

The African School of Fundamental Physics and Applications (ASP)

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on behalf of the ASP International Organizing Committee

<https://www.africanschoolofphysics.org/>
ASP-IOC@CERN.CH

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Outline

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Mission of the ASP

ASP as a start-up

A non-profit organization created by a small group of worldwide scientists to stimulate and include more African talented physics students in the world scientific community.

The aim of the school is not to set a strictly one-way effort to bring knowledge and experience to African colleagues and students, but rather to establish a genuinely integrating scientific network between Africa and the rest of the world.

- To contribute to a world w/ equal access to knowledge
- To support financially up to 85 African students for 3-week classes attendance
- To establish a biennial educative program to be hosted across Africa
- To provide high quality classes by international renowned Scientists



Mission of the ASP

Committees to build momentum

Build strategic partnership and collect financial support from Africa, Europe, USA and Asia via universities, laboratories, UN, and other organizations.



B. Acharya (ICTP & King's College London UK)



K. A. Assamagan (BNL)



A. Dabrowski (CERN)



C. Darve (ESS)



J. Ellis (CERN & King's College London UK)



F. Ferroni (INFN)



S. Muanza (CNRS-IN2P3)

- Conceptual thinking by **S. Muanza** and **J. Ellis** in 2001 and IN2P3 to trigger
- International Center for Theoretical Physics (ICTP), **B. Acharya**, as incubator and greatly encouraged by CERN and Fermilab.
- Preparation teams led by **K. A. Assamagan** and **C. Darve** (ASP2010).



Mission of the ASP

Sponsorships for Student Participations

"If each African country supports its participants, or contributes 2500 Euros every year to the ASP budget, ASP will be entirely financed by African countries. And *2500 Euros* is marginal even for the least developed country".

ICTP Support major

- Student participation
- Management of application database
- Arrange student travels



Host Country Support Significant

- In-kind support
- Direct Financial contributions
- Human Resources toward ASP Organization

IOC

- Writes Proposals, Requests for Supports
- Produces Final Reports of Activities
- **Seeking permanent financial backing**

African Contributions:

- SA DST/NRF
- IUCEA

Fund Management

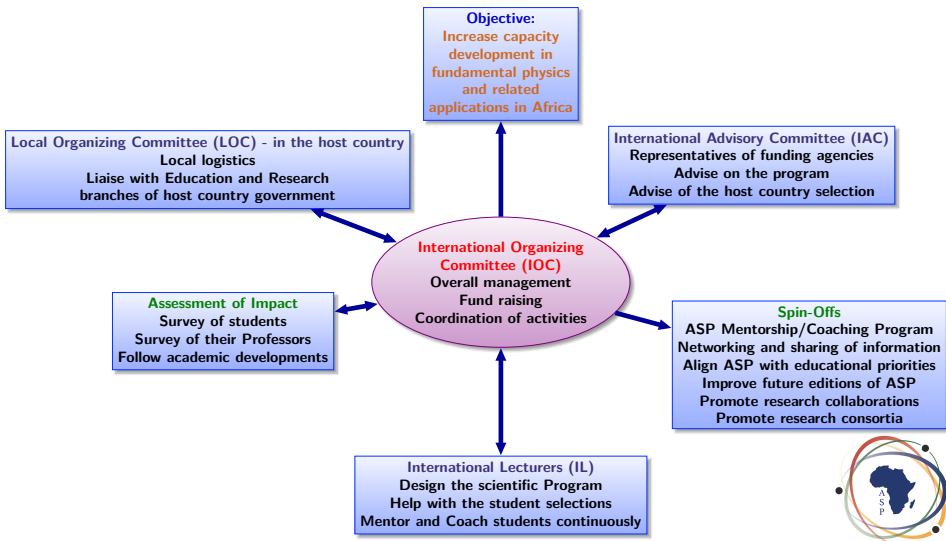
Funds centralized and managed by the South African Institute of Physics (SAIP)

Lecturers and Organizers Supported by External Sources - Significant

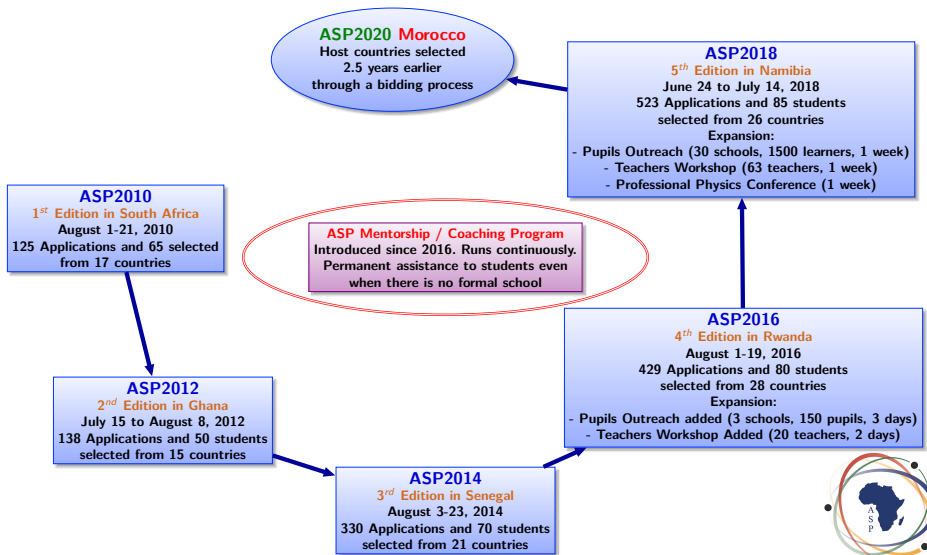
Support received then used to maximize student participation



