time in South Africa are eligible for consideration with the permission of a National Research Facility. Some National Research Facilities may require that international candidates qualifying for Tier 1 SARChI Chair spend up to 100% of the time conducting research in South Africa.

## **2. Proposal Submission and Assessment Process**

This section of the Framework and Funding Guide provides details of the research focus areas or themes that the National Research Facilities should align their respective research proposals. It also describes the process for proposal submission and assessment and provides details on the call timelines.

### **2.1. Research Focus and Thematic Areas**

The proposed thematic areas for the awarding of new Research Chairs is intended to support scientific research and innovation generally, but also to respond to the priorities of government, namely:

- Creation of decent work and sustainable livelihood;



- Water, energy and the environment;
- Education;
- Health;
- Rural development, food security and land reform; and
- The fight against crime and corruption.

These have been expanded into priorities of the *Medium Term Strategic Framework* (MTSF) and its 12 Outcomes. The following outcomes have been prioritised in formulating the theme for the awarding of the Chair:

- A long and healthy life for all South Africans;
- Vibrant, equitable, sustainable rural communities and food security for all;
- Protection and enhancement of environmental assets and natural resources;
- An efficient, competitive and responsive economic infrastructure;
- Sustainable Human Settlements and improved quality of households;
- Skilled and capable workforce to support inclusive growth;
- Quality education; and
- All people in South Africa are, and feel, safe.

The proposed themes are also informed by the need to strategically grow specific research areas as well as the absorptive capacity of individual National Research Facilities.

## 2.2. Description of the respective SARChI chairs

Below is a list of National Research Facilities and description of the respective SARChI chairs (Table 2)

**Table 2:** Description of the respective SARChI chairs for the National Research Facilities

National Research Facility	Maximum number of Research Chairs that may be awarded
Harterbeesthoek Radio Astronomy Observatory (HartRAO)	1
<p data-bbox="269 581 1406 617"><b>Proposed name of SARChI Chair: Very Long Baseline Interferometry (VLBI)</b></p> <p data-bbox="748 688 927 724" style="text-align: center;"><b>Description</b></p> <p data-bbox="253 743 1425 1545">The Hartebeesthoek Radio Astronomy Observatory (HartRAO) is a National Research Facility managed by the National Research Foundation (NRF) and is located north-east of Johannesburg, South Africa. HartRAO functions as a multidisciplinary scientific node on the southern part of the African continent. It operates within several global international radio astronomy, space geodetic and geophysical networks. The observatory is strategically placed in terms of its geographical location and therefore plays a significant role in instrumentation and scientific capacity in a region sparsely equipped when compared to other continents; it has also extended its instrumentation to Marion Island, Gough Island and Antarctica. The main radio telescope (26-m) operates in both single dish and Very Long Baseline Interferometry (VLBI) mode (astronomy, astrometry and geodetic). HartRAO and SKA-SA will be merging into a combined astronomy and space geodesy research platform, the South African Radio Astronomy Observatories (SARAO) during 2017 and HartRAO will play a leading role in VLBI activities of SARAO.</p> <p data-bbox="253 1606 1425 1749">The objectives of the DST/NRF SARChI Research Chair in VLBI would be to develop core capacity in astronomy utilizing the technique of VLBI. This can be achieved through key responsibilities:</p> <ul data-bbox="310 1808 1365 1843" style="list-style-type: none"> <li>• Lead the astronomy development initiatives at the University of Pretoria</li> </ul>	

- Foster international and local collaborations
- Expand research capacity by producing high quality postgraduate students (masters and doctoral) and by developing a strong post-doctoral team
- Increase research outputs
- Attract and retain high calibre researchers
- Develop a relevant and appropriate research programme
- Participate in the training and development initiatives of the African VLBI Network (AVN)

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National Research Facility	Maximum number of Research Chairs that may be awarded
iThemba Laboratory for Accelerator Based Sciences (iThemba Labs)	1

**Proposed name of SARChI Chair: Nuclear Physics**

**Description**

The iThemba LABS LERIB facility, which is based on the ISOL production of beams of fission fragments, is funded and under construction with delivery of the production target and ion source expected soon. It is expected that the first use of the low energy fission fragments beams would be on beta delayed gamma spectroscopy that could make use of a tape station (under development) and existing germanium detectors in a very close geometry. Conversion electron spectroscopy for low energy or E0 transitions is also envisaged. The proposed research chair would be expected to take a leading role in developing research programmes around this facility and would have to work in close collaboration with researchers in at iThemba LABS.

