

MISSION STATEMENT

The centre, which carries two official names, African Regional Centre for Space Science and Technology Education in English (ARCSSTEE) and Centre for Space Science and Technology Education (CSSTE) aims to build capacities for applications of Space Science and Technology (SST) for sustainable national and regional development. This will be achieved by developing skills and knowledge in four prime areas of SST viz; Remote Sensing/Geographic Information System, Satellite Meteorology and Global Climate, Satellite Communications, and Basic Space and Atmospheric Sciences. For the purpose of accessing funds, logistics and other support services from the Federal Government of Nigeria, the Centre operates under the direct supervision of the National Space Research and Development Agency (NASRDA) of Federal Ministry of Science and Technology to undertake two major responsibilities; academic/research and educational/outreach in the area of space science and technology applications.

BACKGROUND

The Second United Nations Conference on Exploration and Peaceful Uses of Outer Space (UNISPACE '82) held in 1982 in Vienna, Austria; recommended that the United Nations Programme on Space Applications should focus its attention, inter alia, on the development of indigenous capabilities in Space Science and Technology at the local level. The United Nations General Assembly (GA) endorsed the recommendation in its resolution 37/90 of 10th December 1982.

The GA in its resolution 45/72 of 11th December 1990 also endorsed the recommendation of committee on Peaceful Uses of Outer Space, (COPUOS) that the United Nations should lead, with the active support of its specialized agencies and other international organizations, an international effort to establish Regional Centres for Space Science and Technology Education in existing national/regional educational institutions in the developing countries (A/AC.105/456, annex II, Para 4 [n]). In various United Nations documents, A/AC.105/498 of 1992 and A/AC.105/534 of 1993, the Office for Outer Space Affairs (UNOOSA) outlined a number of steps to translate the GA resolutions mentioned above into operational programmes. In a statement on the 15th of September, 1995, by UNOOSA, Nigeria was chosen to host, for the benefit of Anglophone countries, the African Regional Centre for Space Science and Technology Education in English (ARCSSTEE). A similar Centre for the benefit of Francophone countries in Africa, Centre Régional Africain des Sciences et Technologies de l'Espace en Langue Française (CRASTELF) was established in Rabat, Morocco.

On the 24th of November 1998, ARCSSTEE was formally inaugurated for the Anglophone countries to execute the United Nations' Mandate of capacity building in SST at the postgraduate level. Also, in 1999, National Space Research and Development Agency (NASRDA) was established to pursue the development and application of space science and technology for the socioeconomic benefits of the nation. To achieve part of its enormous objectives, NASRDA set up the Centre for Space Science and Technology Education (CSSTE) as an activity centre to create awareness, sensitize, mobilize and educate the generality of the Nigerians on the benefits of space science technology through school's outreach activities.

