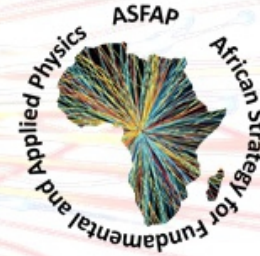




African Strategy for Fundamental and Applied Physics



ICTP - East African Institute
for Fundamental Research
under the auspices of UNESCO



Gihan Kamel

IR Beamline Principal Scientist/Team Supervisor

SESAME Synchrotron

On Leave from: Department of Physics, Faculty of Science, Helwan Un., Cairo, Egypt

On behalf of the ASFAP Light Sources Working Group

ASFAP Community Town Hall – Wednesday, July 14, 2021

Light Sources Working Group



Thierry d'Almeida



Tabbetha A. Dobbins



Gihan Kamel



Simon Connell

GROUP CONVENERS *in brief*

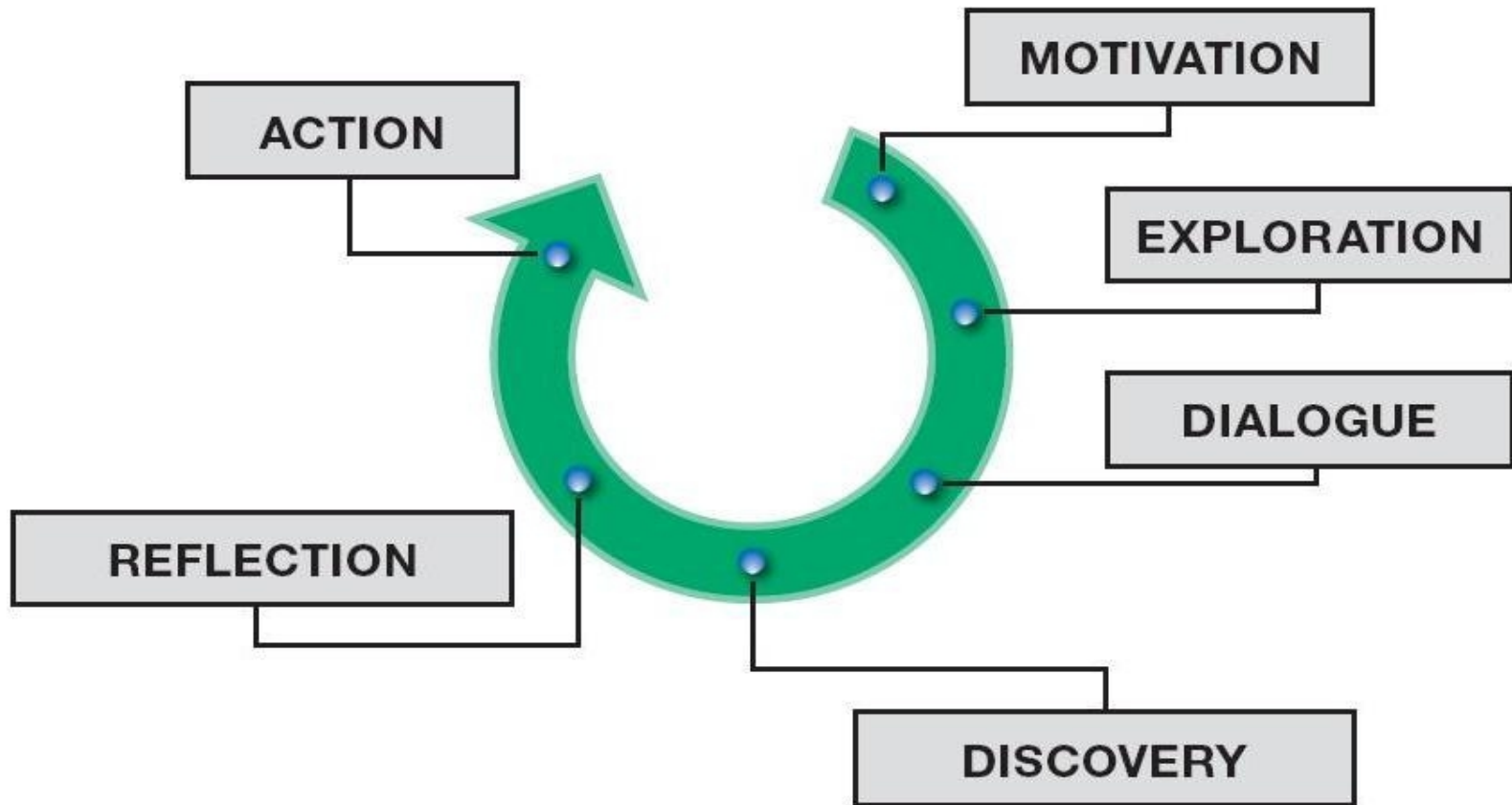
NAME	AFFILIATION	EMAIL	Gender	African origin/Diaspora
Dr. Thierry d'Almeida	Benin	tdalmeida[at]semecity.com	M	Benin
Dr. Tabbetha Dobbins	Rowan U., USA	Dobbins[at]rowan.edu	F	African-American
Dr. Gihan Kamel	Helwan U., Egypt and SESAME Light Source	gihan.kamel[at]sesame.org.jo	F	Egypt

GROUP OBSERVERS *in brief*

NAME	AFFILIATION	EMAIL	Gender	
Dr. Simon H. Connell	University of Johannesburg, South Africa	Si[at]lmykonos.org.za	M	South Africa

