Moving towards diversity and inclusion in science: Why it is essential for Physics in Africa

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Outline

- The need for diversity & inclusion in science
- Why it is essential for Physics in Africa
- Initiatives and projects addressing diversity & inclusion in Physics in Africa
- Summary and Outlook

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The need for diversity and inclusion in science

Diversity in science should be considered in its holistic approach – not just about the demographic numbers.

Diversity should be used within context – addressing the who, what, where, when, and why questions, including life experiences.

Environment (the 'where' question) should be part of the holistic approach – for the environment to be inclusive safe spaces should be created.

For example, at Nelson Mandela University such spaces are created under 'Courageous Conversations' with diverse stakeholders.

Studies have shown that diversity and inclusion when viewed in positive light leads to more positive beneficial innovative solutions and good science.
(*Douglas L. Medin and Carol D. Lee, Diversity Makes BeHer Science, 2012, Observer* ; *Chris Tachibana, Diversity: Promo6ng New Perspec6ves, 2014, Science*)

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Why diversity & inclusion essential for Physics in Africa

Africa has a diverse range of challenges:

Some countries need to deal with internal exclusionary legacies: e.g. Apartheid SA had regulations that restricted the majority African population from studying mathematical sciences.

Youth in Africa constitute 19% of the global youth population in 2015. In Africa 60% of the population is below 25 yrs. Population is about 1.2 billion

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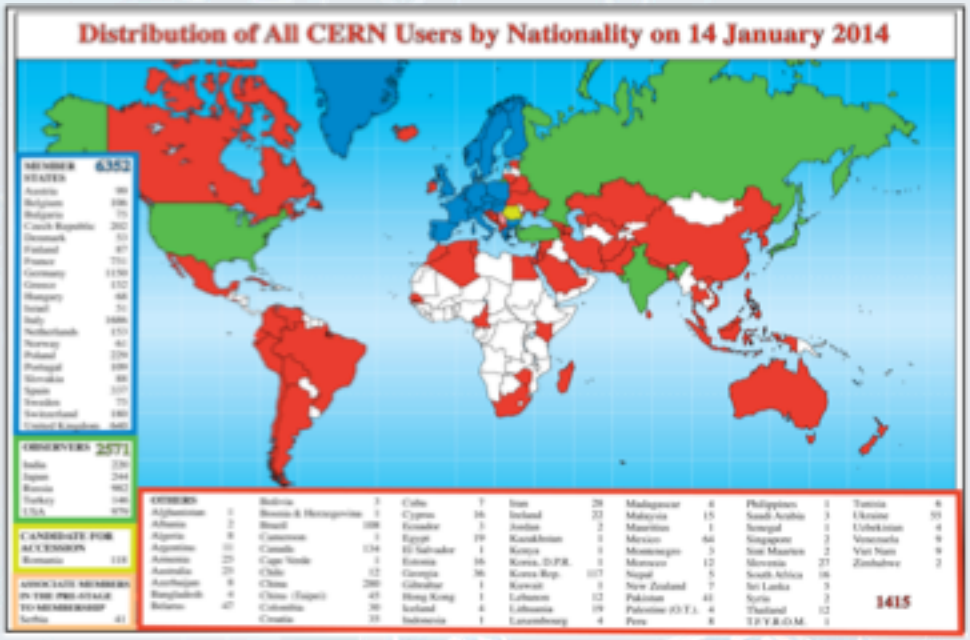
African participation at CERN

- Low participation of African scholars in major research labs around the world. Some examples:
  - CERN users
  - Users of LHC experiments
- Not limited to CERN. Broader issue.



About 0.5% of CERN users are African Nationals

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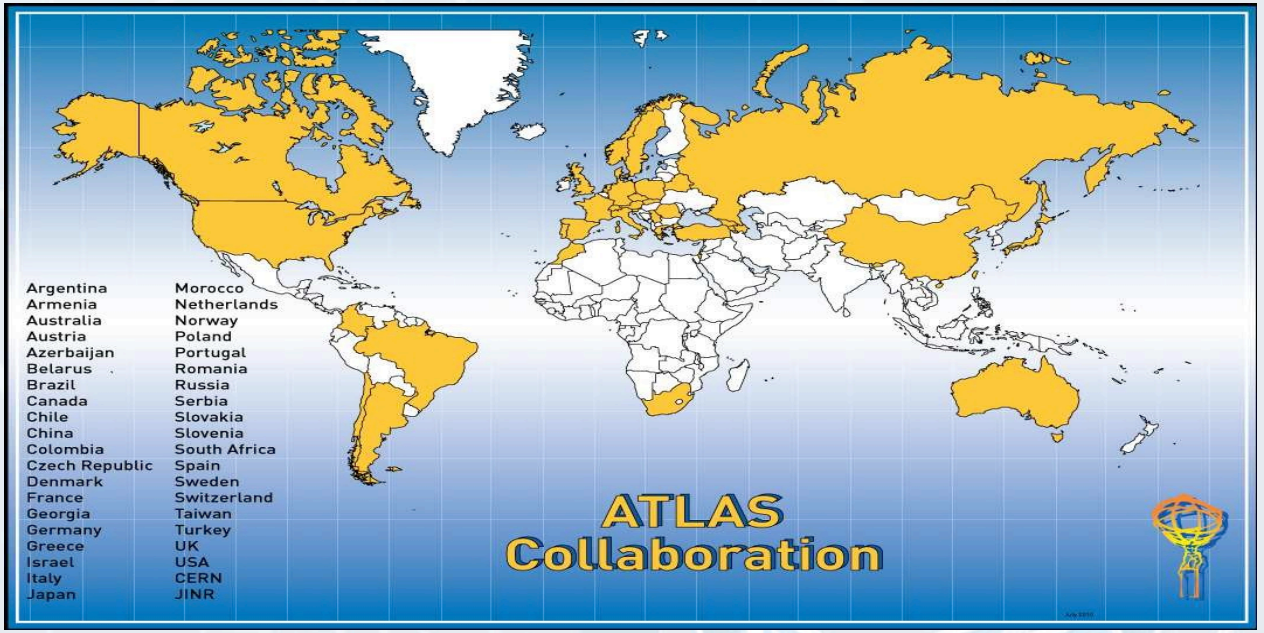
African participation in the ATLAS Experiment

In ATLAS, Morocco and South Africa.