MANAGEMENT OF THE CENTRE

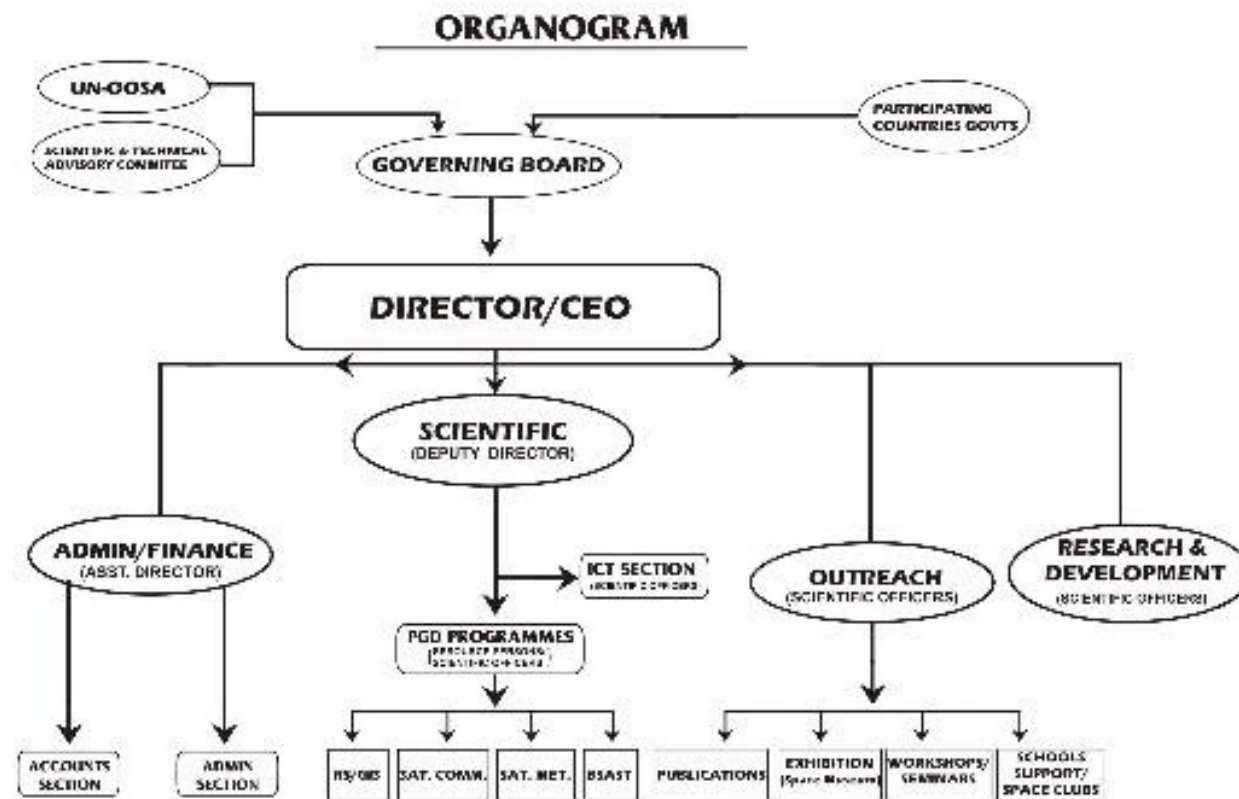
The African Regional Centre for Space Science and Technology Education (ARCSSTEE) is managed under the auspices of the United Nations Office for Outer Space Affairs (UNOOSA), while the Centre for Space Science and Technology Education (CSSTE) is under the direct supervision of

National Space Research and Development Agency (NASRDA) of the Federal Ministry of Science and Technology in Nigeria. An Executive Director oversees the daytoday running of the Centre.

In order to formalize the operations and management of the Centre, an INSTRUMENT which contains general and specific responsibilities of each unit/division, as well as the roles and responsibilities of each participating country, the United Nations, the host University, and other institutions/agencies exists. Under this guidance document, the institutional framework which defines and supports ARCSSTEE/CSSTE's structure, activities and operations, is presented in the organogram shown below.

The Centre is presently housed in the extension to faculty of science buildings at Obafemi Awolowo University IleIfe, Nigeria. The present staff strength is thirty comprising scientific officers and management support staff.

AFRICAN REGIONAL CENTRE FOR SPACE SCIENCE AND TECHNOLOGY EDUCATION-ENGLISH



ROLE OF THE CENTRE

The Centre was established principally to boost the growth; domesticate capacities of participating African countries and to enable each of them (Anglophone Africa) to enhance its knowledge, understanding and skills in many aspects of Space Science and Technology (SST). The Centre will solely serve as an education and research institution; capable of high attainments in the development and transmission of knowledge in all fields of SST applications. Hence, it is expected to offer the best possible education and applications experience to participants in all its training programmes. Thus the main role of the Centre will be the development of skills and knowledge of educators, scientists and enthusiasts in all areas of SST. Acquisition of these capacities should have a great impact on the socioeconomic development of the member countries. Furthermore, the Centre will aim aggressively at pursuing regional cooperation and supporting international actions and programmes in SST. The longterm goal is the utilization of research results for peaceful uses of

Outer Space for regional development.