While the LERIB facility is being constructed and in parallel to the development work on the future use of fission fragment beams, it is expected that the research chair would be a developing various ISOL techniques and conduct gamma and electron spectroscopy research using presently available stable beams and existing detector systems. LERIB is the first step towards the Accelerator Center for Exotic beams (ACE-Beams) which may offer a longer term perspective for a very good candidate.

The use of alpha emitting isotopes in cancer therapy is rapidly gaining prominence internationally, and concerted efforts are put into finding the most efficient production methods in order to establish a reliable and cost effective supply. iThemba LABS intends investigating production of the  $^{225}\text{Ac}/^{213}\text{Bi}$  generator system, presently extracted from  $^{229}\text{Th}$  produced in reactors. It is envisaged that the research chair will enhance the physics research aspect of this, and other similar projects of interest to isotope production at iThemba LABS. Since the work would mainly involve gamma spectroscopic measurements of cross sections there is significant synergy between this work and the spectroscopy of the fission fragments mentioned above. In addition there may be some opportunities in beta decay studies of relatively short-lived isotopes that can be produced at iThemba LABS.

The requirement for the position would be extensive experience and proven leadership in ISOL techniques and nuclear spectroscopy.

The research focus of the proposed research chair is broadly aimed at two aspects of the future project of iThemba: The South African isotope facility (SAIF) project which is part of the long range plan of iThemba LABS :

1. To develop capability and initiate and conduct research programmes that would take full advantage of opportunities in the spectroscopy of fission fragments that would become available from the Low Energy Radioactive Ion Beam (LERIB) facility currently planned and under construction.

2. To enhance the nuclear physics research aspects of the R+D on the production of alpha-emitting isotopes.

**OR**

**Proposed name of SARCHI Chair: Ion Beam Analysis and Materials Sciences**

**Description**

iThemba LABS has actively participated at national and international level in the development of techniques based on Ion-Solid interaction with accelerators available at iThemba LABS and abroad. In particular using the 5.5 CN Van de Graff accelerator at the Materials Sciences Department (MSD) the Group working on Ion Beam Analysis in partnership with national and international collaborators have developed through the years Ion Beam Techniques at the forefront in this field. From the development of the Rutherford Backscattering Spectrometry technique in the seventies up to the development of international reputable techniques such as *in-situ* RBS and Heavy Ion ERDA ToF Spectrometer facility most recently. The research in this field at the MSD can confidently support the creation of a SARCHI Chair at iThemba LABS. Furthermore with the commissioning of a new 3.0 MeV Tandem Accelerator in April 2017 hosting of the Research Chair is most relevant.

The main goal of the Initiative is to strengthen and improve research and innovation capacity on Ion-Solid Interaction and Ion Beam Activation Analysis (IBAA) for the synthesis and characterization of nano-structured materials.

Candidate must be an established IBAA researcher with proven international record. Candidate must submit a proposed research programme that is innovative, original and of high quality with particular emphasis to all aspects of accelerator sciences for use in applications of IBAA in Materials Research. Main criteria for selection will be:

- Should be an outstanding and innovative researcher whose accomplishments have made a major impact in the field of Ion Beam Analysis in Materials Sciences.

- Should be recognised internationally as an undisputed leader in IBAA and/or have received substantial international recognition for their research contributions;
- Should have a superior record in attracting and supervising post-graduate students and postdoctoral fellows, taking into account the research methodology in IBAA.

