



The Africa Light Source Foundation

Towards a Lightsource for the African Continent



The AfLS

On behalf of AfLS Exec

1. Brief update
2. CDR
3. LoS, MoU
4. IAC
5. Countries supporting
6. Regional Centres
7. Partners
8. Linkages to LSs

World Scientific
Connecting Great Minds


Subject Journals Books E-Products Partner With

Cookies Notification
We use cookies on this site to enhance your user experience. By the use of our cookies. [Learn More](#) [I Agree](#)

Modern Physics Letters A | Vol. 33, No. 09, 1830003 (2018)
| Brief Review [No Access](#)

Synchrotron light sources in developing countries
Sekazi K. Mtingwa and Herman Winick

<https://www.worldscientific.com/doi/abs/10.1142/S0217732318300033>

 The African Review of Physics (2018) 13: 0019
Proceedings of the first African Conference on Fundamental Physics and Applications 2018, Namibia.
Guest Editors: K. A. Assamagan, M. Backes, D. Charlton, S. Muanza, D. Sahu, and D. Singh

The African Light Source Project

<http://lamp.ictp.it/index.php/aphysrev/article/view/1610/586>

Useful Websites

- AfLS Website <http://africanlightsource.org>
- AfLS3 2021 <https://events.saip.org.za/e/AFLS3>

BIOPHYSICAL REVIEWS

Biophysical Reviews
pp 1-9 | [Cite as](#)

Towards an African Light Source

Authors [Authors and affiliations](#)