<https://twiki.cern.ch/twiki/bin/view/AfricanStrategy/AfLightSources>

LEARNING PROCESS

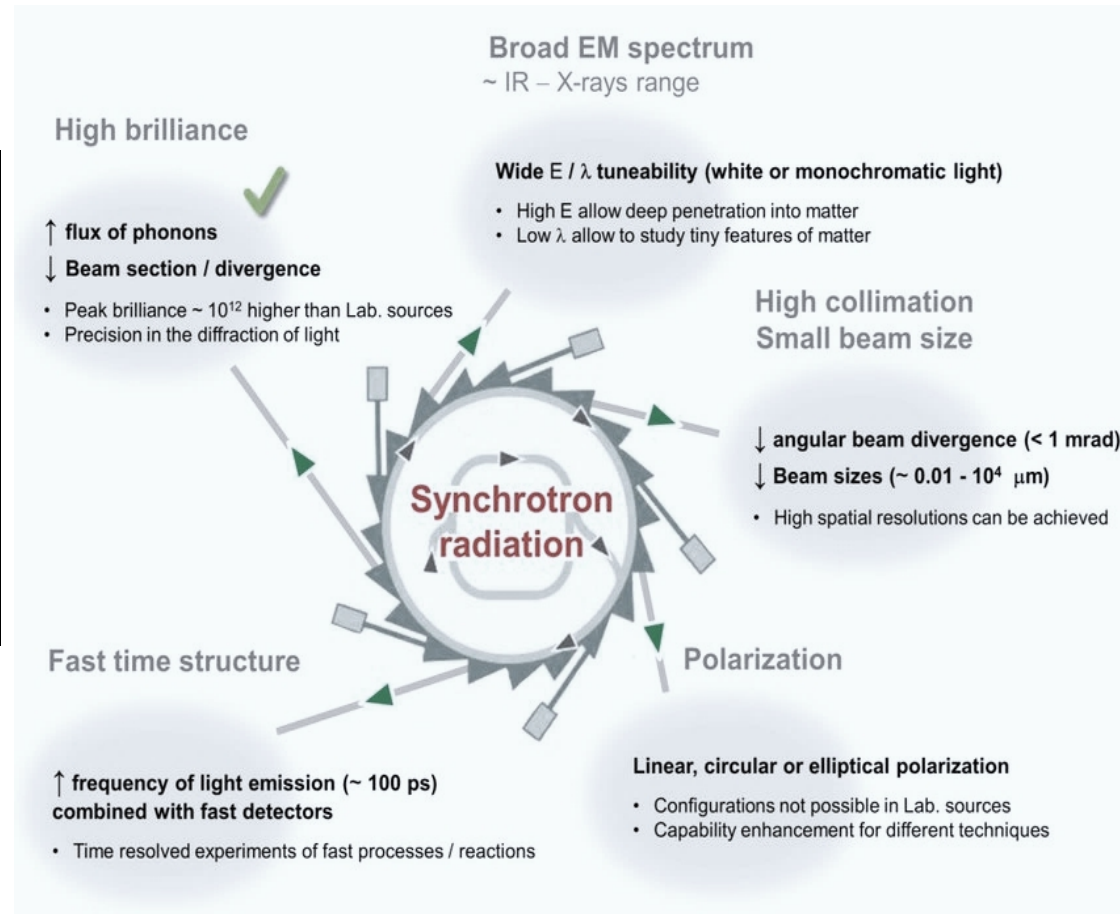


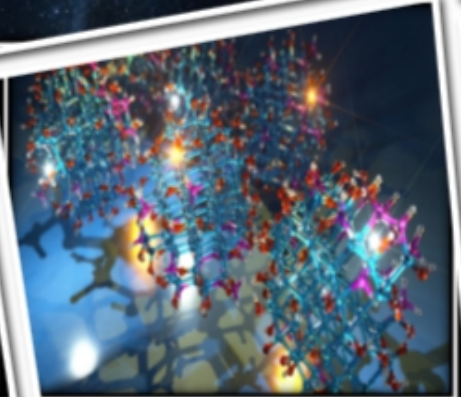
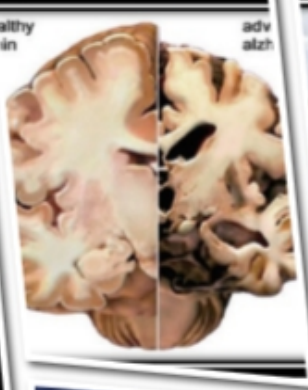
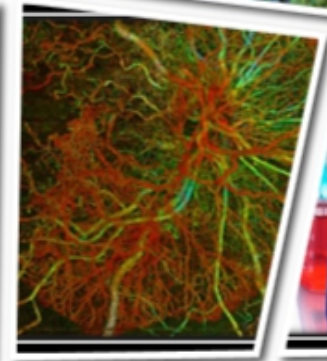


Synchrotron radiation: electromagnetic waves emitted by charged particles that move in a curved trajectory at a speed close to the speed of light.. *Spectrum of opportunities and (complementarity)..*



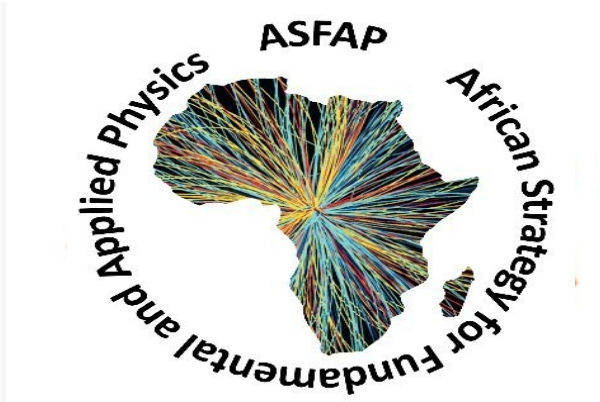
NASA, ESA, G. Dubner (IAFE, CONICET-University of Buenos Aires) *et al.*; A. Loll *et al.*; T. Temim *et al.*; F. Seward *et al.*; VLA/NRAO/AUI/NSF; Chandra/CXC; Spitzer/JPL-Caltech; XMM-Newton/ESA; and Hubble/STScI.





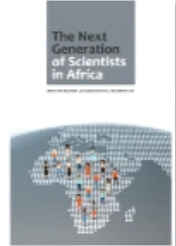
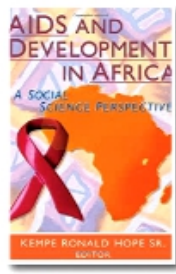
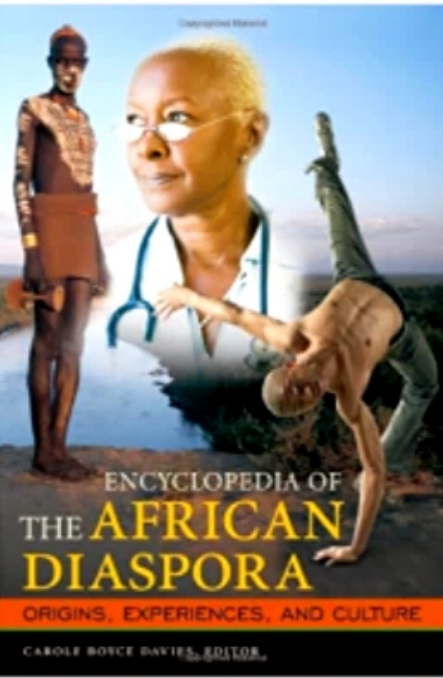
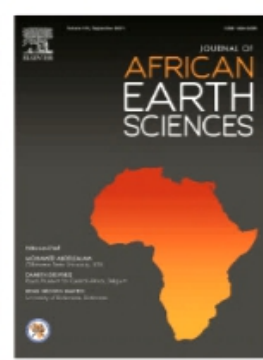
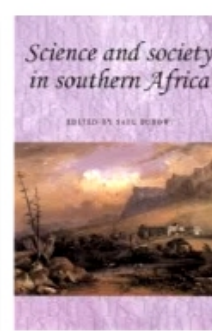
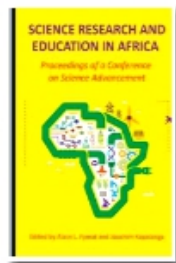


Exceptionally brilliant science ..