**OR**

**Proposed name of SARChI Chair: Radiation Biology / Nuclear Medicine**

**Description**

To perform research and training of postgraduates in the field of radiation medicine. Applicants should have a background in doing Biophysical Research using radiation from radionuclide's or other sources in the detection and treatment of cancer.

iThemba LABS produce both PET and SPECT isotopes for use in nuclear medicine applications and theranostic isotopes based on alpha particle emitters are being planned. Peptides and organic compounds specific to targets for cancer cells detection and treatment need to be labelled with isotopes. Suitable knowledge in organic chemistry and radiochemistry is required. iThemba LABS is also equipped with a radiation biology laboratory to follow the up-take of labelled compounds and resulting cellular radiation damage.

iThemba LABS collaborate with various nuclear medicine, chemistry and molecular biology Departments at different universities in South Africa and have access to pre-clinical micro-PET imaging to evaluate the suitability of novel compounds.

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<b>National Research Facility</b>	<b>Maximum number of Research Chairs that may be awarded</b>
National Zoological Gardens of South Africa (NZG)	1
<p data-bbox="253 415 1422 506" style="text-align: center;"><b>Proposed name of SARChI Chair: Wildlife Molecular Ecology &amp; Conservation Biology</b></p> <p data-bbox="748 579 927 615" style="text-align: center;"><b>Description</b></p> <p data-bbox="253 636 1422 1713">Historical, current and future environmental change carries significant implications for the sustainability of wildlife populations, particularly so at a genetic level, within and between species. It is thus essential to understand the relationships between the degree of genetic diversity, phylogenetics, and genetic factors that determine population viability, in order to craft conservation strategies to prevent extinction. The molecular ecology and conservation biology research programme of the NZG has been developed and structured to respond to this challenge. It focuses on animal/wildlife population genetics, genetic health of populations, wildlife molecular forensics, molecular diagnostics of parasites in wildlife and other animals of economic importance, as well as environmental molecular detection and identification of pathogens. Genetic techniques such as molecular marker development &amp; deployment, sequencing of genes and whole genomes, as well as DNA profiling, are used in a multidisciplinary approach as an aid for genetic management of threatened populations. Molecular forensic investigations provide a science-based weapon to fight illegal wildlife trade and to stem the impact thereof on the conservation status of species and populations. The NZG has state of the art laboratories and equipment that include PCRs, realtime PCRs, DNA sequencers and is in the process of acquiring Next Generation sequencing capacity in order to enhance its dedicated capacity for bioinformatics, wildlife forensics and conservation genetics.</p> <p data-bbox="253 1787 1365 1822">The Chair will be required to take the work described above to the next level by</p> <ul data-bbox="302 1843 1292 1879" style="list-style-type: none"> <li>• leading high impact research to gain a better understanding of how</li> </ul>	

- species' phenotypic and genotypic variation allows them to persist in the environments they prefer
- patterns of local adaptation are likely to change under future anthropogenic land and other natural resource use, including climate change scenarios.
- Develop and apply cutting edge –omic technologies such as genome (re)sequencing, transcriptomic profiling, epigenomic analyses allied to GIS, landscape genetic and genomic analysis (including habitat modelling).
- Develop and deploy modelling expertise and techniques for hindcasting and forecasting species distributional and genomic responses to climate and other environmental changes.
- Train postgraduate students and mentor postdoctoral fellows and young researchers.

**OR**

**Proposed name of SARChI Chair: Wildlife Health and Eco-physiology**

**Description**

The research programme on wildlife health & eco-physiology examines the determinants of health and disease in wildlife, disease epidemiology, the clinical management of diseased animals, and the dynamic interaction between the animal and its ecological setting (eg. nutrition, host-parasite relationships) and how that may affect the well-being of the animal. It seeks to understand the causes, prevalence, distribution and evolutionary consequences of disease in captive and wild animals in South Africa and the continent.