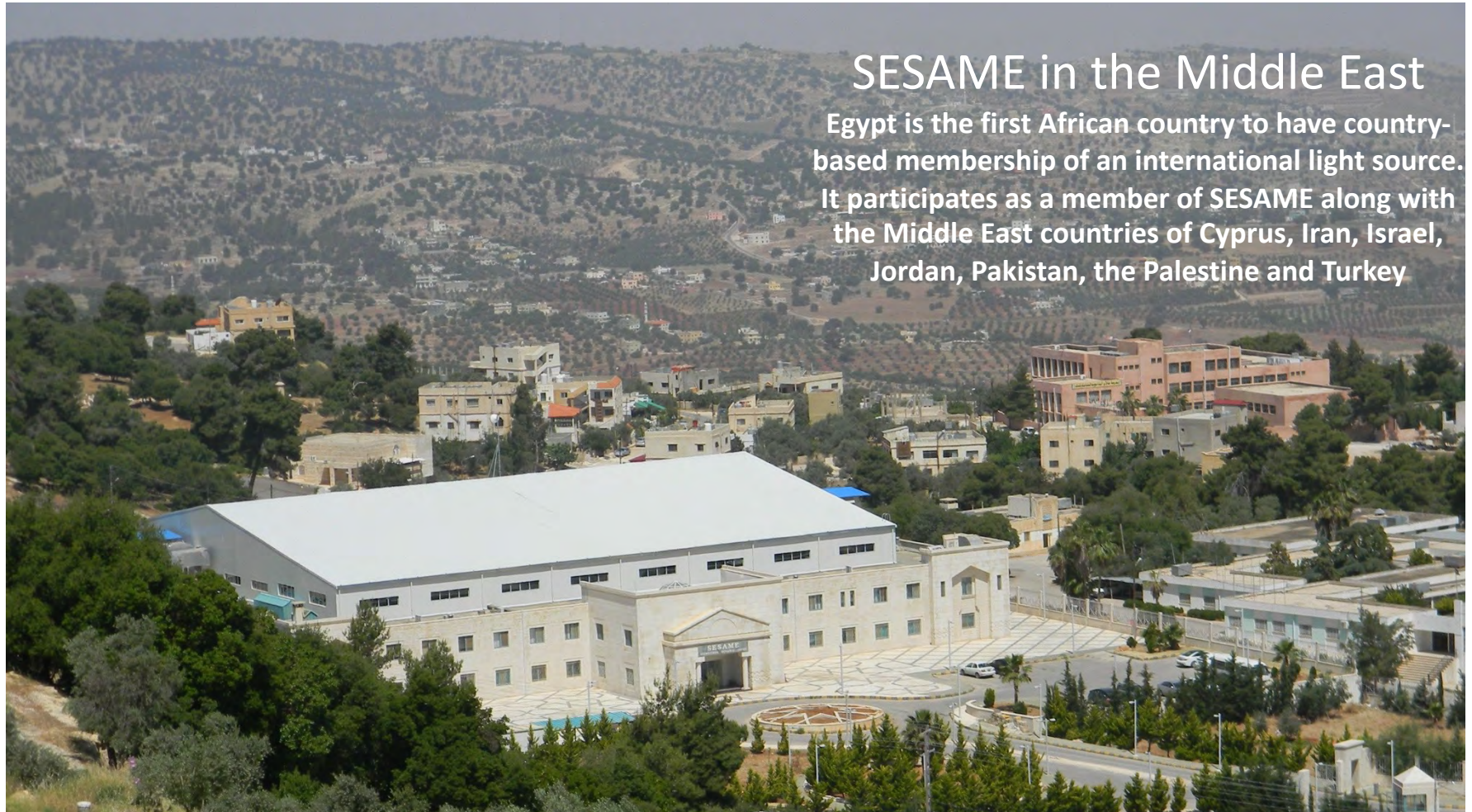


The Africa Light Source Foundation

Towards a Lightsource for the African Continent



What is a synchrotron





The Africa Light Source Foundation

Towards a Lightsource for the African Continent



What is a synchrotron





The Africa Light Source Foundation

Towards a Lightsource for the African Continent



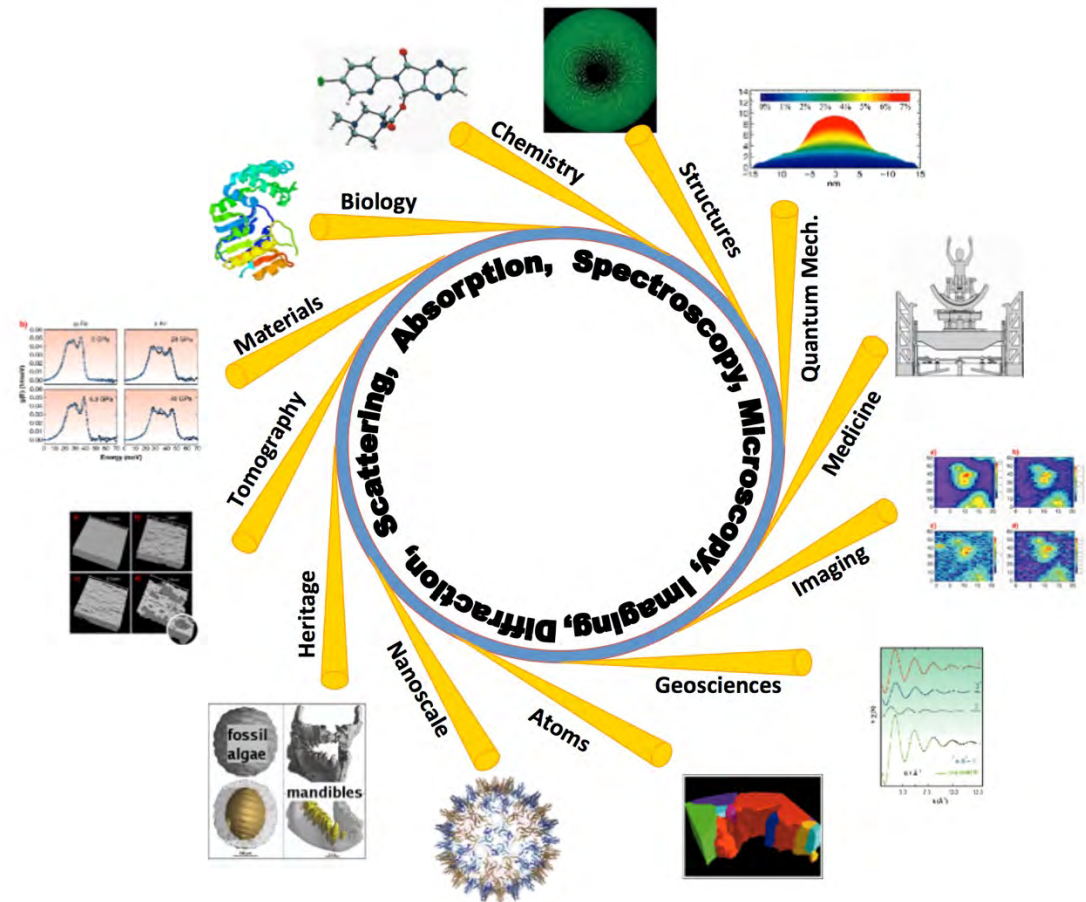
What is a synchrotron

Some examples of Science with Synchrotrons

Multidisciplinary

- Research
- Technology
- Industry

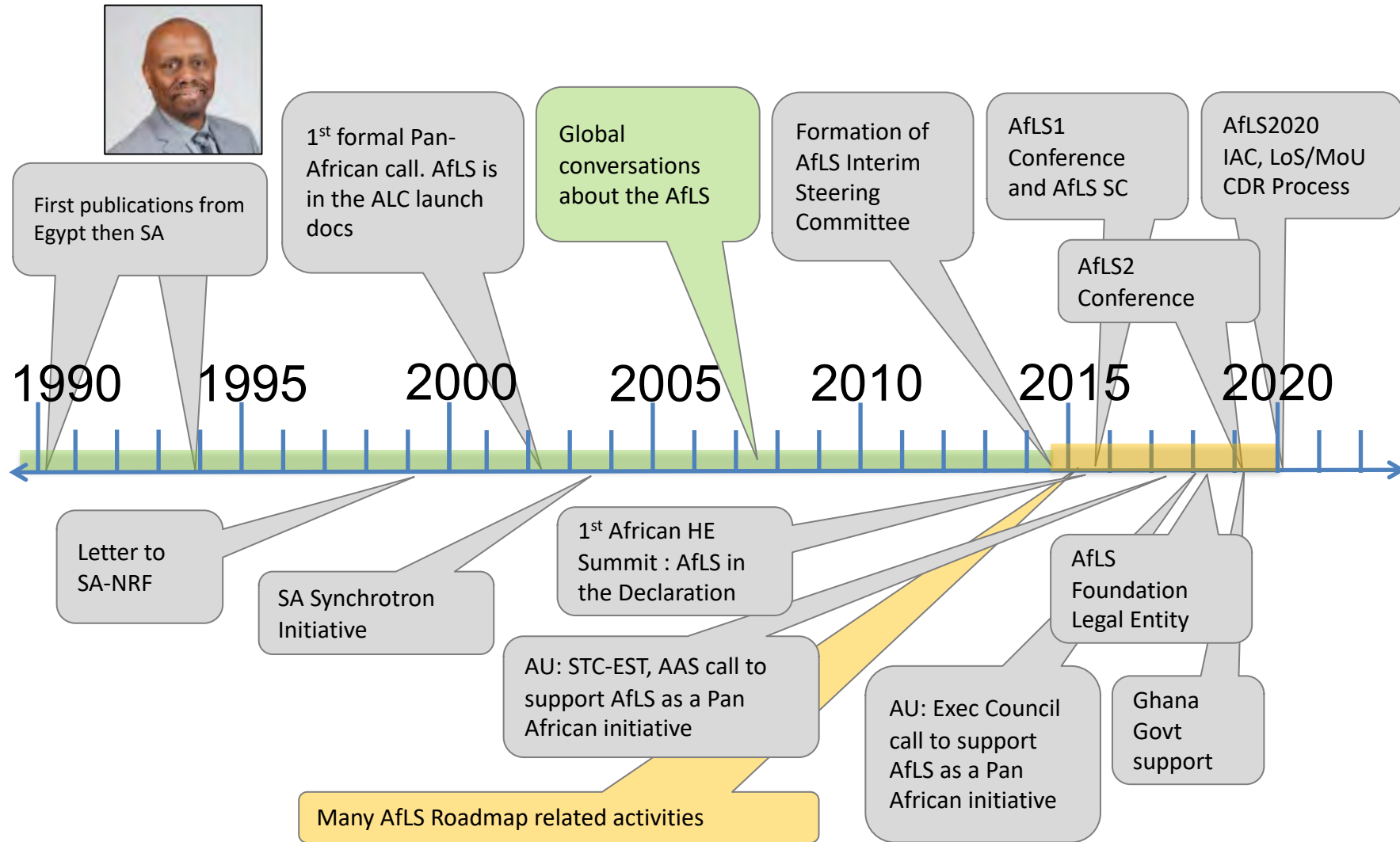
* Credit inferred from each slide





The Africa Light Source Foundation

Towards a Lightsource for the African Continent





The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Roadmap : AfLS Conference 2016

