

A synchrotron light source for Africa, by Africa, in Africa

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The science strategies of many Global North countries have included a synchrotron light source on their roadmaps. This has been the case for many decades now with the resulting large-scale research infrastructures acting as hubs for, arguably, the most diverse user community of any such research infrastructure.

The European Synchrotron (ESRF) in Grenoble (France) is one such example and is an international synchrotron, supported by 22 countries with over 40 nationalities represented on its staff. The user community of the ESRF is growing, counting today around 9,000 user visits every year and around 6 publications every day using data and results from its 43 X-ray beamlines.

This is just one light source. There are over 50 around the world. But none in Africa.

Advanced synchrotron light sources benefit a wide range of science, being transversal in supporting chemistry, biology, physics, cultural heritage, medicine, environment, materials, geology, nanoscience, engineering amongst many other disciplines, from both academic institutes and industrial enterprises. As such, they can lead to new and better drugs, vaccines, better exploitation of natural resources, understanding human history and origins, enhancing catalysts and paving the way for materials innovation and tailoring. The mostly X-ray, but also IR and UV, beamlines at such synchrotrons provide a deep vision into materials and living matter, with spatial and time resolutions far beyond conventional laboratory-based techniques. The extreme intensity and coherence in modern synchrotron beams provides unparalleled opportunities for unique research and innovation.

The time is now for Africa to also benefit from a large-scale synchrotron research infrastructure as a trans-national project, benefitting all researchers, younger and more senior, across Africa and further afield. It is important to note that such centres are breeding grounds for interdisciplinary and cutting-edge science, as well as training grounds for the next generation of scientists, technologists and engineers, thereby both nurturing talent and retaining trained resources for Africa.

A light source is not a panacea. But synchrotrons have proven themselves to be a strong provider of return on investment, through science, socio-economic impact, training, technology and public-science awareness, wherever constructed and operated around the world. Africa deserves its own light source and not to be dependent upon other facilities. It will take time and concrete plans, capacity building and a vision to be constructed. This has already been initiated by the African Light Source Foundation (www.africanlightsource.org) which is putting the African concept of “ubuntu” first and foremost in its approach to building the case for the African Lightsource, and it is encouraging to see the AAS taking now a stronger interest in such an initiative.