Available state of the art infrastructure and capacity have optimized the research potential in opportunistic, retrospective and prospective wildlife pathology and host-pathogen interactions focusing on the aetiological agents of disease in captive and free-ranging wildlife. Current research develops molecular diagnostics for zoonotic disease detection and for the investigation of viral, bacterial, fungal, protozoal and parasitic pathogens, diseases and vector control in wildlife. An affiliate aspect of the



research explores the nature and extent of wildlife reproductive health in captive, semi-wild and wild settings.

The proposed Research Chair is expected to further develop and lead internationally competitive research in the field of wildlife health in order to:

- Explore and expand research on the epidemiology of important veterinary and zoonotic pathogens in South African and African wildlife.
- Promote epidemiological research and related data collection, collation, synthesis, and modelling for the provision of science-based advice on disease management plans in captive and wild populations
- Enhance the understanding of epidemiology and the complex links between animals, their environment and diseases
- Explore the determinants of wildlife reproductive health in an ecophysiological and ecobiological context
- Train postgraduate students and mentor postdoctoral fellows and young researchers

In this way, it is envisaged that the NZG will be in a position to undertake higher order science that will lead to a greater impact, as evidenced by:

- an increased scientific understanding of wildlife populations and the ecosystems within which they exist, which in turn will lead to
- an enhanced capability to manage both better, in order to ensure their sustainability into the future.

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National Research Facility	Maximum number of Research Chairs that may be awarded
South African Astronomy Observatory (SAAO)	1
<p><b>Proposed name of SARChI Chair: Observational Optical/Infrared Astronomy</b></p> <p style="text-align: center;"><b>Description</b></p> <p>South African Astronomical Observatory (SAAO) is a National Facility for optical and infrared astronomy, and operates a number of telescopes, including Southern African Large Telescope (SALT), near Sutherland in the Northern Cape. It has a staff complement of 120 spread between the Sutherland observing station and Cape Town headquarters. A quarter of the staff are PhD astronomers (including postdocs). SAAO astronomers supervise postgraduate students registered at universities around the country. Research interests of staff cover a range of topics including stellar astrophysics, particularly time-resolved studies; transients; extragalactic astronomy; galaxies, AGN, cosmology; computational astrophysics; planetary science; and astronomical instrumentation. In addition, SAAO hosts the IAU Office of Astronomy for Development and is committed to promoting astronomy to the public, especially previously disadvantaged groups.</p> <p>Requirements: Ph.D. in astronomy, record of high quality international research which connects with SAAO research interests, commensurate with Tier level. The ideal candidate would expand these research areas, and make use of National Facilities such as SALT.</p> <p><b>Contact person:</b> Prof Ted Williams  <b>Email address:</b> <a href="mailto:williams@saa0.ac.za">williams@saa0.ac.za</a></p>	

National Research Facility	Maximum number of Research Chairs that may be awarded
South African Environmental Observation Network (SAEON)	1
<p data-bbox="248 413 1427 449"><b>Proposed name of SARChI Chair: Integrated Ecological Economic Modelling</b></p> <p data-bbox="743 499 922 535" style="text-align: center;"><b>Description</b></p> <p data-bbox="248 585 1427 842">The South African Environmental Observation Network's (SAEON) mandate from the South African Government is to provide a comprehensive, sustained, coordinated and responsive South African environmental observation network that delivers long-term reliable data for scientific research and informs decision-making; for a knowledge society and improved quality of life.</p> <p data-bbox="248 915 1427 1226">The network has been manifested as a cohort of scientific staff operating and maintaining environmental research infrastructures for distributed observations across the main terrestrial, freshwater, coastal and oceanic systems of importance to the South African economy. Physical and automated <i>in situ</i> observations are made from 3000m above sea level in the Drakensberg to 4000m below sea level in the centre of the Agulhas Current.</p> <p data-bbox="248 1299 1427 1665">A data management system ensures open online access to public-funded data and has been further developed as government policy development tools such as the South African Risk and Vulnerability Atlas and the South African Bio-Energy Atlas. The Minister of Science and Technology has recently appointed SAEON to host additional research infrastructures for terrestrial, freshwater and coastal systems. These additions will produce large amounts of new data, some of which will be of a social-ecological nature.</p> <p data-bbox="248 1738 1427 1829">Given the current and future availability of ecosystem ecological and social-ecological data, this Chair is mandated to advance environmental futures research</p>	

through the qualitative and quantitative analysis and modelling of large-scale environmental socio-economic frameworks and data across SAEON domains and nodes, and through which national environmental policy and management can be informed.