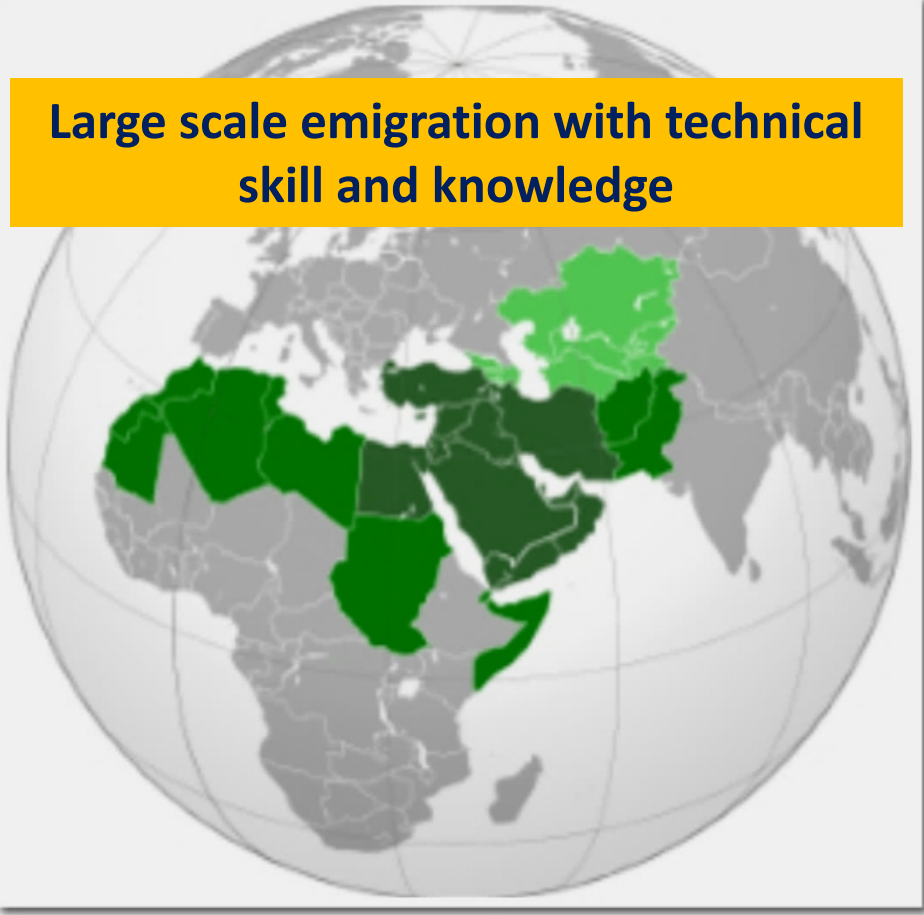


Worldwide Synchrotron facilities





Large scale emigration with technical skill and knowledge



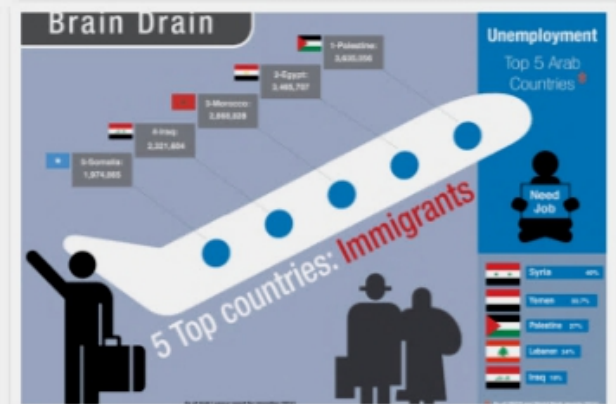
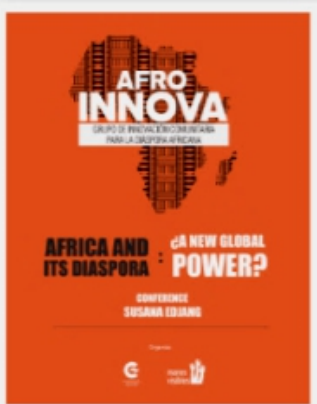
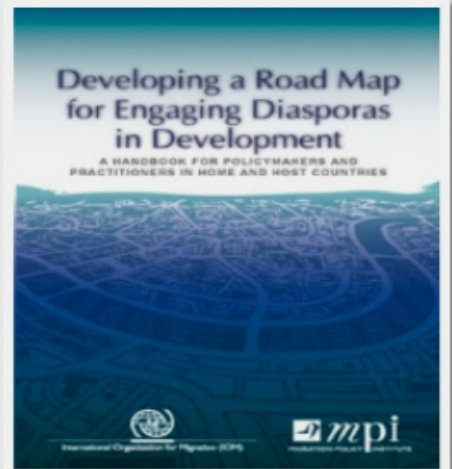
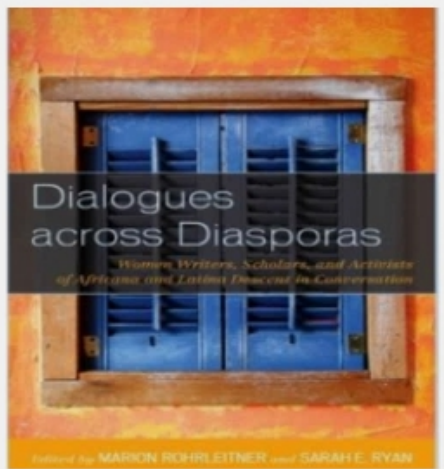
Good friends look out for each other

BRAIN DRAIN HURTS AFRICA

Local hospitals are left high and dry as poorly-paid nurses head north to shore up Britain's National Health Service

THE 'BRAIN DRAIN' THAT CHANGED NURSES' LIVES — PAGE 5

INSIDE
 Critical care splits Commonwealth
 Why women should be fearless
 Threat of a smothering war