The Centre for Space Science and Technology Education (CSSTE) is involved in National Schools' Space Science Education workshops, seminars, exhibitions, practicals/hands-on targeting school children at all levels in the 'catchtheyoung' initiative.

SCIENTIFIC OBJECTIVES OF THE CENTRE

Apart from serving as a nodal point for space science and technology education in Africa, the Centre aims to:

- (a) develop the skills and knowledge in four principal areas: (i) Remote Sensing and GIS, (ii) Satellite Meteorology and Climate Change, (iii) Satellite Communications and (iv) Basic Space and Atmospheric Sciences;
- (b) assist educators to develop environmental and atmospheric sciences curricula that can be used to inculcate and advance the knowledge of the elementary school students in space science and technology;
- (c) assist research scientists and project personnel in preparing the space-derived information for presentation to the policy and decision makers in charge of national and regional development programmes;
- (d) enhance regional and international cooperation in space science and technology programmes;
- (e) assist in disseminating to the general public, the value of space science and technology in improving the every day quality of life;

The African Regional Centre for Space Science and Technology Education in English (ARCSSTEE) will contribute to sustainable development of natural resources (air/water/land) and provide an input for biodiversity conservation and other related environmental programmes through the development of in-depth knowledge and skills of educators, research scientists, engineers and others in environmental information systems with emphasis on remote sensing, satellite meteorology and relevant technologies at the local level.

OVERVIEW OF EDUCATIONAL PROGRAMMES

The benefits of Space Technology, both direct and indirect, have introduced new dimensions into the study and understanding of Earth's processes towards improving the quality of life. An essential prerequisite to partaking in these opportunities is the building of various indigenous capacities for the development and utilization of Space Science and Technology. In recognition of such a prerequisite, a consensus has emerged within the international community that if effective assimilation and appropriate application of Space Science and Technology are to succeed in the developing countries, devoted efforts must be made at the local level for the development of necessary human and infrastructural capacity in all Space Science and Technology fields. It is to evolve the process through which the application of new technologies, and the acquisition, processing, interpretation and management of all data relevant for regional development could be achieved within the shortest possible time. The educational programmes are being developed to cater for the region's interests and aspirations regarding the peaceful uses of SST for socioeconomic development, education and research. It is oriented towards the dissemination of knowledge in relevant aspects of Space Science and Technology. The initial emphasis of the Centre is to concentrate on in-depth education, research and applications programmes, linkages to the regional and international research center's programmes/databases, execution of pilot projects and continuing education. Scholars and professionals who contribute to the educational programmes are drawn from both within and outside the region.

The Outreach programme which creates awareness is primarily executed through workshops and other forms of educational support to school children at all levels (nursery/primary/secondary). Also at the societal level, the Centre promotes awareness through print and electronic media, posters, and charts among others.

The main programmes of the Centre are summarized below:

POST GRADUATE DIPLOMA (PGD) PROGRAMME

The African Regional Centre for Space Science and Technology Education in English (ARCSSTEE) was established by the United Nations through the Office for Outer Space Affairs (UNOOSA) to promote SST education in Africa through its 9month (January – October) PGD programme. In line with its mandate of capacity building, the centre focuses on four relevant areas which are of immense benefit to the region's growth and development. These are; Remote Sensing/ GIS, Satellite Communications, Basic Space and Atmospheric Science and Satellite Meteorology. Applicants for the programme are expected to have a minimum of a bachelor's degree obtained from an internationally recognized university/ institution. A minimum of five years of postgraduate experience in teaching, research or practical workexperience in any related field is desirable. The programme is open to qualified graduates of the participating African countries. The PGD programme started in year 2000 with little international participation. However, over the years it has metamorphosed to a full fledged regional/international programme. In 2006 academic session, fortysix graduate research scientists participated in the programme; fourteen participated in Satellite Communication, twentyeight in Remote Sensing/Geographic Information System (RS/GIS) and four in Basic Space and Atmospheric Sciences. Eighteen out of this number were foreign participants drawn from eleven countries; Uganda, Kenya, Ethiopia, Sudan, Zambia, South Africa, Gambia, Liberia, Cameroon, Malawi and Nigeria. All participants in the satellite communication options were Nigerians drawn from the Nigerian Armed Forces; Nigeria Air Force, Nigeria Navy, Nigeria Army and Nigeria Police; government ministries/agencies and public and private sectors. There were also privately sponsored individuals. In the 2007 academic session, there were eleven Nigerians and thirteen international students from Malawi, Cameroon, Sudan and the Democratic Republic of Congo, a Francophone country.

