

The role of nuclear and particle physics, astrophysics, and cosmology in building capacity for Physics in Africa

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In Africa particle physics, nuclear physics, astrophysics, and cosmology have been grabbing our attention, and that of our students for years. In the last decade, the field of a diverse research programme joining nuclear and particle physics with astrophysics, astronomy, cosmology and the enticing 'new worlds' imagined in theoretical physics has become particularly exciting due to the unprecedented scale of modern machinery and the discoveries that come with it. There are so many opportunities for students, teachers, and the public to learn about modern science such as the value of blue-skies research to society and everyday applications. For teachers, students, and academics this is also an opportunity to rethink the African science curriculum.

The South African Institute of Physics has created opportunities for the physics community in Africa to engage in physics education and outreach. The nuclear and particle physics community participates through iThemba LABS and the South Africa-CERN Consortium while the astrophysics and cosmology community participates in the astronomy facilities such as the Southern African Large Telescope (SALT) and the Square Kilometre Array (SKA) and its precursor MeerKAT. Teachers, researchers in education and science communication, professionals who work in engagement and outreach in particle physics, nuclear physics, astrophysics, and cosmology, as well as academics across both areas, collaborate in physics education and outreach programmes.

The aim of this report is to highlight the challenges Africa faces in building capacity in physics and the positive impact particle physics, nuclear physics, astrophysics, and cosmology has on physics education, communication, and outreach in Africa.

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