<http://events.saip.org.za/conferenceDisplay.py/getPic?picId=66&confId=61>

1. Promote human capacity development: scientists, engineers, technicians, students
2. African scientists access existing LSs
3. Develop African relationships with existing LSs.
4. Promote the involvement of industry
5. Communication structure for the African light source science community.
6. Promote outreach
7. Strategic approach to African Governments and similar (Pan) African orgs.
8. Support Conceptual Design Report (CDR)
9. Inter-African co-operation on Local / Regional feeder infrastructure
10. African multinational beamlines at existing LSs
11. Regional / Pan African membership of existing LSs
12. Technical Design Report (TDR)



The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Conceptual Design Review

CDR 4 Volumes

Volume I.

Scientific, Socio-Economic, Educational
and Political Benefits

Volume II.

Machine Design Concepts

Volume III.

Scientific Capabilities and Beamline
Technical Concepts

Volume IV.

Building Design and Infrastructure

Volume V.

Finance, Governance





The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Memoranda of Understanding

Advanced Light Source Facilities



Synchrotron-Light for Experimental Science and Applications in the Middle East (SESAME)

International Institutions / Organisations



Lightsources for Africa, the Americas, Asia and Middle East and the Pacific (LAAAMP)

Letters of Support

African Institutions / Organisations



African Crystallography Association Steering Committee (AfCA-SC), Africa



Ghana Academy of Arts and Sciences, Ghana



African Seismological Commission (AfSC), Africa



International Union of Geodesy and Geophysics (IUGG), Africa



Network of African Science Academies (NASAC), Africa



South African Institute of Physics (SAIP), South Africa



Ministry of Environment, Science, Technology & Innovation (MESTI), Ghana



Federation of African Medical Physics Organizations, FAMPO, Africa



Mbarara University of Science and Technology, Faculty of Science, Uganda



African Physical Society (AfPS)



BioStruct Africa, Africa



African Materials Research Society (AMRS), Africa

Advanced Light Source Facilities



Diamond Light Source, UK



Centre for Advanced Microstructures and Devices (CAMD) Louisiana State University, USA



European XFEL, Europe



Paul Scherrer Institute (PSI), Switzerland



Elettra Sincrotrone Trieste, Italy



European Organization for Nuclear Research (CERN)



The European Synchrotron Radiation Facility (ESRF)



MAX IV laboratory, Sweden



Synchrotron SOLEIL, France



National Synchrotron Light Source II (NSLS II), USA



Australian Synchrotron (ANSTO), Australia



Singapore Synchrotron Light Source NUS



National Synchrotron Radiation Research Center (NSRRRC), Taiwan

International Institutions / Organisations



International Center for Theoretical Physics (ICTP)



International Union of Pure and Applied Chemistry (IUPAC)



International Union of Pure and Applied Physics, (IUPAP)



International Union of Crystallography (IUCr)

External National Institutions / Organisations



The Cockcroft Institute of Accelerator Science and Technology, UK)



US Particle Accelerator School (USPAS), USA



National Society of Black Physicists (NSBP), USA



The Africa Light Source Foundation

Towards a Lightsource for the African Continent



International Advisory Committee

Dr Khotso Mokhele, INTERIM CHAIR Chancellor, University of the Free State (SA)	Prof Tom Blundell, Cambridge University (UK)	Dr Harry Westfahl Jr, Director of the Brazilian Light Source	Prof Caterina Biscari, Director ALBA Synchrotron (Spain) and Chair of LEAPS (Europe)
Prof Rolf Heuer, President of SESAME Council, former DG CERN	Prof Francesco Sette, Director General ESRF (France)	Prof Melissa Denecke, Director of the IAEA Division of Physical and Chemical Sciences	Prof Jim Gates, Brown Theoretical Physics Center Director and APS President Elect (USA)
Prof Mary Teuw Niane, former Minister of Science (Senegal)	Prof Hitoshi Abe, Synchrotron Radiation Science Div, KEK Light Source (Japan)	Dr Daniel Nvanganvura, Regional Director, ISC Regional Office for Africa	



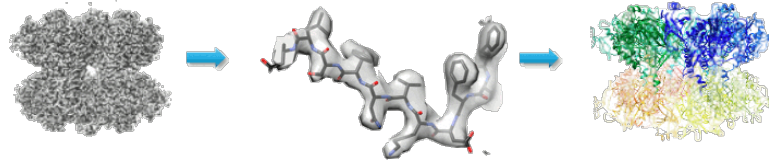


The Africa Light Source Foundation

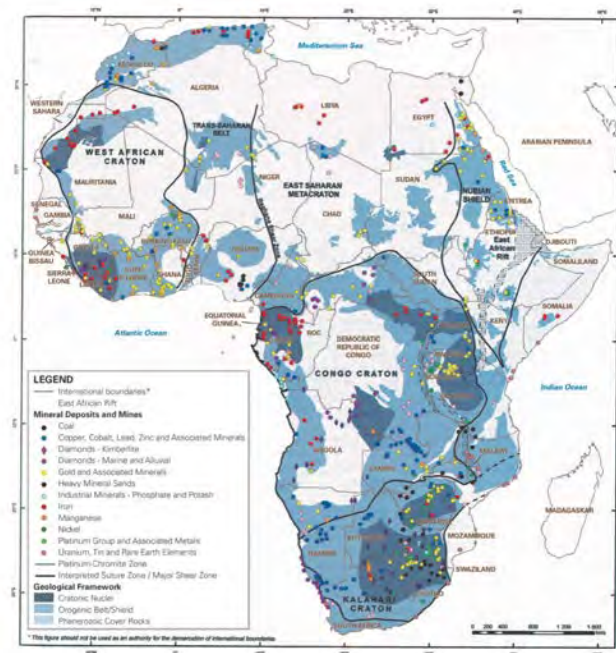
Towards a Lightsource for the African Continent