ASP Organization



ASP Editions



ASP Activities

The topics of interest

Theoretical Physics

- Nuclear and Particle Physics
- Beyond the Standard Model
- Astro-particle physics and Cosmology
- Theoretical Heavy-ion physics

Experimental Physics

- Particle Detectors
- Particle Identification and Data Analysis and statistics
- Exp. Particle physics, current status of the field
- Exp. Nuclear Physics
- Exp. Heavy Ion Physics
- Exp. Astro-particle Physics

Accelerator and Applications and GRID

- Accelerator physics and Technology
- Physics of Particle Beams
- Medical Applications
- Neutron and Light Sources
- Energetics and solid state
- GRID and computing
- Digital Library



ASP Activities

ASP Program Expansion

Student Program

3-week intensive school

- 3rd year of University to Ph.D.
- Mostly African Students
- 70-85 Students

Learners Program

1-week learners Outreach

- 10 – 12th grade learners
- Encourage learners to develop and maintain interests in Physics and Applications
- Up to 1500 high school students

ASP Conference

Introduced since 2016

1-week International Conference

- Participation of ASP Alumni
- Participation of Research Faculties
- Networking and collaborations

Forum and Outreach

- Involve Regional policy makers
- Promote spin-off activities in Africa
- Introduce students to policy

High School Teachers Program

1-week intensive workshop

- Train High School Teachers for improved physics teaching
- Up to 70 high school teachers from the host country

Mentorship / Coaching Program

At all times

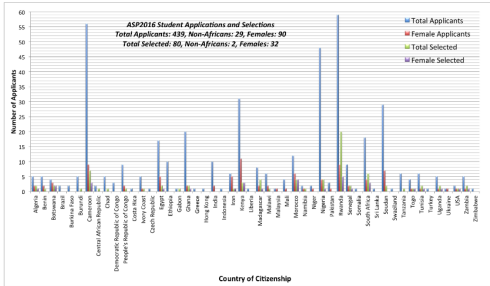
- Connect Students with Researchers
- Place students at Laboratories
- Listen to students and help address their academic needs if possible



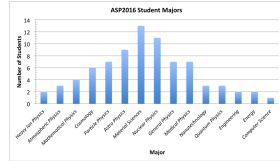
ASP Activities

ASP2016 Students Profile

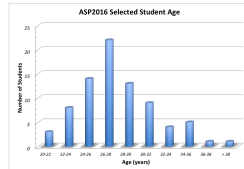
ASP2016 Selected Students by Citizenship



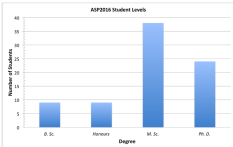
ASP2016 Selected Students by Field of Study



ASP2016 Selected Students by Age



ASP2016 Selected Student Degree Programs



- 429 Applications
- Total Selected: 80 students
- Selected from: 28 countries



ASP Activities

ASP2016 - A Moroccan in Rwanda

- My flight from Morocco (Casablanca) to Rwanda (Kigali)
- Kigali, Rwanda's capital (Africa's cleanest city)
- ASP has opened my mind in so many ways; academically, socially, morally...
- ASP Mentorship Program (**Dr. Mario Campanelli & Dr. Kate Shaw**)
- This school meant a lot for my Ph.D research (Thanks to **Dr. K. A. Assamagan** (BNL) & **Dr. L. Elouadrhiri** (JLab))
- Internship at BNL for summer 2019 (3 months)



I will forever be grateful for this privileged scientific adventure.



ASP Activities

Forum & Outreach Day



Dedicated to Knowledge and Transfer of Technology

Dr. D. ADAMS, chief director: Emerging Research areas & Infrastructure, Human Capital and Knowledge Systems.



East Afr. Science and New ICTP Center
Rwandan Ministry of Education



AfLS and compact acc.

Prof. H. WINICK, Prof. Emeritus, SLAC and
Prof. L. SERAFINI (INFN, IT)



Dr T. TJIVIKUA, Vice-Chancellor, Namibia
University of Science and Technology
(Namibia)
Dr. R. ADAM (SKA, SA)



UN support

Dr. H. TOURE, UN ITU Secretary General.
Prof. A. WAGUE and O. KA M. NGOM - US
Embassy rep.



Coming up.



