

The SA-ESRF-2019 Conference 11-13 November 2019 : Johannesburg

Introduction

This SA-ESRF-2019 meeting builds on more than a decade of deep commitment to develop the ESRF User Base in South Africa. The broadness of the current user base already reflects the global nature of science and the ESRF as a leading international facility. The SA-ESRF relationship forms part of a wider context of the full Light Source User Base of South Africa, which accessed many Light Sources available around the world. The ESRF had been selected by the SA Community for Scientific Associateship as it was an International Facility, which has some premier and unique features, and which is especially heavily used by South Africa, to a level comparable to other smaller European nations. It also plays the role of supplying central innovation for other Light Sources, and extended capacity for special training as its staff complement is about a factor of two more than for other light sources. All light sources accessed by South Africans remain important to our User Base, either because of a niche competence, special collaborative networks, or efficiencies of access.



Address by Dr Daniel Adams of the DSI to the SA-ESRF-2019 Conference.



Address by Dr Clifford Nxomani of the NRF and the ESRF Prof Francesco Sette

In the meeting, delegates explored the enhanced capacity of the ESRF following the upgrade of the ESRF to an Extremely Brilliant Source (EBS). The ESRF was represented by the top leadership, including the Director Dr Francesco Sette, the two Research Directors: Harald Reichert (Physical Sciences) and Jean Susini (Life Science), as well as four leading beamline scientists. The latter represented all major areas of research for South Africa: Paleontology,

Structural Biology and Materials Science. The ESRF-EBS represents an impressive increase in the performance of both the source and the detectors: 100 fold improved emittance and 10 to 1000 times better detector performance depending on the context. In addition to dramatic enhancement the usual spectroscopies and imaging techniques, novel techniques and opportunities emerge. The dramatic improvement and novelty analytical and imaging modalities means there is not really an established user-experience yet and so the exploitation of the new capacity requires partnerships with beamline scientists. This meeting extended the possibility for all SA Users and also potential new users to grow their connections with the ESRF or launch new ones. This should lead to the development of proposals ready for March 2020.

Growth of Light Source Science in SA

The meeting noted the increased number of projects and organisations involved in operating and growing the SA Light Source user community. For example, there were also talks from AfCA (also including IUCr and PCCR), the START program, ANSDAC, ASNAEM, LAAAMP and also the neutron related complementary techniques at Necsa. The delegates have a shared intention of working together in a common coherent vision, not only for South Africa, but also for Africa (training, impactful science, science for development, amongst other outcomes). All programmes and projects were stakeholders and could work together coherently avoiding silos, and build the common vision of growing the User Base in South Africa, with training, mobility and shared local infrastructure.