To encourage participation, the centre offers full scholarship to all international participants to cover tuition fees, flight tickets, monthly stipends and hostel accommodation. The PGD programme is exclusively funded by the Federal Government of Nigeria through National Space Research and Development Agency (NASRDA), Federal Ministry of Science and Technology. The centre employs the services of seasoned resource persons from relevant research institutions, industries and universities for effective and efficient dissemination of knowledge. Lectures are delivered in comfortable modern lecture rooms fully air-conditioned. The centre provides teaching and learning facilities like overhead projectors and internetready computers. The uniqueness of this arrangement lies in the fact that each participant has an exclusive use of personal computer spanning the 9 month period. To enhance the application of skills acquired, field trips are organized as part of the training programme at intervals. This creates opportunities for hands on activities or first hand experience. The four course options; Remote Sensing/GIS, Satellite Meteorology/Global Climate Change, Satellite Communications and Basic Space and Atmospheric Sciences are divided into modules and at the end of every module, participants are assessed and examined. A pilot project is submitted by every participant and at the end of the nine month course, diploma certificate is awarded. A reference library is provided for the PGD programme. Though it is being upgraded, participants could get books, journals and research to assist in the programme. In addition, participants have access to the University library. The total well being of participants is of paramount importance to the centre. To this end, participants have limited access to free medical services. Other facilities to serve the recreational needs of the participants are also provided by the Centre. The centre organises excursions to historical tourist sites at regular intervals. The excursions afford participants rare opportunity of learning about the history, culture and the physical environment of the Nigerian peoples. There is a very high employment prospect for our graduates. Over the years, our graduates have been outstanding in their specialized area of space science and technology applications. For instance, some were part of the team that was trained in China towards the building and launching of Nigeria Communication Satellite (NIGCOMSAT1) project. While some are contributing actively behind the scene either in academic institutions, relevant telecommunication industries, ministries, agencies parastatals of government, some are involved in developing space technology for the Nation. The success of the programme is attested to by the chains of commendations and encomiums from our graduates, African embassies and other institutions. The PGD programme is endorsed by the United Nations Office for Outer Space Affairs (UNOOSA).

The interdisciplinary nature of the postgraduate diploma programme is expected to cover all relevant areas where peaceful applications of Space Science and Technology are identified to be of potential benefit to the region's growth and development in the short to long term. Thus,

(a) Remote sensing and GIS with emphasis on the utilization of remote sensing for efficient resource utilization and management, hence generating sustainable plans for development. This module would cover fundamentals of remote sensing; concepts of resource management and science of sustainable development; GIS and global positioning system technology; integrated resources development; project capacity assessment and environmental management based on the global issues.

(b) Satellite communications with emphasis on the understanding of communications technology and its applications for providing services for education, health care, rural communications, etc. Satellite communication is the only means of reaching out to the world and it is towards this that the module will be focused. The module will cover system design and system engineering by undertaking major projects for demonstration; validation of system concepts and their applications; and design, fabrication and testing of specialized ground and space hardware.

(c) Satellite meteorology and global climate module is fashioned towards research and study of climate and weather processes with a view towards understanding and managing the phenomenon of squallline systems, cloud dynamics, etc. The programme will include aspects of satellite meteorology and atmospheric processes dealing with climate change, particularly of the impact of the ElNino and southern oscillations index in the region. The impact of the subtropical high pressure systems, the monsoon systems, the subtropical jets (TEJ), the African easterly jet (AEJ), ocean processes, the Earth's boundary layer processes, etc. on the weather and climate regimes of the continent as revealed by meteorological satellites will form an important part of the programme.