Global and Africa relevant Research and Innovation – by Africans and partners

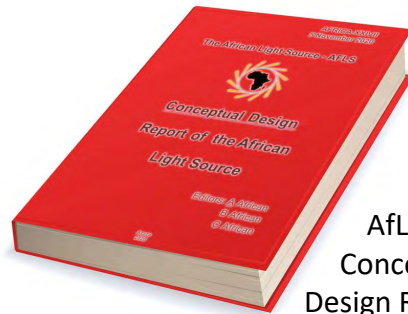


Developing medical interventions for Africa's disease burden, Malaria, HIV, TB, Ebola



Beneficiating Africa's mineral wealth: Mining Review Africa

African Cultural and Paleo Heritage



AfLS-CDR
Conceptual
Design Report



Energy Materials
Innovations

..... and much
more



The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Feeder Facilities

1. South Africa

- Aaron Klug Centre, UCT, [link](#),
U Witwatersrand, U Free State,
U Stellenbosch, iThemba

2. Benin, X-TechLab, Benin, [link](#)

3. Ghana, U Ghana, [link](#)

4. Côte d'Ivoire, LaCPM, Université Felix Houphouët Boigny, Abidjan, [link](#)

5. Senegal, Ziguinchor, [link](#)

6. Cameroon, Dschang, [link](#)

7. Kenya, Kenyatta University, [link](#)

8. Tunisia

- Monastir, [link](#), Nabuel, Tunisia, [link](#)

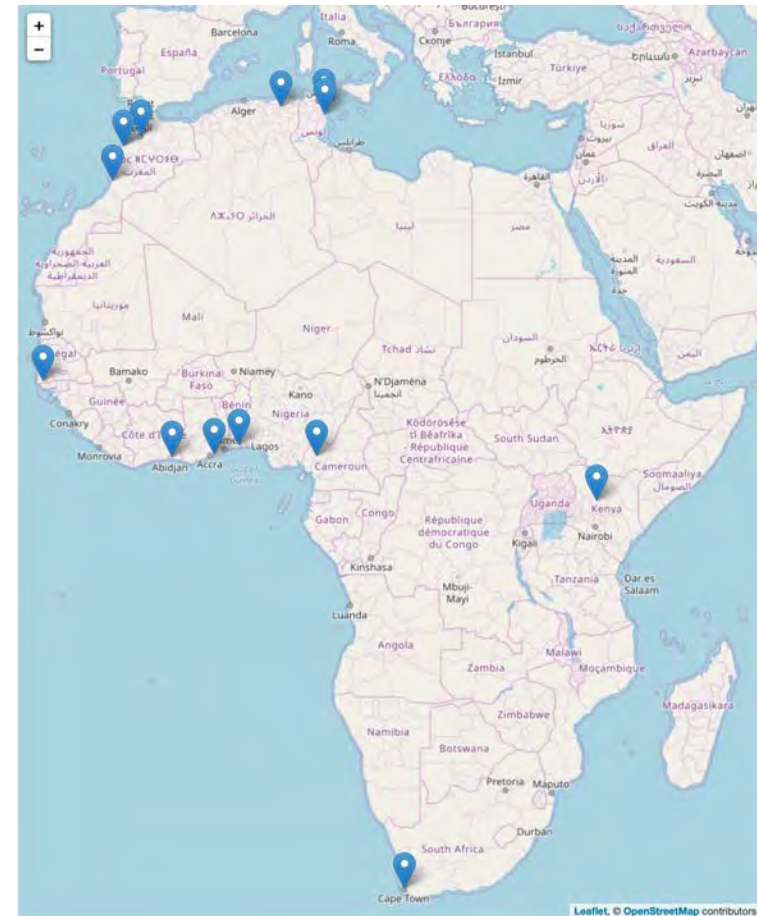
9. Algeria, Constantine 1, [link](#)

10. Morocco

- U Rabat,, [link](#), El Jadida, Morocco, [link](#),
Agidir, Morocco, [link](#)

Significant facilities

IUCr OpenLab venues with facilities





The Africa Light Source Foundation

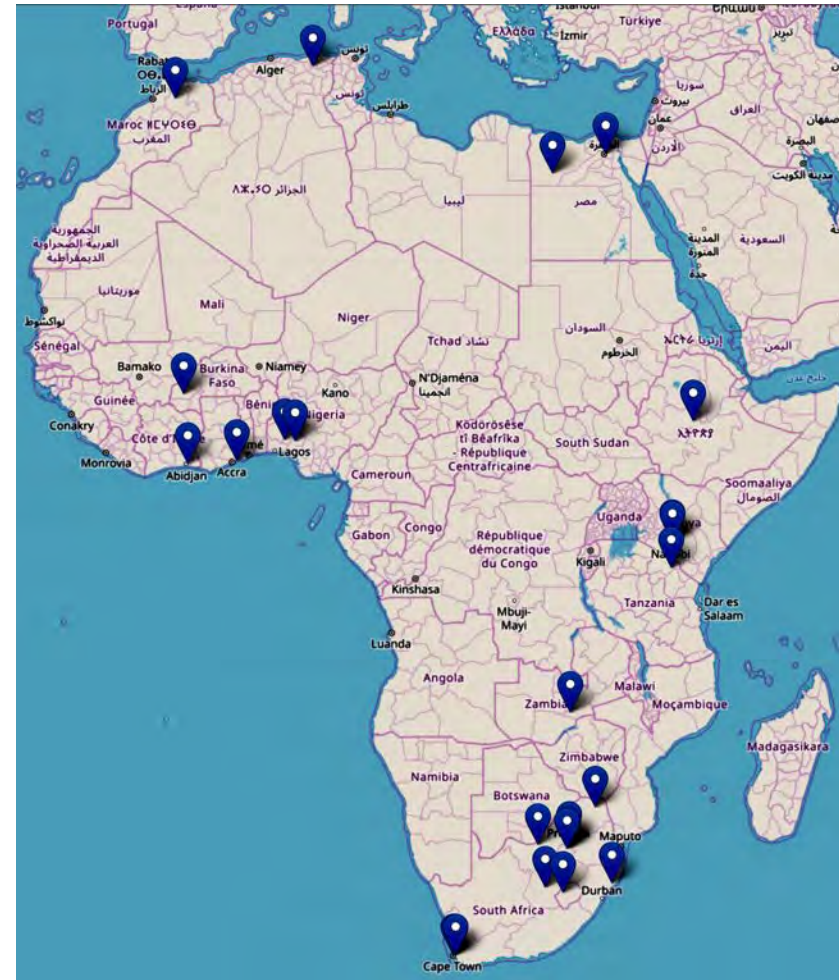
Towards a Lightsource for the African Continent