The research chair is expected to pursue the following:

- Identification of gaps in the knowledge bases pertaining to ecosystems ecology and human-nature interactions.
- Large-scale interdisciplinary scenario development in conjunction with domain specialists.
- Transdisciplinary research in which stakeholders help to identify the research questions and modelling frameworks.
- Data analysis and model-based assessments of environmental and socio-economic impacts of drivers and pressures on ecosystems including extreme events, slow directional changes, environmental management practices and government policies or the lack thereof.
- Socio-economic and political valuation of ecosystems and services.
- Risk and vulnerability modelling and assessment.
- Supervision of postgraduate students and-postdoctoral research.
- Interlocution with key stakeholders to inform environmental management plans and options for policy-makers.
- Transformation and normalisation of the research community.
- Broad-based science engagement.

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National Research Facility	Maximum number of Research Chairs that may be awarded
South African Institute for Aquatic Biodiversity (SAIAB)	1
<p data-bbox="269 413 1406 449"><b>Proposed name of SARChI Chair: Inland Fisheries and Freshwater Ecology</b></p> <p data-bbox="748 522 927 558" style="text-align: center;"><b>Description</b></p> <p data-bbox="250 577 1427 1108">The South African Institute for Aquatic Biodiversity (SAIAB) has an overall strategic theme <b><i>“To explore and sustain African aquatic biodiversity”</i></b>. The emphasis by individual researchers will depend on the particular project and may be focused at the intra-specific (genetic), species or systems level, or a combination of different levels. Programmes address national research and information priorities and interdisciplinary and multidisciplinary studies are encouraged. In addition, inter-institutional collaboration and partnerships are promoted, with education and training components being a high priority. Fortunately SAIAB is in an excellent position to combine both sustainable environment and global change issues into its research and education agenda, thereby addressing both NRF and DST priorities.</p> <p data-bbox="250 1182 1427 1272">The research chair is expected to complement and strengthen SAIAB’s contribution to biodiversity conservation further by:</p> <ul data-bbox="306 1293 1427 1629" style="list-style-type: none"> <li>• Developing research directed at better understanding the biological, ecological and social aspects of freshwater fisheries to inform ecologically, economically and socially sustainable fisheries resource utilisation.</li> <li>• Better understanding of the trade-off between socio-economic and food security benefits linked to alien fish introductions for fisheries, the risk of invasions, and subsequent ecological consequences.</li> <li>• Developing capacity in inland fisheries ecology by training a cadre of young scientists in inland fisheries ecology, conservation and management.</li> </ul> <p data-bbox="250 1709 1427 1799">In this way, it is envisaged that the SAIAB will be in a position to undertake higher order science that will lead to a greater impact, as evidenced by;</p>	

- an increased understanding of freshwater fish populations and the ecosystems within which they exist, which in turn will lead to
- an enhanced capability to safeguard the future of freshwater fishes and fisheries which are essential to sustaining the societal services that they provide.

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### 2.3. Application, Review and Selection Process

The Research Chair will be awarded in an open and competitive process. The application must include, (i) *the motivation by the National Research Facility to host the Research Chair* (ii) *the suitability of a candidate for appointment to the Chair position*; (iii) *a research and activity plan drafted by the approved candidate.*

Each National Research Facility will be permitted to allow applications of up to three candidates, who must each submit a separate full proposal. The proposal must be led by the National Research Facility with technical aspects authored by each candidate nominated and approved by the National Research Facility to submit a proposal for a SARChI Chair described by the National Research Facility.