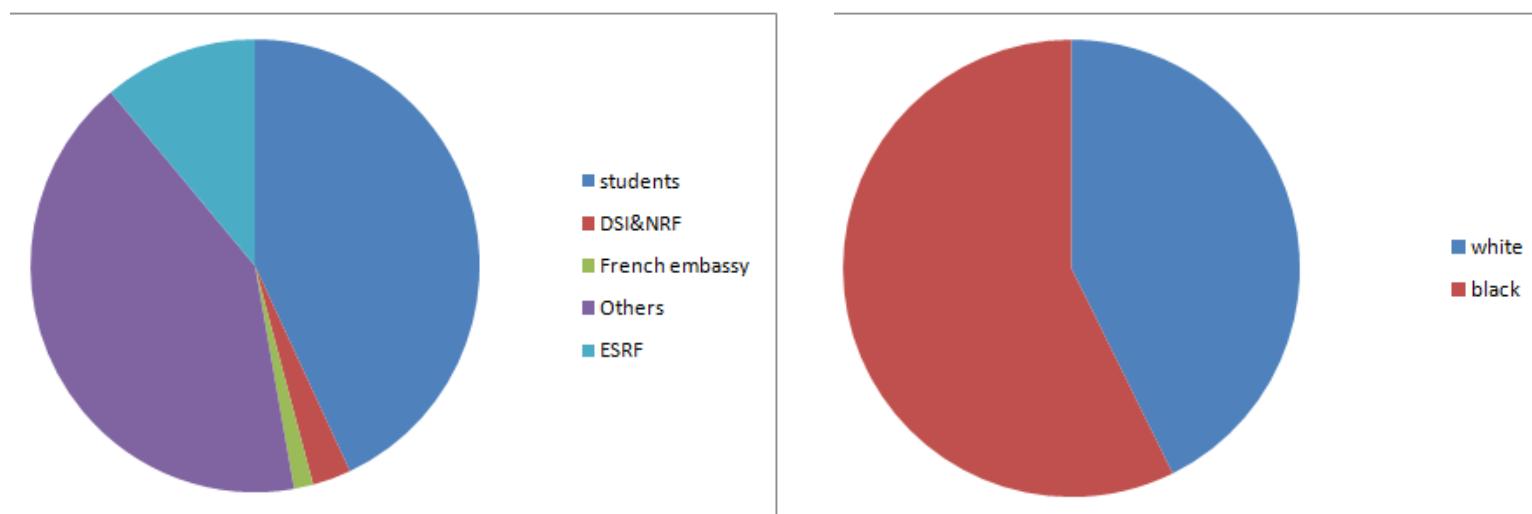


Delegates attending the SA-ESRF-2019 Conference

The ESRF in particular were committed to the concept of coherence and inclusivity of stakeholders. The coherence of the South African Community had suffered in the last decade because of the failure of the NRF to provide regular support for the Science@Synchrotrons biennial conference since 2011 and also to not respond to the SAILS Proposal (which was planned to replace the SRRIC). The DSI and NRF meanwhile supported comprehensively

other similar programmes, such as the SA-CERN, JINR, NitheP and NRF-Centre programmes amongst others. The self-organised interdisciplinary community of Light Source Users are not actually supported as a coherent programme, as was requested in the SAILS proposal. The SA-ESRF Scientific Associateship and the special KIC-Synchrotron mobility grant for access, which is very valuable, needed to have been supplemented with a funded structure and a regular meeting in order to fully extract the value, audit it and grow the community coherently. This is why in the meantime partial silos have developed, and the coherence of the community has been somewhat lost.

The SRRIC or SAILS (or SA Light Source user community) are a volunteer management group who are under-resourced to grow coherently, develop joint proposals, provide training and audit and comment on their performance. It is possible that they represent one of the most valuable academic communities in South Africa, given their self-organised interdisciplinary nature that encourages training and usage of large scale research infrastructures at a level rivalling that of CERN, or global scale astronomy projects. Synchrotrons are more interdisciplinary and more directly focused on research issues that are deeply relevant to South Africa (and the whole of Africa), the well-being of the South African voter and South African industry.