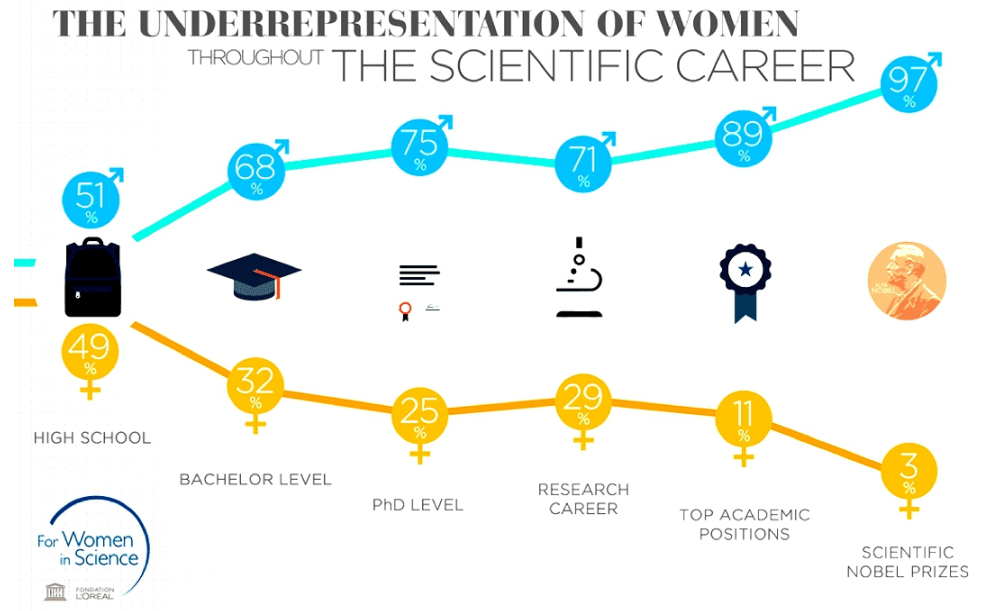
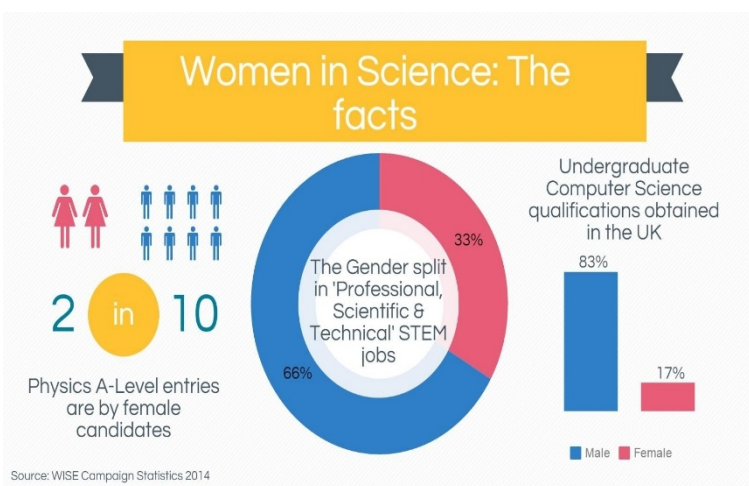
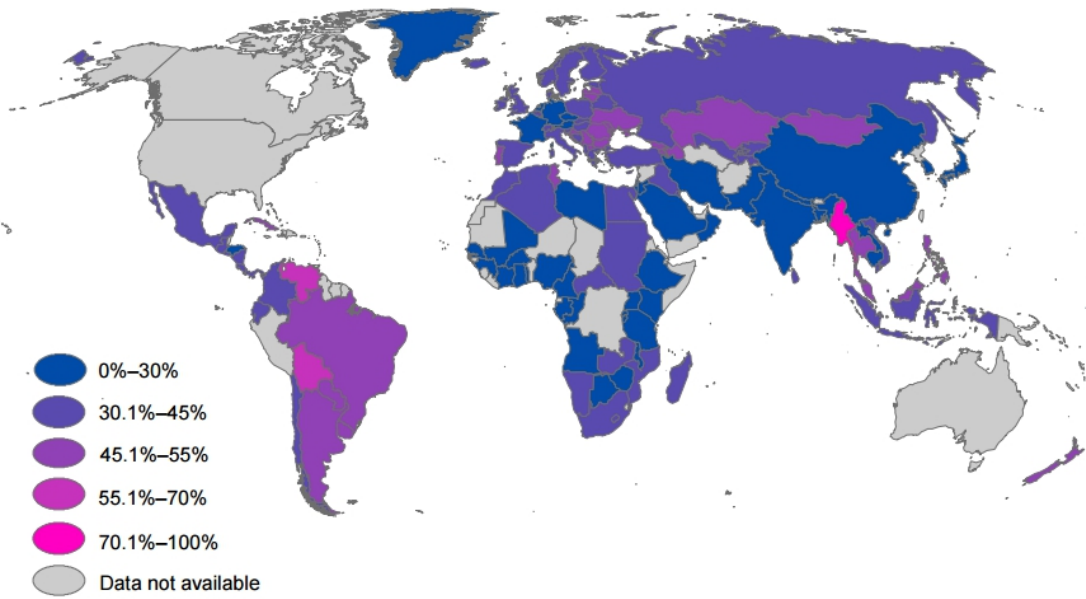
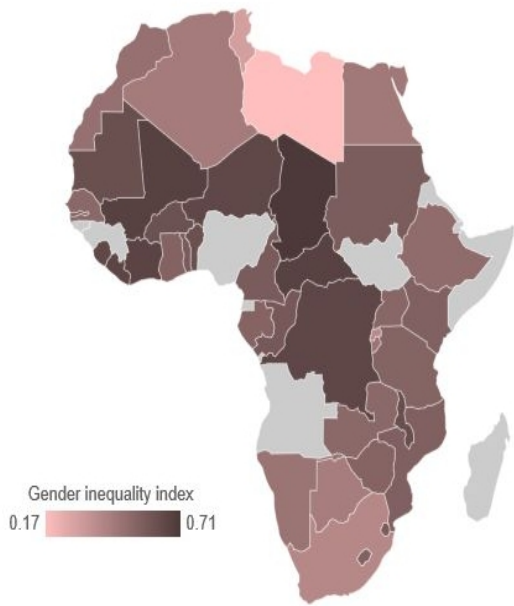


FIGURE 1. THE GENDER GAP IN SCIENCE
Women as a share of total researchers, 2013 or latest year available



Source(s): UNDP, Human Development Reports 2017.



Why do we need and work for the AfLS?

- Foster World-class basic and applied research, and development of high-tech industry.
- Address regional and global concerns: biomedical, environmental, cultural/ human heritage.
- Reverse the brain-drain.
- Decrease the gender gap *as much as possible!*



THE AFRICAN LIGHTSOURCE

Towards a Lightsource for the African Continent

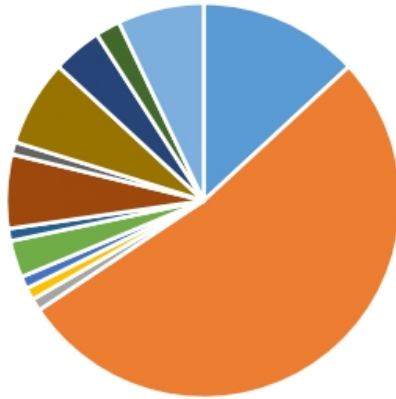


Community?