(d) Basic Space and Atmospheric Sciences module will focus on the understanding of the basic aspects of space and atmospheric sciences (and technology). The programme will include studies of the Earth's atmosphere and its changes over the region/globe; ionosphere and solar-terrestrial interactions; space science, data assimilation and modelling. The module will cover system design and system engineering of desired space technology systems, undertaking projects for demonstration and validation of system concepts and their applications and design, fabrication and testing simple and specialized space technology hardware.

OUTREACH PROGRAMME

The CSSTE runs an Outreach Programme fundamentally designed to create public awareness, sensitize nursery/primary and secondary school children in the area of space science and technology education. The centre periodically organizes schools workshops with themes bordering on applications and benefits of space science. These workshops provide opportunities for students to try their hands on different science-based activities like assembling of mockups of satellite, rocket, rocket launchers and performance of simple on-the-spot experiments. In furtherance of this task of popularizing space science, lectures, talks, video shows and quiz competitions are organized. These fun-filled activities are designed to increase the curiosity and interest of students in the sciences generally and space science in particular thereby firing their imaginations. Souvenirs, teaching aids and promotional materials such as T-shirts, face caps, pens, exercise books, conference bags and folders are distributed to students and teachers. To enrich the outreach programme, the centre has a space museum replete with mockups of space hardware (rocket launchers, Space Shuttles, Ariane 5 rocket, Galileo Satellite, NigeriaSat1, etc) locally fabricated inhouse. The space museum is becoming a tourist destination of some sort as school children from far and near visit on excursion. The exhibitions make space science and technology real to the students and in a way demystifies the myth surrounding space science.

An equally vital objective of the programme is the inclusion of space science education in the school curriculum; to this end, the centre is in partnership with other science related bodies and educational institutions. The centre has also launched Space Science clubs for students of primary and secondary schools. In January 2007, the centre in collaboration with the Osun State Government organized the First Osun State GLOBE Nigeria workshop. The centre celebrates the World Space Week (October 4-10) annually to further sensitize and motivate young scientists who would take up careers in space science and technology.

To further achieve the desired impact, the Centre is collaborating with stakeholders, Federal Ministry of Education and United Nations Scientific and Cultural Organization (UNESCO), to design space education curriculum for schools. The Centre also organizes competitions which involve essays and drawings for school children's perception of space science. Excursions to spacerelated scientific establishments are organized by the Centre as part of efforts to popularize space science and technology in Nigeria.

III. THE VISITORS' PROGRAMME

ARCSSTEE is an educational and research establishment, whose aim is to bring together researchers in the region to work together in the areas of Space Science and Technology. Thus the primary objective is to create the enabling environment for researchers to use available information from satellite and other remote sensing data in research for the overall socioeconomic benefit of the participating countries and the entire region. It is also aimed at ensuring that African countries keep abreast with the world progress in SST.

As such the Centre welcomes scientific visitors (postdocs and senior academics) wishing to spend between 1 and 3 months as short term visitors, and for a longer period (maximum of one year), to be engaged in any of the four major areas of SST programmes being offered at the Centre. Also, for senior academics visiting the Centre, there is the opportunity for those who may wish to partake in teaching of courses in the diploma programme. Application can be made at any time of the year.

IV. CONSULTANCY AND SHORT COURSES

Upon request, the Centre is willing to organize packaged training for any agency (e.g. parastatals on the environment, armed forces, etc.) that may wish to avail their staff benefits of short/refresher courses in the areas of SST. It is also possible to conduct these short intensive programmes on site if so desired. Also, the Centre can undertake consultancies for both governments and nongovernmental organizations, and mount workshops for scientists and policy makers. In pursuance of this mandate, the Centre is collaborating with Centre for Distance Learning, Departments of Electrical/Electronics, Educational Technology and Geography of the Obafemi Awolowo University to meet training needs of Nigerians on a large scale.

INFORMATION

For more information about the African Regional Centre for Space Science and Technology Education in English (ARCSSTEE) and its programmes, please contact:

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