

Draft Plan for Astronomy Education and Outreach in Africa:
With Special Focus on the International Year of Astronomy 2009

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1. Background:

Astronomy is a subject that encompasses a large number of science, engineering and mathematics disciplines. As such it bears a distinct strength in the promotion of these disciplines to students and the public. It is also a subject that sparks the curiosity of young and old alike. In Africa, where education is probably the most sustainable solution to development challenges facing the continent, a group of astronomy-, space science- and education-related individuals and organizations have decided to come together to harness these useful characteristics of astronomy for the benefit of Africa as a whole. In building the astronomy community in Africa, the group aims to use the subject to spark an interest not only in science, engineering and mathematics disciplines, but also in education in general. The International Year of Astronomy shall be used as a launching pad for a network of African individuals and organizations who intend to work together into the future using astronomy to enhance education in Africa.

2. Vision:

The continent of Africa, with an ever-growing astronomy research community, united in the fields of education and outreach, working together and sharing resources, such that the people of Africa are educated, especially in the fields of science, engineering and technology.

3. Theme:

Astronomy for Education

4. Core Missions:

The vision will be realized through the following four core missions (and related objectives), with a focus on building and supporting human resources:

- A. **Enhance the teaching and interest in Mathematics and Science in schools through:**
 - A.1. Educational Resource Development and Distribution
 - A.2. Educator Development
 - A.3. Learner Development
 - A.4. Promotion of Astronomy Related Careers

- B. **Enhance the teaching and research interest in astronomy in universities through:**
 - B.1. Promotion and encouragement of post-graduate studies
 - B.2. Encouragement and support of physics/astronomy related student bodies
 - B.3. Equipping of universities with necessary infrastructure and resources

- C. **Increase the awareness and knowledge of science amongst the public through:**
 - C.1. Public Resource Development and Distribution
 - C.2. Astronomy communication capacity building and implementation
 - C.3. Public programmes and events
 - C.4. Astronomy in the Media

- D. **Support and encourage an African network through:**
 - D.1. Sourcing and sharing of astronomy and education related resources
 - D.2. Human resource development
 - D.3. Close liaison with Pan African organizations such as NEPAD and African Union

The following table contains a more detailed description of the core missions:

Target	Objectives	Examples of Actions	Impact
A. Schools	A.1. Educational Resource Development and Distribution	Wide distribution of high quality (curriculum related) resources for educators, learners and educator trainers	Widespread access by schools to high-quality resources
	A.2. Educator Development	Educator workshops, enhanced educator training programmes, incentives, motivational talks	Motivated and capable educators; An expanded team of people promoting astronomy
	A.3. Learner Development	Learner workshops, facility visits, school visits, astronomy clubs	Motivated and capable learners An expanded team of people promoting astronomy
	A.4. Promotion of Astronomy Related Careers	Selected career expos; university student events; talks by scientists/role models; career magazines	Greater interest in and awareness of astronomy and related careers
B. Universities	B.1. Promotion and encouragement of post-graduate studies	Student information sessions; more attractive post graduate funding	Larger number of post graduate students resulting in larger research community
	B.2. Encouragement and support of physics/astronomy related student bodies	Inter-university links and projects through student bodies; Competitions and incentives	Strong student community supporting each other and organized enough to drive big projects
	B.3. Equipping of universities with necessary infrastructure and resources	Sourcing of telescopes for all universities; Equipping libraries with astronomy related books and software	Sufficient resources available to encourage students to study astronomy (or at least science, engineering or maths)
C. Public	C.1. Public Resource Development and Distribution	Posters, popular science magazines, planispheres, telescope kits, flyers	Interest in astronomy generated amongst public and fed by resources
	C.2. Astronomy communication capacity building and implementation	Training for astronomers in communication skills; astronomy training for journalists (science writing); astronomers “on stage”	More astronomers available for media interactions; Greater accuracy of astronomical content in media An expanded team of qualified people promoting astronomy
	C.3. Public programmes and events	Facility tours of carefully monitored quality; public lectures; open nights; star parties; development of visitor centres; off-site activities e.g. “street astronomy”	Generate an interest in and excitement about astronomy amongst the public

	C.4. Astronomy in the Media	Regular TV/radio shows or newspaper articles; media presence (TV/Radio) at major events; database of available astronomers for media; train scientists to talk to media	Visibility of astronomy increased through media and greater interest generated amongst the public
D. African Network	D.1. Sourcing and sharing of astronomy and education related resources	Distribution of electronic and “sample” materials that have been developed at various institutions; invitations to events; support and mentorship wherever possible	Strong international collaborations; Assistance provided to neighbouring countries
	D.2. Human resource development	Training workshops on materials development and usage; communication skills training	Large well trained pool of individuals distributed across Africa and able to perform astronomy education and outreach activities
	D.3. Close liaison with Pan African organizations such as NEPAD and African Union	Attendance of meetings; regular consultation with local government	Achievement of certain goals of Pan African organizations; efficient utilization of and incorporation into existing international programmes

5. Structure:

It is recommended that the African network remain an online and dynamic structure with the Pan-African body keeping informed and in contact through email and a website for Africa. Within each country however, is required a driver (single point of contact) along with a team that comprises the steering committee for that country.

