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**Letter of Intent (LoI):
The Need for an African Synchrotron Lightsource**

**To: The Steering Committee of the African Strategy for Fundamental and Applied Physics
(ASFAP)**

This letter of intent (LoI) is to show my strong interest for the African synchrotron lightsource; and also, to demonstrate how having it set up in Africa would be very beneficial to the continent as a whole. Research infrastructures are facilities used by the scientific community to carry out exploratory research in different fields using diversified scientific instruments to address well-defined questions. Answering such questions often leads, both in the short- and long-term, ultimately to a wide range of practical applications and defines pathways for addressing global challenges, such as tackling endemic diseases, food security and scarcity of clean water.

To address Africa's huge challenges in the long-term requires research activities in nearly all scientific disciplines and the utilization of scientific infrastructures that are both multi- and inter-disciplinary. Such infrastructures should bring together research activities in medical sciences, environmental sciences, energy sciences, materials sciences, and cultural heritage sciences amongst others. One of the reasons Africa needs such infrastructures is that scientists could, for example, develop cures for diseases of particular relevance to Africa that may not be receiving sufficient research attention from outside. Africa cannot continue waiting for those outside the continent to take the lead in developing treatments for diseases like Ebola and malaria.

The evident choice of such a large scale multi- and inter-disciplinary research infrastructure is a synchrotron light source (SLS). A SLS is a mega-scale research and industrial infrastructure that delivers light that can be billions of times brighter than our sun. This extremely bright light is useful for imaging viruses, bacteria, cells and nanostructures, to name but a few. Knowledge from such images can be extremely useful in addressing health/medical/biomedical problems, environmental problems, and in the development of novel materials and devices that could lead to diversified technological applications for Africa and even the world at large. An SLS also could generate a combined science and industrial park

that springs up around it and become a clustered science-megalopolis of globally competitive research activities, training and innovations. However, for now, Africa is the only habitable continent without an SLS. African researchers and scientists have to travel abroad to perform experiments at facilities in Europe, South and North America, Asia and Australia.

Having such an advanced light source in Africa would be very beneficial to the continent as a whole. Currently Africa is losing many of its talented and energetic young scientists to the African science Diaspora. The research work that we are doing abroad is not possible with the current research and scientific facilities in Africa. An SLS would play an important role in retaining talented scientists and preventing the best-trained researchers and multi-disciplinary innovators from emigrating. Thus, setting up such a mega-scale infrastructure somewhere in Africa would make that region a unifying point and a leader in bringing many African and international scientists together. In addition to the above scientific benefits, such a large-scale infrastructure would also play a pivotal role in seeding local competitive industries on the continent.

In particular, an SLS in Africa would enhance the advancement of basic and applied scientific research and capacity-building on the continent. Advanced techniques employed at an SLS would be applied for research in many fields that are relevant for Africa. For example, in agriculture for the analysis of soil and environmental pollutants; in health for tackling and development of new drugs for malaria, HIV, tuberculosis and Ebola, which are amongst the top challenges facing Africa today.

Furthermore, SLSs are complex machines requiring an enormous range of scientific, mathematical, engineering, technological and industrial skills. Thus, it is envisaged that the African SLS would open employment opportunities for Africans, international engineers, and people having a diversity of qualifications. Other socio-economic benefits for an African SLS include the growth of spin-off companies for technological development and innovation and the generation of employment opportunities for qualified African youth. The African SLS would also give African countries another opportunity to work together in taking control of their destinies and becoming major players in the international community.

This document is part of my reflection about the need for multidisciplinary scientific infrastructures in Africa, in particular the importance of an African Synchrotron Lightsource, which can be accessed on [online here](#).

Thank you for your consideration,
Prosper Ngabonziza

