African Strategy for
Fundamental and Applied Physics

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The African School of Fundamental Physics and Applications (ASP)

International cooperation forms the common denominator of the today's culture of scientific activities. However, in many scientific disciplines and especially in fundamental and applied physics the cooperation among African countries and between them and the rest of the world is not well developed. This is especially the case for sub-Saharan Africa, which is one of the most rapidly developing regions in the world with great educational needs. In order to extend the existing international scientific ties to this geographical zone, we have established a biennial African School of Physics (ASP) [1] with a focus on fundamental and applied physics.

The ASP series started in 2010 in South Africa, then Ghana (2012), Senegal (2014), Rwanda (2016), and Namibia (2018) [2-6]. The 2020 edition of ASP was planned in Morocco; however, because of the COVID-19 pandemic, it was organized online in July 2021. The ASP is based on the close interplay between theoretical, experimental, and applied physics, as well as computing. It covers a wide range of topics in fundamental and applied physics. About eighty students are selected from all over Africa, from upwards of four hundred applications in each edition. International scientists are invited to prepare and deliver lectures according to the proposed topics considering the diverse levels and backgrounds of the students. The duration of the school allows for extensive networking between participants. A one-week training workshop for about seventy high school teachers and a one-week outreach for over fifteen hundred high school pupils are included in the program.

Research institutions, universities, government agencies, and foundations have sponsored ASP. The success of the school is sufficiently encouraging to provide motivation for a review of the ASP goals and for consideration of mechanisms that would make it sustainable. The central long-term objective of the School is to help improve higher education in Africa and in doing so, to contribute in a significant way to the development of science and technology on this continent. We believe that maintaining the leadership of the organization of the ASP series in partnership with other interested institutes and African governments and policy makers presents a unique opportunity to pioneer the scientific and technological development of a region of more than 1 billion people with large unmet needs but vast human potential. What is needed at this time to ensure the future of ASP and the success of its mission are partners that can provide sustained support for the participation of African School students, teachers and pupils.

The biennial support for the participation of African Students, teachers and pupils in future ASP can be realized in various ways: Direct financial support to the budget of the school to cover participant travels; Travel support for ASP organizers / lecturers in the activities that enhance the reach and coverage of the ASP; or travel coverage for ASP alumni to spend 2-3 months at international research labs.

The objective of ASP is achieved through an outreach effort, an increased awareness of the potential of high-quality training offered by large scale experiments in context of various scientific disciplines, and a system of networking on the international scale. There is a strong alignment between the mission and the vision of African governments and policy makers on education and capacity building and their programs with the goals of the ASP. The ASP is committed to include African governments in the planning, in order to take advantage of aspects such as consolidating agreements and their goals, building on synergy with other programs, improving the sustainability and impact of capacity development and improving the measurement and visibility of the impact. By working with African governments and policy makers on education, ASP seeks to promote a culture of science that creates an attractive environment for African student alumni, thus encouraging their retention within Africa. ASP promotes sustainable scientific development in Africa by building a network between African and international researchers for increased collaborative research and shared expertise.

ASP2010–21 were very successful schools as can be seen from the final reports and the numerous press releases. The success of the school is due to the financial support from institutes in the USA, Europe, Asia and Africa, and to the dedication of the organizing committee, to the lecturers, and the students themselves. Many students in Africa face challenges in terms of the logistical support, the quality of education and the opportunity for higher education. It is often the case in Africa that even the best students do not have the needed support to succeed or to acquire the necessary skills to be competitive at an international level. It is

important to help resolve some of the challenges to improve physics education and research in Africa. ASP serves at least two purposes: it provides a template for solving educational challenges, and offers opportunity for networking, which helps prepare the students to find practical answers to many issues.

Looking at the long-term objectives, the success of ASP is encouraging and allows us to review the goals and consider mechanisms to make it sustainable. To build upon the success of ASP2010–21, we propose to establish a longer partnership between international institutes and African governments and policy makers on capacity development for the component of funding, and to develop the ASP project goals and the key performance indexes further. These developments are timely given the progress made by the ASP and the synergy that can be established with the African policy makers on education and research.

References

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Primary Category

Physics Education

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Commnuity Engagement

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