



Africa preparing to host the world's largest radio astronomy project

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South Africa and Australia are the finalists in the bid to host the Square Kilometre Array (SKA) telescope. This is an internationally supported project to build the most powerful and technologically advanced research facility in the field of radio astronomy. It will utilise cutting edge technology in electronics, computing, network connectivity, material sciences and engineering.

The South African SKA bid comprises nine African partner countries and associate countries. The nine partner countries – South Africa, Botswana, Ghana, Kenya, Madagascar, Mauritius, Mozambique, Namibia and Zambia - will co-host the SKA infrastructure. The partner countries participate in engineering and ICT initiatives, and the training of undergraduate and postgraduate students. Membership to become an SKA African Associate Country is open to all African countries.

In preparation for hosting of the SKA telescope, South Africa has introduced a comprehensive human capital development programme that supports students across the continent to study physics, astronomy, engineering and ICT. This programme has been extremely successful in attracting young African students into science and engineering and in producing a cohort of postgraduates. Since its inception in 2005, the programme has awarded 263 grants for undergraduate and postgraduate studies.

In addition to the HCD programme, the African SKA bid has stimulated interests in the field of astronomy across the continent. To mention but a few, the University of Botswana, the University of Antananarivo in Madagascar and the Eduardo Mondlane University in Mozambique have recently introduced courses in astronomy and astrophysics. The SKA will provide opportunities for practical work in these countries and will enhance the uptake of science training programmes in various countries. By way of illustration, Mozambique had 75 students registered for courses in astronomy and astrophysics by the summer of 2010, with a growing demand for placements in these courses.

In order to secure the bid for the SKA, South Africa has begun with the construction of a demonstrator telescope called MeerKAT in the Karoo area of the Northern Cape province. The MeerKAT will consist of 64 dishes and will be the largest and most sensitive radio telescope in the Southern Hemisphere. Plans are afoot to finalise MeerKAT phase 1 consisting of seven dishes, which are already installed and undergoing various operational tests. This has been a rewarding experience and a clear indication that Africa is ready to host the SKA. South Africa is already a host to major astronomy facilities that include the Southern African Large Telescope (SALT) in the Northern Cape, South Africa, and the HESS gamma ray telescope in Namibia.

Immediate benefits are in the form of research and development opportunities during the design phase. Scientists from universities across the continent have an opportunity to participate in the design of SKA novel technologies and instrumentation. The construction phase of the SKA will generate localised direct benefits in the form of jobs, procurement and sourcing of local materials in each of the partner countries. A combination of these benefits will contribute to improvement in the sub-Saharan GDP.

In addition to the immediate or short-term benefits, there are numerous long-term benefits accruable to the general community at large. Because of the scientific nature of the project, the biggest benefit will be the improvement of the skills base and access to top international research facilities and networks which will in turn boost our output of scientific publications. The SKA science provides opportunities for development of new algorithms and underlying mathematics for manipulating large data sets, new imaging technologies and techniques, new data compression

algorithms for purposes, as well as new ICT skills beyond what is currently available. These are essential skills which may be applied in other productive sectors of the economy.

In the next ten months the International SKA Office will make the final pronouncement as to who, between Africa and Australia, will host the SKA.

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