**Therefore, interested established researcher(s) meeting the minimum requirements stated in Table 1 and Table 2 respectively, should contact the relevant National Research Facility by the 6<sup>th</sup> February 2017 to enter into discussions about a possible submission. Contact details of Managing Directors of the respective National Research Facilities are provided in Table 2 at the end of the description for each proposed Chair.**

The application should give details on:

- (i) The readiness and commitment of the National Research Facility to provide an enabling environment to ensure the success of the Research Chair;

- (ii) Strengths, capabilities, strategic environment and competencies of the National Research Facility;
- (iii) The alignment of the proposed Research Chair with the proposed thematic area and the research strategy of the National Research Facility;
- (iv) The potential of the proposed Research Chair to enhance the international research and/or innovation competitiveness within the discipline;
- (v) The potential of the research to impact on transformation, the social and/or economic development of the country;
- (vi) The research focus of the Research Chair;
- (vii) A proposed plan on how the Research Chair will fulfill SARChI objectives, including the strategic considerations mentioned in the proposal; and how it will deliver on research strategy of the National Research Facility; and
- (viii) Specific objectives, outputs and outcomes for the five-year period.

The approved candidate(s) must use the NRF Online Submission System (<https://nrfsubmission.nrf.ac.za/nrfmkii/>) to register (if not already registered) and complete/update his/her *curriculum vitae* and complete the application.

As awards of SARChI Research Chairs are to be made to the host National Research Facilities, the application by the approved candidate has to be supported through the electronic application process. The National Research Facility must undertake the support of the application on the online application. Each National Research Facility must submit the following documentation to be considered as a host for Research Chair, through the online application:

- Research Strategy of the National Research Facility;
- Programme and Qualification Mix (PQM) approved by the Department of Higher Education and Training for universities where the Masters and PhD students are going to be registered;
- Details of current academic and research staff of the National Research Facility in the specific discipline; and

- Statistics on National Research Facility research outputs and postgraduate students (Masters and PhD) trained and graduated for the period 2012 to 2016, in the specific discipline.

## **2.4. Selection Criteria**

### **2.4.1. Application to Host the Research Chair by National Research Facility**

The selection of the applications will be based on (i) the readiness and suitability of the National Research Facility to host the proposed Research Chair, (ii) the strategic alignment of the proposed Research Chair, (iii) the motivation by the National Research Facility to host the Research Chair; (iv) the nomination of a candidate for appointment to the Chair position; (v) a research and activity plan drafted by the nominated candidate.

The application must therefore demonstrate the following:

- Alignment of the proposed Research Chair with the National Research Facility research strategy and PQM of universities where Masters and PhD students will be registered;
- Alignment of the proposed Research Chair's focus with that of existing research activities or capacity;
- National Research Facility commitment for creating an enabling environment with regard to:
  - Office and/or laboratory space.
  - Infrastructure (equipment, IT facilities, etc.);
  - Academic support (information, resource facilities and related research groups);
  - Management and leadership; and
  - Financial support (direct and indirect);
- Reporting lines and location of the Research Chair within the National Research Facility structure.



The selection of candidates will be based on the merits of each candidate's full research proposal. This will include the strength of the candidate's profile, including her/his qualifications and experience, publications in the discipline of the Research Chair and postgraduate student supervision track records. This will also include an assessment of the candidate's research and activity plan in respect of its ability to deliver on SARChI objectives, as well as a proposed budget (see Section 3.3. of this document for Funding Levels).

The full proposal must also give specific details on:

- Proposed teaching/administration to research time ratio;
- Research objectives for the five year period;
- Expected knowledge<sup>1</sup> outputs in the first five year period;
- Expected human capital<sup>2</sup> outputs in the first five year period; and
- Existing and planned collaborations in the first five-year period.

### **3. Management of the Research Chairs**

This section of the Framework and Funding Guide for Applications describes what follows after the Research Chair has been awarded to the National Research Facility.