Bottom Up

Bio-Science Capacity in Africa

- Ghana**
University of Ghana
- Zambia**
The University of Zambia
- Algeria**
Ecole Nationale Polytechnique de Constantine
- Nigeria**
Federal University of Technology, Akure
University Ile-Ife
- Burkina Faso**
Institute of Research in Health Sciences, Burkina Faso
- Morocco**
University Sidi Mohamed Ben Abdellah
- Ivory Coast**
Universite Felix Houphouet Boigny
- Egypt**
Helwan University, Ain Shams University
- Lesotho**
National University of Lesotho
- Ethiopia**
Addis Ababa University





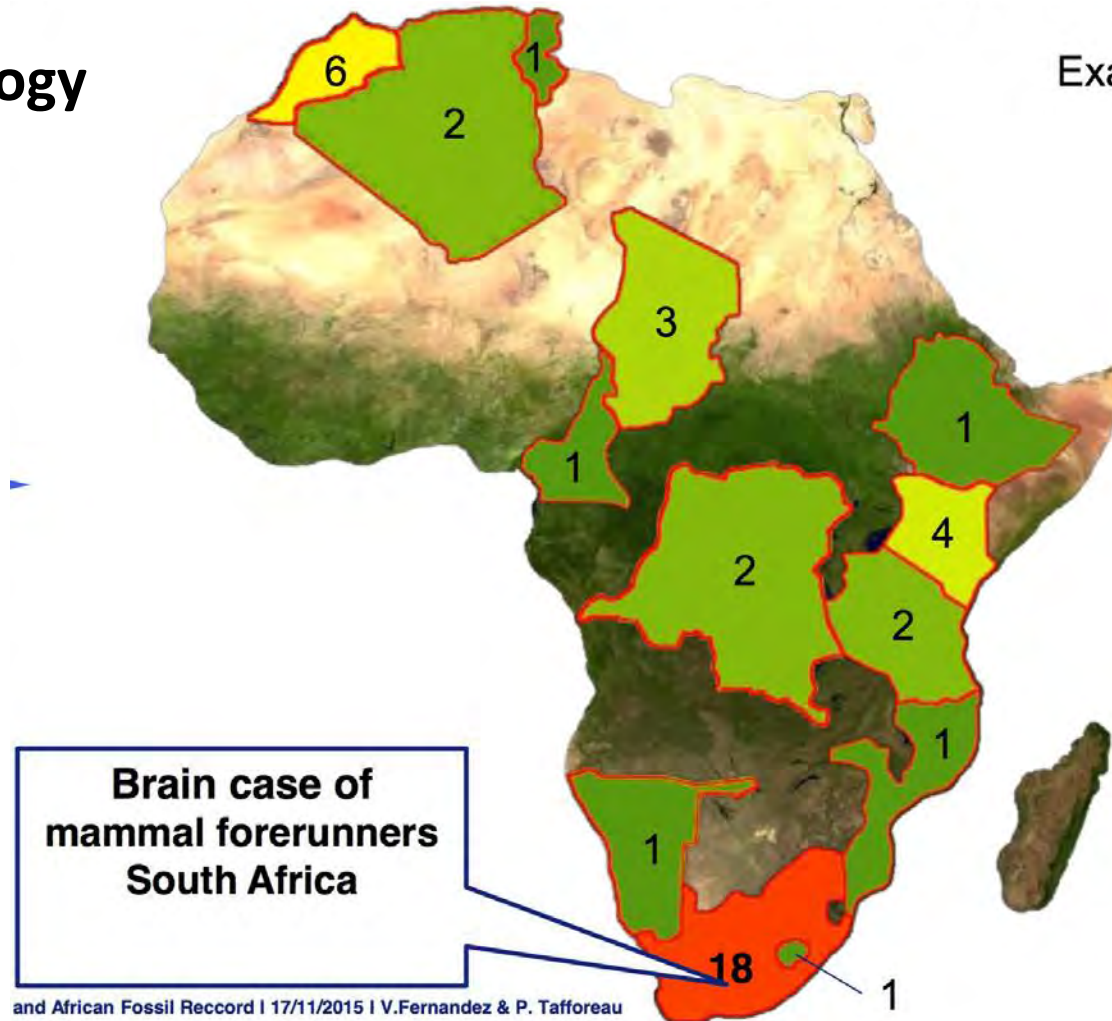
The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Palaeontology