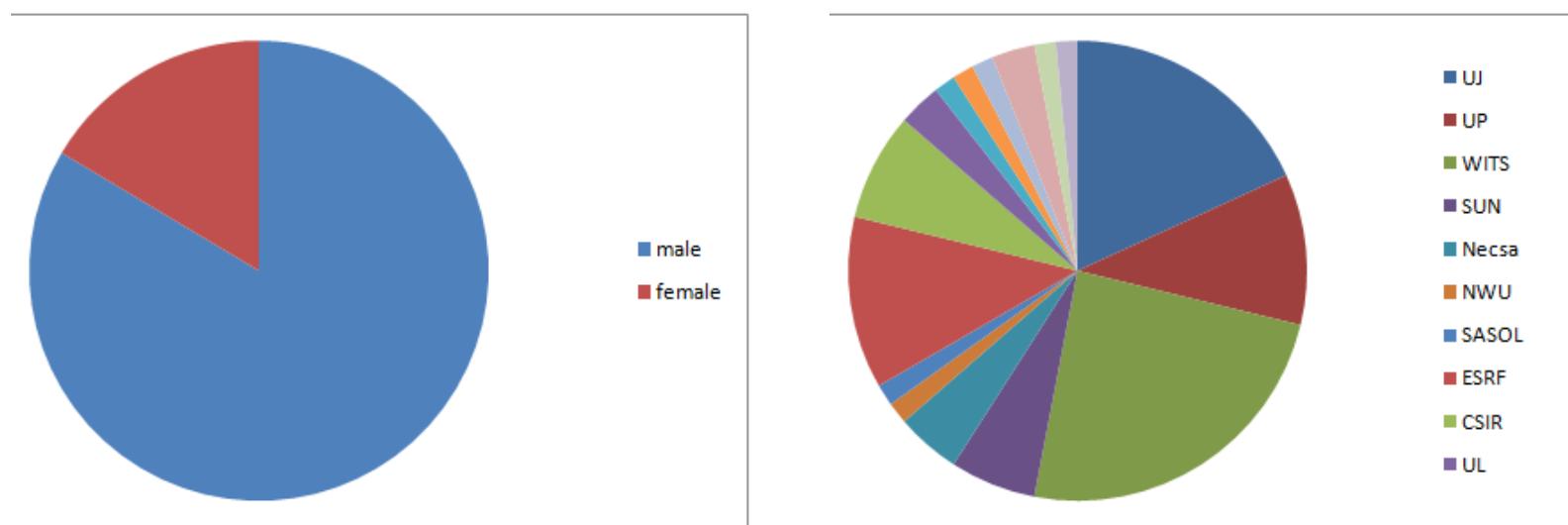


Delegate Composition

The meeting was organised at very short notice. Yet it still managed to draw delegates with a wide footprint around South Africa, and especially, many student delegates. All of this despite a shortage of funds and time to attract such delegates. Delegates clearly saw it as critical to meet as a User Group and to work towards their common needs and visions. They were further enthused about learning about new science and analyses that will be possible at the ESRF-EBS. A third aspect was to hear about the progress of colleagues around the country. The meeting resolved to develop leadership in the youth, and to provide as many opportunities as possible for the students and emerging researchers to conduct both short term and longer term (deep training) visits light sources abroad.

A total of ~82 delegates from 11 institutions attended the meeting. This included students, post-docs, synchrotron users (new and old), government officials, the ESRF delegation as well

as French scientific attaché. A breakdown in terms of the institutions represented and gender is shown below:



Scope of Presentations

The ESRF delegation presented talks on the increased performance of both the source and the beamline instrumentation. This was done under the headings of Instrumentation, Biosciences, Heritage sciences and Materials sciences. The last category was a catchall for chemistry, the environment, nanoscience, new materials, energy materials, minerals science and so on. This set of talks was rounded off with a clinic on how to submit proposals. Each themed talk from the ESRF delegation was matched with a review level status talk for the same theme by a South African scientists. This enabled the delegates to get an overview of how South African scientists could take advantage of the new enhanced ESRF-EBS. It also covered the state of the feeder infrastructure in SA and the level of internal organization of the various scientific communities. Overall, the South African picture is very promising and indicates the health and maturity South Africa as experienced Users of Light Sources. There was a very strong contingent of students and early career researchers. This indicates the possibility of growth. The footprint of the South African representation was very broad and many Universities and research centers were covered (12). Details of the talks can be downloaded for information and further study from the website. The Book of Abstracts is also available at the Website.

Outcomes and recommendations

1. The meeting agreed to establish and operate within a single unifying management structure that would be called SAILS.
2. SAILS would seek funding support from multiple sources. The meeting recognised that it made most sense for the NRF and DSI to understand their role to support this group.
3. The importance of the shared local research infrastructure both as fully fledged research infrastructure and also as feeder research infrastructure was well established. This was reaffirmed at the meeting.
4. The meeting resolved to use its combined efforts to push for the development and renewal of the shared local research infrastructure.

Abbreviations

AfCA	-	African Crystallography Association
IUCr	-	International Union of Crystallography
PCCR	-	Pan African Conference on Crystallography
START	-	Synchrotron techniques for African Research and Technology
ANSDAC	-	African Neutron and Synchrotron Data Analysis Competency
ASNAEM	-	African Synchrotron Network for Advanced Energy Materials
LAAAMP	-	Light Sources for Africa, Americas, Asia and Middle East Project
SRRIC	-	Synchrotron Research Roadmap Implementation Committee
SAILS	-	South African Institute for Light Source based sciences
UJ	-	University of Johannesburg
UP	-	University of Pretoria
WITS	-	University of Witwatersrand
SUN	-	Stellenbosch University
NECSA	-	Nuclear Energy Corporation of South Africa
NWU	-	North West University
ESRF	-	European Synchrotron Radiation Facility
UL	-	University of Limpopo
NRF	-	National Research Foundation
DSI	-	Department of Science and Innovation
UCT	-	University of Cape Town
UZ	-	University of Zululand
CSIR	-	Council for Scientific and Industrial Research