#### **3.1. Duration of the Research Chair**

Tier 1 Research Chairs will be tenable for five years, renewable for two further five-year periods giving a total lifespan of 15 years, subject to satisfactory performance by the Chair following each five year in-depth review. Eligibility for renewal will be entirely performance-linked.

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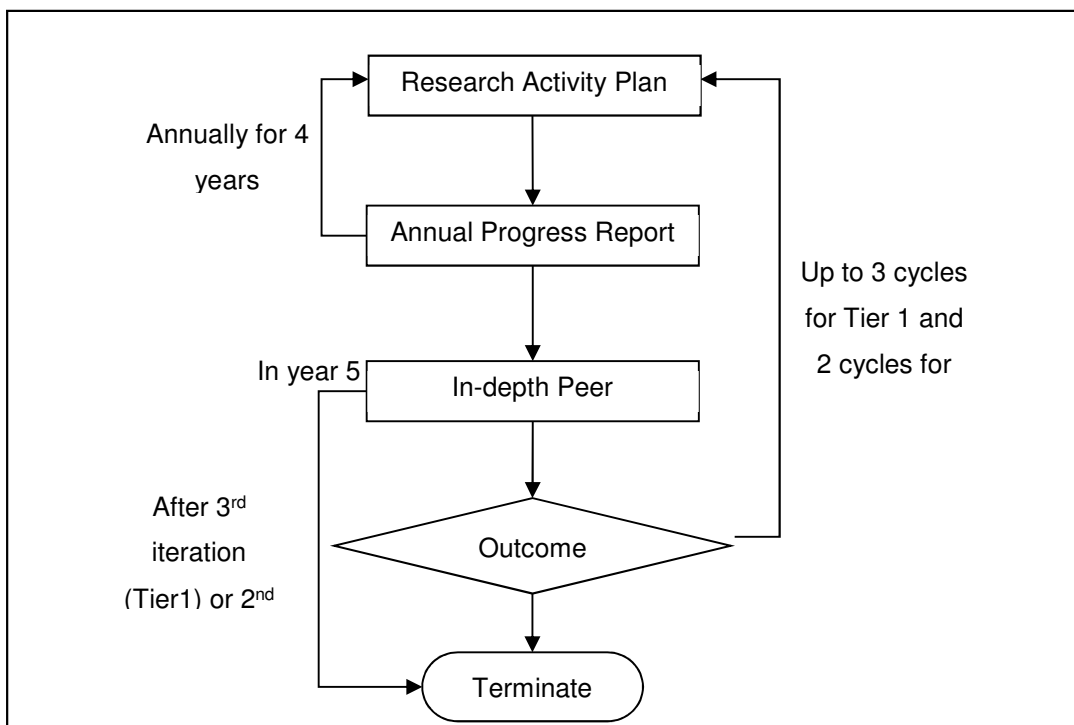
<sup>1</sup> Peer-reviewed journal articles, peer-reviewed conference proceedings, scholarly books and book chapters, patents, invited keynote presentations, conference presentations etc.

<sup>2</sup> Numbers of Masters and Doctoral graduates and completed postdoctoral fellowships.

### 3.2. Management of Research Chairs

The management of SARChI grants is described below and illustrated (Figure 1). On accepting the award and signing the *Conditions of Grant*, the newly appointed incumbent of the Research Chair will be required to deliver on the research activity plan that formed part of the accepted full proposal. At the end of each financial year the incumbent will be required to submit to the National Research Foundation an Annual Progress Report (APR) addressing the milestones and expected outcomes as presented in the research activity plan in the application.

During year five, of the five-year funding cycle, the Research Chair will be subjected to an in-depth evaluation undertaken by peers following the framework set out in the *SARChI Monitoring and Evaluation Framework*.



**Figure 1:** Management of Research Chairs over the tenure of the Research Chair

### 3.3. Funding Levels

SARChI proposes to make an initial award of up to R2 680 000 per annum for Tier 1. This award will cover salaries<sup>3</sup>, postdoctoral fellowships and bursaries for postgraduate students, research operating costs, research equipment and infrastructure and host institution overheads. The guidelines for apportioning of the grant across these categories and the values of fellowships and scholarships are shown in Table 2.