Example of ongoing projects



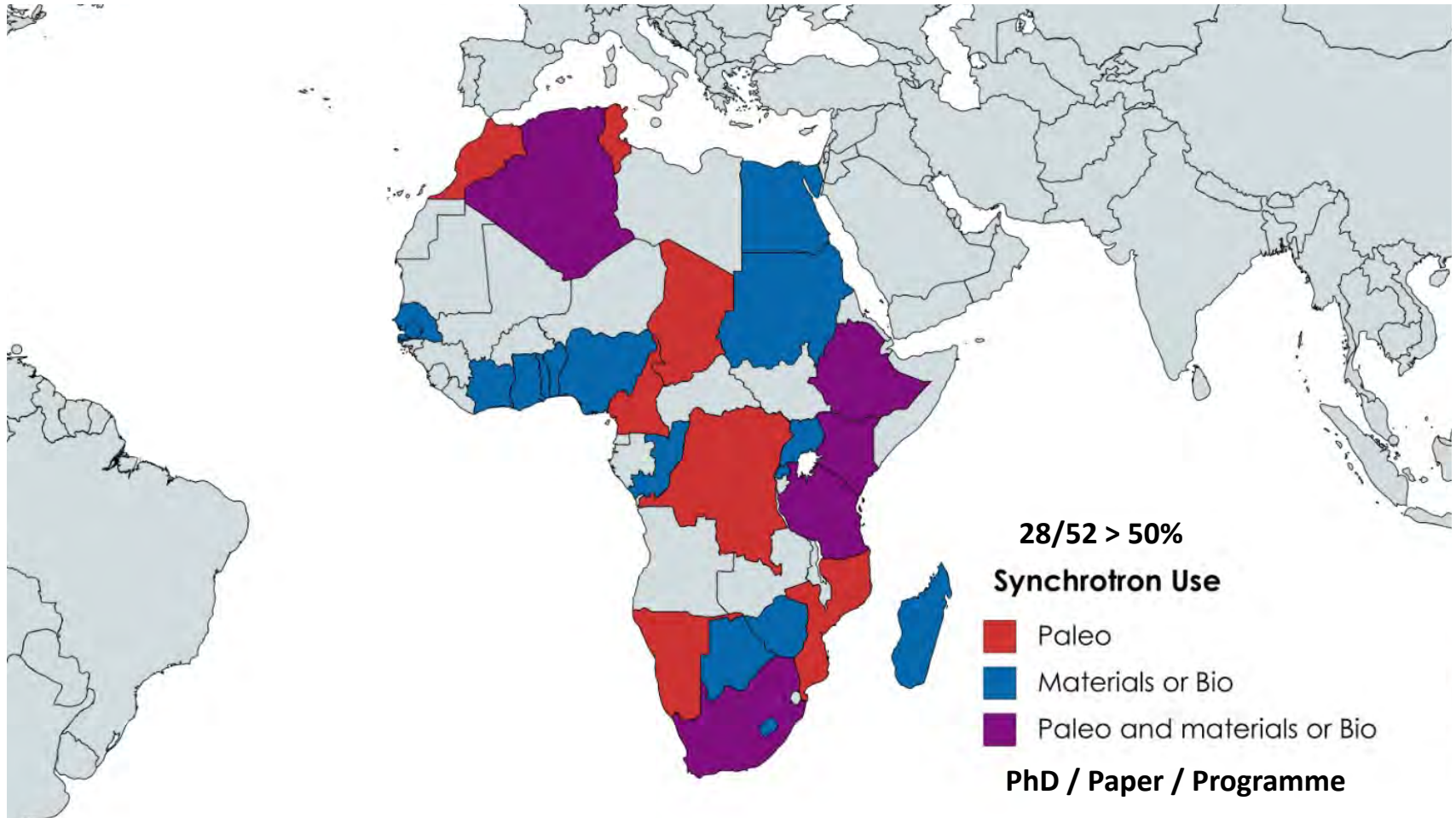


The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Bottom Up





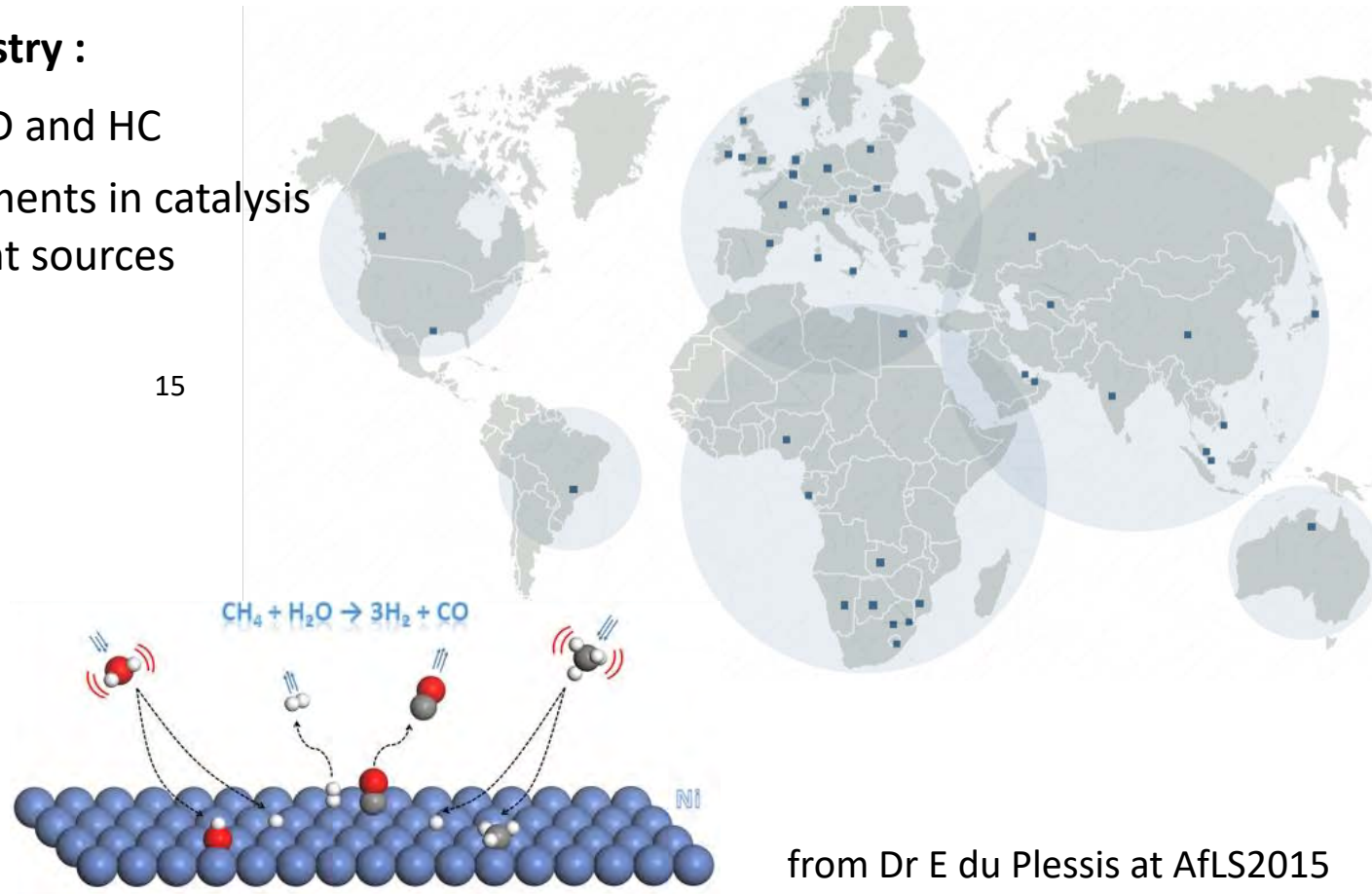
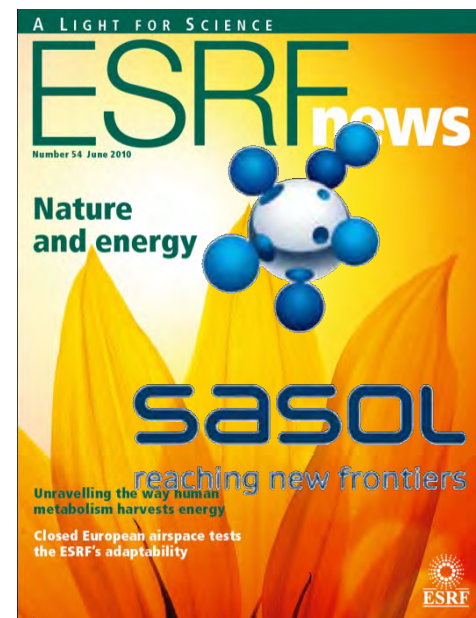
The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Example of African Industry :