100 Participants

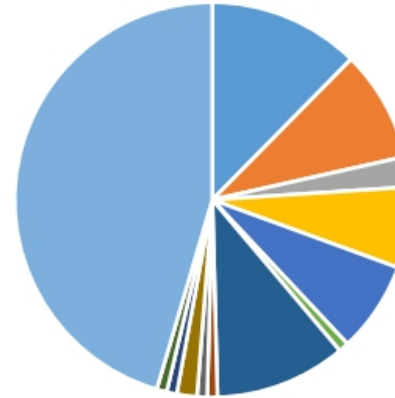
SESAME UM 2013



- Egypt
- Jordan
- Spain
- Canada
- Cyprus
- USA
- France
- Iran
- Israel
- Pakistan
- Turkey
- UK
- Palestinian Authority

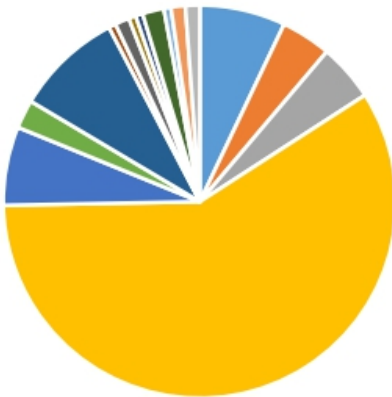
117 Participants

SESAME UM 2014



- Egypt
- Iran
- Israel
- Pakistan
- Palestinian Authority
- Cyprus
- Turkey
- USA
- France
- Spain
- UK
- South Africa
- Jordan

SESAME UM 2015

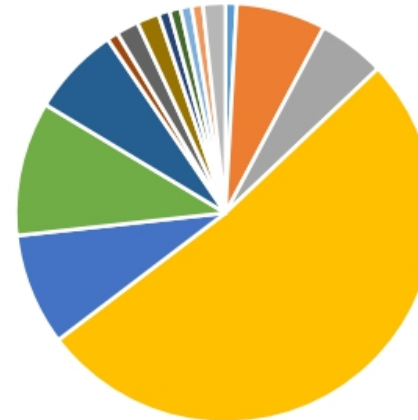


171 Participants

- Egypt
- Pakistan
- Iran
- Jordan
- Palestinian Authority
- Israel
- Turkey
- Canada
- UK
- France
- USA
- Switzerland
- Sweden

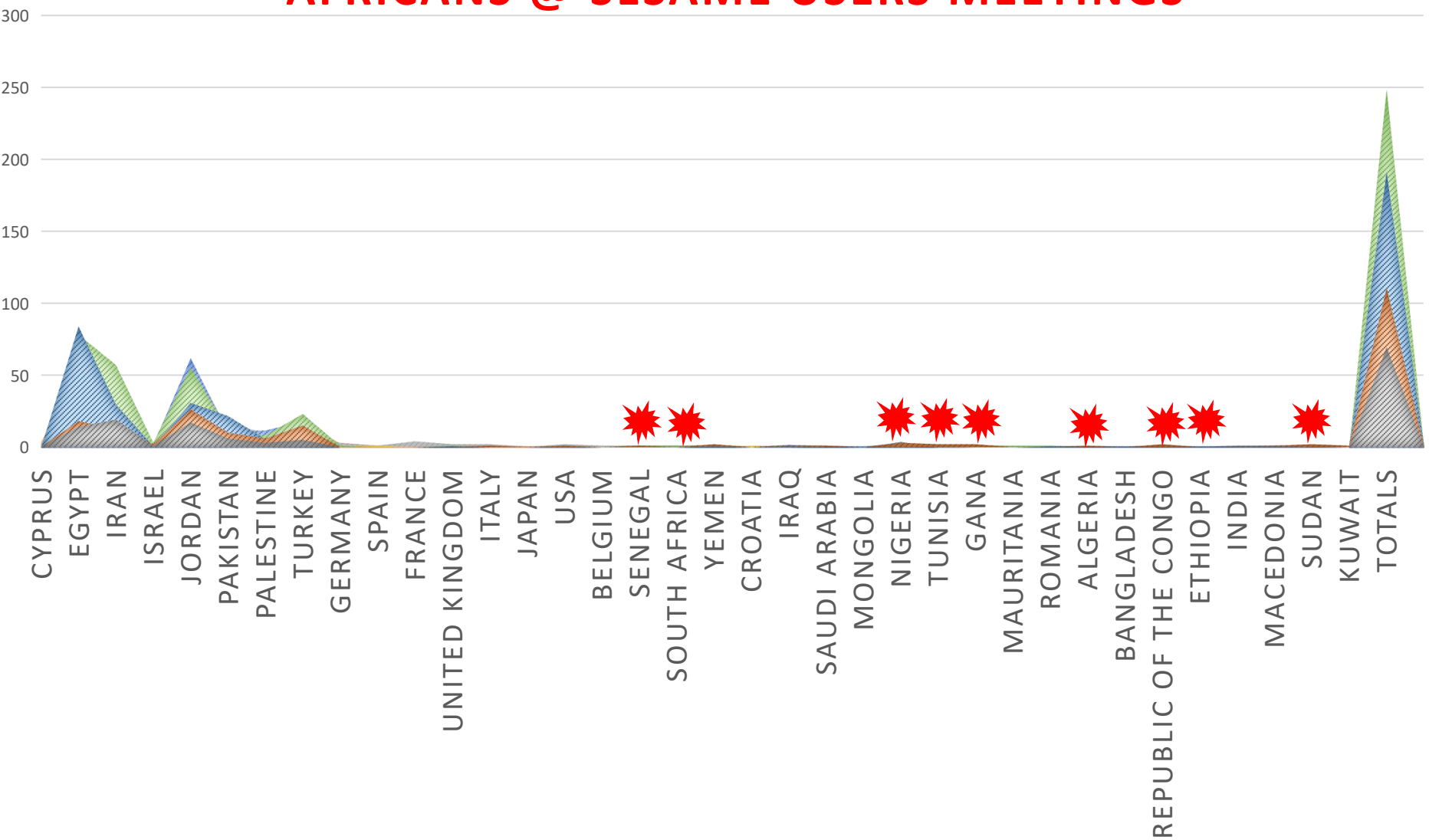
200+ Participants

SESAME UM 2016



- Croatia
- Pakistan
- Iran
- Jordan
- Palestinian Authority
- Egypt
- Turkey
- Germany
- UK
- France
- Iraq
- Spain
- Saudia Arabia
- Israel