**Table 3:** Guidelines for SARChI annual budget breakdown for Tier 1 allocated Research Chairs

Budget category	Sub-item	Cost pa (ZAR)	Minimum number of people	Maximum number of people
Salaries	Chair	700 000 (Tier 1)	1	1
	Admin support	30 000	0	1
	Research assistants (per person)	30 000	0	3
Fellowships	Postdoctoral fellows (per person awarded pro rata)	200 000	1	Variable
Bursaries	Doctoral (full time)	100 000	2	Variable
	Masters (full time)	70 000	2	Variable
	Honours	40 000	4	4

<sup>3</sup> Salaries of the incumbent and limited administrative support

Research equipment or infrastructure	Variable	Up to R400 000	Not applicable	Not applicable
Running	Variable	Up to 30% of total budget	Not applicable	Not applicable
Overheads	Variable	Up to 10% of total budget	Not applicable	Not applicable

It is important to note that this budget template provides a guide that stipulates the minimum and maximum amounts per budget category and has the flexibility for the Chair to allocate the SARChI grant based on the research activity plan. The proposed budget will be approved at the commencement of each five-year funding cycle. The incumbent will be given an opportunity, at the end of each calendar year, to make budget adjustments for the subsequent year in consultation with the Research Chairs and Centres of Excellence Directorate of the NRF.

Tier 1 Chairs will not be eligible for additional National Research Facility parliamentary core grant funding, except in respect of Rated Researchers Incentive Funding. Incumbents must apply for grants for large equipment through the National Research Facility Infrastructure Funding Instrument.

However, Tier 2 Chairs may apply for National Research Foundation grants as outlined in the Multiple Grants Eligibility Overview (<http://www.nrf.ac.za/document/multiple-grants-eligibility-overview-july-2015>)

Chairs are expected to dedicate at least 80% of their time conducting research and supervising an average of 10 Masters and Doctoral students per annum. The Chairs are therefore strongly encouraged to attract additional funding for research and human capital development from other national and international funders and donors to supplement the SARChI grant.

### 3.4. Payment of Grants

The operational value of the grant for year 1 of 5 for the awarded Research Chair will be released to the host institution upon receipt of the signed '*Conditions of Grant*' and paid upon the release of funds. Student funding will be made available to successful nominated postgraduate students and postdoctoral fellows. Grants will thereafter be disbursed to the National Research Facilities on an annual basis, for the approved funding period, subject to the appointed Chair meeting the '*Conditions of Grant*' and submitting an APR.

### 3.5. Evaluation and Impact of Research Chairs

A baseline study of Research Chairs, their institutional and intellectual environments will be conducted with each round of new awards. These studies, together with the Strategic Research Plans and the Research Chair's research and activity plan, will serve as the baseline to evaluate impact on the discipline and at the institutional level.

### 3.6. Call Timelines

The key activities and timelines, to ensure effective implementation by the National Research Foundation and the universities, are outlined below (Table 4).

**Table 4:** Call activities and timelines for SARChI Chairs for National Research Facilities

Activities	Timelines
1. Communication and briefing sessions with the National Research Facility.	November 2016
2. Pre-call and advert sent out by the respective National Research Facilities.	December 2016
3. Call officially opens on the National Research Foundation online system.	24 <sup>th</sup> January 2017
4. Interested researchers meeting the minimum requirements are required to contact respective National Research Facilities to discuss a possible submission by the 31 <sup>st</sup> January 2017.	6 <sup>th</sup> February 2017
5. Call closes for applications	7 <sup>th</sup> March 2017
6. Panel review meetings	April 2017
7. Review outcome letter sent to National Research Facility	April 2017
8. Feedback letter sent to National Research Facility	April 2017

## 4. References

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## 5. NRF Contact Persons

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