Several institutes, about 35 members total.

Size of the collaboration: over 3,000



In CMS, only Egypt with 1 institute, 10 members.
Size of the collaboration: over 3,000

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African participation in the ALICE Experiment

Only South Africa:
2 institutes with 5 members.
Collaboration over 1000 members

LHCb: 60 institutes, over 800 members. No African participation.
There may be a few Africans through participating institutes.

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SKA and opportunities for collaborations

Major research stations located outside the club: change in global engagements

SKA - The largest radio astronomy observatory to be (co-) hosted by South Africa (70%) and Australia (30%) : meaning that two Global/Geographical South nations will be at the heart of managing and driving the project; and this will add a new dynamic to the nature and culture of global collaboration – also fostering inclusion

Africa and in particular Southern Africa has geographic advantage in astronomy research (besides point of human origins)

In Africa the diversity challenge is both local and global.

Multi-messenger astronomy

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Addressing the diversity & inclusion question : South African Institute of Physics(SAIP) & Physics in Africa

Women in Physics in South Africa (WiPiSA) Lunch conversations

In Africa the biggest challenge is attraction and retention of girls and women in STEM subjects and disciplines due to historical traditions and cultures

In other countries such as South Africa the challenge is multi-dimensional or complex due to the country's historical apartheid policies

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WiPiSA Lunch Conversations

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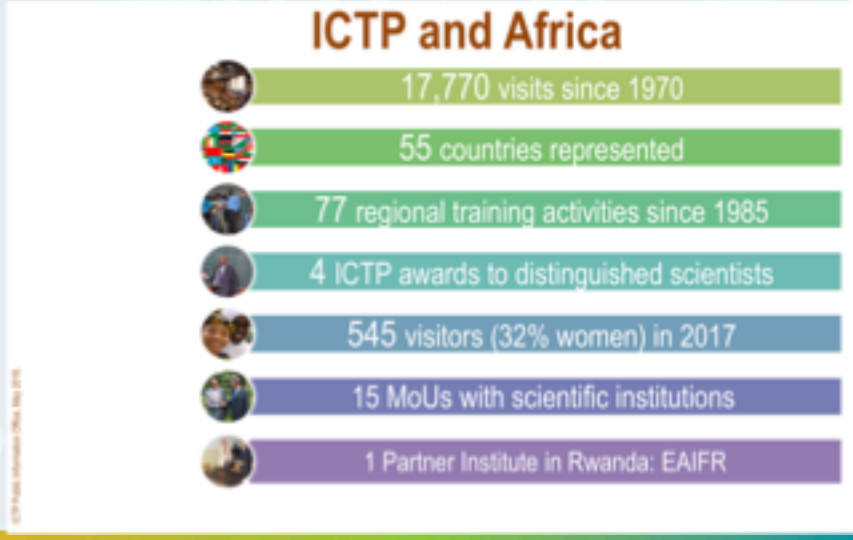
ICTP Women in Science from Africa

presented at ASP2018 by ICTP Director, Fernando Quevedo

Besides CERN there are other international research entities partnering with Africa to develop capacity in physics such as ICTP

African Synchrotron Light Source (AfLS) Project

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



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African School of Fundamental Physics and Applications

THE BIENNIAL AFRICAN SCHOOL OF FUNDAMENTAL PHYSICS AND APPLICATIONS

- **International Organizing Committee (IOC)**
  - The IOC is the main organizer of the school

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African Conference on Fundamental Physics and Applications

THE BIENNIAL AFRICAN CONFERENCE ON FUNDAMENTAL PHYSICS AND APPLICATIONS

- **International Organizing Committee (IOC)**
  - The IOC is the main organizer of the school
- **Local Organizing Committee (LOC)**
  - Local committee in the host country
- **International Advisory Committee (IAC)**
  - Advises on various aspects of the organization including fund raising

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The South Africa – CERN Programme

The main aim of the SA – CERN programme is to make the facilities at CERN available to South African researchers, engineers, technicians and students.

SA-CERN sub-programs:

SA-ALICE, SA-ATLAS, SA-ISOLDE, and SA-THEORY

10 Years of SA-CERN Celebration
November 19-21, 2018

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Summary and Outlook

Embracing diversity in science – in all its senses – is key to good science and Africa is getting ready – as evidenced by physics initiatives within Africa by Africa and in collaboration with partners beyond Africa

Science has already been through one revolution in diversity

Distinct disciplines have crumbled

Interdisciplinary research emerged with benefits– led by senior scientists and funders

For science (and physics in particular) to become inclusive and develop the benefits of diversity – similar intervention is necessary and senior scientists(in our case senior physicists) should pause in their very busy schedule and consider the issue of diversity and inclusion even if it will be for the first time

Inclusive science is better science and it benefits everyone

I wish one day inclusion in science will be the default and not the exception. For this to happen there is still much work to be done.

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