6. Guiding Principles:

- 6.1. Encourage collaboration both nationally and internationally.
- 6.2. Support and enhance rather than reinvent programmes.
- 6.3. Ensure adequate monitoring, evaluation and quality assurance.
- 6.4. Development and support of human resources
- 6.5. Ensure sustainability at every stage

7. Before IYA2009:

In the time preceding 2009 there will have to be activities carried out in preparation. Some of these activities may require funding of some sort but it is essential to have them completed before the start of 2009:

- 7.1. **Establishment of networks:** This will include both collaborative networks amongst the various organizations and individuals as well as a communication network for the dissemination of resources e.g. school clubs network, media network, contacts database, etc
- 7.2. **Consolidation of astronomical resources and best practices:** In order to prevent duplication of materials and to ensure effective use of limited human resources, a database needs to be created at a venue that will serve as a “clearing-house” for astronomy resources in

Africa. This database will also be valuable for anyone to use during 2009. During this process a list of “best practices” for astronomy outreach can also be obtained. Each country would be required to consolidate their resources and send to a central database.

7.3. Survey and List of Activities: By June 2008 a survey should be completed with each country submitting details regarding astronomy, mathematics and science education and outreach. From these surveys a finalized list of activities for 2009 should be determined, both local and international.

7.4. Funding for 2009: Funds should be sourced for IYA2009 activities both local and international.

8. During IYA2009

Activities during IYA2009 will fall into one of 4 geographical categories: **global, regional, national** and **local**:

- 8.1. Global:** These projects are essentially driven by the International IAU IYA2009 Working Group and entail participation in global programmes such as GLOBE at Night.
- 8.2. Regional:** Any project specifically involving collaborations between or reach into other African countries are considered to be regional activities. These collaborations may fall under bilateral and regional agreements such as NEPAD or SADC and are encouraged for African development. It is envisaged that these projects would be jointly funded by the national government and the participating countries.
- 8.3. National:** During the course of 2009 there will be various national projects aimed at a group that is spread throughout each country (e.g. a national astronomy quiz, astronomy puzzle in a national newspaper). It is envisaged that these will be funded by the national government.
- 8.4. Local:** These are activities that are targeted at people within a limited area of the country (e.g. a town or province). These activities will be implemented by small groups and it is envisaged that funding would either be provided by the organizations/individuals themselves (implementers of the project) or small grants made available by the national government.

9. After IYA2009

In order to ensure that the impact of IYA2009 has a high degree of sustainability, the following activities need to be carried out in the time shortly thereafter:

- 9.1. Global Consolidation of Astronomy Resources:** Many new resources would have been produced during IYA2009 and these should be consolidated and made available to the network for further use in promoting astronomy.
- 9.2. Regular Astronomy Club/Society Activities:** All new astronomy clubs or societies should have a support base in order to ensure regular activities that keep them alive. This support could come from research facilities but would mainly come from well-established amateur societies.
- 9.3. Regular Communication with the Astronomy in Africa Network:** This could take the form of a discussion forum or an e-newsletter that would keep the network active.

- 9.4. **Universe Awareness Programme:** This programme should be launched during IYA and sustained thereafter through the use of existing networks and incorporation of the philosophy into all astronomy outreach programmes.
- 9.5. **African Hands on Universe:** Another programme that would bring benefit to African countries.
- 9.6. **Astronomy in the Media:** There should be a regular media features established during IYA that can be sustained thereafter e.g. daily newspaper column on astronomy, popular television series, etc.
- 9.7. **Astronomy in the Classroom:** Schools should have been exposed to astronomy during IYA and in the years that follow regular activities should be arranged to keep the motivation alive e.g. activities on solstices, measuring shadows at different times of the year, astronomy in the arts faculty, etc.
- 9.8. **African Collaborations:** Africa should make maximum use of IYA to build on collaborations with other countries in Africa, specifically in terms of astronomy research and astronomy education/outreach. These should be followed up after IYA with specific projects and programmes that follow the lead that IYA collaborations take.

10. Funding:

- 10.1. Although funding will be sought from as many sources as possible it is envisaged that the bulk will be provided by the national governments of each individual country. However, an active African network will serve as a motivation for the provision of funding by any potential funders.