



AFRICA ARRAY

A public-private partnership supporting capacity building for Africa's natural resource sector

About AfricaArray

AfricaArray is a long-term (20 years) initiative to promote, in the full spirit of NEPAD (New Partnership for Africa's Development), coupled training and research programs for building and maintaining a scientific workforce for Africa's natural resource sector.

The name "AfricaArray" refers to an array of training programs, an array of scientific observatories, scientists across the continent working on an array of projects, and above all, a vision that Africa will retain capacity in an array of scientific fields vital to the development of its natural resource sector.

Vision

Africa's natural resource sector (petroleum, minerals, and water, in particular) is a major driving force for economic development. Africa is a primary source of strategic and base metals for the world market and a significant portion of the world's petroleum production comes from Africa



AfricaArray has been established to create a pool of highly trained African professionals to be employed across the continent, in industry, government and academia, to help manage and

develop Africa's natural resource sector, and to assist in mitigating related natural hazards (e.g., mine seismicity, tectonic earthquakes, volcanoes, tsunamis).

AfricaArray's initial focus is in geophysics and is designed to:

- Maintain and develop further geophysical training programs, in response to industry, government and university needs.
- Promote geophysical research, and establish an Africa-to-Africa research support system.

- Obtain geophysical data, through a network of shared observatories, to study scientific targets of economic and societal importance, as well as fundamental geological processes shaping the African continent.

AfricaArray is addressing workforce demands defined under the Mining Charter in South Africa and similar legislation adopted by other African governments by providing training and research opportunities to students from historically disadvantaged communities.

Organization

AfricaArray has been established through a partnership of four founding organizations: The University of the Witwatersrand (Johannesburg, South Africa), the Council for Geoscience (Pretoria, South Africa), The Pennsylvania State University (University Park, PA, USA), and the Incorporated Research Institutions for Seismology (IRIS). The partnership base has rapidly expanded to include many other organizations.

Implementation

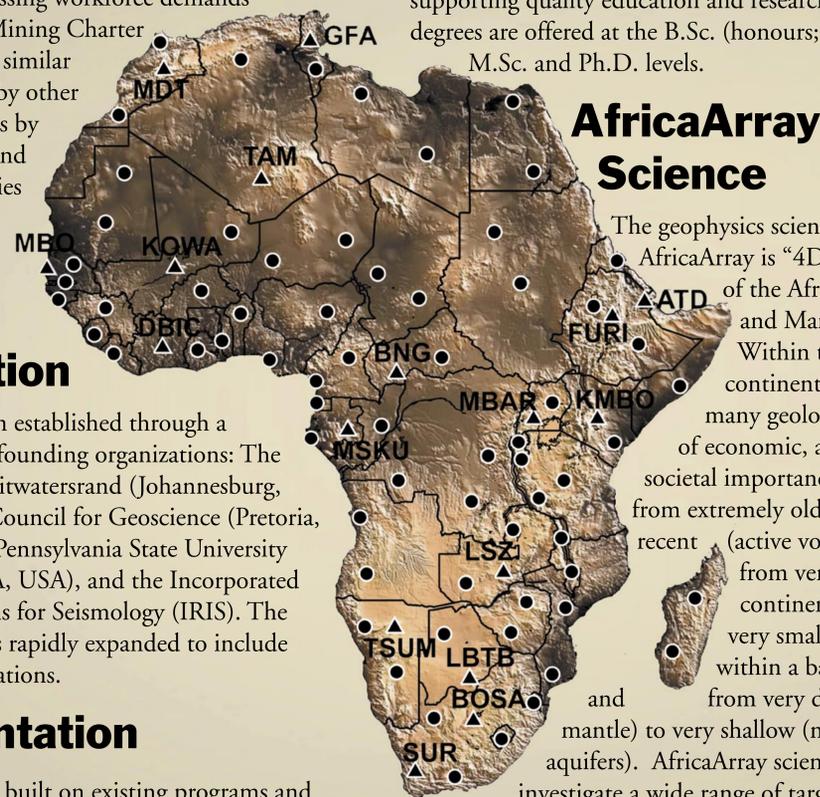
AfricaArray is being built on existing programs and expertise within the partner institutions and is being implemented in three phases. During Phase 1 (1/2005 – 12/2007), the educational program at the University of the Witwatersrand is being expanded and improved to provide B.Sc., M.Sc., and Ph.D. degree training in geophysics. Seismic stations are being built to form a network of shared scientific observatories, and data from the observatories are being used for student research projects.

During subsequent phases, training opportunities and the network of scientific observatories will be expanded, sustainable centers of excellence in geophysics will be established at other African universities, and a secondary school outreach program will be set up with a focus on natural hazards, mine safety, and career

opportunities in the natural resource sector. The "AfricaArray" model of promoting capacity building through tightly coupled training and research activities will also be propagated to other science fields vital to the development of Africa's natural resources, and will include adding additional monitoring equipment to the scientific observatories.

Degree Programme

The geophysics training programme is based in the School of Geosciences (www.wits.ac.za/geosciences) at the University of the Witwatersrand (Wits), Johannesburg, South Africa. The university has an enrollment of 25,000 students and is one of Africa's top universities with a long and distinguished tradition of supporting quality education and research. Geophysics degrees are offered at the B.Sc. (honours; 4th year), M.Sc. and Ph.D. levels.



The geophysics science theme for AfricaArray is "4D Imaging of the African Crust and Mantle". Within the African continent, there are many geological targets of economic, academic and societal importance ranging from extremely old (Archean) to recent (active volcanoes), from very large (sub-continental scale) to very small (faults within a basin or mine), and from very deep (lower mantle) to very shallow (near-surface aquifers). AfricaArray scientists will investigate a wide range of targets spanning much of geologic time and many spatial scales using data from the AfricaArray scientific observatories, plus geophysical, geochemical, and geological data available from other sources. The scope of AfricaArray science will expand over time to include other themes relevant to the development of Africa's natural resource sector.

Observatories

A network of shared scientific observatories is being built across Africa to help achieve an integrated training and research programme for science capacity building. The network of observatories, linked through common instrumentation, open data access, and operation, form a "shared" facility and as such provide an important

means of building a science community.

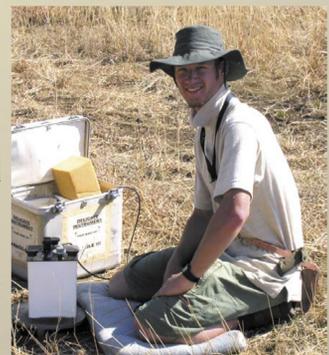
The scientific observatories are built around broadband seismic stations for recording earthquakes because many stations already exist and provide a framework from which to launch a larger, multifunctional network. It is envisioned that the observatories will be equipped with additional monitoring equipment over time, such as GPS, meteorological, hydrologic and other environmental sensors.



During the first phase, a network of 20 to 30 permanent observatories spanning much of southern and eastern Africa is being built. During later phases the network of permanent observatories will be expanded into other parts of Africa. The map to the left shows a proposed distribution of scientific observatories after 10 or more years.

Technical Training Program

The technical training of personnel to operate and maintain geophysical equipment for AfricaArray is provided by the Council for Geoscience (CGS) both at the CGS's offices in Pretoria and in the field at selected AfricaArray observatories.



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Support:

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Council for Geoscience