SASOL investment in R&D and HC
SASOL capacity, achievements in catalysis studies – local and at light sources



from Dr E du Plessis at AfLS2015



The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Countries Involved

Ghana

2019, the President Akufo-Addo of Ghana pledged to champion the project in the African Union. 2020, the science minister, Dr. Kwabena Frimpong-Boateng, reaffirmed Ghana's support for the African light source



Benin

X-TechLab, as a government priority project, expresses itself as part of the Roadmap to the AfLS.

Contribute to the establishment of the first African Synchrotron

X-TechLab aims to contribute to the emergence of a community of experts of x-rays experts who will, not only be active users of the future African synchrotron, but also be instrumental in defining its strategy and scientific priorities.



African Laser Centre

Pan-African NEPAD flagship initiative

SA

SA Dept Science and Innovation and the NRF invite a proposal towards the AfLS as a "Flagship Project"



Draft Roadmap: The African Light Source Foundation and South Africa's Department of Science and Innovation (DSI) and National Research Foundation

Noting:

1. An advanced light source (AdLS) is one of the most transformative large-scale infrastructures for knowledge and innovation based sustainable socioeconomic development for the African continent.
2. An AdLS has a broad footprint in many disciplines that include physics, chemistry, bioscience, materials science, nanoscience, geoscience, heritage science, environmental science, medical science, all fields of engineering and industrial manufacturing. A few examples are highlighted:



The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Existing Regional Facilities

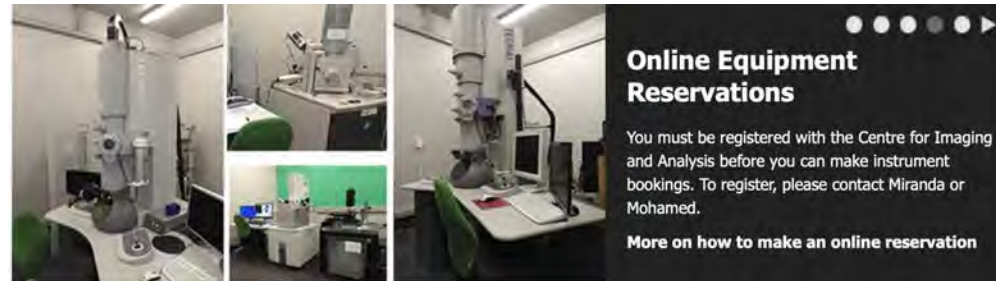
X-TechLab - Benin

Materials analysis, spectroscopy for many disciplines.
Energy, health, environment, agriculture, materials



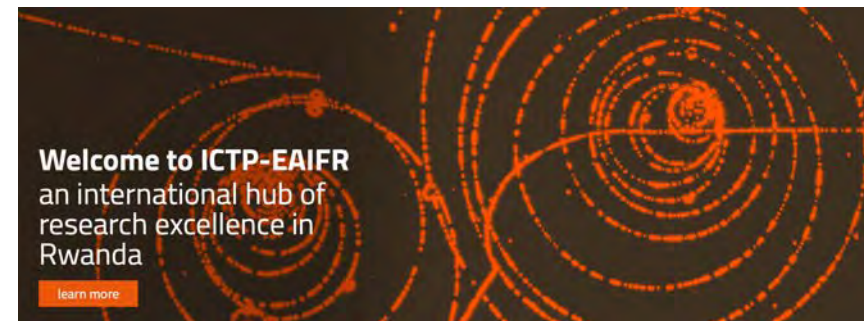
Sir Aaron Klug Centre - SA

Structural biology resource widely used in SADEC region



ICTP-EAIFR - Rwanda

Condensed matter, Geology, Particle Physics,
Cosmology, Astroparticle physics



Others ... next pages



AfLS and LSs

Long history of association of many synchrotrons with AfLS

ESRF, SESAME, Elettra, Alba, SOLEIL, Diamond, Sirius and UVX, DESY, LNL, CHESS, SLAC, SPRING8, NSLS II, Taiwan, ALS, CANDLE, APS, (others too, and no particular order)

AfLS encourages connections that enhance its vision to all.