AFRICANS @ SESAME USERS MEETINGS



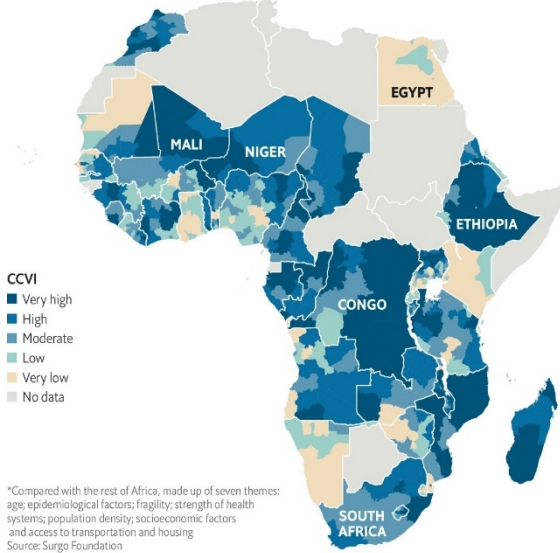
SESAME

- ▨ UM 17
- ▨ UM 16
- ▨ UM 15
- ▨ UM 14
- ▨ UM 13
- ▨ UM 12
- ▨ UM 11
- ▨ UM 10
- ▨ UM 9

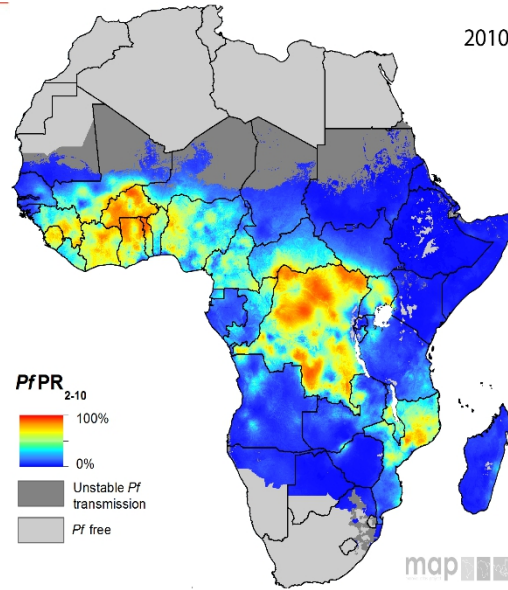
COVID-19

Continental exposure

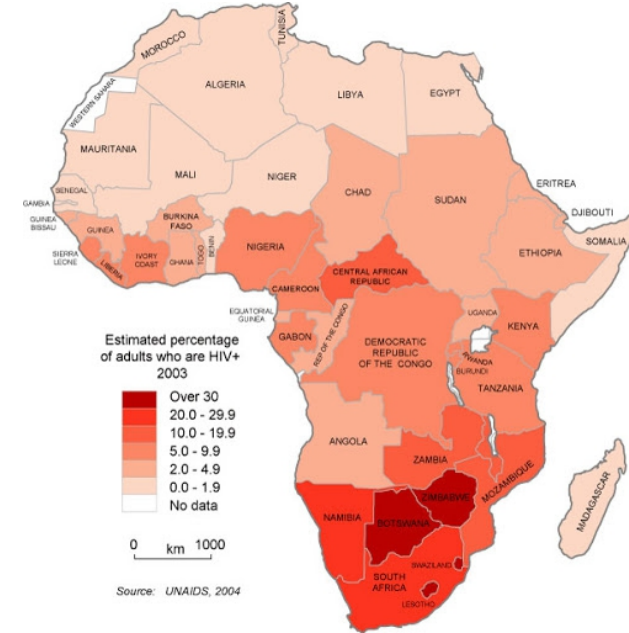
Covid-19 community vulnerability Index (CCVI)*, by region



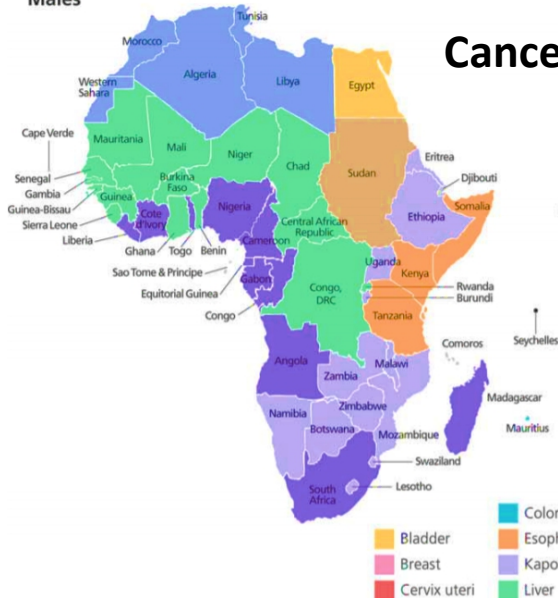
Malaria



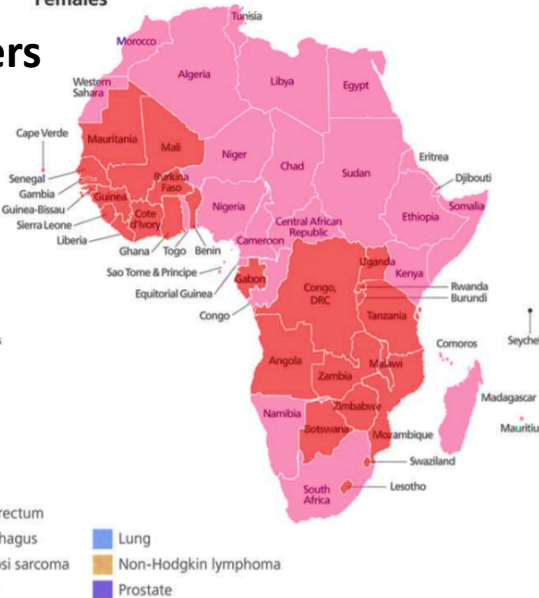
HIV



Males



Females



Cancers

Maternal Mortality

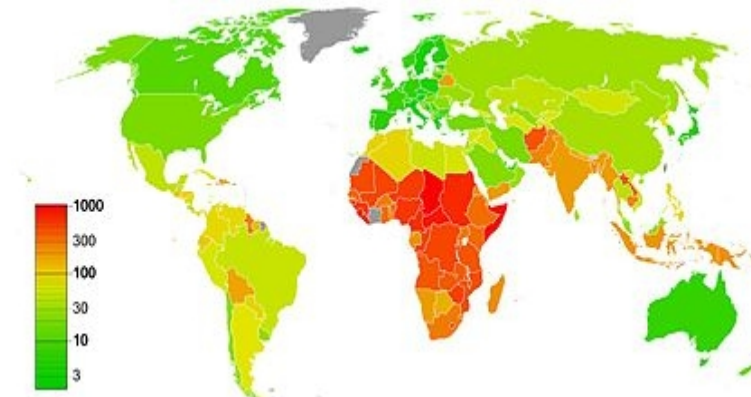
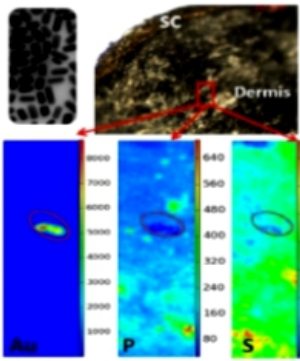
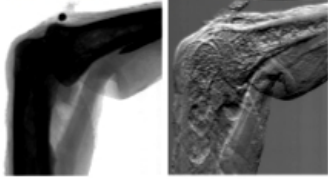


Figure 3. Most common cancer sites in Africa by sex and country are shown for 2008. Source: GLOBOCAN 2008.

