Technical Training Program
The technical training of personnel to operate and maintain geophysical equipment for AfricaArray is provided by the Council for Geoscience.

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Support:
AfricaArray is supported by a public-private partnership of organizations in academia, government and industry, and is part of the Alliance for Earth Sciences, Engineering, and Development in Africa (AESEDA) (www.aeseda.psu.edu/).

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. A significant portion of the world’s petroleum production comes from Africa. Water resource development and natural hazard mitigation are needed for supporting sustainable livelihoods throughout the continent, and in some countries geothermal reservoirs provide an important energy source.

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 social importance, as well as fundamental geological processes shaping the African continent.

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. Information on how to become a partner in AfricaArray can be found at: www.africaarray.psu.edu/involved/involved.htm.
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 (Wits) 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, Johannesburg, South Africa. Geophysics degrees are offered at the B.Sc. (honours; 4th year), M.Sc. and Ph.D. levels.

To increase AfricaArray's training capacity at the M.Sc. and Ph.D. levels, a "sandwich" program has been set up whereby students spend up to 6 months each year studying and doing research with a professor at one of the AfricaArray-affiliated universities in the U.S. or Europe. Students are co-supervised by faculty at Wits and at the host institutions within the U.S. or Europe. Degrees are granted from the University of the Witwatersrand. Application materials are available at: www.africaarray.psu.edu/degree_programmes/degree_programmes.htm.

Science Theme

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. Information on specific projects and research opportunities for students and post-docs is available at http://www.africaarray.psu.edu/science/science.htm.

Scientific 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. Data from the observatories provide the underpinning for much of the science supported by AfricaArray. Some of the observatories are permanent, while others are or will be deployed on a temporary basis.

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, multi-functional network. During the first phase of AfricaArray (2005-2007), 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.

Geophysics Field Course

The AfricaArray summer geophysics field course is designed to provide physics, math, engineering and geoscience students from historically black colleges and universities in the U.S. with exposure to geophysics field methods, modeling techniques, and career opportunities.

The course is eight weeks long. Students spend two weeks at Penn State for orientation, 1 week at Wits to design a field project, 2 weeks in the field collecting and analyzing geophysical data, and 3 weeks back at Penn State to complete the project report.

The course is part of the Summer Research Opportunities Program (SROP) at Penn State, and students admitted to the course will have all expenses (travel, food, lodging) paid for and will also receive a stipend. Application information is available at http://www.africaarray.psu.edu/field_course/field_course.htm.

Map of proposed distribution of AfricaArray scientific observatories after 10 or more years.