Driven by :

Bottom up (scientists, collaborations, training, history)

Top Down (strategy and policy)



The Africa Light Source Foundation

Towards a Lightsource for the African Continent



AfLS and LSs

As an example, the recent AfLS2020 Virtual Conference.

Session on Light Sources Round table.
Scheduled time for 5 LS presentations

Presented by Directors
Strong supportive relationships

All are available at
<http://afls2020.africanlightsource.org>

One eg. **GCRF-START Programme** [\[link\]](#)



AfLS2020 Session :: Towards the AfLS

Kenenth Evans-Lutterodt

15:00 - 16:30

Letters of Support and Light Sources Roundtable

Kenenth Evans-Lutterodt



ESRF - The Light Sources Round Table

Dr Francesco Sette



Elettra - The Light Sources Round Table

Prof. Giorgio Paolucci



ALBA and LEAPS - The Light Sources Round Table

Caterina Biscari



Diamond - The Light Sources Round Table

Prof. Harrison Andrew



SESAME - Light Sources Round Table

Dr Khaled Toukan





AfLS and Biophysics

African health is a special case for Structural Biology on the continent and the AfLS

- 1. Training Programmes, building the User Base**
 - a) START – continuation, SA-ESRF continuation
 - b) Others
- 2. Local and regional equipment infrastructure**
- 3. African Governments positions creating African excellence in Bio Sciences**
 - a) Build activities at University Departments
 - b) AKC as a regional Centre, support as a CoE
 - c) BioStruct Africa
 - d) Other National, Regional and African initiatives
- 4. Regional African Partnerships**
 - a) African Beamline at a International facility
 - b) Multi-state membership of an international facility



The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Top Down

Declaration and Action Plan

1st African Higher Education Summit on Revitalizing Higher Education for Africa's Future,
10-12 March 2015, Dakar, Senegal.

Article 5.3.2 p 22 :
Recommends
establishing a
Synchrotron as a
centralized African
scientific facility.



Co written by
Dr Nkem Khumbah,
STEM-Africa Initiative





The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Top Down

Specialized Technical Committee on Education, Science and Technology Africa Union : STC-EST

20 October 2017 Egypt

H.E. Prof. Sarah Anyang Agbor

AU Commissioner for Human
Resources, Science and Technology.

African Academy of Science

President **Prof. Felix Dapare Dakora**

Presentation on African Light Source





The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Top Down

AfLS at the AU : Jan 2018

DECISION ON THE REPORTS OF THE SPECIALISED TECHNICAL COMMITTEES (STCs)

The Executive Council,

C. STC ON EDUCATION, SCIENCE AND TECHNOLOGY

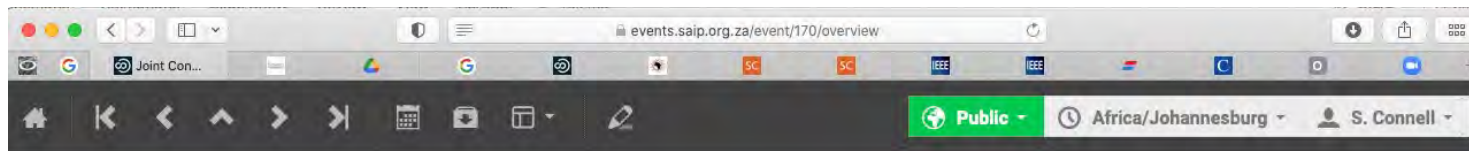
21. CALLS UPON Member States to support the Pan-African Synchrotron Initiative;





The Africa Light Source Foundation

Towards a Lightsource for the African Continent



<https://events.saip.org.za/event/170/>

15-19 November 2021
Hosted by X-TechLab
Africa/Johannesburg timezone

Big Science and Big Goals for Africa

Overview

- T1 : AfLS Topics
- T2 : ePCCr / AfCA Topics
- T3 : AfPS Topics
- T4 : Co-convenor Topics

Conference Posters

The time zone is controlled by you as an Indico Setting (top right). The session times will therefore be shifted if you are not set to Central Africa Time (CAT) = GMT+2.

Welcome to the 2021 joint virtual meeting of the African Light Source (AfLS), the African Physical Society (AfPS), and Pan African Conference on Crystallography (ePCCr), co-convened with several other Pan African professional science societies, all hosted by X-TechLab. We hope that you will join us as we communicate and celebrate **Big Science and Big Goals for Africa!**

Participating Organisations

As advanced light sources support multiple disciplines, the AfLS conference formally includes



The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Come · Learn · Teach · Volunteer

TOWN HALL

African Light Source (AfLS)

Conceptual Design Report



Monday, 11 October 2021, 15:00 CAT

Register : <https://events.saip.org.za/e/AfLS-CDR-TownHall>

Chair of Meeting: Sekazi K. Mtingwa

Welcome & Opening Comments	Sekazi K. Mtingwa (USA)
Collaborative Writing for ASFAP	Kétévi Assamagan (Gabon, Togo, USA) (AfLS in Context of ASFAP)
AfLS CDR	Tabbatha Dobbins (USA)
Justification for an AfLS-CDR	Marcus Newton (UK)
Overview of AfLS-CDR Process	Simon Connell (South Africa)
Governance and Finance	Jean-Pierre Ezin (Benin)
AfLS3 Meeting	Prosper Ngabonziza (Rwanda, Germany)
LAAAMP	Michele Zema (Italy)
X-TechLab	Thierry d'Almeida (Benin, France)

Q&A and Suggestions

Simon Connell



For those wanting to utilize the AfLS, short proposals (Letters of Interest) can be submitted at

<https://events.saip.org.za/event/223/>



Read more about advanced light sources by downloading the 24-page LAAAMP Brochure at

<https://laaamp.iucr.org/tasks/brochure>



The Africa Light Source Foundation

Towards a Lightsource for the African Continent



Back Up