Conclusions

- ASP has evolved since 2010, to include
 - An intensive 3-week school for students
 - A workshop to train high school teachers
 - An outreach to motivate high school learners
 - A professional physics conference to attract ASP alumni and African research faculties
 - A constant mentorship program even when there is no school
- Thanks to the support and dedication of
 - Sponsors
 - International lecturers
 - Host country governments and educational / research institutes
- ASP constantly improving by
 - Seeking and integrating feedbacks
 - Working in synergy with other capacity development institutes operating in Africa
 - Aligning ASP scientific program to better serve the education priorities of African countries



THE SIXTH BIENNIAL AFRICAN SCHOOL OF FUNDAMENTAL PHYSICS AND APPLICATIONS
 THE SECOND BIENNIAL AFRICAN CONFERENCE ON FUNDAMENTAL PHYSICS AND APPLICATIONS
 24th-30th JULY, 2020
 24th-30th JULY, 2020
 Co-organized by Mohammed V & Cadi Ayyad Universities, Morocco
 at Faculty of Science Senejala, Marrakech

ASFP
 To increase scientific development in fundamental physics and related applications in Africa, the ASFP has arranged for the fourth year since its inception. It is a program of activities which attract eminent leaders from 20-30 countries for development in Africa.

ACADEMIC PROGRAM

• TOPICS

- Astrophysics & Cosmology
- Atomic & Particle Nuclear & Medical Physics
- Astrophysics, Energy & Energy Efficiency
- High Energy Physics
- Physics of Plasmas
- Physics of Condensed Matter
- Quantum Information

• ACTIVITIES

- Workshops for High School Teachers
- Lectures for Undergraduate Students
- Physics Lectures and Experiments for Masters
- Courses for Research Graduate Development & Motivation
- All-Risk Collaboration on Fundamental Physics & Applications

www.asfp2020.ma/ASP2020

ASP2020 - Welcome to Marrakech

THANK YOU!



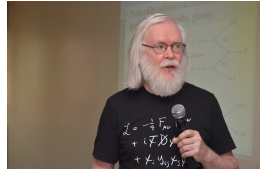
BACK-UP



ASP Activities

World-Class Lecturers

- People-oriented lecturers willing to share their experience with African students
- Highly motivated and motivating characters
- Most of ASP lecturers are financially supported by their home institutes
- Provide fruitful interactions with students
- Lecturers typically attend the ASP for 3-7 days



ASP Activities

High School Teachers Program

Objective:

Support teacher growth in the planning and delivering of instructions



Teachers program is running in parallel with the baseline ASP program

The program consisted of masterclasses, physics demonstrations and experiments

For the **ASP2016**, 20 teachers from all over Rwanda converged to the venue at the University of Rwanda for a 2-day workshop



ASP Activities

ASP Conference

- Participation of ASP Alumni
- The proceedings of the ASP conference are in preparation to be published as a special issue of the African Review of Physics.
- Participation of Research Faculties
- Networking and collaborations
- Professional presenting key-African-projects



ASP Activities

Mentorship & Coaching

Summary

- **ASP2016:** 20 students
- **ASP2018:** 36 students registered

Purpose

- Gauge the impact of ASP
- Support ASP student alumni
- Work with Academic advisor
- Formation of collaborations
- Get African students involved
- Connect Students w/ researcher
- Improve the ASP program

Strengths & Needs for Improvement

- Enthusiastic Mentors
- Ability to share support beyond the academic level
- Increasing # of Mentors & Mentees
- Expert pairing
- Capacity building
- Funding & Partnerships



ASP Activities

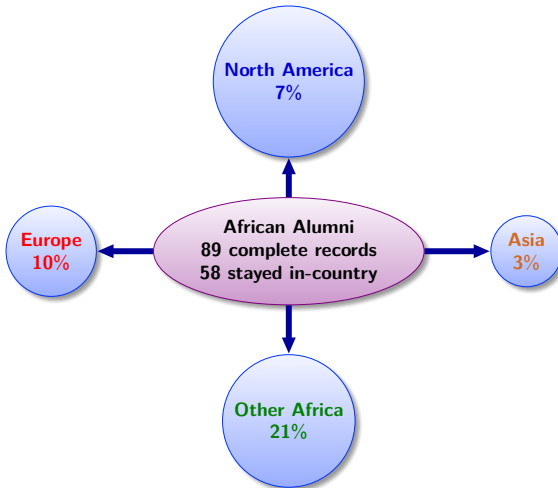
Beyond the Academics

- Social activities to facilitate interactions among students and lecturers
- Create network for student: email, blog, web, FB, WhatsApp
- Provide student with materials: indico, booklets
- Video connection to CERN CCC and ICHEP conf.
- Share experience with public lectures
- Produce movie and press release
- Students poster & oral sessions
- Hands-on and lab-work
- Shipping equipment (cloud chamber, PC, BPM)
- Student Survey and School reports



ASP Activities

Where do African Alumni go ?



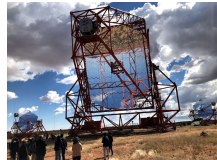
Courtesy Julia Gray



ASP Activities

Excursion & Festivities

And finally some relaxing time: Excursions & Festivities



ASP Activities

Students, lecturers & organizers @



ASP2010



ASP2012



ASP2014



ASP2016



ASP2018