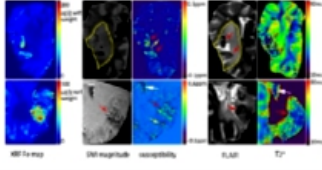
Dermal drug delivery systems



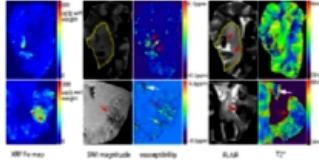
Biomedical imaging and radiotherapy



The Elements of Stroke



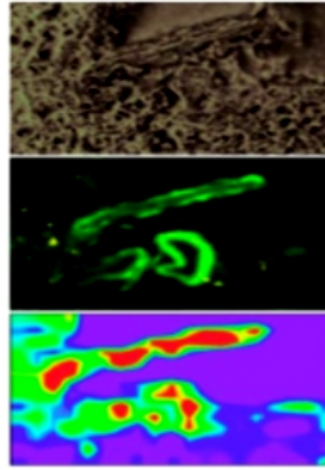
The Elements of Stroke



Mad Cow Disease and Scrapie



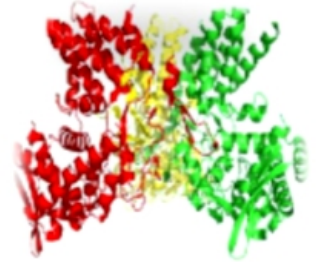
Alzheimer's Disease



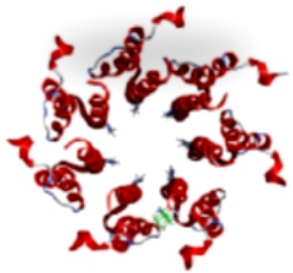
Dengue



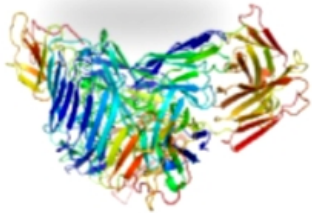
Influenza



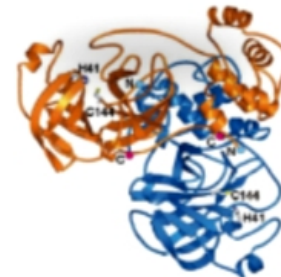
Hepatitis C



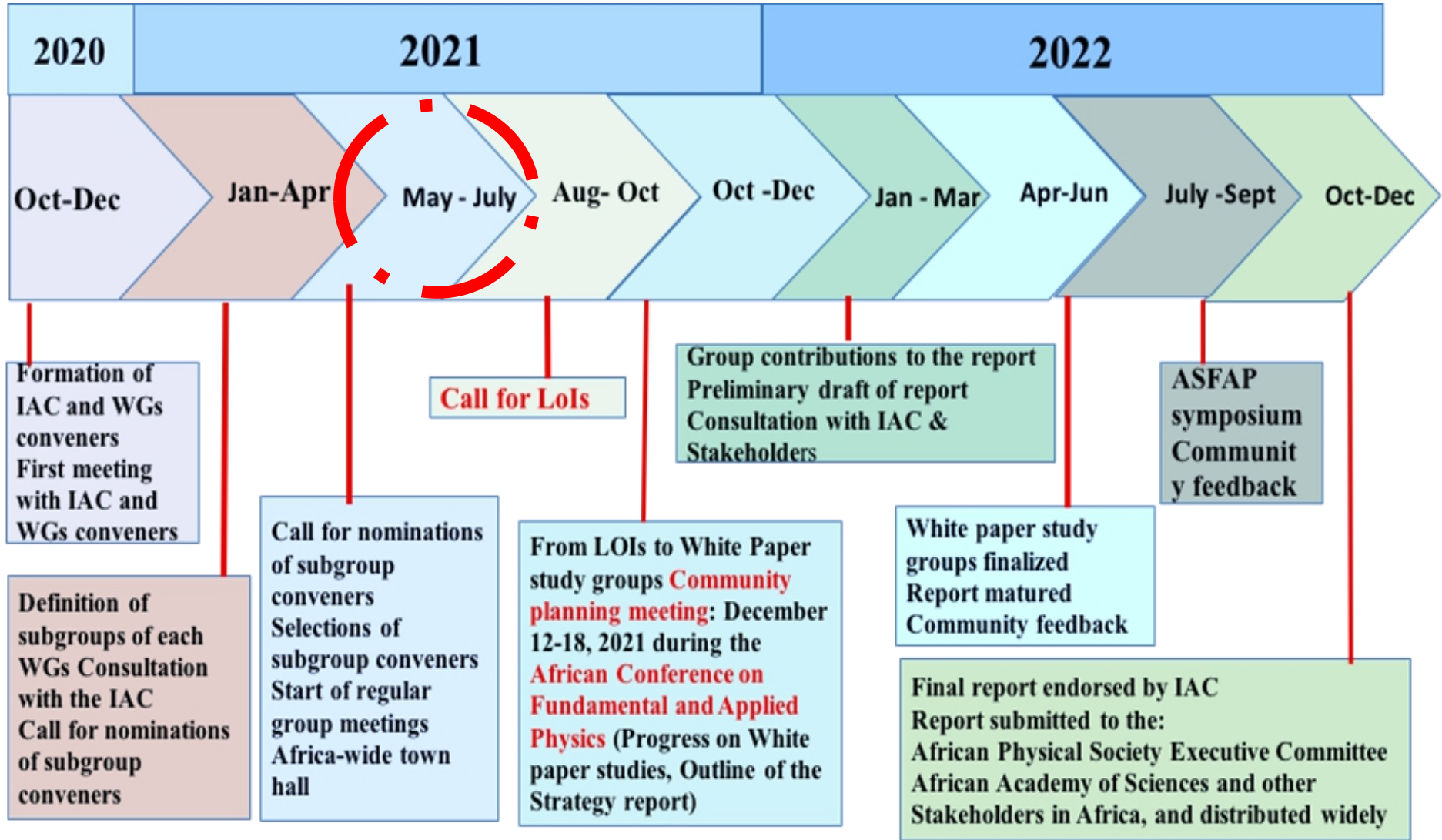
West Nile fever



SARS



The Tentative ASFAP Timeline





Possible topics

Accelerator Physics
Optical Instrumentation
Instrumentation, Samples' Preparation and Data Analysis
Macromolecular X-ray Crystallography (MX)
Small/Wide-angle Scattering (SAXS/WAXS)
Powder X-ray Diffraction (PXD)
X-ray Spectroscopy (EXAFS, XANES)
X-ray Fluorescence (XRF)
Infrared Spectroscopy (IR)
Dynamic and Time-resolved techniques (e.g. Pump-Probe)
X-ray Tomography
X-ray Photoemission Electron Microscopy (XPEEM)
Angular Resolved Photoemission Spectroscopy (ARPES)





African Strategy for Fundamental and Applied Physics



ASFAP Conveners: Ketevi A. Assamagan, Simon H. Connell, Farida Fassi, Shaaban Khalil, and Fairouz Malek
Advisory Committee Members on Light Sources: Thierry D'Almeida, Tabbetha Dobbins, Gihan Kamel
<https://africanphysicsstrategy.org>

June 11, 2021

Dear Potential Contributor to the ASFAP Project:

On behalf of the Advisory Committee on Light Sources for the African Strategy for Fundamental and Applied Physics (ASFAP), it is our particular pleasure to invite you to contribute a 1-page Letter of Intent (LOI) to the "Strategy for Light Sources in Africa" report. The LOI is due by August 15, 2021. If accepted, a finalized White Paper contribution will be requested with a deadline of December 15, 2021. The LOI is planned for the finalized "Strategy for Light Sources in Africa" report, which is one of the whitepapers, to be submitted to the ASFAP on December 15, 2022. The LOI aims to provide advice on strategies towards light sources in Africa and related topics such as synchrotron light sources, synchrotron light sources, and other related topics. We encourage you to link that the LOI and whitepapers link their topic to African perspectives. We look forward to you to share your work contribution.

The ASFAP aims to improve capacity in physics and related fields and technological achievements have become commonplace. As remarkable progress has been made in other regions of the world, enormous challenges and opportunities remain in Africa. It is vital for development, Africa's science, innovation, education and research. Initiatives such as Fundamental and Applied Physics, has been over the years under the leadership of the African Union. The vision is that Africa should take its equal place as a co-leader in the global scientific community and reap the social-economic benefits thereto. The necessity of initiating ASFAP has been a long time in the making. We are confident of your ambition and motivation to jump-start this process. For further details, please visit <https://africanphysicsstrategy.org> and some topics of interest, see: <https://twitter.com/ASFAPStrategy/AfLightSources>.

To respond to this invitation rapidly, please email with your intention (Yes/No) to submit a LOI to ASFAP@lightsources.org at your earliest convenience and before the July 15, 2021.

We would like you to submit the Title, Authors, Author Affiliations, and one-page LOI prior to August 15, 2021. The email address is: asfap.lightsources@gmail.com. Please note that we will not provide a format for the LOI. We would like to hear your input, in your words and format.

We look forward to your reply and your participation in this exciting work!

Sincerely,

The ASFAP Conveners and the Advisory Committee on Light Sources
The full list of Advisory Committee members for the ASFAP are listed on the website:
<https://africanphysicsstrategy.org>

The Letter of Intent was prepared and it is ready for our selected distribution list within the timeframe.

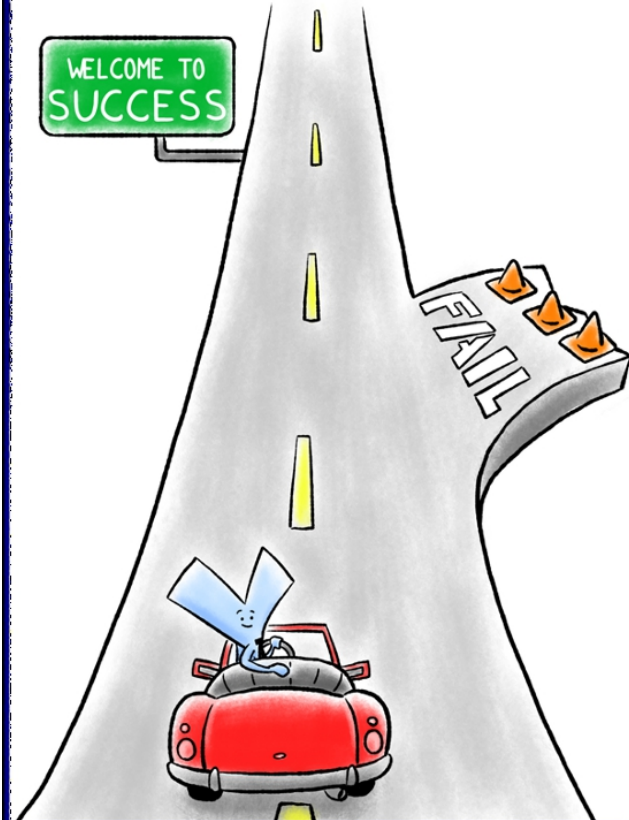
Finalized letter draft

Across borders

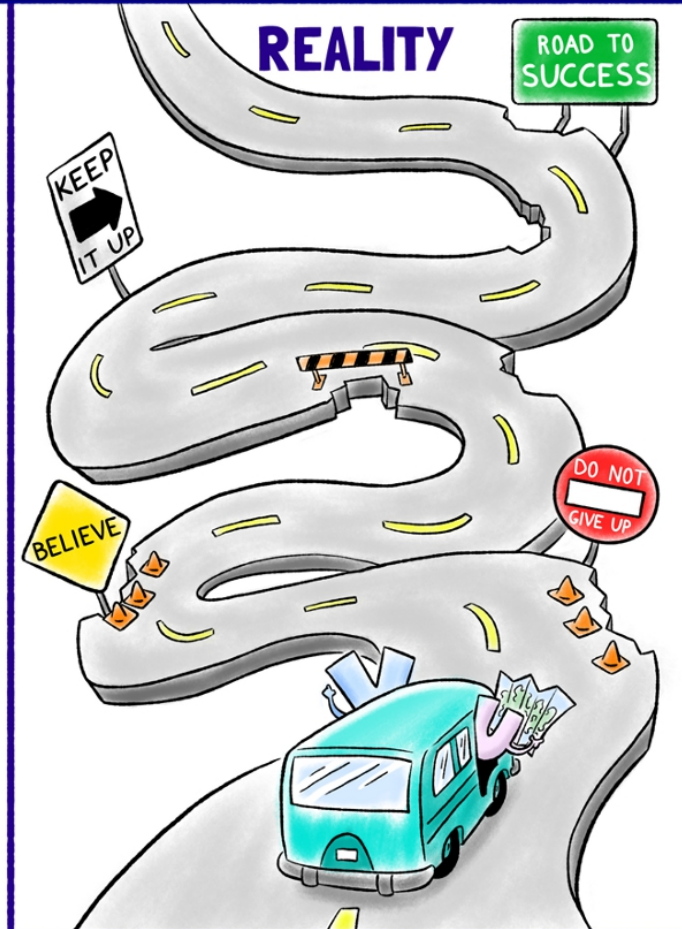


- Accelerators -
- Instrumentation and Detectors -
- Medical Physics -
- Biophysics -
- Materials Physics -
- Optics and Photonics - .
- Late stage (Dec 2021 or 2022 and beyond)- assessment of 6 Engagement Committees/Fora

PERCEPTION



REALITY



NEW CARTOON EVERY MONDAY



EVERYVOWEL.COM

“A synchrotron from Cold War era that divided Berlin now makes its home in Jordan, fostering cooperation from scientists in the Middle East”



SESAME 2002



SESAME 2021



Thank you On behalf of the ASFAP Light Sources Working Group